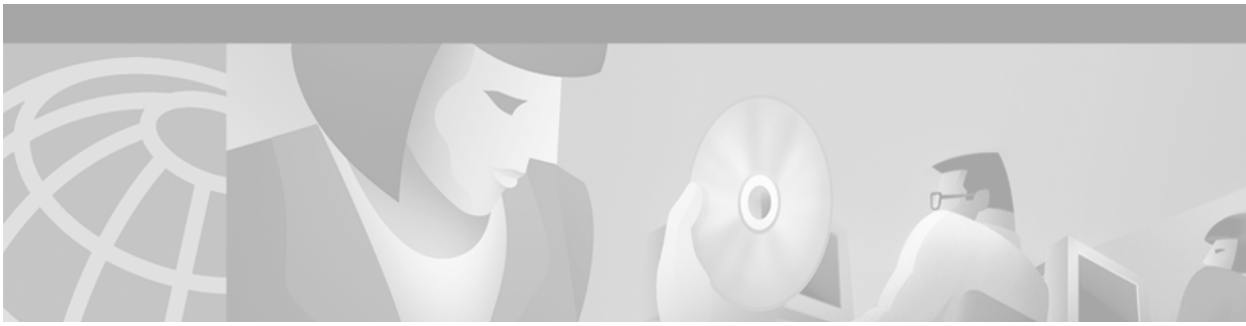

Release Notes for Cisco AS5300 Universal Access Servers for Cisco IOS Release 12.2 XA

April 10, 2002

Cisco IOS Release 12.2(2) XA5

78-12684-01 Rev. I0

These release notes for the Cisco AS5300 universal access servers describe the enhancements provided in Cisco IOS Release 12.2(2) XA5. These release notes are updated as needed.

For a list of the software caveats that apply to Cisco IOS Release 12.2(2) XA5, see the "Caveats for Cisco IOS Release 12.2 XA" section on page 14 and *Caveats for Cisco IOS Release 12.2*. The caveats document is updated for every maintenance release and is located on Cisco.com and the Documentation CD-ROM.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.2* located on Cisco.com and the Documentation CD-ROM.

Cisco recommends that you view the Field Notices for this release to see if your software or hardware platforms are affected. If you have an account with Cisco.com, you can find Field Notices at http://www.cisco.com/warp/customer/770/index.shtml. If you do not have a Cisco.com login account, you can find Field Notices at http://www.cisco.com/warp/public/770/index.shtml.

Contents

These release notes describe the following topics:

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Introduction

The Cisco AS5300 is a versatile data communications platform that performs two functions in a single modular chassis, depending on the installed feature cards and IOS images:

- Remote Access Server
- Voice Gateway

The remote access server is intended for Internet service providers (ISPs), telecommunications carriers, and other service providers that offer managed Internet connections and medium to large sites that provide both digital and analog access to users on an enterprise network. By terminating both analog and digital calls on the same chassis simultaneously, the access server provides a clear, simple, and easy migration path from analog dial access services to digital dial access services.

The Cisco AS5300 Voice Gateway is a versatile data communications platform that provides the functions of an access server, router, and digital modem(s) in a single modular chassis. The Cisco AS5300 includes three feature card slots: one holds a T1/E1/PRI feature card, and the other two support modem feature cards or voice digital signal processor (DSP) feature cards. When equipped with modem cards, the Cisco AS5300 serves as a remote access concentrator for dial-up (modem or ISDN) Internet access. When equipped with voice feature cards and Voice IOS, the Cisco AS5300/Voice Gateway serves as a Voice over IP (VoIP) gateway. By using one slot for modems and the other for voice DSPs, the Cisco AS5300 can serve in both capacities. Modem, voice, or fax calls are routed to the appropriate cards/resources via Dialed Number Identification Service (DNIS).

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.2(2) XA5, see the "New and Changed Information" section on page 7 and the "Related Documentation" section on page 21.

System Requirements

This section describes the system requirements for Cisco IOS Release12.2(2) XA5 and includes the following sections:

Memory Recommendations

Table 1 Memory Recommendations for the Cisco AS5300

Image Name	Software Image	Flash Memory Recommended	DRAM Memory Recommended
IP	c5300-i-mz	16 MB	64 MB
IP Plus	c5300-is-mz	16 MB	128 MB
IP/Voice Plus	c5300-is-mz	16 MB	128 MB
IP Plus IPsec 56	c5300-ik8s-mz	16 MB	128 MB
IP Plus IPsec 3DES	c5300-ik9s-mz	16 MB	64 MB
Desktop	c5300-d-mz	16 MB	64 MB
Desktop Plus	c5300-ds-mz	16 MB	64 MB
Desktop Voice Plus	c5300-ds-mz	16 MB	64 MB
Enterprise	c5300-j-mz	16 MB	64 MB
Enterprise Plus	c5300-js-mz	16 MB	128 MB
Enterprise Voice Plus	c5300-js-mz	16 MB	128 MB
Enterprise Plus IPsec 56	c5300jk8s-mz	16 MB	128 MB
Enterprise Plus IPsec 3DES	c5300-jk9s-mz	16 MB	64 MB

Supported Hardware

Cisco IOS Release 12.2(2) XA5 supports the Cisco AS5300. Table 2 details the supported interfaces.

For detailed descriptions of the new hardware features, see the "New and Changed Information" section on page 7.

