Release Notes for the Cisco 1700 Series Routers for Cisco IOS Release 12.2(13)ZH5

December 13, 2004

These release notes describe new features and significant software components for the Cisco 1700 series routers that support the Cisco IOS Release 12.2 T, up to and including Release 12.2(13)ZH5. These release notes are updated as needed to describe new memory requirements, new features, new hardware support, software platform deferrals, microcode or modem code changes, related document changes, and any other important changes. Use these release notes with the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T* located on Cisco.com and the Documentation CD.

For a list of the software caveats that apply to Release 12.2(13)ZH5, see the "Caveats" section on page 32, and the online *Caveats for Cisco IOS Release 12.2 T* document. The caveats document is updated for every 12.2 T maintenance release and is located on Cisco.com and the Documentation CD.

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System Requirements

This section describes the system requirements for Release 12.2(13)ZH5 and includes the following sections:

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Memory Requirements

Table 1 describes the memory requirements for the Cisco IOS feature sets supported by the Cisco IOS Release 12.2(13)ZH5 on the Cisco 1700 series routers.

Table 1 Recommended Memory for the Cisco 1700 Series Routers

Platform	Image Name	Feature Set	Image	Flash Memory	DRAM
Cisco 1751, Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/ADSL/VOICE PLUS	IP/ADSL/VOICE PLUS	c1700-sv3y7-mz	16 MB	64 MB
	Cisco 1700 IOS IP/VOICE PLUS	IP/VOICE PLUS	c1700-sv3y-mz	16 MB	64 MB

Table 1 Recommended Memory for the Cisco 1700 Series Routers (continued)

Platform	Image Name	Feature Set	Image	Flash Memory	DRAM
Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/VOX/FW/IDS PLUS IPSEC 56	IP/ADSL/IPX/AT/ IBM/VOX/FW/IDS PLUS IPSEC 56	c1700-bk8no3r2sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/VOX/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/IPX/AT/ IBM/VOX/FW/IDS PLUS IPSEC 3DES	c1700-bk9no3r2sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX/ FW/IDS PLUS IPSEC 56	IP/ADSL/VOX/FW/ IDS PLUS IPSEC 56	c1700-k8o3sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX PLUS IPSEC 56	IP/ADSL/VOX PLUS IPSEC 56	c1700-k8sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX/FW/IDS PLUS IPSEC 3DES	IP/ADSL/VOX/FW/ IDS PLUS IPSEC 3DES	c1700-k9o3sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX PLUS IPSEC 3DES	IP/ADSL/VOX PLUS IPSEC 3DES	c1700-k9sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/ VOX/FW/IDS PLUS	IP/ADSL/IPX/ VOX/FW/IDS PLUS	c1700-no3sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX/ FW/IDS PLUS	IP/ADSL/VOX/FW/ IDS PLUS	c1700-o3sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOX PLUS	IP/ADSL/VOX PLUS	c1700-sv8y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/VOICE/FW/IDS PLUS IPSEC 56	IP/ADSL/IPX/AT/ IBM/VOICE/FW/ IDS PLUS IPSEC 56	c1700-bk8no3r2sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/VOICE/ FW/IDS PLUSIPSEC 3DES	IP/ADSL/IPX/AT/ IBM/VOICE/FW/ IDS PLUS IPSEC 3DES	c1700-bk9no3r2sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOICE/ FW/IDS PLUS IPSEC 56	IP/ADSL/VOICE/ FW/IDS PLUS IPSEC 56	c1700-k8o3sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOICE PLUS IPSEC 56	IP/ADSL/VOICE PLUS IPSEC 56	c1700-k8sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOICE/ FW/IDS PLUS IPSEC 3DES	IP/ADSL/VOICE/ FW/IDS PLUS IPSEC 3DES	c1700-k9o3sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/VOICE PLUS IPSEC 3DES	IP/ADSL/VOICE PLUS IPSEC 3DES	c1700-k9sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/ VOICE/FW/IDS PLUS	IP/ADSL/IPX/ VOICE/FW/IDS PLUS	c1700-no3sv3y7-mz	32 MB	96 MB

Table 1 Recommended Memory for the Cisco 1700 Series Routers (continued)

Platform	Image Name	Feature Set	Image	Flash Memory	DRAM
Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/ADSL/VOICE/ FW/IDS PLUS	IP/ADSL/VOICE/ FW/IDS PLUS	c1700-o3sv3y7-mz	32 MB	96 MB
	Cisco 1700 IOS IP/VOX PLUS	IP/VOX PLUS	c1700-sv8y-mz	32 MB	64 MB
Cisco 1720, Cisco 1721, Cisco 1751, Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/IPX	IP/IPX	c1700-ny-mz	16 MB	48 MB
	Cisco 1700 IOS IP/IPX/AT/IBM	IP/IPX/AT/IBM	c1700-bnr2y-mz	16 MB	48 MB
	Cisco 1700 IOS IP/FW/IDS	IP/FW/IDS	c1700-o3y-mz	16 MB	48 MB
	Cisco 1700 IOS IP	IP	c1700-y-mz	16 MB	32 MB
	Cisco 1700 IOS IP/PLUS	IP/PLUS	c1700-sy-mz	16 MB	48 MB
Cisco 1701, Cisco 1721, Cisco 1751, Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/FW/IDS PLUS IPSEC 56	IP/ADSL/IPX/AT/ IBM/FW/IDS PLUS IPSEC 56	c1700-bk8no3r2sy7-mz	16 MB	96 MB
	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM/FW/IDS PLUS IPSEC 3DES	IP/ADSL/IPX/AT/ IBM/FW/IDS PLUS IPSEC 3DES	c1700-bk9no3r2sy7-mz	16 MB	96 MB
	Cisco 1700 IOS IP/ADSL/FW/IDS PLUS IPSEC 56	IP/ADSL/FW/IDS PLUS IPSEC 56	c1700-k8o3sy7-mz	16 MB	64 MB
	Cisco 1700 IOS IP/ADSL PLUS IPSEC 56	IP/ADSL PLUS IPSEC 56	c1700-k8sy7-mz	16 MB	64 MB
	Cisco 1700 IOS IP/ADSL/FW/IDS PLUS IPSEC 3DES	IP/ADSL/FW/IDS PLUS IPSEC 3DES	c1700-k9o3sy7-mz	16 MB	64 MB
	Cisco 1700 IOS IP/ADSL PLUS IPSEC 3DES	IP/ADSL PLUS IPSEC 3DES	c1700-k9sy7-mz	16 MB	64 MB
	Cisco 1700 IOS IP/ADSL/IPX/FW/ IDS PLUS	IP/ADSL/IPX/FW/ IDS PLUS	c1700-no3sy7-mz	16 MB	64 MB
Cisco 1701, Cisco 1720, Cisco 1721, Cisco 1751, Cisco 1751-V and Cisco 1760	Cisco 1700 IOS IP/ADSL/IPX/AT/ IBM PLUS	IP//ADSL/IPX/AT/ IBM PLUS	c1700-bnr2sy7-mz	16 MB	48 MB
	Cisco 1700 IOS IP/ADSL PLUS	IP/ADSL PLUS	c1700-sy7-mz	16 MB	48 MB
	Cisco 1700 IOS IP/ADSL	IP/ADSL	c1700-y7-mz	16 MB	48 MB

Hardware Supported

Cisco IOS Release 12.2(13)ZH5 supports the following Cisco 1700 series routers:

- Cisco 1701 router
- Cisco 1720 router
- Cisco 1721 router
- Cisco 1751 and 1751-V router
- Cisco 1760

The Cisco 1701, Cisco 1720, and Cisco 1721routers run data images only. The Cisco 1751, Cisco 1751-V, and 1760 routers run data or data-and-voice images, providing digital and analog voice support.

