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Release Notes for IP Telephony in Cisco IOS Release 11.3(6)NA2

November 2, 1998

These release notes describe the IP Telephony features and caveats for Cisco IOS Release 11.3(6)NA2. The IP Telephony features are available in the Cisco 2500 and Cisco 3600 series routers and in the Cisco AS5300 universal access servers.

Caution Cisco IOS Release 11.3(6)NA2 requires VCWare Version 2.4.

For more information on these products, in general, refer to the following release notes:

- *Release Notes for the Cisco 2500 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco 3600 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco AS5300 for Cisco IOS Release 11.3 NA*

You can also obtain general information about the features and caveats in these release notes by referring to the *Release Notes for Cisco IOS Release 11.3*, which contains features and caveats for all 11.3 platforms. The electronic documentation can be found on Cisco Connection Online (CCO) and on the Documentation CD-ROM. Refer to the "Related Documentation" section on page 8 for details.

Contents

These release notes discuss the following topics:

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA

System Requirements

System requirements include information such as memory requirements, supported hardware, how to determine your software release, upgrading to a new release, and a list of features.

For details on the system requirements, refer to the System Requirements sections in the following release notes:

- *Release Notes for the Cisco 2500 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco 3600 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco AS5300 for Cisco IOS Release 11.3 NA*

New Features

The following sections list the new features supported by IP Telephony for Cisco IOS Release 11.3(6)NA2. Refer to the document *Configuring the Cisco AS5300 for Voice Service Provider Features* for detailed information about these features, which is an addendum to the *Voice Over IP for the Cisco AS5300 Software Configuration Guide*.

IP Telephony Overview

The IP Telephony features include enhancements made to the functionality and configuration of both the gateway and the VoIP gatekeeper. The architecture of these features provides the Quality of Service (QoS), stability, and functionality necessary for carrier class real-time IP communications services.The Cisco gateway functionality and gatekeeper functionality work in concert to provide the ITU-T H.323 infrastructure.

To help understand the overall implication of which features affect which portion of the internetworking environment, the various IP Telephony features are described in the following two categories:

- Gatekeeper — Can manage a zone and provide bandwidth management and address resolution services to gateways when present in the network.
- Gateway Functionality Enhancements — Refers to the Cisco AS5300 universal access server with voice cards and the VoIP image. Gateways may also be referred to as VoIP gateways.

  The gateway can terminate a call from PSTN and provides user admission control using IVR, and direct the call to the destination, or can terminate the call from another Gateway and send the call to the PSTN, and finally provide accounting records for the calls.

Cisco 2500 Series Routers

This section describes the new IP Telephony features for the Cisco AS5300 universal access server in Cisco IOS Release 11.3(2)NA2.

Gatekeeper

The Gatekeeper can manage a zone and provide bandwidth management and address resolution services to gateways when present in the network.

HSRP Support

Gatekeeper HSRP (Hot Standby Router Protocol) support consists of elements in both the gateway and gatekeeper functions in the router. The gateway periodically retries its registration when it detects a possible gatekeeper failure, in order to register itself with the backup gatekeeper. Although it is a backup, the gatekeeper operates in a passive mode in which it does not accept registrations, and becomes active when it is notified by HSRP that it will become the primary gatekeeper.

E.164 Address Support

There are two types of addresses used in H.323 destination calls:

- H.323-ID (a character string)
- E164 address (a string containing phone-keypad characters)

The Cisco IOS Release 11.3(2)NA software feature Multimedia Conference Manager dealt primarily with H.323-ID addressing in interzone calls. With the new prefix commands, the administrator can now also configure interzone routing when calls are made using E164 addresses.

Technology Prefixes

Technology prefixes are used to distinguish between gateways having specific capabilities within a given zone. They are handled specially because the technology prefix is ignored during the zone selection process and then examined for gateway selection within the zone. This requires that the prefix be ignored during the zone selection process. Technology prefixes have been designed to enable the use of E.164 address routing. E.164 is an International Telecommunications Union (ITU) specification for the ISDN international telephone numbering plan, which has traditionally only been used in telephone networks.