For additional information about supported hardware for this platform and release, please refer to the Hardware/Software Compatibility Matrix in the Cisco Software Advisor at the following location:

http://www.cisco.com/cgi-bin/front.x/Support/HWSWmatrix/hwswmatrix.cgi

Table 2 Supported Interfaces for the Cisco AS5300

Interface and Modem Cards	Product Description
Interface Cards	Ethernet RJ-45 (included with unit)
	Ethernet/Fast Ethernet (RJ-45) (included with unit)
	ISDN PRI
	E1-G.703/G.704
	Channelized T1 (4 ports) without serial support
	Channelized T1 (4 ports) with 4 serial ports
	Channelized T1 (8 ports) with 4 serial ports

Table 2 Supported Interfaces for the Cisco AS5300 (continued)

Interface and Modem Cards	Product Description
Interface Cards Continued	Channelized E1 (4 ports) without serial support
	Channelized E1 (4 ports) with 4 serial ports
	Channelized E1 (8 ports) with 4 serial ports
	HMM/48 channel
	HMM/54 channel
	HMM/60 channel
	DMM/48 channel
	DMM/96 channel
	DMM/108 channel
	DMM/120 channel
	48-Channel, TI C549-based VoIP feature card (Uses High Density AS53-VOXD DSP modules)
	60-Channel, TI C549-based VoIP feature card (Uses High Density AS53-VOXD DSP modules)
	24-Channel, TI C542-based VoIP feature card (First generation, uses AS53-6VOX DSP modules)
	48-Channel, TI C542-based VoIP feature card (First generation, uses AS53-6VOX DSP modules)
Modems	MICA modems
	Microcom 56K modems

