



Release Notes for Cisco AS5400 Universal Gateways for Cisco IOS Release 12.1XM

February 25, 2002

Cisco IOS Release 12.1(5) XM8

78-12126-01 Rev. K0

These release notes for the Cisco AS5400 universal gateways describe the enhancements provided in Cisco IOS Release 12.1(5) XM8. These release notes are updated as needed.

For a list of the software caveats that apply to Release 12.1(5) XM8, see the [“Caveats for Cisco IOS Release 12.1 XM” section on page 14](#) and *Caveats for Cisco IOS Release 12.1T* that accompanies these release notes. This caveats document is updated for every maintenance release and is also located on Cisco.com and the Documentation CD-ROM.

Contents

These release notes describe the following topics:

- [Introduction, page 2](#)
- [System Requirements, page 2](#)
- [New and Changed Information, page 5](#)
- [Limitations and Restrictions, page 14](#)
- [Important Information, page 14](#)
- [Caveats for Cisco IOS Release 12.1 XM, page 14](#)
- [Related Documentation, page 22](#)
- [Obtaining Documentation, page 27](#)
- [Obtaining Technical Assistance, page 28](#)



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Introduction

The Cisco AS5400 universal gateway is a two-rack unit, 8, 12, or 16 T1/E1, 1 CT3 gateway that provides universal port data, voice, and fax services on any port at any time. The Cisco AS5400 offers high performance and high reliability in a compact, modular design. This cost-effective platform is intended for Internet service providers (ISPs) and enterprises requiring innovative universal services.

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.1(5) XM8, see the [“New and Changed Information” section on page 5](#) and the [“Related Documentation” section on page 22](#).

System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(5) XM8:

- [Memory Recommendations, page 2](#)
- [Supported Hardware, page 2](#)
- [Determining the Software Version, page 3](#)
- [Upgrading to a New Software Release, page 3](#)
- [Feature Set Tables, page 3](#)

Memory Recommendations

Table 1 *Memory Recommendations for the Cisco AS5400 Universal Gateways*

Image Name	Software Image	Flash Memory Recommended	DRAM Memory Recommended	Runs From
IP Plus	c5400-is-mz	32 MB	256 MB	RAM
IPSec 56	c5400-is56i-mz	32 MB	256 MB	RAM
Enterprise Plus	c5400-js-mz	32 MB	256 MB	RAM
Enterprise IPSec 56	c5400-js56i-mz	32 MB	256 MB	RAM

Supported Hardware

Cisco IOS Release 12.1(5) XM8 supports the Cisco AS5400. The supported interfaces and dial feature cards are detailed in [Table 2](#).

For detailed descriptions of the new hardware features, see the [“New and Changed Information” section on page 5](#).

Table 2 Supported Interfaces for the Cisco AS5400

Interfaces and Dial Feature Cards	Product Description
Dial Feature Cards	AS54-DFC-8CT1/CE1 (8PRI CT1/CE1)
	AS54-DFC-CT3
	AS54-DFC-108NP
	AS54-DFC-60NP
LAN Interfaces	Fast Ethernet 10/100BaseT (RJ-45)
Trunk/Backhaul Interface Options	8PRI CT1/CE1 DFC
	CT3 DFC