For descriptions of existing hardware features and supported modules, see the hardware installation guides, configuration and command reference guides, and additional documents specific to the Cisco 1700 series routers, which are available on Cisco.com and the Documentation CD at the following location:

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/1700/index.htm

This URL is subject to change without notice. If it changes, point your web browser to Cisco.com, and click the following path:

Cisco Product Documentation: **Access Servers and Access Routers**: **Modular Access Routers**: **Cisco 1700 Series Routers**: **<platform_name>**

Determining the Software Version

To determine which version of Cisco IOS software is currently running on your Cisco 1700 series router, log in to the router and enter the **show version** EXEC command. The following sample output from the **show version** command indicates the version number.

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) C1700 Software (C1700-NY-MZ), Version 12.2(13)ZH5, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
Synched to technology version 12.2(14.5)T
```

Upgrading to a New Software Release

For general information about upgrading to a new software release, refer the *Software Installation and Upgrade Procedures* located at http://www.cisco.com/warp/public/130/upgrade_index.shtml.

Feature Set Tables

The Cisco IOS software is packaged in feature sets consisting of software images, depending on the platform. Each feature set contains a specific set of Cisco IOS features. Release 12.2(13)ZH5 supports the same feature sets as Releases 12.2 and 12.2(13)T, but Release 12.2(13)ZH5 includes new features supported by the Cisco 1700 series routers.

Caution The Cisco IOS images with strong encryption (including, but not limited to, 168-bit [3DES] data encryption feature sets) are subject to United States government export controls and have limited distribution. Strong encryption images to be installed outside the United States will likely require an export license. Customer orders can be denied or subject to delay as a result of United States government regulations. When applicable, the purchaser/user must obtain local import and use authorizations for all encryption strengths. Please contact your sales representative or distributor for more information, or send an e-mail to export@cisco.com.

Table 2 through Table 6 list the features and feature sets supported in the Cisco IOS Release 12.2(13)ZH.

The tables use the following conventions:

- Yes—The feature is supported in the software image.
- No—The feature is not supported in the software image.
- In—The number in the "In" column indicates the Cisco IOS release in which the feature was introduced. For example, "12.2(13)ZH" means that the feature was introduced in 12.2(13)ZH. If a cell in this column is empty, the feature was included in a previous release or in the initial base release.

Note These feature set tables contain only a selected list of features, which are cumulative for Release 12.2(13)*nn* early deployment releases only (*nn* identifies each early deployment release). The tables do not list all features in each image—additional features are listed in the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T* and Release 12.2 T Cisco IOS documentation.

Table 2 Feature List by Feature Set for Cisco 1751, 1751-V, and 1760 Routers

Feature	In	Feature Set	
		IP/ADSL/ VOICE PLUS	IP/VOICE PLUS
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	No	No
DHCP Option 82	12.2(13)ZH	Yes	Yes
ADSL over ISDN	12.2(13)ZH	Yes	No
General Voice Routing Enhancements			

Table 2 Feature List by Feature Set for Cisco 1751, 1751-V, and 1760 Routers (continued)

Feature	In	Feature Set	
		IP/ADSL/ VOICE PLUS	IP/VOICE PLUS
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No
Session Initiation Protocol (SIP) Enhancements			
SIPv2.0 Enhancements		No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements			
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No
IVR: Directing AAA Requests	12.2(13)ZH	No	No
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	No	No
Fax Detection for VoiceXML	12.2(13)ZH	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No
VoiceXML RECORD Element	12.2(13)ZH	No	No
Media Stream Recording Support	12.2(13)ZH	No	No
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No
Voice Infrastructure Enhancements			
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No

Table 3, Part 1 Feature List by Feature Set for Cisco 1751-V and 1760 Routers

Feature	In	Feature Set					
		IP/ADSL/ IPX/AT/ IBM/VOX/ FW/IDS PLUS IPSEC 56	IP/ADSL/ IPX/AT/ IBM/VOX/ FW/IDS PLUS IPSEC 3DES	IP/ADSL/ VOX/FW/ IDS PLUS IPSEC 56	IP/ADSL/ VOX PLUS IPSEC 56	IP/ADSL/ VOX/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ VOX PLUS IPSEC 3DES
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Direct HTTP Enroll with CA Servers	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
ADSL over ISDN	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
General Voice Routing Enhancements							
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Session Initiation Protocol (SIP) Enhancements							
SIPv2.0 Enhancements	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Interactive Voice Response (IVR) and VoiceXML Enhancements							
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
IVR: Configuring Dynamic Prompts	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
IVR: Customizing Accounting Templates	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
IVR: Directing AAA Requests	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
VoiceXML For Cisco IOS	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Fax Detection for VoiceXML	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
VoiceXML Transfer Enhancements	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
VoiceXML Voice Store and Forward	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
VoiceXML RECORD Element	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes

Table 3, Part 1 Feature List by Feature Set for Cisco 1751-V and 1760 Routers (continued)

Feature	In	Feature Set					
		IP/ADSL/ IPX/AT/ IBM/VOX/ FW/IDS PLUS IPSEC 56	IP/ADSL/ IPX/AT/ IBM/VOX/ FW/IDS PLUS IPSEC 3DES	IP/ADSL/ VOX/FW/ IDS PLUS IPSEC 56	IP/ADSL/ VOX PLUS IPSEC 56	IP/ADSL/ VOX/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ VOX PLUS IPSEC 3DES
Media Stream Recording Support	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced VoiceXML Diagnostics	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
Voice Infrastructure Enhancements							
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes

Table 3, Part 2 Feature List by Feature Set for Cisco 1751-V and 1760 Routers

Feature	In	Feature Set					
		IP/ADSL/ IPX/VOX/ FW/IDS PLUS	IP/ADSL/ VOX/ FW/ IDS PLUS	IP/ADSL/ VOX PLUS	IP/ADSL/ IPX/AT/ IBM/VOICE/ FW/IDS PLUS IPSEC 56	IP/ADSL/ IPX/ AT/IBM/ VOICE/ FW/IDS PLUS IPSEC 3DES	IP/ADSL/ VOICE/FW/ IDS PLUS IPSEC 56
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	No	No	No	Yes	Yes	Yes
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
ADSL over ISDN	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
General Voice Routing Enhancements							
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	Yes	Yes	Yes	No	No	No
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Session Initiation Protocol (SIP) Enhancements							

Table 3, Part 2 Feature List by Feature Set for Cisco 1751-V and 1760 Routers (continued)

Feature	In	Feature Set					
		IP/ADSL/ IPX/VOX/ FW/IDS PLUS	IP/ADSL/ VOX/ FW/ IDS PLUS	IP/ADSL/ VOX PLUS	IP/ADSL/ IPX/AT/ IBM/VOICE/ FW/IDS PLUS IPSEC 56	IP/ADSL/ IPX/ AT/IBM/ VOICE/ FW/IDS PLUS IPSEC 3DES	IP/ADSL/ VOICE/FW/ IDS PLUS IPSEC 56
SIPv2.0 Enhancements	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements							
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	Yes	Yes	Yes	No	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	Yes	Yes	Yes	No	No	No
IVR: Customizing Accounting Templates	12.2(13)ZH	Yes	Yes	Yes	No	No	No
IVR: Directing AAA Requests	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	Yes	Yes	Yes	No	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Fax Detection for VoiceXML	12.2(13)ZH	Yes	Yes	Yes	No	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	Yes	Yes	Yes	No	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	Yes	Yes	Yes	No	No	No
VoiceXML RECORD Element	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Media Stream Recording Support	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Enhanced VoiceXML Diagnostics	12.2(13)ZH	Yes	Yes	Yes	No	No	No
Voice Infrastructure Enhancements							
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	Yes	Yes	Yes	No	No	No

Table 3, Part 3 Feature List by Feature Set for Cisco 1751-V and 1760 Routers

Feature	In	Feature Set					