Determining the Software Version

To determine the version of Cisco IOS software running on your Cisco AS5300, log in to the Cisco AS5300 and enter the **show version** EXEC command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.2 Software c5300-i-mz, Version 12.2(2) XA5, RELEASE SOFTWARE
```

Microcode and Modem Code Software

Microcode software images are bundled with the system software image. Bundling eliminates the need to store separate microcode images. When the router starts, the system software unpacks the microcode software bundle and loads the proper software on all the interface processor boards. To obtain the latest Cisco IOS software release compatible with Cisco MICA portware, refer to *Cisco AS5x00 MICA 6-Port and 12-Port Modem Module Portware/Cisco IOS Software Compatibility Matrixes* at http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/5300/sw_conf/sw_ports/compmat/mca12prt.htm

You could have received a later version of modem code than the one bundled with the Cisco IOS software. The modem code in Flash memory is mapped to the modems. Unless you fully understand how Cisco IOS software uses modem code, it is important to keep the factory configuration.

The modem code release notes are on Cisco.com and the Documentation CD-ROM:

On Cisco.com at:

Technical Documents: All Product Documentation: Access Servers and Access Routers: Firmware and Portware Information

On the Documentation CD-ROM at:

Cisco Product Documentation: Access Servers and Access Routers: Firmware and Portware Information

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.

Cisco IOS Release 12.2(2) XA5 is based on the following releases:

- Cisco IOS Release 12.1(5) XM
- Cisco IOS Release 12.2(1)

All features in the above releases are in Cisco IOS Release 12.2(2) XA5. Their features are listed in the Feature Set Tables sections of the following release notes:

- Release Notes for Cisco AS5300 Universal Access Servers for Cisco IOS Release 12.1 XM at http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121relnt/5300/rn5300xm.htm
- Cisco IOS Release 12.2 Cross-Platform Release Notes

  Click **Platform-Specific Information** and **Cisco AS5300 Universal Access Servers** at http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122/index.htm

Caution Cisco IOS images with strong encryption (including, but not limited to, 168-bit Triple DataEncryption Standard [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 are likely to require an export license. Customer orders may be denied or subject to delay because of United States government regulations. When applicable, purchaser and 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 3 and Table 4 list the features and feature sets supported by the Cisco AS5300 in Cisco IOS Release 12.2(2) XA5 and uses 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.

Note These release notes are not cumulative and only list features that are new to Cisco IOS Release 12.2(2) XA5. One of the parent releases for Cisco IOS Release12.2(2) XA5 is Cisco IOS Release 12.2(1). To find information about inherited features in this release, refer to Cisco.com or Feature Navigator. For Cisco.com, go to http://www.cisco.com/univercd/home/index.htm, select the appropriate software release under **Cisco IOS Software**, and click **Release Notes**. If you have a Cisco.com login account, you can use the Feature Navigator tool at http://www.cisco.com/go/fn.

Table 3 Feature List by Feature Set for the Cisco AS5300— Part 1 of 2

Feature	In	Software Images by Feature Sets						
		IP	IP Plus	IP/Voice Plus	IP Plus IPsec 56	IP Plus IPsec 3DES	Desktop	Desktop Plus
Dial								
V.44 LZJH Compression	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
V.92 Modem on Hold	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
V.92 Quick Connect	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quality of Service								
Call Admission Control for H.323 VoIP Gateways	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voice								
Cisco SS7 Interconnect for Voice Gateways Solution 1.3	12.2(2) XA	No	No	No	Yes	Yes	No	No
Cisco Wholesale Voice Solution	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
H.323 Scalability and Interoperability Enhancements	12.2(2) XA	No	Yes	Yes	No	No	No	No
Inter-Domain Gatekeeper Security Enhancement	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MGCP 1.0 Including NCS 1.0 and TGCP 1.0 Profiles	12.2(2) XA	No	Yes	Yes	No	No	No	No

Table 4 Feature List by Feature Set for the Cisco AS5300— Part 2 of 2

Feature	In	Software Images by Feature Sets					
		Desktop Voice Plus	Enterprise	Enterprise Plus	Enterprise/ Voice Plus	Enterprise Plus IPsec 56	Enterprise Plus IPsec 3DES
Dial							
V.44 LZJH Compression	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes
V.92 Modem on Hold	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes
V.92 Quick Connect	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes

Table 4 Feature List by Feature Set for the Cisco AS5300— Part 2 of 2

Feature	In	Software Images by Feature Sets					
		Desktop Voice Plus	Enter-prise	Enter-prise Plus	Enter-prise/ Voice Plus	Enter-prise Plus IPsec 56	Enter-prise Plus IPsec 3DES
Quality of Service							
Call Admission Control for H.323 VoIP Gateways	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes
Voice							
Cisco SS7 Interconnect for Voice Gateways Solution 1.3	12.2(2) XA	Yes	No	No	Yes	Yes	Yes
Cisco Wholesale Voice Solution	12.2(2) XA	Yes	Yes	Yes	Yes	Yes	Yes
H.323 Scalability and Interoperability Enhancements	12.2(2) XA	No	No	Yes	Yes	Yes	Yes
Inter-Domain Gatekeeper Security Enhancement	12.2(2) XA	No	No	Yes	Yes	Yes	Yes
MGCP 1.0 Including NCS 1.0 and TGCP 1.0 Profiles	12.2(2) XA	No	No	Yes	Yes	Yes	Yes

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco AS5300 for Cisco IOS Release 12.2(2) XA5.

New Hardware and Software Features from Cisco IOS Release 12.2(2) XA1 to Cisco IOS Release 12.2(2) XA5

There are no new hardware and software features for the Cisco AS5300 from Cisco IOS Release 12.2(2) XA1 to Cisco IOS Release 12.2(2) XA.

New Software Features in Cisco IOS Release 12.2(2) XA

The following new software features are supported in the Cisco AS5300 for Cisco IOS Release 12.2(5) XA.

Call Admission Control for H.323 VoIP Gateways

Before the call admission control feature, gateways did not have a mechanism to gracefully prevent calls from entering when certain resources were not available to process the call. This causes the new call to fail with unreported behavior, and could potentially cause the calls that are in progress to have quality related problems.

This feature set provides the ability to support resource-based call admission control processes. These resources include system resources such as CPU, memory, and call volume, and interface resources such as call volume.

If system resources are not available to admit the call, two kinds of actions are provided: system denial (which busyouts all of T1 or E1) or per call denial (which disconnects, hairpins, or plays a message or tone). If the interface-based resource is not available to admit the call, the call is dropped from the session protocol (such as H.323).

User Selected Threshold

This feature allows a user to configure call admission thresholds for local resources as well as memory and CPU resources. The list of local resources that are configured for call admission are described in the command description of **call threshold poll-interval**.