Determining the Software Version

To determine the version of Cisco IOS software running on your Cisco AS5400, log in to the Cisco AS5400 and enter the **show version EXEC** command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.1 Software (c5400-is-mz), Version 12.1(5) XM8, RELEASE SOFTWARE
```

Upgrading to a New Software Release

For general information about upgrading to a new software release, refer to *Upgrading the Cisco IOS Software Release in Cisco Routers and Modems* located at:

http://www.cisco.com/warp/public/130/upgrade_index.shtml

Other Firmware Code

Default bundled firmware for Nextport upgraded from version 2.3.3.108 to version 2.3.5.108.

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 12.1(5) XM8 supports the same feature sets as Cisco IOS Release 12.1(5) T, but Cisco IOS Release 12.1(5) XM8 can include new features supported by the Cisco AS5400.



Note

Features in Cisco IOS Release 12.1(5) T are listed in the *Release Notes for Cisco AS5400 Universal Access Servers for Cisco IOS Release 12.1 T*. If you have a Cisco.com login account, you can find image and release information regarding features prior to Cisco IOS Release 12.1(5) T by using the Feature Navigator tool at <http://www.cisco.com/go/fn>.

**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 lists the features and feature sets supported by the Cisco AS5400 in Cisco IOS Release 12.1(5) XM8 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. For example, (5)XM2 means a feature was introduced in 12.1(5) XM2.

Table 3 Feature List by Feature Set for the Cisco AS5400

Feature	In ¹	Software Images by Feature Set			
		IP Plus	IP Plus IPSec 56	Enterprise Plus	Enterprise Plus IPSec 56
Dial					
Call Admission Control Based on CPU Utilization	(5)XM2	Yes	No	Yes	Yes
Dial Peer Enhancements	(5)XM2	Yes	No	Yes	Yes
ISDN Network Side for ETSI Net5 PRI	(5)XM2	Yes	Yes	Yes	Yes
IP					
Redundant Link Manager (RLM)	(5)XM2	Yes	Yes	Yes	Yes
Security					
Cisco H.235 Accounting and Security Enhancements for Cisco Gateways	(5)XM2	Yes	No	Yes	Yes
Cisco H.323 Multizone Enhancements	(5)MX2	Yes	No	Yes	Yes
Video					
H.323 Support for Virtual Interfaces	(5)XM2	Yes	No	Yes	Yes
Voice					
Configurable Timers in H.225	(5)XM2	Yes	Yes	No	Yes
Cisco H.323 Version 2 Phase 2	(5)XM2	Yes	Yes	No	Yes
Ecosystem Gatekeeper Interoperability Enhancements	(5)XM2	Yes	Yes	No	Yes
Ecosystem Gatekeeper Interoperability Enhancements, Phase 2	(5)XM2	Yes	Yes	No	Yes
Feature Group D Support	(5)XM2	Yes	Yes	No	Yes
Gateway Support for Alternate Gatekeeper	(5)XM2	Yes	Yes	No	Yes
Gateway-to-Gatekeeper Billing Redundancy	(5)XM2	Yes	Yes	No	Yes
H.323 Enhancements	(5)XM2	Yes	Yes	No	Yes

Table 3 Feature List by Feature Set for the Cisco AS5400

Feature	In ¹	Software Images by Feature Set			
		IP Plus	IP Plus IPSec 56	Enterprise Plus	Enterprise Plus IPSec 56
H.323 Version 2 Support	(5)XM2	Yes	Yes	No	Yes
Interactive Voice Response Version 2.0 on Cisco VoIP Gateways	(5)XM2	Yes	Yes	No	Yes
Interactive Voice Response for Cisco Access Platforms	(5)XM2	Yes	Yes	No	Yes
Interworking Signaling Enhancements for H.323 VoIP	(5)XM2	Yes	Yes	No	Yes
Monitoring Voice and Fax Services on the Cisco AS5350 and Cisco AS5400 Universal Gateways	(5)XM2	Yes	Yes	No	Yes
Service Provider Features for Voice over IP	(5)MX2	Yes	Yes	Yes	Yes
Settlement for Packet Voice, Phase 2	(5)XM2	Yes	Yes	Yes	Yes
SIP Diversion Header Implementation for Redirecting Number (CSCdr72341)	(5)XM2	Yes	Yes	No	Yes
T.38 Fax for Cisco Universal Gateways	(5)XM2	Yes	Yes	No	Yes
Voice over IP Q.SIG Network Transparency	(5)XM2	Yes	Yes	No	Yes

1. The number in the “In” column indicates the Cisco IOS release when the interface was introduced. For example, (1) means an interface was introduced in Cisco IOS Release 12.1(1). If a cell in this column is empty, the interface was included in the initial base release.

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco AS5400 for Cisco IOS Release 12.1(5) XM8.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM8

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM8.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM7

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM7.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM6

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM6.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM5

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM5.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM4

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM4.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM3

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM3.

New Hardware Features in Cisco IOS Release 12.1(5) XM2

There are no new hardware features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM2.

New Software Features in Cisco IOS Release 12.1(5) XM2

The following new software features are supported by the Cisco AS5400 for Cisco IOS Release 12.1(5) XM2.

Call Admission Control Based on CPU Utilization

The Call Admission Control for CPU Utilization feature permits Cisco access servers, and Cisco universal gateways to deny incoming calls exceeding a preconfigured threshold, permitting the selection of a system CPU load level value. This feature helps ensure the quality of service of existing calls and reliability of system processes by preventing system overload caused by excessive incoming calls. The feature rejects new digital calls (PRI, CAS, and ISDN), with minor disruption to system users. When the preconfigured call denial threshold is reached, subsequent calls cannot get through and the caller hears a busy tone.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5800/sw_conf/ios_122/dt61294.htm.

Cisco H.235 Accounting and Security Enhancements for Cisco Gateways

The Cisco H.323 gateway now supports the use of CryptoH323Tokens for authentication. The CryptoH323Token is defined in H.225 Version 2 and is used in a "password-with-hashing" security scheme as described in section 10.3.3 of the H.235 specification.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5800/sw_conf/ios_122/pul0242x.htm.

Cisco H.323 Multizone Enhancements

This feature enables the Cisco gateway to provide information to the gatekeeper with the use of additional fields in the RAS (registration, admission, and status) messages.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull0244.htm.

Cisco H.323 Version 2 Phase 2

Cisco H.323 Version 2 Phase 2 upgrades Cisco IOS software by adding several optional features of the H.323 Version 2 specification and facilitates customized extensions to the Cisco Gatekeeper.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/121/121x/pullv2p2.htm

Configurable Timers in H.225

The H.323 Support for Virtual Interfaces feature allows users to configure the H.225 TCP connection timeout value for all out-going call attempts (on a per VoIP dial-peer basis).

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulcftgm.htm.

Dial Peer Enhancements

The following are the new dial-peer enhancements supported:

- Additional Dial String Symbols