		IP/ADSL/ VOICE PLUS IPSEC 56	IP/ADSL/ VOICE/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ VOICE PLUS IPSEC 3DES	IP/ADSL/ IPX/VOICE/ FW/IDS PLUS	IP/ADSL/ VOICE/ FW/IDS PLUS	IP/VOX PLUS
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No	No	No	No	Yes
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No	No	No	No	Yes
Direct HTTP Enroll with CA Servers	12.2(13)ZH	Yes	Yes	Yes	No	No	No
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	Yes
ADSL over ISDN	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes	No
General Voice Routing Enhancements							
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No	No	No	No	Yes
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No	No	No	No	Yes
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No	No	No	No	Yes
Session Initiation Protocol (SIP) Enhancements							
SIPv2.0 Enhancements	12.2(13)ZH	No	No	No	No	No	Yes
Interactive Voice Response (IVR) and VoiceXML Enhancements							
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No	No	No	No	Yes
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No	No	No	No	Yes
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No	No	No	No	Yes
IVR: Directing AAA Requests	12.2(13)ZH	No	No	No	No	No	Yes
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No	No	No	No	Yes
VoiceXML For Cisco IOS	12.2(13)ZH	No	No	No	No	No	Yes
Fax Detection for VoiceXML	12.2(13)ZH	No	No	No	No	No	Yes
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No	No	No	No	Yes
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No	No	No	No	Yes
VoiceXML RECORD Element	12.2(13)ZH	No	No	No	No	No	Yes
Media Stream Recording Support	12.2(13)ZH	No	No	No	No	No	Yes

Table 3, Part 3 Feature List by Feature Set for Cisco 1751-V and 1760 Routers (continued)

Feature	In	Feature Set					
		IP/ADSL/ VOICE PLUS IPSEC 56	IP/ADSL/ VOICE/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ VOICE PLUS IPSEC 3DES	IP/ADSL/ IPX/VOICE/ FW/IDS PLUS	IP/ADSL/ VOICE/ FW/IDS PLUS	IP/VOX PLUS
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No	No	No	No	Yes
Voice Infrastructure Enhancements							
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No	No	No	No	Yes

Table 4 Feature List by Feature Set for Cisco 1720, 1721, 1751, 1751-V, and 1760 Routers

Feature	In	Feature Set				
		IP/IPX	IP/IPX/AT/ IBM	IP/FW/ IDS	IP	IP/PLUS
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No	No	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No	No	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	No	No	No	No	No
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes
ADSL over ISDN	12.2(13)ZH	No	No	No	No	No
General Voice Routing Enhancements						
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No	No	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No	No	No	No
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No	No	No	No
Session Initiation Protocol (SIP) Enhancements						
SIPv2.0 Enhancements	12.2(13)ZH	No	No	No	No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements						
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No	No	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No	No	No	No
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No	No	No	No
IVR: Directing AAA Requests	12.2(13)ZH	No	No	No	No	No

Table 4 Feature List by Feature Set for Cisco 1720, 1721, 1751, 1751-V, and 1760 Routers (continued)

Feature	In	Feature Set				
		IP/IPX	IP/IPX/AT/ IBM	IP/FW/ IDS	IP	IP/PLUS
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No	No	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	No	No	No	No	No
Fax Detection for VoiceXML	12.2(13)ZH	No	No	No	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No	No	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No	No	No	No
VoiceXML RECORD Element	12.2(13)ZH	No	No	No	No	No
Media Stream Recording Support	12.2(13)ZH	No	No	No	No	No
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No	No	No	No
Voice Infrastructure Enhancements						
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No	No	No	No

Table 5, Part 1 Feature List by Feature Set for Cisco 1701, 1721, 1751, 1751-V, and 1760 Routers

Feature	In	Feature Set				
		IP/ADSL/ IPX/AT/ IBM/FW/ IDS PLUS IPSEC 56	IP/ADSL/IPX/ AT/IBM/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ FW/IDS PLUS IPSEC 56	IP/ADSL PLUS IPSEC 56	IP/ADSL/ FW/IDS PLUS IPSEC 3DES
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No	No	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No	No	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes
ADSL over ISDN[1]	12.2(13)ZH	Yes	Yes	Yes	Yes	Yes
General Voice Routing Enhancements						
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No	No	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No	No	No	No

Table 5, Part 1 Feature List by Feature Set for Cisco 1701, 1721, 1751, 1751-V, and 1760 Routers (continued)

Feature	In	Feature Set				
		IP/ADSL/ IPX/AT/ IBM/FW/ IDS PLUS IPSEC 56	IP/ADSL/IPX/ AT/IBM/FW/ IDS PLUS IPSEC 3DES	IP/ADSL/ FW/IDS PLUS IPSEC 56	IP/ADSL PLUS IPSEC 56	IP/ADSL/ FW/IDS PLUS IPSEC 3DES
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No	No	No	No
Session Initiation Protocol (SIP) Enhancements						
SIPv2.0 Enhancements	12.2(13)ZH	No	No	No	No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements						
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No	No	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No	No	No	No
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No	No	No	No
IVR: Directing AAA Requests	12.2(13)ZH	No	No	No	No	No
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No	No	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	No	No	No	No	No
Fax Detection for VoiceXML	12.2(13)ZH	No	No	No	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No	No	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No	No	No	No
VoiceXML RECORD Element	12.2(13)ZH	No	No	No	No	No
Media Stream Recording Support	12.2(13)ZH	No	No	No	No	No
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No	No	No	No
Voice Infrastructure Enhancements						
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No	No	No	No

1. ADSL over ISDN feature is not supported on the Cisco 1701 router.

Table 5, Part 2 Feature List by Feature Set for Cisco 1701, 1721, 1751, 1751-V, and 1760 Routers

Feature	In	Feature Set	
		IP/ADSL PLUS IPSEC 3DES	IP/ADSL/IPX/ FW/IDS PLUS
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	Yes	No
DHCP Option 82	12.2(13)ZH	Yes	Yes
ADSL over ISDN[1]	12.2(13)ZH	Yes	Yes
General Voice Routing Enhancements			
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No
Session Initiation Protocol (SIP) Enhancements			
SIPv2.0 Enhancements	12.2(13)ZH	No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements			
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No
IVR: Directing AAA Requests	12.2(13)ZH	No	No
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	No	No
Fax Detection for VoiceXML	12.2(13)ZH	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No
VoiceXML RECORD Element	12.2(13)ZH	No	No
Media Stream Recording Support	12.2(13)ZH	No	No

Table 5, Part 2 Feature List by Feature Set for Cisco 1701, 1721, 1751, 1751-V, and 1760 Routers (continued)

Feature	In	Feature Set	
		IP/ADSL PLUS IPSEC 3DES	IP/ADSL/IPX/ FW/IDS PLUS
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No
Voice Infrastructure Enhancements			
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No

1. ADSL over ISDN feature is not supported on the Cisco 1701 router.

Table 6 Feature List by Feature Set for Cisco 1701, 1720, 1721, 1751, 1751-V, and 1760 Routers

Feature	In	Feature Set		
		IP/ADSL/ IPX/AT/ IBM PLUS	IP/ADSL PLUS	IP/ADSL
Cisco IOS Telephony Service Version 2.1	12.2(13)ZH	No	No	No
Cisco Survivable Remote Site Telephony Version 2.1	12.2(13)ZH	No	No	No
Direct HTTP Enroll with CA Servers	12.2(13)ZH	No	No	No
DHCP Option 82	12.2(13)ZH	Yes	Yes	Yes
ADSL over ISDN[1]	12.2(13)ZH	Yes	Yes	Yes
General Voice Routing Enhancements				
VoIP Gateway Trunk and Carrier Based Routing Enhancements	12.2(13)ZH	No	No	No
Enhanced Debug Capabilities for Cisco Voice Gateways	12.2(13)ZH	No	No	No
VoIP and Policy Based Routing (PBR) Interoperability	12.2(13)ZH	No	No	No
Session Initiation Protocol (SIP) Enhancements				
SIPv2.0 Enhancements	12.2(13)ZH	No	No	No
Interactive Voice Response (IVR) and VoiceXML Enhancements				
TCL IVR 2.0 Call Initiation and Callback	12.2(13)ZH	No	No	No
IVR: Configuring Dynamic Prompts	12.2(13)ZH	No	No	No

Table 6 Feature List by Feature Set for Cisco 1701, 1720, 1721, 1751, 1751-V, and 1760 Routers (continued)

Feature	In	Feature Set		
		IP/ADSL/ IPX/AT/ IBM PLUS	IP/ADSL PLUS	IP/ADSL
IVR: Customizing Accounting Templates	12.2(13)ZH	No	No	No
IVR: Directing AAA Requests	12.2(13)ZH	No	No	No
Speech Recognition and Synthesis for Voice Applications	12.2(13)ZH	No	No	No
VoiceXML For Cisco IOS	12.2(13)ZH	No	No	No
Fax Detection for VoiceXML	12.2(13)ZH	No	No	No
VoiceXML Transfer Enhancements	12.2(13)ZH	No	No	No
VoiceXML Voice Store and Forward	12.2(13)ZH	No	No	No
VoiceXML RECORD Element	12.2(13)ZH	No	No	No
Media Stream Recording Support	12.2(13)ZH	No	No	No