With the **call admission** command, a user is allowed to configure two thresholds, high and low, for each resource. Call treatment is triggered when the current value of a resource goes beyond the configured high. The call treatment remains in effect until current resource value falls below the configured low. Having high and low thresholds prevents call admission flapping and provides hysteresis in call admission decision making.

With the **call spike** command, a user is allowed to configure the limit for incoming calls during a specified time period. A call spike is the term for when a large number of incoming calls arrive from the PSTN in a very short period of time (for example:100 incoming calls in 10 milliseconds).

Configurable Call Treatment

With the call treatment command, users are allowed to select how the call should be treated when local resources are not available to handle the call. For example, when the current resource value for any one of the configured triggers for call admission has reached beyond the configured threshold, the call treatment choices are as follows:

- TDM hairpinning — Hairpins the calls through the POTS dial peer.
- Reject — Disconnects the call.
- Play message or tone — Plays a configured message or tone to the user.

Resource Unavailable Signaling

This feature set supports the autobusyout feature where channels are busied out when local resources are not available to handle the call.

Autobusyout is supported on both channel associated signaling (CAS) and Primary Rate Interface (PRI) channels.

- CAS — Uses busyout to signal “local resources are unavailable.”
- PRI — Uses either service messages or disconnect with correct cause-code to signal “resources are unavailable.”

PSTN Fallback

The goal of PSTN fallback is to monitor congestion in the IP network and either redirect calls to the PSTN or reject calls based on the network congestion. Calls can be re-routed to an alternate IP destination or to the PSTN if the IP network is found unsuitable for voice traffic at that time. The user

defines the congestion thresholds based on the configured network. This functionality enables the service provider to give a reasonable guarantee about the quality of the conversation to their VoIP users at the time of call admission.

Note PSTN fallback does not provide assurances that a VoIP call that proceeds over the IP network is protected from the effects of congestion. This is the function of the other Quality of Service (QoS) mechanisms such as IP Real-Time Transport Protocol (RTP) priority or low latency queuing (LLQ).

PSTN fallback includes the following features:

- Offers flexibility to define the congestion thresholds based on the network.
  - Defines a threshold based on Calculated Planning Impairment Factor (ICPIF), which is derived as part of International Telecommunication Union (ITU) G.113.
  - Defines a threshold based solely on packet delay and loss measurements.
- Uses Response Time Reporter (RTR) probes to provide packet delay, jitter, and loss information for the relevant IP addresses. Based on the packet loss, delay, and jitter encountered by these probes, an ICPIF or delay and loss values are calculated.
- Is supported by calls of any codec. Only G.729 and G.711 have accurately simulated probes. Calls of all other codecs are emulated by a G.711 probe.

For further details, please see:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft_pfavb.htm.

H.323 Scalability and Interoperability Enhancements

The Cisco H.323 Scalability and Interoperability Enhancements feature upgrades the Cisco H.323 Gatekeeper (GK) and Cisco H.323 Gateway to comply with H.323 Version 3. The enhancements in this release include:

- Support for mandatory H.323 Version 3 elements in the gateway and GK, including:
  - multipleCalls
  - maintainConnection
  - alternateTransportAddresses
  - useSpecifiedTransport
- Support for H.225 call signalling over UDP.
- Address resolution using border elements (BE).
- Support for bandwidth request (BRQ) messages.
- Support for concurrent calls over a single H.225 call signalling channel.

For further details, please see:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft323sca.htm.

Inter-Domain Gatekeeper Security Enhancement

The Inter-Domain Gatekeeper Security Enhancement provides a means of authenticating and authorizing H.323 calls between the administrative domains of Internet Telephone Service Providers (ITSPs).

An interzone ClearToken (IZCT) is generated in the originating gatekeeper (OGK) when a location request (LRQ) is initiated or an admission confirmation (ACF) is about to be sent for an intrazone call within an ITSP's administrative domain. As the IZCT traverses through the routing path, each gatekeeper (GK) stamps the IZCT's destination GK ID with its own ID. This identifies when the IZCT is being passed over to another ITSP's domain. The IZCT is then sent back to the OGW in the location confirmation (LCF) message. The OGW passes the IZCT to the terminating gateway (TGW) in the SETUP message. The TGW forwards the IZCT in the admission request (ARQ) answerCall field to the terminating gatekeeper (TGK), which then validates it.

For further details, please see:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft_ctoke.htm.

MGCP 1.0 Including NCS 1.0 and TGCP 1.0 Profiles

This feature implements the following MGCP protocols on the supported Cisco media gateways:

- MGCP 1.0 (RFC2705)
- Network-based Call Signaling (NCS) 1.0, the PacketCable profile of MGCP 1.0 for residential gateways (RGWs)
- Trunking Gateway Control Protocol (TGCP) 1.0, the PacketCable profile of MGCP 1.0 for trunking gateways (TGWs)

For further details, please see
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft_mg10.htm.

V.44 LZJH Compression

V.44 LZJH is a new compression standard based on Lempel-Ziv that uses a new string-matching algorithm that increases upload and download speeds to make Internet access and Web browsing faster. The V.44 call success rate (CSR) is similar to V.42bis with significant compression improvement for most file types, including HTML files. V.44 applies more millions of instructions per second (MIPS) than V.42bis toward the same application data stream and yields better compression rates in almost any data stream in which V.42bis shows positive results.

V.44 supports automatic switching between compressed and transparent modes on Cisco MICA portware platforms. Automatic switching allows overall performance gain without loss in throughput for file streams that are not compressible.

V.44 is globally controlled through dialed number ID service (DNIS), calling line ID (CLID), and resource pool manager server (RPMS) virtual groups, and performance improvement is determined by the LZJH algorithms. The Cisco MICA portware is responsible for the ITU implementation of V.44 and the collection of statistics related to the new feature.

To support V.44 LZJH compression, the control switch module (CSM) has been modified. MIBs that show the status of V.42bis have been extended to show V.44 configuration status. New disconnect reasons help manage V.44 session status and debugging.

For further details, please see:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ftv44mca.htm

V.92 Modem on Hold