Beginning in this release, additional dial string symbols are supported that you use with the destination-pattern dial-peer configuration command to establish the digit pattern.

- Number-Type Matching

To match on a number type for a dial peer call leg, the numbering-type command is used in dial-peer configuration mode. Number-type matching is supported on Plain Old Telephone Service (POTS), VoIP, VoFR, and VoATM dial peers.

- Digit-Strip Option

When a called number is received and matched to a POTS dial peer, the matched digits are stripped and the remaining digits are forwarded to the voice interface. A new command called digit-strip makes this default behavior an option. The digit-strip option is supported on POTS dial peers only.

- Translation Rule Implementation

When configuring your dial peers, you are provided with an option called the translation rule. This rule applies a translation rule to a calling party number (Automatic Number Identification [ANI]) or a called party number (Dial Number Information Service [DNIS]) for both incoming and outgoing calls within Cisco H.323 voice-enabled gateways. Also, the rule allows translation of the type of number.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/puldt662.htm.

Ecosystem Gatekeeper Interoperability Enhancements

The H.323 Support for Virtual Interfaces feature supplements the existing support for alternate gatekeepers and adds support for the alternate gatekeeper field (altGKInfo) to the gatekeeper rejection (GRJ) and registration rejection (RRJ) messages. This allows a gateway to move between gatekeepers during the gatekeeper request (GRQ) and registration request (RRQ) phases.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulclrnt.htm.

Ecosystem Gatekeeper Interoperability Enhancements, Phase 2

The H.323 Support for Virtual Interfaces feature supplements the existing support for alternate gatekeepers and adds support for the alternate gatekeeper field (altGKInfo) to the admission rejection (ARJ). This allows a gateway to move between gatekeepers during the admission request (ARQ) phase.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulgkarj.htm.

Feature Group D Support

This feature extends support for Feature Group D signaling on Cisco platforms. Feature Group D service is a trunk side connection that enables telephone customers to choose their long distance network and use the same number of digits no matter which carrier they use. Routers interface with interexchange carriers using Feature Group D to support voice traffic in the carrier environment.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulhdvfg.htm.

Gateway Support for Alternate Gatekeeper

The Alternate Gatekeeper feature provides redundancy for a gatekeeper in a system where gatekeepers are used. This enhancement allows a gateway to use up to two alternate gatekeepers as a backup in the case of a primary gatekeeper failure.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulaltgk.htm.

Gateway-to-Gatekeeper Billing Redundancy

The Gateway-to-Gatekeeper Billing Redundancy feature enhances the accounting capabilities of the Cisco H.323 Gateway and provides support for Vocaltec Gatekeepers. The Gateway-to-Gatekeeper Billing Redundancy feature provides redundant billing information to an alternate gatekeeper if the primary Gatekeeper to which a Gateway is registered becomes unavailable.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulgwgkb.htm.

H.323 Enhancements

This feature consists of the following:

- Source Call Signal Address, which is an enhancement to the admissions request (ARQ) message to allow a source call-signal address field.
- H.245 Empty Capabilities Set, which is a mandatory part of H.323, Version 2. It is used by applications to redirect the voice media stream, which is a new address

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull_fts.htm.

H.323 Support for Virtual Interfaces

The H.323 Support for Virtual Interfaces feature allows users to configure the IP address of the gateway, so that the IP address include in the H.323 packet is deterministic and consistently indicates the same address for the source.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull_bnd.htm.

H.323 Version 2 Support

Cisco H.323 Version 2 Support upgrades Cisco IOS software to comply with the mandatory requirements and several of the optional features of the version 2 specification. This upgrade enhances the existing Voice Over IP Gateway, the Multimedia Conference Manager (Gatekeeper and Proxy).

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pullh323.htm.

Interactive Voice Response for Cisco Access Platforms

The Interactive Voice Response (IVR) feature allows the use of one of several interactive voice response scripts during the call processing. The TCL scripts are designed to interact with the IVR application software to perform the various functions. TCL scripts contain both executable files and audio files that interact with the system software. The IVR application is used for information gathering and processing purposes, such as accounting and billing.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull_ivr.htm.

Interactive Voice Response Version 2.0 on Cisco VoIP Gateways

IVR Version 2.0 is the fourth release of IVR and TCL scripting on Cisco IOS VoIP gateways. The Cisco IVR feature (first made available in Cisco IOS Release 12.0(3)T and 12.0(7)T) provides IVR capabilities using TCL scripts.

IVR systems provide information in the form of recorded messages over telephone lines in response to user input in the form of spoken words. For example, when a user makes a call with a debit card, an IVR application is used to prompt the caller to enter a specific type of information, such as an account

number. After playing the voice prompt, the IVR application collects the predetermined number of touch tones (digit collection), forwards the collected digits to a server for storage and retrieval, and then places the call to the destination phone or system. Call records can be kept and a variety of accounting functions performed.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pullskyn.htm.

Interworking Signaling Enhancements for H.323 VoIP

The Interworking Signaling Enhancements for H.323 and SIP VoIP feature enables VoIP networks to properly signal the setup and tear-down of calls, including generating in-band tones and announcements when needed at the originating or terminating switch. When a tone (for example, ringback, busy, reorder) or announcement (for example, "The number you have dialed is no longer in service") is played at the destination switch, the backward voice path from the called party to the calling party is cut-through early, so that the calling party can hear the tone or announcement. To prevent fraudulent calls, the voice path is cut-through in both directions only after the Connect message is received from the destination. The call progress indicator, which signals the availability of in-band communication, is carried end-to-end as required when interworking with ISDN and CAS protocols.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pul323pi.htm.