Enhanced VoiceXML Diagnostics	12.2(13)ZH	No	No	No
Voice Infrastructure Enhancements				
VoIP and Cisco Express Forwarding (CEF) Interoperability	12.2(13)ZH	No	No	No

1. ADSL over ISDN feature is not supported on the Cisco 1701 and Cisco 1720 routers.

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco 1700 series routers for Release 12.2(13)ZH.

New Hardware Features in Release 12.2(13)ZH

The following sections describe the new hardware features supported by the Cisco 1700 series routers for Release 12.2(13)ZH.

ADSL over ISDN

The asymmetric digital subscriber line (ADSL) over ISDN WAN interface card (WIC) (WIC-1ADSL-I-DG) conforms to the Cisco WIC or WIC/voice interface card (VIC) interfaces and enables ADSL services to be deployed. The WIC supports the UR-2 and Annex B G.992.1 technical specifications.

Cisco 1701

The Cisco 1701 router (part number CISCO1701-K9) is an ADSL security access router. It is a fixed configuration dual-port router, designed in a desktop form factor, that provides primary WAN access through ADSL (ADSL over plain old telephone service [POTS]) and a backup link through ISDN (BRI-S/T). It also provides standard Cisco IOS security capabilities through support for IPSec Virtual Private Network (VPN), stateful inspection firewall, and intrusion detection system.

The Cisco 1701 ADSL security router is ideal for providing secure/reliable Internet and corporate network connectivity to enterprise small branch offices and small- and medium-sized businesses. It offers business-class ADSL over POTS service with a redundant ISDN WAN link to ensure high availability of critical business applications. The Cisco 1701 router also supports a wide range of integrated security services, as well as advanced quality of service (QoS) features to prioritize mission-critical data traffic.

New Software Features in Release 12.2(13)ZH

The following sections describe the new software features supported by the Cisco 1700 series routers for Release 12.2(13)ZH.

Cisco IOS Telephony Service Version 2.1

The Cisco IOS Telephony Service (ITS) provides basic Cisco IP phone call-handling capabilities in a LAN environment on the Cisco routers. This service enables the Cisco multiservice routers to act as the Cisco IOS Telephony Service for the Cisco IP Phone 7960, Cisco IP Phone 7940, Cisco IP Phone 7910, and Cisco IP Conference Station 7935. This service also helps download phone software images and configures and manages the Cisco IP phones in your LAN. ITS provides a telephony system useful for a small office with a small number of extensions.

ITS offers an entry-level IP telephony solution integrated directly into the Cisco IOS software. Customers can now deploy voice, data, and IP telephony on a single platform for their small offices. ITS offers a core set of phone features that customers commonly require for their everyday business needs, and it leverages the wide array of voice capabilities that are available in the Cisco IOS software to provide a very robust IP telephony offering for the small office environment.

Cisco ITS version 2.1 provides support for the following new features:

- Additional languages
- Phone loads for Cisco CallManager 3.1 and above
- GUI customization capability
- H450.2 and H450.3 support in the Cisco IOS
- Consultative transfer
- Hookflash transfer

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_book09186a00801 53d1f.html

Cisco Survivable Remote Site Telephony Version 2.1

The Cisco Survivable Remote Site (SRS) Telephony feature provides Cisco CallManager with fallback support for Cisco IP phones attached to a Cisco router on your local network. The SRS Telephony feature enables routers to provide call-handling support for Cisco IP phones when they lose connection to remote primary, secondary, or tertiary Cisco CallManager installations, or when the WAN connection is down. Cisco CallManager version 3.2 supports Cisco IP phones at remote sites attached to Cisco multiservice routers across the WAN. Prior to the SRS Telephony feature, when the WAN connection between a router and Cisco CallManager failed, or when connectivity with Cisco CallManager was lost for some reason, Cisco IP phones on the network became unusable for the duration of the failure. The SRS Telephony feature overcomes this problem and ensures that the Cisco IP phones offer continuous (yet minimal) service by providing call-handling support for Cisco IP phones directly from the SRS Telephony router. The system automatically detects a failure and uses Simple Network Auto Provisioning (SNAP) technology to autoconfigure the branch office router to provide call processing for Cisco IP phones registered with the router. When the WAN link or connection to the primary Cisco CallManager is restored, call-handling reverts back to the primary Cisco CallManager.

Cisco SRS Telephony Version 2.1 introduces the following new features:

- Additional language options for IP Phone display
- Cisco IP Phone Expansion Module 7914 support
- dialplan-pattern command
- Increase in directory number maximums
- Unity Voice Mail integration

For more details on Cisco Survivable Remote Site Telephony feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/voicesw/ps2169/products_feature_guide09186a008018912f. html

Direct HTTP Enroll with CA Servers

Some Certificate Authorities (CAs) support enrollment via HTTP. The Cisco IOS software allows a user to specify a profile for HTTP enrollment related operations. The Cisco IOS software will fill in the command template within the profile with the PKCS 10 certificate request and up to eight user provided values. The resulting message will be sent to the HTTP server, and the response will be parsed for a PEM format certificate.

For more details of this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps5012/products_feature_guide09186a0080173d24.html

DHCP Option 82

The Dynamic Host Configuration Protocol (DHCP) relay agent information option (option 82) enables a DHCP relay agent to include information about itself when forwarding client-originated DHCP packets to a DHCP server. The DHCP server can use this information to implement IP address or other parameter-assignment policies.

DHCP Option 82 Support for Routed Bridge Encapsulation

The DHCP Option 82 Support for Routed Bridge Encapsulation feature provides support for the DHCP relay agent information option when ATM routed bridge encapsulation (RBE) is used.

This feature communicates information to the DHCP server using a sub-option of the DHCP relay agent information option called *agent remote ID*. The information sent in the agent remote ID includes an IP address identifying the relay agent and information about the ATM interface and the PVC over which the DHCP request came in. The DHCP server can use this information to make IP address assignments and security policy decisions.

DHCP Option 82 for Subscriber Identification

This feature enables the DHCP relay agent to include information about itself and the attached client when forwarding DHCP requests from a DHCP client to a DHCP server. The DHCP server can use this information to assign IP addresses, perform access control, and set quality of service (QoS) and security policies (or other parameter-assignment policies) for each subscriber of a service-provider network.

By enabling the DCHP option 82 feature on the switch, a subscriber is identified by the switch port through which it connects to the network (rather than by its MAC address). Multiple hosts on the subscriber LAN can be connected to the same port on the access switch and are uniquely identified.

For more details, refer to the following URLs:

- DHCP Address Allocation Using Option 82

  http://www.cisco.com/en/US/products/sw/iosswrel/ps5012/products_feature_guide09186a0080173d22.html

- DHCP Option 82 Support for Routed Bridge Encapsulation

  http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a0080087ad8.html

- DHCP Option 82 for Subscriber Identification

  http://www.cisco.com/en/US/products/hw/switches/ps646/products_configuration_guide_chapter09186a00800c6ed2.html

General Routing Enhancements

VoIP Gateway Trunk and Carrier Based Routing Enhancements

The Gateway Trunk and Carrier Based Routing Enhancements feature implements carrier sensitive routing (CSR) for the Cisco voice gateways. The gateway feature adds the following routing features:

- Implementation of trunk groups and enhanced key matches on several platforms and interfaces
- Reduction of the number of dial peers in a dial plan by using profile aggregation and multiple trunk group supports
- Enhanced hunting schemes
- Call capacity updates on carriers and trunk groups
- Carrier ID support
- Trunk group label support
- Number translation profiles per trunk group, source IP group, voice port, and dial peer
- Dial peer support of multiple trunk groups with translations per trunk group