Cisco 3600 Series Routers

This section describes the new IP Telephony features for the Cisco 3600 series routers, including the Cisco 3620 and the Cisco 3640, in Cisco IOS Release 11.3(2)NA2.

Gatekeeper

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Cisco AS5300 Universal Access Servers

This section describes the new IP Telephony features for the Cisco AS5300 universal access server in Cisco IOS Release 11.3(2)NA2.

Gateway

See the “IP Telephony Overview” section on page 2 for details.

Gateway RAS Implementation

Registration, Admission, and Status (RAS) is a signaling function that performs registration, admissions, status, and disengage procedures between the VoIP gateway and gatekeeper.

The gateway relies on Cisco IOS command-line interface commands, outside of gateway configuration mode, to configure handling of the AAA servers. Two following RAS command fields have been added to the dial-peer entry to enable the RAS implementation:

- Technology prefix
- Session target RAS

AAA Enhancements

The feature AAA represents authentication, authorization, and accounting features that are required in the VoIP gateway. The standard Cisco authentication, authorization, and accounting functionality is enhanced to allow calls to:

- Create a Call Detail Record
- Authenticate based on information collected from the Interactive Voice Response (IVR) feature, or from caller identification data.

The AAA authentication feature permits RADIUS to be used to authenticate users on the gateway. It is normally used with IVR to check the legitimacy of a prospective gateway user based on an account number (collected by IVR) or based on answer number identification (ANI).

Interactive Voice Response

This application provides basic Interactive Voice Response (IVR) capabilities necessary to collect caller Personal Identification Number (PIN), passwords, and destination phone numbers. IVR consists of simple voice prompting and digit collection to collect information from the caller for the purpose of authenticating the user and to identify the destination.

"Simple" IVR allows the use of one of several interactive voice response scripts embedded in Cisco IOS software. The ability to modify the embedded scripts is not yet provided. However, the audio files (for the prompts) can be modified for the user.

The user receives a voice prompt instruction to enter a specific type of information, for example, a PIN number. After playing the voice prompt, the IVR feature starts the process of collecting some number of touch tones (digit collection).

The IVR application specifies a sequence of voice prompts and touch-tone collection instructions. IVR applications can be assigned to specific ports, or can be invoked based on DNIS. An IP/PSTN gateway can have several different IVR applications to accommodate many different gateway services. The IVR applications can be customized to present different interfaces to the caller.

ISDN Redirect Number Support

The purpose of this feature is to support the redirecting call feature of the VoIP gateway. The redirecting number is an optional field of the Q.931 Setup message.

When a local exchange carrier (LEC) switch detects an incoming call that is destined for a busy or nonanswering party, the switch formulates a Q.931 Setup message with redirecting number field set to the originally called number, and sends it to the gateway. The called party number of the Setup message will be set to one of the service access numbers dialed number identification service (DNIS) of the gateway.

If a redirect number is present on an incoming call, then it is used in place of the called number (DNIS).

Rotary Call Pattern

The Rotary Calling Pattern feature provides the ability to route an incoming call arriving via a telephony interface back out via another telephony interface under certain circumstances. This is primarily used to provide reliable service during network failures. Call establishment via Rotary Call Pattern will be supported via rotary group support of dial peers, where multiple dial peers may match a given destination phone number and will be selected in sequence.

In prior releases of VoIP, if you wanted the system to search through a number of destinations, when a given number is dialed, you needed to configure those dial peers with the same destination pattern. Now with the Rotary Call Pattern feature, if you want the destinations to be tried in a certain order, you can assign preference (via the **preference** command) to the dial peers to reflect that order.

T1 CAS

Channel associated signaling (CAS) is the transmission of signaling information within the voice channel. In addition to receiving and placing calls, T1 CAS provides the receipt and capture of Dialed Number Identification (DNIS) and Automatic number identification (ANI) information. This particular information (DNIS and ANI) is used to support authentication and other functions that use this information. This feature allows the support of E&M signaling on the T1 interface.