ISDN Network Side for ETSI Net5 PRI

The ISDN Network Side for ETSI Net5 PRI feature enables Cisco IOS to replicate the public switched network interface to a PBX that is compatible with the ETSI Net5 switch type.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/puldtpri.htm.

Monitoring Voice and Fax Services on the Cisco AS5350 and Cisco AS5400 Universal Gateways

The universal port dial feature card (DFC) is a hardware card that processes voice and data services port technology for the Cisco AS5350 and Cisco AS5400. The ports on the Universal Port DFC support multiple types of service including modem, digital, voice, and fax. Ports can be aggregated at the slot level of the Universal Port module, the Service Processing Element (SPE) level within the Universal Port module, and the individual port level.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121limit/121x/121xm/121xm_5/ftupspe.htm.

Prepaid Distributed Calling Card via Packet Telephony

The Debit Card for Packet Telephony on Cisco Access Platforms is an application supported by the Cisco Interactive Voice Response (IVR) feature. The IVR voice scripts have been modified to use Tool Command Language (TCL) scripts.

The feature components consist of IVR functionality in Cisco IOS software that work in conjunction with an integrated third-party billing system. The Debit Card feature includes the ability to maintain per-user credit balance information through the use of a billing system. When these features are implemented, the billing system and IOS software functions enable a carrier to authorize voice calls and debit individual user accounts in real time at the edges of a voice-over-IP network, without requiring external service nodes. This feature uses vendor specific attributes (VSAs) to communicate with the billing system.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull0134.htm.

Redundant Link Manager (RLM)

The goal of Redundant Link Manager (RLM) is to primarily provide a virtual link management over multiple IP networks so that the Q.931 signaling protocol and other proprietary protocols can be transported on top of multiple redundant links between the Cisco Signaling Controller (CSC) and the Network Access Server (NAS). In addition to this, RLM opens, maintains, and closes multiple links, manages buffers of queued signaling messages, and monitors whether links are active for link failover and Signaling Controller failover. The user can create more than one IP connection between the CSC and the NAS.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull_rlm.htm.

Service Provider Features for Voice over IP

The Cisco voice Service Provider features include enhancements made to the functionality and configuration of both the gateway and the Voice over IP (VoIP) gatekeeper. The architecture of these features provides the Quality of Service (QoS), stability, and functionality necessary for carrier class, real-time IP communications services.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pulvoip1.htm.

Settlement for Packet Voice, Phase 2

The Settlements for Packet Voice, Phase 2 feature contains two features that were not in the first Cisco implementation of OSP (Settlement for Packet Telephony on Cisco Access Platforms): Roaming and PKI Multiple Roots.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pul0123b.htm.

SIP Diversion Header Implementation for Redirecting Number (CSCdr72341)

The SIP Diversion Header Implementation for Redirecting Number feature provides support for a new SIP header field; Call Control (CC)-Diversion. The CC-Diversion header field enables the SIP gateway to pass call control redirecting information during the call setup. Call control redirection is the redirection of a call based on a subscriber service such as call forwarding. Call redirection information is typically used for Unified Messaging and voice mail services to identify the recipient of a message. Call control redirection information can also be used to support applications such as automatic call distribution and enhanced telephony features such as Do Not Disturb and Caller ID.

For further details, please see

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121rel/sipcfs/hennigan.htm>.

T.38 Fax for Cisco Universal Gateways

A universal port dial feature card (DFC) is a hardware card that processes digital service port technology for the Cisco AS5400. Ports on the universal port DFC support multiple types of services such as modem, fax, digital data, and voice. The universal port DFC provides multiple port sessions, with each session capable of originating or terminating a session over a DS-0 in PCM format. The number of sessions depends on the port density of the card. You can manage your port connections at the universal port slot level, service processing element (SPE) level, or port level using monitoring and troubleshooting commands. A port is defined as an endpoint on a DFC card through which multiservice tones, voice, and data flow. There are six ports per SPE.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/puldtfax.htm.

Voice over IP Q.SIG Network Transparency

Integration of Q.SIG enables Cisco voice switching services to connect private branch exchanges (PBXs), key systems (KTs), and central office switches (COs) that communicate by using the Q.SIG protocol.

The Q.SIG protocol is a variant of ISDN D-channel voice signaling. It is based on the ISDN Q.921 and Q.931 standards and is becoming a worldwide standard for PBX interconnection. By using Q.SIG signaling, the Cisco AS5300 can route incoming voice calls from a private integrated services network exchange (PINX) across a wide-area network (WAN) to a peer Cisco AS5300, which can then transport the signaling and voice packets to a second PINX.

For further details, please see

http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull0125.htm.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM1

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM1.

New Hardware and Software Features in Cisco IOS Release 12.1(5) XM

There are no new hardware and software features in the Cisco AS5400 for Cisco IOS Release 12.1(5) XM.

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 Management Information Bases (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 NMS applications. You can update from deprecated MIBs to the replacement MIBs as shown in [Table 4](#).

Table 4 *Deprecated and Replacement MIBs*

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

Limitations and Restrictions

The MICA and microcom modems are not supported on the Cisco AS5400. Only modem and voice services are supported by using the NextPort dial feature card.

Important Information

The following section contains important notes about Cisco IOS Release 12.1(5) XM8 that can apply to the Cisco AS5400.

FastNet Interface Configuration Issues

Voice testing with the Cisco AS5400 and the FastNet interface requires the following configurations:

- The config set must be:


```
speed auto
duplex auto
```
- Fast switching must remain at its default **ip route-cach** configuration.

Caveats for Cisco IOS Release 12.1 XM

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

All caveats in Cisco IOS Release 12.1 and Cisco IOS Release 12.1T are also in Cisco IOS Release 12.1(5) XM8.

For information on caveats in Cisco IOS Release 12.1T, see *Caveats for Cisco IOS Release 12.1T*.

For information on caveats in Cisco IOS Release 12.1, see *Caveats for Cisco IOS Release 12.1*, which lists severity 1 and 2 caveats and select severity 3 caveats for Cisco IOS Release 12.1 and is located on Cisco.com and the Documentation CD-ROM.

Caveat numbers and brief descriptions of caveats in Cisco IOS Release 12.1(5) XM5 are listed in [Table 5](#) and [Table 6](#). 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. For information about how to obtain an account, go to the [“Cisco IOS Software Documentation Set”](#) section on page 23.



Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, **log in** to Cisco.com and click **Service and Support: Technical Assistance Center: Select & Download Software: Jump to a software resource: Software Bug Toolkit/Bug Watcher**. Another option is to go to <http://www.cisco.com/support/bugtools/>.

Open Caveats — Cisco IOS Release 12.1(5) XM8

All the caveats listed in [Table 5](#) are open in Cisco IOS Release 12.1(5) XM8. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 5 Open Caveats for Release 12.1(5) XM8

Caveat ID Number	Description
CSCdv68388	Enhancements/Fixes to Cache Error Exception Handler

Resolved Caveats — Cisco IOS Release 12.1(5) XM8

All the caveats listed in [Table 6](#) are resolved in Cisco IOS Release 12.1(5) XM8. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 6 Resolved Caveats for Release 12.1(5) XM8

Caveat ID Number	Description
CSCdu69834	ip mtu adjust should default to off
CSCdt67753	Need knob to disable automatic MTU adjustment added via CSCdr01713

Open Caveats — Cisco IOS Release 12.1(5) XM7

There are no open caveats specific to Cisco IOS Release 12.1(5) XM7 that require documentation in the release notes.

Resolved Caveats — Cisco IOS Release 12.1(5) XM7

All the caveats listed in [Table 7](#) are resolved in Cisco IOS Release 12.1(5) XM7. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 7 Resolved Caveats for Release 12.1(5) XM7

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 12.1(5) XM6

All the caveats listed in [Table 10](#) are open in Cisco IOS Release 12.1(5) XM5. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 8 Open Caveats for Release 12.1(5) XM6

Caveat ID Number	Description
CSCdv83040	RADIUS attribute 242 does not support protocol 50 and 51

Resolved Caveats—Cisco IOS Release 12.1(5) XM6

All the caveats listed in [Table 9](#) are resolved in Cisco IOS Release 12.1(5) XM6. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 9 Resolved Caveats for Release 12.1(5) XM6

Caveat ID Number	Description
CSCdv14000	NAS Port format E inconsistent Async slot/port formatting
CSCdv11586	Attr 11-non existent access-lists on NAS-removes route to user
CSCdv22919	Extra STOP record being generated by send-stop authentication fail
CSCdv27705	AAA should report physical port info for VAccess VProfile users
CSCdv35240	SNMP set command sent to T3 & T1 controller adds blank descr command
CSCdv54407	L2TP acc req packet not sending class 25 att
CSCdr08256	* is converted to 0 in the running config
CSCdr47232	Set operation not implemented for dsx1CircuitIdentifier
CSCdv48261	Improvements to dynamic acls for ios fw
CSCdv65523	Dialer Idle-timeout on the dialer interfaces does not reset
CSCdu81936	Received gratuitous ARP overwrites interface MAC address in ARP tbl
CSCdw04350	sh spe displays incorrect number of disabled/free ports after stress
CSCdv75228	Unable to make outbound modem calls or use modemcap after voice call
CSCdv73152	Characters Tx is always 0

Open Caveats—Cisco IOS Release 12.1(5) XM5

There are no open caveats specific to Cisco IOS Release 12.1(5) XM5 that require documentation in the release notes.

Resolved Caveats—Cisco IOS Release 12.1(5) XM5

All the caveats listed in [Table 10](#) are resolved in Cisco IOS Release 12.1(5) XM5. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 10 Resolved Caveats for Release 12.1(5) XM5

Caveat ID Number	Description
CSCdt88329	Port modem startup-test, test port modem back-to-back fail on AS5400
CSCdu87662	Cisco as5400 reloads during stress test with process_handle_watchdog error
CSCdt09214	Spurious memory access at vp_ipfib_fixup+0x20

Open Caveats—Cisco IOS Release 12.1(5) XM4

All the caveats listed in [Table 11](#) are open in Cisco IOS Release 12.1(5) XM4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 11 Open Caveats for Release 12.1(5) XM4

Caveat ID Number	Description
CSCdt61467	Need a way to change the default value of VPDN parameters
CSCdt86063	Outbound HDLC calls do not function after first ping
CSCdt88329	Port modem startup-test fails for 50% of modems
CSCdu06258	CPU over 95% on AS5400 voice gateway with 100 calls