- E.164 telephone number mapping (ENUM) support
- Source IP groups
- Voice over IP (VoIP) access list control
- Enhanced translation rules in stream editor (SED) regular expressions
- Incoming call blocking
- Cisco interactive voice response (IVR) 2.0 support for carrier ID–based dial peer matching, incoming call blocking, and dial peer number translation
- Call detail record (CDR) support
- Virtual Private Network (VPN) source routing (also referred to as static or basic carrier routing)

In a typical scenario, a call from the public switched telephone network (PSTN) arrives at a gateway (the ingress gateway), leaves the gateway as a VoIP call, arrives at a destination gateway (the egress gateway), and leaves that gateway as a PSTN call.

For more information on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a00800b5dbf.html

Enhanced Debug Capabilities for Cisco Voice Gateways

The enhanced debugging capability for Cisco voice gateways provides improvements to the debugging output in order to identify and track a specific call in a multiple-call environment. Prior to the implementation of this feature, it was difficult to correlate call information between gateways or to identify specific debug messages associated with a single call, when multiple voice calls were simultaneously active. The output was unstructured and presented in a free form.

This feature adds a new header to the debug outputs of multiple voice modules, such as Voice Telephony Service Provider (VTSP), call control application program interface (CCAPI), session application (SSAPP), and IVR. This feature also introduces the ability to have short/full header. There are no configurable tasks for this feature.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a00800b3566.html

VoIP and Policy Based Routing (PBR) Interoperability

Policy Based Routing (PBR) gives you a flexible means of routing packets by allowing you to configure a defined policy for traffic flows, lessening reliance on routes derived from routing protocols. To this end, PBR gives you more control over routing by extending and complementing the existing mechanisms provided by routing protocols. PBR allows you to set the IP precedence. It also allows you to specify a path for certain traffic, such as priority traffic over a high-cost link.

This feature enables PBR of VoIP traffic that originates or terminates on the specified voice gateways and introduces voice packet Differentiated Services Code Point (DSCP) marking for Media Gateway Control Protocol (MGCP) voice gateways.

For more details on the feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a00800b5db0.html

SIP Version 2.0 Enhancements

The Session Initiation Protocol (SIP) is a new protocol developed by the Internet Engineering Task Force (IETF) for multimedia conferencing over IP. SIP features are compliant with IETF RFC 2543, SIP: Session Initiation Protocol, published in March 1999.

The Cisco SIP functionality enables Cisco access platforms to signal the setup of voice and multimedia calls over IP networks. The SIP feature also provides non-proprietary advantages in the following areas:

- Protocol extensibility
- System scalability
- Personal mobility services
- Interoperability with different vendors

The SIP feature enhancements include the following:

- Configurable in-band alerting.
- Ability to specify the maximum number of SIP redirects.
- Ability to specify SIP or H.323 on a dial-peer basis.
- Configurable SIP message timers and retries.
- Interoperability with unified call services (UCS).
- Support for a variety of signaling protocols, including ISDN, PRI, and channel associated signaling (CAS).
- Support for a variety of interfaces, including
  - Analog interfaces: Foreign Exchange Station (FXS)/Foreign Exchange Office (FXO)/receive and transmit (E&M) analog interfaces.
  - Digital interfaces: T1 CAS and E1 CAS.
- Support for SIP redirection messages and interaction with SIP proxies. The gateway can redirect an unanswered call to another SIP gateway or SIP-enabled IP phone. In addition, the gateway supports proxy-routed calls.

- Interoperability with DNS servers including support for DNS SRV and *A* records to look up SIP URLs.
- Support for SIP over TCP and User Datagram Protocol (UDP) network protocols.
- Support Routing Table Protocol (RTP)/RTP Control Protocol (RTCP) for media transport in VoIP networks.
- Support for Record-Route headers.
- Support for IP QoS and IP precedence.
- Support for IP Security (IPSec) for SIP signaling messages.
- AAA support. For accounting, the gateway device generates call data record (CDR) accounting records for export. For authentication, the SIP Gateway sends validate requests to the AAA server. For authorization, the existing access lists are used.
- Support for call hold and call transfer features. The call hold sends a mid-call INVITE message, which requests that the remote endpoint stop sending media streams. The call transfer is done without consultation. This is called a *blind transfer*. The transfer can be initiated by a remote SIP endpoint.
- Support for configurable expiration time for SIP INVITEs and maximum number of proxies or redirect servers that can forward a SIP request.
- Ability to hide the calling party's identity based on the setting of the ISDN presentation indicator.
- Expanded support for the mapping of public switched telephone network (PSTN) cause codes to SIP events.

IVR and VoiceXML Enhancements

TCL IVR 2.0 Call Initiation and Callback

This feature provides support for VoIP callback service in response to an inbound trigger call. The authentication and callback call are initiated by a Toolkit Command Language (TCL) interactive voice response (IVR) 2.0 script.

The Cisco IVR feature provides IVR capabilities using TCL scripts. IVR Version 2.0 is made up of several separate components. These new features include the following:

- Real Time Streaming Protocol (RTSP) client implementation
- New Tool Command Language (TCL) verbs to utilize RTSP scripting features
- IVR prompt playout and digit collection on IP call legs
- Performance improvements and TCL infrastructure changes
- IVR application management information base (MIB) for network management

These features add scalability and enable the IVR scripting functionality on VoIP legs. In addition, support for RTSP enables VoIP gateways to play messages from RTSP-compliant announcement servers.

IVR: Configuring Dynamic Prompts

The functionality of dynamic prompts, an existing Cisco IOS feature, has been expanded to play out ISO formatted time and date, and visible non-control ASCII characters. Dynamic prompts allow a TCL application to play the date and time information on a Cisco voice gateway. The information is first retrieved by using the **clock** command in the TCL library, and then played through dynamic prompts using the multi-language script.

The **media play** command in the TCL library plays the specified dynamic prompt on the specified call leg. The English version of the multi-language TCL script must be enabled before you use the **media play** command; it allows a dynamic prompt to play string, and visible non-control ASCII characters.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_book09186a00800b5ddf.html

IVR: Customizing Accounting Templates

You can create an accounting template to customize your accounting records, based on your billing needs. An accounting template is a text-based interface that allows you to customize and define the content of the template and helps reduce billing traffic from the gateway to the accounting servers.

A sample accounting template applicable to POTS and VoIP dial peers is shown below.

Attribute Name	Usage Restrictions
h323-gw-id	
h323-call-origin	
h323-call-type	
h323-setup-time	
h323-connect-time	
h323-disconnect-time	
h323-disconnect-cause	
h323-remote-address	
h323-voice-quality-subscriber	IPCIF
Detail CallHistory	
acom-level	#POTS leg only
noise-level	#POTS leg only
img-pages-count	#POTS leg only
voice-tx-duration	#POTS leg only
tx-duration	#POTS leg only
charged-units	
disconnect-text	
peer-if-index	
logical-if-index	
codec-type-rate	
codec-bytes	#IP leg only
session-protocol	#IP leg only
vad-enable	#IP leg only
remote-udp-port	#IP leg only
hiwater-playout-display	#IP leg only
lowater-playout-display	#IP leg only

Attribute Name	Usage Restrictions
receive-delay	#IP leg only
round-trip-delay	#IP leg only
ontime-rv-playout	#IP leg only
gapfill-with-silence	#IP leg only
gapfill-with-prediction	#IP leg only
gapfill-with-interpolation	#IP leg only
gapfill-with-redundancy	#IP leg only
lost-packets	#IP leg only
early-packets	#IP leg only
late-packets	#IP leg only