V.92 Modem on Hold allows a dial-in customer to suspend a modem session to answer an incoming voice call or to place an outgoing call while engaged in a modem session. When the dial-in customer uses Modem on Hold to suspend an active modem session to engage in an incoming voice call, the Internet service provider (ISP) modem listens to the original modem connection and waits for the dial-in customer's modem to resume the connection. When the voice call ends, the modem signals the telephone system to end the second call and return to the original modem connection, then the modem signals the ISP modem that it is ready to resume the modem call. Both modems renegotiate the connection, and the original exchange of data continues.

For further details, please see:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft92mmoh.htm

V.92 Quick Connect

V.92 Quick Connect speeds up the client-to-server startup negotiation, reducing the overall connect time up to 30 percent. The client modem retains line condition information and characteristics of the connection to the Internet service provider (ISP), which reduces connect time by avoiding some of the initial signal handshaking.

For further details, please see:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122x/122xa/122xa_2/ft92mqc.htm

Software Solutions in Cisco IOS Release 12.2(2) XA

The following solutions are supported in the Cisco AS5300 for Cisco IOS Release 12.2(2) XA:

Cisco Wholesale Voice Solution

The Cisco Wholesale Voice Solution provides service providers (SPs) with the required architecture design, network components, software features, functional areas, and provisioning methodologies needed to run a VoIP wholesale service. With an understanding of the concepts underlying the architecture, including interconnect topologies, components, and a variety of important issues that must be considered, the SP can then deploy options from a set of configuration templates. The result is a wholesale network that allows the SP to sell unbranded voice services to retailers, such as Internet telephony service providers (ITSPs), application service providers (ASPs), interexchange carriers (IXCs), or Post Telephone and Telegraph administrations (PTTs).

For further details, please see:
http://www.cisco.com/univercd/cc/td/doc/product/access/sc/rel7/soln/wv_rel1/wsv_rn.htm.

Cisco SS7 Interconnect for Voice Gateways Solution 1.3

The Cisco SS7 Interconnect for Voice Gateways Solution is a distributed system that provides SS7 connectivity for Voice-over-IP (VoIP) access gateways by using the Cisco Signaling Controller (also referred to as the Cisco SC2200 product) and the access gateways as a bridge from the H.323 IP network to the PSTN network. This solution interacts over the IP network with other Cisco H.323 VoIP access gateways. In addition, the Cisco SS7 Interconnect for Voice Gateways Solution can interoperate with H.323 endpoints, using non-SS7 signaling such as ISDN PRI and channelized T1.

MIBs

Current MIBs

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.

Deprecated and Replacement MIBs

Old Cisco MIBs will be replaced in a future release. Currently, OLD-CISCO-* MIBs are being converted into more scalable MIBs without affecting existing Cisco IOS products or network management system (NMS) applications. You can update from deprecated MIBs to the replacement MIBs as shown in Table 5.

Deprecated MIB	Replacement
OLD-CISCO-APPLETALK-MIB	RFC1243-MIB
OLD-CISCO-CHASSIS-MIB	ENTITY-MIB
OLD-CISCO-CPUK-MIB	To be determined
OLD-CISCO-DECNET-MIB	To be determined
OLD-CISCO-ENV-MIB	CISCO-ENVMON-MIB
OLD-CISCO-FLASH-MIB	CISCO-FLASH-MIB
OLD-CISCO-INTERFACES-MIB	IF-MIB CISCO-QUEUE-MIB
OLD-CISCO-IP-MIB	To be determined
OLD-CISCO-MEMORY-MIB	CISCO-MEMORY-POOL-MIB
OLD-CISCO-NOVELL-MIB	NOVELL-IPX-MIB
OLD-CISCO-SYS-MIB	(Compilation of other OLD* MIBs)
OLD-CISCO-SYSTEM-MIB	CISCO-CONFIG-COPY-MIB
OLD-CISCO-TCP-MIB	CISCO-TCP-MIB
OLD-CISCO-TS-MIB	To be determined
OLD-CISCO-VINES-MIB	CISCO-VINES-MIB
OLD-CISCO-XNS-MIB	To be determined

Important Information

The following section contains important notes about Cisco IOS Release 12.2(2) XA5 that can apply to the Cisco AS5300.

H.323 and SIP Coexistence

Cisco IOS Software Release 12.2(2) XA provides support for session initiation protocol (SIP) and H.323 coexistence on the Cisco IOS gateway. SIP and H.323 coexistence is supported for the Cisco AS5300 and Cisco AS5350 platforms. The following H.323, SIP, and other features function simultaneously on the Cisco IOS gateway.

H.323 Features

- Cisco SS7 Interconnect for Voice Gateways Solution features
- Netspeak interoperability (Internet call waiting)
- PC to phone interoperability (Click to dial)
- Netspeak Cleartoken object ID (OID)
- Q.SIG
- Call deflection (H.450.3)
- Call transfer (H.450.2)
- H.235 call security
- Dual Tone Multi-Frequency (DTMF) tunneling
- Public Switched Telephone Network (PSTN) fallback based on Voice Over IP (VoIP) network congestion
- Call admission control; programmable call treatment
- T.38 fax relay and fax relay reliability
- Time division multiplex (TDM) hairpinning
- Programmable interactive voice response (IVR)
- Rotary dial peers
- Alternate gatekeeper support on the gateway
- Multiple redirecting numbers (RDNs)
- IP address bind
- New resource availability indication (RAI) algorithm
- Frame size negotiation
- Codec negotiation and support

SIP Features

- SIP via user datagram protocol (UDP)
- Primary rate interface (PRI)

- Call transfer
- Call hold
- UDP connected socket
- Privacy indicator
- Mapping PRI within 180/183 SIP messaging
- Call control redirect/diversion
- Domain name server (DNS)
- Codec negotiation and support

Other Features

- Call history
- Quality of Service: IP precedence and Priority Queue Weighted Fair Queuing (PQWFQ)
- AAA/Radius server
- Network side PRI for 5ESS, DMS100, NI2, and NET5 switch types

Field Notices and Bulletins

- Field Notices—Cisco recommends that you view the Field Notices for this release to see if your software or hardware platforms are affected. If you have an account with Cisco.com, you can find Field Notices at: http://www.cisco.com/warp/customer/770/index.shtml. If you do not have a Cisco.com login account, you can find Field Notices at http://www.cisco.com/warp/public/770/index.shtml.
- Product Bulletins—If you have an account with Cisco.com, you can find Product Bulletins at http://www.cisco.com/warp/customer/cc/general/bulletin/index.shtml. If you do not have a Cisco.com login account, you can find Product Bulletins at http://www.cisco.com/warp/public/cc/general/bulletin/iosw/index.shtml.
- *What's Hot for IOS Releases: Cisco IOS 12.2—What's Hot for IOS Releases: Cisco IOS 12.2* provides information about caveats that are related to deferred software images for Cisco IOS Release 12.2. If you have an account with Cisco.com, you can access *What's Hot for IOS Releases: Cisco IOS 12.2* at http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml or by logging in and selecting **Software Center: Cisco IOS Software**.
- *What's New for IOS — What's New for IOS* lists recently posted Cisco IOS software releases and software releases that have been removed from Cisco.com. If you have an account with Cisco.com you can access *What's New for IOS* at http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml or by logging in and selecting **Software Center: Cisco IOS Software**.

Caveats for Cisco IOS Release 12.2 XA

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious. Severity 3 caveats are moderate caveats, and only select severity 3 caveats are included in the caveats document.

This section contains only open and resolved caveats for the current Cisco IOS maintenance release.