T1 Channel Associated Signaling (CAS) capabilities have been implemented on the AS5300 voice feature card to support common central office and PBX configurations for voice calls. The development of this feature is to enhance and integrate T1 CAS capabilities on the DSP Module (DSPM) in order to support central office (CO) and PBX configurations for voice calls.

Caveats

The caveats listed in this section apply to Cisco IOS Release 11.3(6)NA2 for the Cisco 2500 and 3600 series routers and for the Cisco AS5300 universal access servers.

AAA Enhancements

When using the H.323 accounting method, the “overloaded” acct-session-id attribute is truncated in AAA debug information. The attribute is sent to the RADIUS server properly. [CSCdk30888]

Gatekeeper

When using HSRP to provide gatekeeper redundancy, the **show gatekeeper status** command indicates the state (UP vs. HSRP STANDBY) of a disconnected gatekeeper incorrectly. [CSCdk52261]

When configuring the proxy with a specified gk-id, multicast GK discovery will not work. In this situation, use unicast discovery. [CSCdk31965]

If the proxy receives a GRJ from a gatekeeper, the message "GK_DISCOVERY_FAILED" will be displayed. You can safely ignore these messages. [CSCdk53121]

In certain rare circumstances, a race condition can cause the proxy to admit more sessions than the MAX-SESSION limit. [CSCdk31683]

If the Gatekeeper receives a multicast GRQ which is not honored, it erroneously responds with silence. The proper response is to send a GRJ. [CSCdk22713]

If an endpoint makes an Admission Request (ARQ) to a gatekeeper which requires multiple Location Requests (LRQ), the endpoint may time-out before the ARJ or ACF is returned. [CSCdk23668]

When a static alias is entered in the Gatekeeper configuration with a fully-qualified E.164 address, i.e., with a prefix matching the gatekeeper's zone prefix, the address will be stored with its prefix stripped off. [CSCdk32624]

If the Gatekeeper configures a static alias for a gateway and that gateway registers with the gatekeeper then subsequently unregisters, it will be unable to re-register with the same gatekeeper. [CSCdk31603]

The proxy does not respond to DRQ request. The GK feature (CSCdk48054) to allow the sysadmin to shutdown an active call which will result a DRQ to be sent to the proxy only goes into 12.0(5)T. [CSCdk26892]

The potential H.225 Library memory leak is fixed. This one is fixed on 11.3NA as CSCdk27035. The only thing 11.3NA does not have is the freeing of the tech-prefix in the setup message. Because CSCdk27035 went into 11.3NA (not gte_sigma) which was before tech-prefix got introduced. But this is not a big deal since the gateway (already confirmed with Binh Ha a while back) does not send tech-prefix in the setup message. [CSCdk25068]

Gateway RAS

When more than one interface can be used to communicate by the gateway to communicate with a gatekeeper, the gateway might fail to process calls properly because it is using more than one source address to communicate with the gatekeeper. The workaround is to ensure that communication with the gatekeeper occurs using only one source interface. [CSCdk24938]

When using RADIUS accounting, the NAS-Port reported for calls corresponds to the D channel of the ISDN PRI interface associated with the call (for example, serial 0:23) rather than the B channel associated with the call. [CSCdk33562]

When using RAS to place a call using a gatekeeper, the gateway always requests 64 kbps of bandwidth even though the connection might require less. [CSCdk44159]

Miscellaneous

Some fax machines might not successfully be able to train down to speeds supported by high compression CODECs. For a workaround, explicitly configure **fax-rate 9600** on the dial-peer. [CSCdk55064]

The message "%CSM-1-HWIDB_SUBBLOCK: EVENT_FROM_ISDN:: hwidb subblock for b channel *n* is in use" might appear if an ISDN PRI connection goes down unexpectedly. You can safely ignore this message. [CSCdk25989]

When receiving calls from other vendors' H.323 clients, the message "ISDN ERROR: Module-l3_sdl_u Function-Ux_BadMsg Error-Source ID = 400 Event = A0" might appear on the console. You can safely ignore this message, and the voice connection is set up properly. [CSCdk38886]