Vendor-specific attributes (VSAs) used in session applications such as h323-ivr-out, h323-credit-amount, h323-credit-time, and h323-billing-model, are controlled only in the TCL script and not in the accounting template. If you specify these VSAs in the accounting template, they are ignored and no error messages are reported. You cannot control h323-conf-id and h323-incoming-conf-id; they are mandatory VSAs required for correlating accounting messages on the incoming and outgoing legs.

For authentication and authorization, session applications also use some VSAs that are not controlled by the accounting template. The VSAs listed in this template are voice-specific only. Non-voice-specific attributes cannot be controlled through this template. To add new attributes not defined in the template, contact your Cisco marketing representative.

To delete an attribute, add the pound (#) sign in front of the attribute name.

You can create a custom accounting template by selecting only those VSAs that are applicable to your billing needs. The list below shows some VSAs that can be used to create custom accounting templates.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_book09186a00800b5ddf.html

IVR: Directing AAA Requests

This feature introduces the capability of splitting Authentication, Authorization, and Accounting (AAA) requests to Remote Authentication Dial-In User Service (RADIUS) servers based on account number, called party number, and incoming trunk groups.

For more details on the feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_book09186a00800b5ddf.html

Speech Recognition and Synthesis for Voice Applications

The Speech Recognition and Synthesis feature provides interfaces to automatic speech recognition (ASR) and text-to-speech (TTS) media servers by using Media Resource Control Protocol (MRCP), an application-level protocol developed by Cisco and its ASR and TTS media server partners, Nuance Communications and SpeechWorks International. Client devices that are processing audio or video streams use MRCP to control media resources on external media servers, such as speech synthesizers for

TTS and speech recognizers for ASR. The Cisco gateway, which runs a voice application, and the media servers, which provides speech recognition and speech synthesis, maintain a client/server relationship through a RTSP connection. The gateway is the RTSP client, and the RTSP server is the streaming media server providing speech recognition and speech synthesis.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_chapter09186a00800b6069.html

VoiceXML for Cisco IOS

Voice Extensible Markup Language (VoiceXML) is a language similar to HTML that brings the full power of Web development and content delivery to interactive voice response (IVR) applications.

VoiceXML is designed for creating audio dialogs that feature synthesized speech, digitized audio, recognition of spoken and dual-tone multifrequency (DTMF) key input and recording of spoken input. It is a common language for content providers, tool providers, and platform providers. VoiceXML promotes service portability across implementation platforms. VoiceXML separates user interaction presentation logic in VoiceXML "voice Web pages" from service logic, and it shields application authors from low-level, platform-specific IVR and call control details. It is easy to use for simple interactions, yet it provides language features that support complex IVR dialogs.

VoiceXML complements the existing TCL-IVR capability in the Cisco IOS software that is currently used for scripting calling card and other voice applications.

For more information on VoiceXML feature, refer to the following URL:

http://www.cisco.com/en/US/tech/tk652/tk773/technologies_q_and_a_item09186a008011376a.shtml

Fax Detection for VoiceXML

When a VoiceXML fax detection application is configured on the gateway, callers can dial a single number for both voice and fax calls. The gateway automatically detects when a call is a fax transmission by listening for the distinctive fax calling tone (CNG). The Cisco IOS VoiceXML gateway, when configured for fax detection, continuously listens to incoming calls to determine whether a call is voice or fax. The gateway then routes the call to the appropriate application or media server.

After a call is established, the VoiceXML application can play an audio prompt to the caller while waiting for CNG detection. CNG detection continues for the entire duration of the call, so it is possible that a caller could first be connected to a voice-mail server and leave a voice message, and then start to transmit a fax, and the application would automatically switch the call to the fax application. After the application detects whether a call is voice or fax, the gateway routes the call, based on dial peers.

For more details on and configuration information for this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_chapter09186a008011066b.html

VoiceXML Transfer Enhancements

This feature enhances the TRANSFER functionality. It extends the VoiceXML 1.0 <*transfer*> element by introducing a set of new parameters as attributes. They will align with the standard VoiceXML definitions.

This feature supports equivalent capability for <*transfer*> tag as existing TCL IVR leg setup verb.The existing <*transfer*> tag already supports two of the five parameters, attributes dest and connecttimeout. The new VoiceXML application will pass on additional accounting information (automatic number identification [ANI], redirected dialed number identification service [RDNIS] and caller's account

number) to CallSetup via the CallInfo data structure. Subsequently, corresponding Call Detail Records will be generated from the account number so that they can be processed by downstream billing systems. In addition to the above parameters equivalent to TCL IVR leg setup, this feature will support the following subfields for ANI and RDNIS: Type of Number, Numbering Plan Identification, Presentation Indicator, and Screening Indicator. The subfields Type of Number, Numbering Plan Identification for DNIS will be included. The subfield Reason for Redirection will also be supported for RDNIS.

The following are the new fields added to the <*transfer*> tag (equivalent TCL IVR leg setup verbs are given in parenthesis).

- RADIUS User Name (accountNum)
  - cisco-username
- Caller's Number (originationNum) and subfields
  - cisco-ani
  - cisco-aniexpr
  - cisco-anitype
  - cisco-aniplan
  - cisco-anipi
  - cisco-anisi
- Destination Number subfields
  - cisco-desttype
  - cisco-destplan
  - cisco-destexpr
- Redirecting Number (redirectNum) and subfields
  - cisco-rdn
  - cisco-rdnexpr
  - cisco-rdntype
  - cisco-rdnplan
  - cisco-rdnpi
  - cisco-rdnsi
  - cisco-redirectreason

The following is a list of attributes to the VoiceXML session variables mapping (not all attributes have corresponding session variables).

Attributes	Session Variables
cisco-ani, cisco-aniexpr	session.telephone.ani
cisco-rdn, cisco-rdnexpr	session.telephone.rdnis
cisco-redirectreason	session.telephone.redirect_reason
cisco-anitype	com.cisco.ani_noa
cisco-aniplan	com.cisco.ani_npi
cisco-anipi	com.cisco.ani_pi
cisco-anisi	com.cisco.ani_si

Attributes	Session Variables
cisco-rdntype	com.cisco.rgn_noa
cisco-rdnplan	com.cisco.rgn_npi
cisco-rdnpi	com.cisco.rgn_pi
cisco-rdnsi	com.cisco.rgn_si
cisco-desttype	com.cisco.dnis_noa
cisco-destplan	com.cisco.dnis_npi

VoiceXML Voice Store and Forward

The VoiceXML Voice Store and Forward feature expands the Cisco IOS VoiceXML to include the input processing of form field entries using recorded audio clips, rather than numeric input only. Audio clips can be captured and then submitted to an external web server using HTTP or RTSP, or to a messaging server using Extended Simple Mail Transfer Protocol (ESMTP) for additional processing.

This recording feature can be used to collect caller names or addresses for call screening, product registration, or similar e-commerce applications, and for simple voice messaging, or for any voice browser application where alphanumeric input using DTMF is cumbersome or impractical.

The VoiceXML Voice Store and Forward feature supports speech recording and playback with a choice of four different media locations as follows:

- Local memory—Voice recordings are stored in local memory on the Cisco gateway, and can be played back or submitted to an HTTP server using the POST method. Intended for temporarily storing short-length speech clips, such as caller name or address, or a short voice message.
- HTTP—Voice recording is streamed directly to an external HTTP server using the URL specified by the user. Recording can be played back in streaming or non-streaming mode.
- RTSP—Voice recording is directly streamed to and from an external RTSP server using the URL specified by the user. Intended for storing indefinite-length audio recordings.
- ESMTP—Voice recording is directly streamed to the ESMTP server as e-mail audio attachments. This option supports the Mailto: URL.