CSCdu52551	Output of sh spe shows incorrect number of free ports
CSCdu57265	Memory leak in EST msg processing during stress test

Resolved Caveats—Cisco IOS Release 12.1(5) XM4

All the caveats listed in [Table 12](#) are resolved in Cisco IOS Release 12.1(5)XM4. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 12 Resolved Caveats for Release 12.1(5) XM4

Caveat ID Number	Description
CSCds14059	Support for untagged Radius tunnel attributes (attr.69 et al)
CSCds55510	Memory Leak with AAA route download
CSCds62454	Need MIB interface for echo coverage values of 64ms and 128ms
CSCds63993	H323 GW: IP calls dangling when delay TCP connection occurs
CSCds65611	All B-chan out of serv after controller no-shut then serial no-shut
CSCds71291	Spurious Accesses in mlp_timer
CSCdt07405	Activecallsummary table not getting populated for analog,V110 calls
CSCdt10347	Contradictory nature of sh busy o/p
CSCdt11503	IOS crashes when large OID (>256 fields) is received
CSCdt26310	Fax tx level is set to wrong parameter
CSCdt40518	Cannot properly reconfigure multiple CAS ds0-groups without reload
CSCdt41888	Add dlcx functionality as hidden command

Table 12 Resolved Caveats for Release 12.1(5) XM4 (continued)

Caveat ID Number	Description
CSCdt44593	Two L2TP tunnels for 2 users with same domain-name
CSCdt46181	Redzone corruption in pptp_tcp_readf()
CSCdt52171	Router crashed when switching E1 controller card with T1 contr card
CSCdt63518	FIB-4-PUNTINTF msg for L2F/MP bundle member w no ip route-cache cef
CSCdt66730	VAD is not enabled in both directions for E1R2
CSCdt69055	B-channels IN_SERVICE after RESTART when L1 is DEACTIVATED
CSCdt79258	sh spe fax active always shows Tx/Rx page count as zero
CSCdt83356	Alignment errors in resource accounting
CSCdt89495	24th channel of T1 0 stays busied-out
CSCdt89614	Display Stack Trace and Error Msg for Out Of Range NAKs
CSCdt96253	CRC-32 compensation vulnerability
CSCdt96945	Resource threshold information lost on GK after element failure
CSCdt97078	AS5400 crashed at call_prog_notif_fe_tcp_hostfailed
CSCdu02268	Need bounds checks for NextPort dsp config params
CSCdu05205	Memory corruption crash
CSCdu05236	Default disabling of parser cache should not be nvgened
CSCdu06654	T1 PRI calls, codec counter pegged twice under show spe voice summary
CSCdu06973	Audio path cut thru prematurely in forward direction
CSCdu07270	Object check in ivr and resources check in voip_aaa to be added
CSCdu07504	sh voice dsp causes reload
CSCdu08214	Calltracker MIB returns NULL for userid when DNIS/ANI is not present
CSCdu14000	Traceback at rlm_link_weight_priority_insert_compare after reload
CSCdu17817	Trunk clock spam at boot up
CSCdu18968	Cannot config 240 bytes g711ulaw under voice class codec
CSCdu25007	clear spe with calls running could have negative effects
CSCdu25394	SNMP query returns wrong values for dsx3LineType & TransmitClock
CSCdu25778	AAA accounting authen failure sends STOP on exec autoselect
CSCdu27780	AS5300 Suspend message not sent on H323 side with fax configured
CSCdu27954	%SYS-6-STACKLOW: Stack for process EST msg processing running low
CSCdu28900	Modem namestring function doesnt get registered in AS5400 platform
CSCdu31149	AAA Resource Accounting missing Attr 5 for CAS calls
CSCdu34741	Term GW doesnt disconnect call which arrives after RLM is down
CSCdu35774	Memory leak when all Radius servers down (aaa_res_acct_call_setup)
CSCdu38607	It fixes a problem whereby some attr 196 progress codes get lost. This affects TCP Clear codes and possibly other too.
CSCdu42219	Throttle 21 fails to bring up B channels after reboot w/SS7

Table 12 Resolved Caveats for Release 12.1(5) XM4 (continued)

Caveat ID Number	Description
CSCdu50069	%VTSP-3-NOEVENT: no free event structure available for DSP message
CSCdu61652	E1 - R2 Signalling does not send ANI
CSCdu62721	12.1(5)XM4 candidate fails to bring up B-channels

Open Caveats—Cisco IOS Release 12.1(5) XM3

All the caveats listed in [Table 13](#) are open in Cisco IOS Release 12.1(5) XM3. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 13 Open Caveats for Release 12.1(5) XM3

Caveat ID Number	Description
CSCdu02919	Cisco AS5400 hangs after bootup
CSCds52536	ISDN sync call rejected/failed caller id screening/workaround>reload
CSCds70303	SHOW ISDN STAT shows hanging CCBs (CCBs without active calls)

Resolved Caveats—Cisco IOS Release 12.1(5) XM3

All the caveats listed in [Table 14](#) are resolved in Cisco IOS Release 12.1(5) XM3. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 14 Resolved Caveats for Release 12.1(5) XM3

Caveat ID Number	Description
CSCds61268	Crash seen in aaa_free_user_internal()
CSCdt08577	Crash in aaa/radius code
CSCdt65421	Crash after removing sgbp member
CSCdt78099	Crash seen at aaa_acct_periodic
CSCdt82097	Crash seen at aaa_do_accounting
CSCds76424	Large 1500 byte packets through ISL/DOT1Q trunk on AS5400 dropping
CSCdt05873	RADIUS resource accounting acknowledgements un-sane
CSCdt18436	Wedged input during MLPPP calls
CSCdt24091	hide-telnet-addresses does not suppress hostname in TCPClear call
CSCdt58639	CDAPI TSP ERROR create msg failed with mixed voice/fax/modem calls