All caveats in Cisco IOS Release 12.1(5) XM, and Cisco IOS Release 12.2(1) are also in Cisco IOS Release 12.2(2) XA5.

For information on caveats in Cisco IOS Release 12.1(5) XM see the "Caveats" section in the Release Notes for Cisco AS5300 Universal Access Servers for Cisco IOS Release 12.1 XM at http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121relnt/5300/rn5300xm.htm.

For information on caveats in Cisco IOS Release 12.2(1), see *Caveats for Cisco IOS Release 12.2*, which lists severity 1 and 2 caveats and select severity 3 caveats and is located on Cisco.com and the Documentation CD-ROM.

Caveat numbers and brief descriptions of caveats in Cisco IOS Release 12.2(2) XA5 are listed in Table 5. For details about a particular caveat, go to Bug Toolkit at:

http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl

To access this location, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at cdbadmin@cisco.com. If you do not have an account on Cisco.com, go to http://www.cisco.com/register and follow the directions to set up an account.

Open Caveats—Cisco IOS Release12.2(2) XA5

There are no open caveats specific to Cisco IOS Release 12.2(2) XA5 that require documentation in the release notes.

Resolved Caveats—Cisco IOS Release12.2(2) XA5

All the caveats listed in Table 5 are resolved in Cisco IOS Release 12.2(2) XA5. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

Table 5 Resolved Caveats for Release 12.2(2) XA5

Caveat ID Number	Description
CSCdw65903	An error can occur with management protocol processing. Please use the following URL for further information: http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903

Open Caveats—Cisco IOS Release 12.2(2) XA4

All the caveats listed in Table 6 are open in Cisco IOS Release 12.2(2) XA4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 6 Open Caveats for Release 12.2(2) XA4

Caveat ID Number	Description
CSCdv89015	Spurious Access in if_dequeue_common
CSCdv53203	dead air calls result when NAS receives SETUP before COT_LP_OFF
CSCdv29225	5300 returns channel state to IDLE after receiving GSM OOS from SC
CSCdv49859	Gateway reloaded while running calls

Table 6 Open Caveats for Release 12.2(2) XA4 (continued)

Caveat ID Number	Description
CSCdv79077	Wrong IP address used to connect to host behind NAT
CSCdv61013	Dial modifier W detected in MICA offramp
CSCdv19662	STATUS message with cause code 100, cause DISCONNECT to be generated
CSCdv61349	Voice path not established in forward direction
CSCdv61372	No Speech Path in Backward direction
CSCdv66644	IVR: Stutter in IVR prompts
CSCdv15322	AS5300 Gateway reloaded while running ingress cot calls
CSCdu72787	In an SS7 configuration wrong response sent to an ISDN DISCONNECT

Resolved Caveats—Cisco IOS Release 12.2(2) XA4

All the caveats listed in Table 7 are resolved in Cisco IOS Release 12.2(2) XA4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 7 Resolved Caveats for Release 12.2(2) XA4

Caveat ID Number	Description
CSCdv39711	Outbound modem calls fail with %CSM-1-NO_VDEV: No modems associated:
CSCdu06427	Cleanup fix for CSCdt11503
CSCdv56410	Incorrect DiscwithPI handling causes memory leak and crash
CSCdv65099	OLI-SIP:5400 platform fails to pass valid FG-D oli information
CSCdu81936	Received gratuitous ARP overwrites interface MAC address in ARP tbl
CSCdv42346	All DSLs except primary advertised as OOS in GSM after RLM reinit
CSCdv43578	SIP: Incorrect Timestamps in SIP msgs
CSCdv48261	Improvements to dynamic acls for ios fw
CSCdv04703	TCL APP leaking rtpspi event buffers
CSCdv52628	DSP resources to 99% utilization
CSCdv09382	Memory leak in ISDN process for SS7 mixed mode calls
CSCdu62096	All incoming analog calls fail to connect with Soft Reset error.
CSCdv15655	$$Test Stopper$$ Crashes on OGW with H.450-3 calls not working.
CSCdv68078	CPU storm and mem leak in stress negative testing
CSCdu48296	IOS is freezing the echo filter before the channel is opened
CSCdv45035	Memory leak on 5300/5800
CSCdv27502	T.38 Fax-relay broken when using IVR Session Application
CSCdu75062	Tunnel formed in spite of Failed Chap authentication.
CSCdv44380	Spurious memory access at get_nfas_int under load
CSCdu02703	AS5300 crashes when forwarding via L2X with dialer CEF

Table 7 Resolved Caveats for Release 12.2(2) XA4 (continued)

Caveat ID Number	Description
CSCdv20566	Router crashes while sending facility msg on default application
CSCdv61312	AS5300: Voice path for voip calls corrupted after tdm hairpin calls.
CSCdv52629	Router crashes when E action specified in RQNT

Open Caveats—Cisco IOS Release 12.2(2) XA3

All the caveats listed in Table 8 are open in Cisco IOS Release 12.2(2) XA3. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 8 Open Caveats for Release 12.2(2) XA3

Caveat ID Number	Description
CSCdv21960	PPP encap causes voice call failures on 24th channel
CSCdv44380	Spurious memory access at get_nfas_int under load
CSCdv45035	Memory leak on 5300

Resolved Caveats—Cisco IOS Release 12.2(2) XA3

All the caveats listed in Table 9 are resolved in Cisco IOS Release 12.2(2) XA3. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 9 Resolved Caveats for Release 12.2(2) XA3

Caveat ID Number	Description
CSCdu57102	Removing bearers on an nfas group causes nas to crash
CSCdv41159	Remote IP Address in H.323 CDR shows media instead of signaling addr

Open Caveats—Cisco IOS Release 12.2(2) XA2

All the caveats listed in Table 10 are open in Cisco IOS Release 12.2(2) XA2. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 10 Open Caveats for Release 12.2(2) XA2

Caveat ID Number	Description
CSCds86189	Dialer profile in idle state with one active ppp/mlp channel
CSCdu72813	ALIGN-3-SPURIOUS: csm_check_neq_dchan_idb
CSCdv05516	Calls not disconnected after T309 timer
CSCdv20653	Multiple tracebacks generated during failed-COT calls
CSCdv24469	COT failure with retry using resend-setup fails
CSCdv29253	CAC does not busy 24th channel in SS7 configuration

Table 10 Open Caveats for Release 12.2(2) XA2 (continued)

Caveat ID Number	Description
CSCdv34585	AS5300 crashes with bus error at PC 0x0
CSCdv36061	Software Forced Crash, memory corruption
CSCdv41159	Remote IP address in H.323 CDR shows media instead of signaling addr
CSCdv41888	bus error crash at mgd_timer_set_exptime_internal under load

Resolved Caveats—Cisco IOS Release 12.2(2) XA2

All the caveats listed in Table 11 are resolved in Cisco IOS Release 12.2(2) XA2. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 11 Resolved Caveats for Release 12.2(2) XA2

Caveat ID Number	Description
CSCdu57102	Removing bearers on an nfas group causes nas to crash
CSCdu70230	No data path for TDM switched Synchronous 64K digital data calls
CSCdu72214	Nas returns wrong operation in Cot confirm message
CSCdu72226	TDM switching makes wrong connection with RPMS enabled
CSCdu74065	DSPless hairpin call fails if RPMS is enabled
CSCdu83242	Wrong data path for TDM switched synchronous 64K digital calls
CSCdu83755	Twenty-fifth TDM switched call connected to wrong inbound ds0
CSCdv01881	ppp negotiation keep running
CSCdv16323	Translation-rule sets callingNumber to string value null
CSCdv21526	Pavo CDR for initial call leg has bad Cause Code
CSCdv23618	Slight clipping of first prompt in IVR prompt playout
CSCdv24190	Continuous SS7 RSC sent on busy cics despite receipt of RLC
CSCdv25563	Gateway does not honor MediaWaitForConnect=TRUE
CSCdv30352	Empty Caps set should only close channel in one direction

Open Caveats—Cisco IOS Release 12.2(2) XA1