The Voice Store and Forward feature enables dynamic voice messaging by switching a busy or no-answer voice call to a VoiceXML application. The voice gateway can operate in two modes:

- On-ramp mode—Incoming calls are handled by a VoiceXML document that lets callers record voice messages if the called party is busy or there is no answer. The on-ramp gateway stores the voice recordings as audio clips to the selected media location: to an external HTTP or RTSP server; to internal memory if space is available; or, by directly streaming the voice message as an e-mail attachment, to an external ESMTP server.
- Off-ramp mode—An external mail server sends an e-mail notification to the off-ramp gateway. The off-ramp gateway extracts the dialed number in the e-mail header and places an outbound call to the corresponding PSTN or IP destination. When the call is answered, the gateway executes the configured VoiceXML application. The VoiceXML application retrieves the audio clip from the external media server and plays the message to the PSTN or IP destination. The gateway does not support the streaming of audio clips directly from the ESMTP server.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide_chapter09186a00800b5dda.html

VoiceXML RECORD Element

This feature helps enable the Cisco IOS voice gateway to be used as part of a VoiceXML-based message center to record an audio message into the gateway's memory by using a VoiceXML application. This is accomplished by enhancing the gateway VoiceXML capabilities and the media stream functionality in order to support audio recording using the G723.1, and G711u-law codec in .au file format. The recording is stored in RAM.

You can use properties to specify the default attribute values for the <*record*> tag. These properties can be specified at <*vxml*>, <*form*>, and <*record*> level, and allow the user flexibility in specifying a default value. Cisco's implementation of VoiceXML 2.0 supports message disposition notification (MDN) and delivery status notification (DSN).

The MDN address is specified by the following specific Cisco VoiceXML properties:

- com.cisco.mta.send.mdn_request
  - Setting com.cisco.mta.send.mdn_request to TRUE sends the MDN request.
- com.cisco.mta.send.mdn_hostname and com.cisco.mta.send.mdn_username
  - If these properties are not specified, the MDN address is composed by configuring the **mta send return-receipt-to hostname** and **mta send return-receipt-to username** commands of the Cisco IOS software. If these commands are not configured, the MDN address is composed by configuring the **mta send postmaster email-address** command. If this command is not configured, the **mta send mail-from command** is used.

For a list of Cisco specific properties that are supported for the <*record*> tag, refer to the following URLs:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_programming_usage_guide_chapter09186a0080107a62.html#17822

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_programming_usage_guide_chapter09186a0080107a62.html#59448

Delivery Status Notification (DSN) is specified by the following specific Cisco VoiceXML properties:

- com.cisco.mta.send.dsn_delay
- com.cisco.mta.send.dsn_success
- com.cisco.mta.send.dsn_failure

The subject header is specified by the com.cisco.mta.send.subject property. If this property is not defined, the subject field of the e-mail header is set by using the **mta send subject** command of the Cisco IOS.

The following specific Cisco properties are also supported for platform-specific settings for SMTP:

- com.cisco.mta.send.from_username
- com.cisco.mta.send.from_hostname
- com.cisco.mta.send.server
- com.cisco.mta.send.origin_prefix

Note

- The properties used to specify MDN and DSN have equivalent Cisco IOS commands. If the specific Cisco VoiceXML properties and their equivalent Cisco IOS commands are specified simultaneously, the VoiceXML properties take precedence over the CLI.
- For MDN, the username and the host name must be specified to form a valid e-mail address.
- The scope of each property conforms to the VoiceXML Version 2.0 working draft (October 23, 2001). Each property can be defined at the application root document level, document <vxml> level, dialog <form> or <menu> level, or the form item <record> level.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps5012/products_programming_reference_guide09186a008010925d.html

Media Stream Recording Support

This feature enhances the Cisco IOS media stream functionality to support audio recording. This helps enable the Cisco IOS voice gateway to be used as part of a VoiceXML-based message center. This is accomplished by enhancing the gateway VoiceXML capabilities and the media stream functionality in order to support audio recording using the G723.1, and G711u-law codec in .au file format.

For more details on this feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_programming_usage_guide_chapter09186a0080107a62.html

Enhanced VoiceXML Diagnostics

With the Enhanced VoiceXML Diagnostics feature, debugging output can be filtered for all VoiceXML applications except the application named in the debug condition application voice command. When this command is configured, the gateway displays debugging messages only for the specified VoiceXML application when using the **debug vxml** and **debug http client** commands.

Voice Infrastructure Enhancements

VoIP and Cisco Express Forwarding (CEF) Interoperability

This feature enables Cisco Express Forwarding (CEF) of VoIP signaling and payload packets that originate from voice interfaces and interactive voice response (IVR) application.

This feature modifies the Voice over IP (VoIP) and IVR programming so that they can interoperate with features that are supported only in the CEF path (not in the fast switching path that VOX uses). Voice and IVR only work in the fast path on the routers where they are originated and terminated (Voice and IVR on transit routers are just data packets and of course can be CEF switched).

CEF is advanced Layer 3 IP switching technology. CEF optimizes network performance and scalability for networks with large and dynamic traffic patterns, such as the Internet, on networks characterized by intensive Web-based applications, or interactive sessions.

Although you can use CEF in any part of a network, it is designed for high-performance, highly resilient Layer 3 IP backbone switching.

For more details on the feature, refer to the following URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_feature_guide09186a00800b5db0.html

New Software Features in Release 12.2(13)T

For information regarding the features supported in the Cisco IOS Release 12.2 T, refer to the Cross-Platform Release Notes and New Feature Documentation links at the following location on Cisco.com:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122t/index.htm

This URL is subject to change without notice. If it changes, point your web browser to Cisco.com, and click the following path:

Service & Support: **Technical Documents**: **Cisco IOS Software**: **Release 12.2**: **Release Notes**: **Cross-Platform Release Notes (Cisco IOS Release 12.2T)**

Important Notes

The following sections describe important notes concerning the new software features supported by the Cisco 1700 series routers for Release 12.2(13)ZH.

CSCdz67374

When you have insufficient available DSP channels and attempt to configure more PRI channels configured on a T1 or E1 interface in a router, only as many number of voice ports as the DSP channels are created. However **show running-config** command output will say that all PRI channels are configured. In this case, if you assign this PRI interface to a trunk group, the output of the **show trunk group** command would only take all the PRI channels that are configured and not the available PRI voice ports.

CSCea52903

Change extended echo cancellation as the default setting, and hide g165 echo cancellation configuration.

Enhanced ITU-T G.168 Echo Cancellation

This feature provides an alternative to the default Cisco-proprietary G.165 echo canceller (EC). The new extended EC provides improved performance for trunking gateway applications and provides a configurable tail length that supports up to 64 ms of echo cancellation.

The Cisco IOS command-line interface (CLI) has been modified to make the extended EC the default on the Cisco 1700.

The extended EC offers the following improvements over the Cisco default EC:

- Complies with the ITU-T G.168 (2000) standard in addition to maintaining support for the old
- ITU-T G.165 standard.

- Increases the configurable tail length from a maximum of 32 ms to a maximum of 64 ms.

For additional information about this feature, including the **voice echo-canceller extended** command, refer to the document *Enhanced ITU-T G.168 Echo Cancellation*.

A new CLI is introduced to configure **voice echo-canceller extended** as default.

Example