CSCdt58743	SIP:TGW crashed during stress run with Bus Error exception
CSCdt64833	RM: NAS expecting rg_ss7_rpms_v.110 instead of rg_ss7_rpms_v110
CSCdt68288	Stress crashed in mixed V/F/M - pm_call_event_process(0x601a943c)
CSCdt76186	Test Nextport firmware download commnad fails
CSCdt78894	Original stack is lost upon crash if there is another crash

Table 14 Resolved Caveats for Release 12.1(5) XM3 (continued)

Caveat ID Number	Description
CSCdt80688	AS5400 hangs after 6hrs due to ppp_flushing_pending_ncps
CSCdt11245	Router crashes while running cas calls traceback from avl_insert
CSCdt82075	GW stops accepting calls due to SYS-2-INPUTQ tracebacks
CSCdu04869	Unframed data dropped when no process on line (regress CSCdt29989)
CSCdt55258	MLP hangs router or causes stack overrun
CSCds52920	Syslog messages are not logged onto syslog server.
CSCdt01452	Lex interface forward bridge BPDUs coming from remote LAN extender
CSCdt09023	Cannot build the 7200 platform -p- images
CSCdt10151	H323 VSA attribute being sent for all platforms
CSCdt30629	Need to speed up RM to TACACS+ accounting processing
CSCdt38813	H323 GW leaks RTCP ports with signal only call
CSCdt78196	Cisco 3640 router crashes at L3_ProcessInternal

Open Caveats—Cisco IOS Release 12.1(5) XM2

This section documents possible unexpected behavior by Cisco IOS Release 12.1(5) XM2 and describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds45111 and CSCdt30629

On a Cisco AS5400 platform, when a configuration is copied from a TFTP server to the running configuration using the **copy tftp running** command, a low-memory error message is generated, even though there is sufficient memory. There is no workaround.

- CSCds81187

When the PPP Password Authentication Protocol (PAP)-password validation fails—that is, when the PPP PAP password is configured incorrectly—a slow memory leak occurs. There is no workaround.

- CSCdt45598

On a Cisco AS5400, if the “Group-Async” interface has the **ip address negotiated** command enabled and the **group-range** command is removed while traffic is passing through the interface, the router reloads.

Workaround: Do not remove the **group-range command** while traffic is passing through the interface.

Alternative workaround: Instead of the **ip address negotiated** command, configure the **ip unnumbered** command on the “Group-Async” interface.

- CSCdt64336

On a Cisco AS5400, if an NP108 card is hot-swapped with an NP60 card, the **group-range** command under the “Group-Async” interface does not change.

Workaround: Reconfigure the “Group-Async” interface.

Resolved Caveats—Cisco IOS Release 12.1(5) XM2

All the caveats listed in this section are resolved in Cisco IOS Release 12.1(5) XM2. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds04747

Cisco IOS software contains a flaw that permits the successful prediction of TCP Initial Sequence Numbers.

This vulnerability is present in all released versions of Cisco IOS software running on Cisco routers and switches. It only affects the security of TCP connections that originate or terminate on the affected Cisco device itself; it does not apply to TCP traffic forwarded through the affected device in transit between two other hosts.

To remove the vulnerability, Cisco is offering free software upgrades for all affected platforms. The defect is described in DDTs record CSCds04747.

Workarounds are available that limit or deny successful exploitation of the vulnerability by filtering traffic containing forged IP source addresses at the perimeter of a network or directly on individual devices.

This notice will be posted at <http://www.cisco.com/warp/public/707/ios-tcp-isn-random-pub.shtml>.

This caveat is resolved in Cisco IOS Release 12.1(5)XM2.

- CSCds70303

When running a Cisco SS7 Interconnect for Voice Gateways Solution configuration on a Cisco AS5400 platform, the output of the **show isdn stat** command might list call control blocks (CCBs) for calls that are no longer active. These CCBs might accumulate over time. There is no workaround.

This caveat is resolved in Cisco IOS Release 12.1(5)XM2.

Open and Resolved Caveats — Cisco IOS Release 12.1(5) XM1

There are no open and resolved caveats specific to Cisco IOS Release 12.1(5) XM1 that require documentation in the release notes.

Open Caveats—Cisco IOS Release 12.1(5) XM

This section describes possibly unexpected behavior by Cisco IOS Release 12.1(5)XM and describes only severity 1 and 2 caveats and select severity 3 caveats:

- CSCds70303

When running a Cisco SS7 Interconnect for Voice Gateways Solution configuration on a Cisco AS5400 platform, the output of the **show isdn stat** command might list call control blocks (CCBs) for calls that are no longer active. These CCBs might accumulate over time. There is no workaround.

Resolved Caveats—Cisco IOS Release 12.1(5) XM

There are no resolved caveats specific to Cisco IOS Release 12.1(5) XM that require documentation in the release notes.

Related Documentation

The following sections describe the documentation available for the Cisco AS5400. 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-ROM.