All the caveats listed in Table 12 are open in Cisco IOS Release 12.2(2) XA1. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 12 Open Caveats for Release 12.2(2) XA1

Caveat ID Number	Description
CSCdu30387	Offnet-to-uOne call: TGW does not detect DTMF digits
CSCdu60694	ISDN process holds a large amount of memory
CSCdu63648	Caller ID not passed to the end user equipment

Table 12 Open Caveats for Release 12.2(2) XA1 (continued)

Caveat ID Number	Description
CSCdu75062	Tunnel formed in spite of Failed Chap authentication.
CSCdu79898	COT tests fail, CRCX with S:co2 and R:co2 generates a 512 error
CSCdu83763	Channel state stuck in Proposed after NAS rec invalid call state
CSCdu86918	DSP resources not release on hair pinned calls
CSCdv01881	ppp negotiation keep running
CSCdv04703	TCL APP leaking rtpspi event buffers
CSCdv04749	NACKs (400,510) with back-to-back CRCX/DLCX
CSCdv04795	bus error at address 0xD0D0D21 in asfax_txservice
CSCdv06717	Upon Switchover in SC2200 one of the T1 Controller goes OOS
CSCdv11004	logging buffered does not enable Buffer logging (duplicate of CSCdt96143)
CSCdv11333	Three way conferencing is not working with Centile CA using MGCP 1.0
CSCdv23618	Slight clipping of first prompt in IVR prompt playout
CSCdv30465	Egress 5300 doesn't propagate ALERT across VOIP after resend-setup

Resolved Caveats—Cisco IOS Release 12.2(2) XA1

All the caveats listed in Table 13 are resolved in Cisco IOS Release 12.2(2) XA1. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 13 Resolved Caveats for Release 12.2(2) XA1

Caveat ID Number	Description
CSCdt29190	TV:AS5300:Wrong controller number used in Radius
CSCdt59455	vty-async virtual-template does not work with no peer default ip addr
CSCdt88628	modems stuck in modem-management-mode when downloading portware
CSCdt93862	Access level issue while using Web interface
CSCdt97942	Call gets disconnected before a settlement dial-peer is tried.
CSCdu00064	RTSP: some prompts do not get played
CSCdu08214	Calltracker MIB returns NULL for userid when DNIS/ANI is not present
CSCdu09342	ISDN network-side continuously sends RESTART after user-side reloads
CSCdu11203	Invalid memory action (malloc) at interrupt level due to CDAPI
CSCdu30345	DSP stopped collection digits - phone # with 0 length
CSCdu30729	Should include responseString when sending DLCX ack to Call Agent
CSCdu36171	Router Crashed when RLM link removed
CSCdu37471	RAI is not send out when signal channel is out of serv
CSCdu39498	TDMHP->DSP is not getting released,spurious
CSCdu41258	Bus error exception Access address=0xb0d0f59 when removing command
CSCdu46942	NU tone is not heard on ivr calls

Table 13 Resolved Caveats for Release 12.2(2) XA1 (continued)

Caveat ID Number	Description
CSCdu50601	ISDN should release 64K call w/ cause=Bearer Cap not supported
CSCdu55874	resource monitor reports a busyout ds0 as free after call disconnect
CSCdu56186	H323 GW:RSVP and Signal only call cleared by TGW after ACF received
CSCdu57066	CONN_LOST event needs to be handled in ACC_FASTSTART_PROGRESS state
CSCdu57585	After V92/QC stress test, cannot dialout of the 5300
CSCdu59975	Glare Conditions are not detected in vtsp
CSCdu60377	SIP GW: Calling number in ISDN SETUP not mapped to From header
CSCdu62721	Candidate fails to bring up B-channels (not du42219)
CSCdu65116	DLCX returns 517 invalid Mode for IVR calls
CSCdu66372	Modem passthru fails when Modem tone generated before CONNECT
CSCdu70661	all channels except 24th channel stay busied out after configuration
CSCdu76098	fax relay is broken when modem passthru is configured
CSCdu76502	Mica getting stuck in C state with isdn/pri
CSCdu79309	SETUP message incorrectly includes Calling Party Number IE
CSCdu79582	ISDN Number Plan UNKNOWN causes SIP call to fail
CSCdu79911	5300 reverts back to voice in OLC-ACK of t38 call
CSCdu82224	V120 calls were mis-identified as PIAFS calls
CSCdu87080	Attach domain name to TGCP
CSCdv01493	NAS Send MLP bundle ID for non-MLP VPDN call.
CSCdv06717	Upon Switchover in SC2200 one of the T1 Controller goes OOS
CSCdv14277	Memory leak related to CCH323_CT causes router to crash.
CSCuk21553	telnet client fails to perform DNS lookup of hostname

Open Caveats—Cisco IOS Release 12.2(2) XA

All the caveats listed in Table 14 are open in Cisco IOS Release 12.2(2) XA. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 14 Open Caveats for Release 12.2(2) XA

Caveat ID Number	Description
CSCdt35119	ISDN layer 2 is not up due to ds0-busyout
CSCdt38499	System returned to ROM by bus error at PC 0x0, address 0x0.
CSCdt77000	Tracebacks when fully loadingE1 pri NAS (120 calls).
CSCdt94802	5300 voice gateway big buffer leaking due to VFC OOB message
CSCdu06849	Modem calls don’t drop after clear interface command on d_channel
CSCdu13767	5300 NEAT_CRASHED

Table 14 Open Caveats for Release 12.2(2) XA (continued)

Caveat ID Number	Description
CSCdu14929	OSP config modified during reload, now Signature not verified.
CSCdu31155	DTMF-Relay fails with more than one call.
CSCdu37471	RAI is not sent out when signal channel is out of service.
CSCdu38669	Interoperation of ISDN and SIP messages is not behaving correctly.
CSCdu41258	Bus error exception Access address=0xb0d0t59
CSCdu44402	ISDN memory leak and call confirm errors after interfaceshut/noshut.
CSCdu54524	The ringback which is generated by the router is distorted.
CSCdu55457	No path confirmation tone is received.
CSCdu55874	Resource monitor reports a busyout ds0 as free after call disconnect.
CSCdu57585	After V92/QC stress test, cannot dial out of the 5300.
CSCdv21526	Pavo CDR for initial call leg has bad Cause Code
CSCdv28221	Gateway cannot accept RTP before FastStart elements received

Resolved Caveats—Cisco IOS Release 12.2(2) XA

There are no resolved caveats specific to Cisco IOS Release 12.2(2) XA that require documentation in the release notes.

Related Documentation

The following sections describe the documentation available for Cisco IOS Release 12.2. These documents consist of software installation guides, Cisco IOS configuration and command references, system error messages, 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-ROM.

Use these release notes with these documents:

- Release-Specific Documents, page 22
- Platform-Specific Documents, page 22
- Feature Modules, page 23
- Feature Navigator, page 23
- Cisco IOS Software Documentation Set, page 23

Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.2 and are located on Cisco.com and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.2*

  On Cisco.com at:

  Technical Documents: **Cisco IOS Software**: **Cisco IOS Release 12.2: Release Notes: Cross-Platform Release Notes**

  On the Documentation CD-ROM at:

  Cisco Product Documentation: Cisco IOS Software Configuration: **Cisco IOS Release 12.2: Release Notes**: **Cross-Platform Release Notes**

- Product bulletins, field notices, and other release-specific documents on Cisco.com at:

  Technical Documents

- The "Caveats for Cisco IOS Release 12.2 XA" section on page 14

  As a supplement to the caveats listed in "Caveats for Cisco IOS Release 12.2 XA" in these release notes, see *Caveats for Cisco IOS Release 12.2*, which contain caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.2.

  On Cisco.com at:

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

  On the Documentation CD-ROM at:

  Cisco Product Documentation: Cisco IOS Software Configuration: **Cisco IOS Release 12.2: Caveats**

Platform-Specific Documents

These documents are available for the Cisco AS5300 on Cisco.com and the Documentation CD-ROM:

- *Quick Start Guide Cisco AS5300 Universal Access Server Install and Configure*
- Hardware Installation Documents for Cisco AS5300
- Configuration Documents for Cisco AS5300
- *Regulatory Compliance and Safety Information*

  On Cisco.com at:

  Technical Documents: Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5300

  On the Documentation CD-ROM at:

  Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5300

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.2(2) XA1 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. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On Cisco.com at:

Technical Documents: Cisco IOS Software: Cisco IOS Release 12.2: New Feature Documentation

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: **Cisco IOS Release 12.2: New Feature Documentation**

Feature Navigator

Cisco Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

Cisco Feature Navigator is available 24 hours a day, 7 days a week. To access Cisco Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at http://www.cisco.com/register.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

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

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. The Cisco IOS software documentation set is shipped with your order in electronic form on the Documentation CD-ROM—unless you specifically ordered the printed versions.

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.

On Cisco.com at:

Technical Documents: Cisco IOS Software: Cisco IOS Release 12.2: Configuration Guides and Command References

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Configuration Guides and Command References

Release 12.2 Documentation Set

Table 15 lists the contents of the Cisco IOS Release 12.2 software documentation set, which is available in electronic form and in printed form if ordered.

Note You can find the most current Cisco IOS documentation on Cisco.com and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hard-copy documents were printed.

On Cisco.com at:

Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.2

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2

Table 15 Cisco IOS Release 12.2 Documentation Set

Books	Major Topics
• *Cisco IOS Configuration Fundamentals Configuration Guide* • *Cisco IOS Configuration Fundamentals Command Reference*	Cisco IOS User Interfaces File Management System Management
• *Cisco IOS Bridging and IBM Networking Configuration Guide* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 1 of 2* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 2 of 2*	Transparent Bridging SRB Token Ring Inter-Switch Link Token Ring Route Switch Module RSRB DLSW+ Serial Tunnel and Block Serial Tunnel LLC2 and SDLC IBM Network Media Translation SNA Frame Relay Access NCIA Client/Server Airline Product Set DSPU and SNA Service Point SNA Switching Services Cisco Transaction Connection Cisco Mainframe Channel Connection CLAW and TCP/IP Offload CSNA, CMPC, and CMPC+ TN3270 Server

Table 15 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Dial Technologies Configuration Guide: Dial Access* • *Cisco IOS Dial Technologies Configuration Guide: Large-Scale Dial Applications* • *Cisco IOS Dial Technologies Command Reference, Volume 1 of 2* • *Cisco IOS Dial Technologies Command Reference, Volume 2 of 2*	Dial Access Modem and Dial Shelf Configuration and Management ISDN Configuration Signaling Configuration Point-to-Point Protocols Dial-on-Demand Routing Dial Backup Dial Related Addressing Service Network Access Solutions Large-Scale Dial Solutions Cost-Control Solutions Internetworking Dial Access Scenarios
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	LAN Interfaces Serial Interfaces Logical Interfaces
• *Cisco IOS IP Configuration Guide* • *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services* • *Cisco IOS IP Command Reference, Volume 2 of 3: Routing Protocols* • *Cisco IOS IP Command Reference, Volume 3 of 3: Multicast*	IP Addressing IP Services IP Routing Protocols IP Multicast
• *Cisco IOS AppleTalk and Novell IPX Configuration Guide* • *Cisco IOS AppleTalk and Novell IPX Command Reference*	AppleTalk Novell IPX
• *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide* • *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference*	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
• *Cisco IOS Voice, Video, and Fax Configuration Guide* • *Cisco IOS Voice, Video, and Fax Command Reference*	Voice over IP Call Control Signaling Voice over Frame Relay Voice over ATM Telephony Applications Trunk Management Fax, Video, and Modem Support
• *Cisco IOS Quality of Service Solutions Configuration Guide* • *Cisco IOS Quality of Service Solutions Command Reference*	Packet Classification Congestion Management Congestion Avoidance Policing and Shaping Signaling Link Efficiency Mechanisms

Table 15 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Security Configuration Guide* • *Cisco IOS Security Command Reference*	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options Supported AV Pairs
• *Cisco IOS Switching Services Configuration Guide* • *Cisco IOS Switching Services Command Reference*	Cisco IOS Switching Paths NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
• *Cisco IOS Wide-Area Networking Configuration Guide* • *Cisco IOS Wide-Area Networking Command Reference*	ATM Frame Relay SMDS X.25 and LAPB
• *Cisco IOS Mobile Wireless Configuration Guide* • *Cisco IOS Mobile Wireless Command Reference*	General Packet Radio Service
• *Cisco IOS Terminal Services Configuration Guide* • *Cisco IOS Terminal Services Command Reference*	ARA LAT NASI Telnet TN3270 XRemote X.28 PAD Protocol Translation
• *Cisco IOS Configuration Guide Master Index* • *Cisco IOS Command Reference Master Index* • *Cisco IOS Debug Command Reference* • *Cisco IOS Software System Error Messages* • *New Features in 12.2-Based Limited Lifetime Releases* • *New Features in Release 12.2 T* • *Release Notes* (Release note and caveat documentation for 12.2-based releases and various platforms)	

Obtaining Documentation

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

World Wide Web

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

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

Documentation CD-ROM

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

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/en/US/ordering/index.shtml

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

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

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

Documentation Feedback

If you are reading Cisco product documentation on the World Wide Web, you can submit technical comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco.

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

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Attn Document Resource Connection
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

To access Cisco.com, go to the following website:

http://www.cisco.com

Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

http://www.cisco.com/tac

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

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

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

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

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

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

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.

P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 21.