```
Router(config)#voice echo-canceller extended
```

- Echo canceller extended/g165 is hidden

```
Router(config)#voice echo-canceller g165
```

- Without configuration, voice echo-canceller extended get chosen as default

```
Router(config)#no voice echo-canceller extended
```

- Cisco echo cancellation will be used

```
Router(config)#no voice echo-canceller g165
```

- Extended echo cancellation will be used

For **show run** command, when **voice echo-canceller g165** is configured, the following output will be displayed. The default extended echo cancellation configuration will not display any output.

```
!
voice echo-canceller g165
!
```

CSCea00395

Codec mismatch is seen when **voice-class codec** command is configured on a POTS dial-peer having a VoiceXML application.

Workaround

Configure **codec** *codec name* command instead of **voice-class codec**.

Caveats

Caveats describe unexpected behavior or defects in the Cisco IOS software releases. Severity 1 caveats are the most serious caveats, severity 2 caveats are less serious, and severity 3 caveats are the least serious of these three severity levels.

Caveats in Release 12.2 T are also in Release 12.2(13)ZH5. For information on caveats in Cisco IOS Release 12.2 T, refer to the *Caveats for Cisco IOS Release 12.2 T* document. For information on caveats in Cisco IOS Release 12.2, refer to the *Caveats for Cisco IOS Release 12.2* document. These documents list severity 1 and 2 caveats; the documents are located on Cisco.com and the Documentation CD.

Note If you have an account with Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to Cisco.com and click **Service & Support**: **Technical Assistance Center**: **Tool Index: Bug Toolkit**. Another option is to go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Open Caveats for Release 12.2(13)ZH

The following sections lists the open caveats for the Cisco IOS Release 12.2(13)ZH.

CSCea31211

The Cisco IOS Release 12.2(13)ZH does not support BRI-S/T v2 cards in the Cisco 1700 routers.

CSCdz23046

The Siemens DSLAM and the WIC-1ADSL-I-DG report different speeds.

When WIC-1ADSL-I-DG trains to the Siemens DSLAM, the bit-rate shown on the CPE will always be 64 Kb more in the downstream direction and 32 Kb more in the upstream direction than what is configured on the DSLAM port. This additional bandwidth is used for a proprietary overhead channel that can be used only by a Siemens chipset–based CPE.

CSCdz15027

Downstream throughput is low for small packets.

CSCea49972

When a VXML document with volume control functionality is invoked on a dial-peer, the output attenuation does not change as expected.

CSCea47149

Voice port fails to go on-hook after handling the CNG event when VoiceXML application is playing the recorded audio.

Workaround

Use the audio file recorded using G711ulaw codec.

Resolved Caveats for Release 12.2(13)ZH

The following sections lists the resolved caveats for the Cisco IOS Release 12.2(13)ZH.

CSCea51049

When Caller ID function is enabled, FXO port answers the call approximately 8 sec after the first ring.

CSCea81965

Change default WIC-1-Symmetrical High-Speed Digital Subscriber Line (SHDSL) signal-to-noise ratio (SNR) startup margin.

Currently the default WIC-1SHDSL SNR startup margin is set to 0 dB. A new command-line interface (CLI) **dsl snr margin** *<0-15>db* is introduced to set SNR margin from 0 dB to 15 dB. Startup SNR margin will be used with existing SNR threshold of 23 dB, together during SHDSL training time. At SHDSL line resetting time, only the threshold of 23 dB will be used. Initial line will train at lower line rate to get better noise when SNR margin is more than 0 dB.

CSCin82407

Cisco Internetwork Operating System (IOS) Software release trains 12.2T, 12.3 and 12.3T may contain vulnerabilities in processing certain Internet Key Exchange (IKE) Xauth messages when configured to be an Easy VPN Server.

Successful exploitation of these vulnerabilities may permit an unauthorized user to complete authentication and potentially access network resources.

This advisory will be posted to http://www.cisco.com/warp/public/707/cisco-sa-20050406-xauth.shtml

Related Documentation

The following sections describe the documentation available for the Cisco 1700 series routers. Typically, these documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents. Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online on Cisco.com and the Documentation CD.

Use these release notes with the documents listed in the following sections:

- Release-Specific Documents
- Platform-Specific Documents

Release-Specific Documents

The following documents are specific to Release 12.2 and apply to Release 12.2(13)ZH5. They are located on Cisco.com and the Documentation CD (under the heading Service & Support):

- To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2 T*, click this path:

  Technical Documents: **Cisco IOS Software**: **Release 12.2**: **Release Notes**: **Cisco IOS Release 12.2 T**

- To reach product bulletins, field notices, and other release-specific documents, click this path:

  Technical Documents: **Product Bulletins**

- To reach the *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2 T* documents, which contain caveats applicable to all platforms for all maintenance releases of Release 12.2, click this path:

  Technical Documents: **Cisco IOS Software**: **Release 12.2**: **Caveats**

Note If you have an account with Cisco.com, you can also use the Bug Toolkit to find selected caveats of any severity. To reach the Bug Toolkit, log in to Cisco.com, and click **Service & Support**: **Technical Assistance Center**: **Tool Index: Bug Toolkit**. Another option is to go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

Platform-Specific Documents

Hardware installation guides, configuration and command reference guides, and additional documents specific to Cisco 1700 series routers are available on Cisco.com and the Documentation CD at the following location:

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/1700/index.htm

This URL is subject to change without notice. If it changes, point your web browser to Cisco.com, and click the following path:

Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 1700 Series Routers: <platform_name>

Additional References

The following sections describe the documentation available for the Cisco SOHO 71, SOHO 76, SOHO 77, and the Cisco 826, Cisco 827, and Cisco 828 routers. Typically, these documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents. Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online on Cisco.com in pdf or html form.

Use these release notes with the documents listed in the following sections:

- Release-Specific Documents, page 35
- Platform-Specific Documents, page 35

Release-Specific Documents

The following documents are specific to Release 12.2 and apply to Release 12.2(13)ZH. They are located on Cisco.com:

- *Cross-Platform Release Notes for Cisco IOS Release 12.2T*
- *Field Notices:* http://www.cisco.com/warp/public/tech_tips/index/fn.html.
- *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2T*

Platform-Specific Documents

Hardware installation guides, configuration and command reference guides, and additional documents specific to the Cisco SOHO 71, SOHO 76, SOHO 77, and the Cisco 826, Cisco 827, and Cisco 828 routers are available on Cisco.com at the following location:

http://www.cisco.com/en/US/products/hw/routers/tsd_products_support_category_home.html

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.2 and Release 12.2(13)ZH, and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only.

Cisco Feature Navigator

Cisco Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image. Cisco Feature Navigator is available 24 hours a day, 7 days a week.

To use Cisco Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript support and enabling instructions for other browsers, check with the browser vendor.

Cisco Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. You can access Feature Navigator at the following URL:

http://www.cisco.com/go/cfn

Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents.

Documentation Modules

Each module in the Cisco IOS documentation set consists of one or more configuration guides and one or more corresponding command references. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference. *Cisco IOS Software Documentation* is available in html or pdf form.

Select your release and click the command references, configuration guides, or any other Cisco IOS documentation you need

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feed-back, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Use this document in conjunction with the documents listed in the "Additional References" section.