Under various circumstances, various "%VTSP-4-FSM_BAD_EVENT: Invalid FSM Input on channel" messages might appear on the console. You can ignore these messages. [CSCdk42704, CSCdk44816, CSCdk47695, CSCdk47703, CSCdk47706]

Under heavy call load conditions, "%ISDN-6-SETUP_PENDING" messages might appear on the console. You can safely ignore these messages. [CSCdk45064]

Under heavy call load conditions, various "ISDN ERROR: Module-l3_sdl_u Function-Ux_BadMsg" messages might appear on the console. These messages may safely be ignored. [CSCdk45070]

Sometimes, after a period of heavy fax traffic, messages similar to "%SYS-2-LINKED: Bad enqueue of 60C047D4 in queue 60DA2F88 -Process= 'VTSP'" may be seen. This message does not affect the fax call, only RTCP statistics collection. [CSCdk45362]

Fax relay at 14400 bps does not function properly. The maximum rate at which fax relay will operate is 9600 bps. [CSCdk50298]

Under heavy load conditions with fax traffic, the message "cch323_do_call_disconnect: cannot find control block based on callID" might appear on the console. You can ignore these messages. [CSCdk51646]

The output of the **show version** command might indicate only 24 voice resources, while a larger number are actually present in the system. [CSCdk54557]

Outgoing VoIP call legs might terminate with an incorrect cause code as shown by debug information and accounting data. [CSCdk56000]

The **session target** dial peer parameter is improperly updated when changing from one session target to another. As a workaround, configure **no session target** before reconfiguring it. [CSCdk54591]

T1CAS

When using T1 CAS with loop start signaling, it might take up to 1 minute for a channel to be freed at the conclusion of a call. [CSCdk35267]

When changing T1 CAS signaling type, it is necessary to **shut**/**no shut** the associated controller in order for the signaling type change to take effect. [CSCdk42591]

Related Documentation

For more information on IP telephony features, refer to the document, *Configuring the Cisco AS5300 for Voice Service Provider Features*.

For more information on the specific platforms, you can supplement these release notes by referring to the following release notes:

- *Release Notes for the Cisco 2500 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco 3600 Series Router for Cisco IOS Release 11.3 NA*
- *Release Notes for the Cisco AS5300 for Cisco IOS Release 11.3 NA*

Feature Documentation

- To access the feature modules on CCO, follow this path:

  Products and Ordering, **Cisco Documentation**: **Cisco IOS Software Configuration**: **Cisco IOS Release 11.3**: **Cisco IOS 11.3T New Features**

- To access the feature modules on the Documentation CD-ROM, follow this path:

  Cisco Product Documentation: **Cisco IOS Software Configuration**: **Cisco IOS Release 11.3**: **Cisco IOS 11.3T New Features**

Cisco IOS Software Documentation

For more information on the Cisco IOS software documentation, see the product-specific release notes for the Cisco IOS Release 11.3 T.

- To access CCO, follow this path:

  Cisco Product Documentation: **Cisco IOS Software Configuration***:* **Cisco IOS Release 11.3**

- To access Product Bulletins on CCO, follow this path:

  Products and Ordering: **More Information**: **Product Bulletins**

  In the Software area, under Cisco IOS 11.3, click on the bulletin you wish to see. The Product Bulletin for Cisco IOS Release 11.3 NA is No. 762.

- To access the Documentation CD-ROM, follow this path:

  Cisco Product Documentation: **Cisco IOS Software Configuration**: **Cisco IOS Release 11.3**

The following are some of the types of Cisco IOS Release 11.3 documents:

- Feature descriptions, configuration guides, command references
- Cisco IOS 11.3T new features
- Product-specific release notes
- Cisco IOS software release caveats

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

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You can access CCO in the following ways:

- WWW: http://www.cisco.com
- WWW: http://www-europe.cisco.com
- WWW: http://www-china.cisco.com
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

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Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at http://www.cisco.com, http://www-china.cisco.com, or http://www-europe.cisco.com.

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This document is to be used in conjunction with the Cisco IOS Release 11.3 configuration guides and command references publications.