Use these release notes with these documents:

- [Release-Specific Documents, page 22](#)
- [Platform-Specific Documents, page 23](#)
- [Feature Modules, page 23](#)
- [Cisco IOS Software Documentation Set, page 23](#)
- [Cisco IOS Software Documentation Set, page 23](#)

Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.1 and are located on Cisco.com and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.1*

On Cisco.com at:

Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: 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 12.1 XM](#)” section on page 14

As a supplement to the caveats listed in “[Caveats for Cisco IOS Release 12.1 XM](#)” in these release notes, see *Caveats for Cisco IOS Release 12.1* and *Caveats for Cisco IOS Release 12.1T*, which contains caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.1 and Cisco IOS Release 12.1 T.

On Cisco.com at:

Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1: Release Notes: Caveats

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Caveats

**Note**

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, log in to Cisco.com and click **Service & Support: Technical Assistance Center: Select & Download Software: Jump to a software resource: Software Bug Toolkit/Bug Watcher**. Another option is to go to <http://www.cisco.com/support/bugtools/bugtool.shtml>.

Platform-Specific Documents

These documents are available for the Cisco AS5400 on Cisco.com and the Documentation CD-ROM:

- *Cisco AS5400 Universal Gateway Read Me First*
- Hardware Installation Documents for Cisco AS5400
- Configuration Documents for Cisco AS5400
- Regulatory Compliance and Safety Documents for Cisco AS5400

On Cisco.com at:

Technical Documents: Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5400

On the Documentation CD-ROM at:

Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5400

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 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 12.1: New Feature Documentation

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation

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 12.1: Configuration Guides and Command References

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References

Cisco IOS Release 12.1 Documentation Set Contents

Table 14 lists the contents of the Cisco IOS Release 12.1 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: Cisco IOS Software: Cisco IOS Release 12.1

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1

Table 15 Cisco IOS Release 12.1 Documentation Set

Books	Major Topics
<ul style="list-style-type: none"> <i>Cisco IOS Configuration Fundamentals Configuration Guide</i> <i>Cisco IOS Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS System Management Cisco IOS User Interfaces Commands Cisco IOS File Management Commands Cisco IOS System Management Commands
<ul style="list-style-type: none"> <i>Cisco IOS Bridging and IBM Networking Configuration Guide</i> <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume I</i> <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume II</i> 	Using Cisco IOS Software Overview of SNA Internetworking Bridging IBM Networking

Table 15 Cisco IOS Release 12.1 Documentation Set (continued)

Books	Major Topics
<ul style="list-style-type: none"> • <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i> • <i>Cisco IOS Dial Services Configuration Guide: Network Services</i> • <i>Cisco IOS Dial Services Command Reference</i> 	Preparing for Dial Access Modem Configuration and Management ISDN and Signaling Configuration PPP Configuration Dial-on-Demand Routing Configuration Dial-Backup Configuration Terminal Service Configuration Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Networks X.25 on ISDN Solutions Telco Solutions Dial-Related Addressing Services Interworking Dial Access Scenarios
<ul style="list-style-type: none"> • <i>Cisco IOS Interface Configuration Guide</i> • <i>Cisco IOS Interface Command Reference</i> 	Interface Configuration Overview Configuring LAN Interfaces Configuring Serial Interfaces Configuring Logical Interfaces
<ul style="list-style-type: none"> • <i>Cisco IOS IP and IP Routing Configuration Guide</i> • <i>Cisco IOS IP and IP Routing Command Reference</i> 	IP Addressing and Services IP Routing Protocols IP Multicast
<ul style="list-style-type: none"> • <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i> • <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i> 	AppleTalk and Novell IPX Overview Configuring AppleTalk Configuring Novell IPX
<ul style="list-style-type: none"> • <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i> • <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i> 	Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Overview Configuring Apollo Domain Configuring Banyan VINES Configuring DECnet Configuring ISO CLNS Configuring XNS
<ul style="list-style-type: none"> • <i>Cisco IOS Multiservice Applications Configuration Guide</i> • <i>Cisco IOS Multiservice Applications Command Reference</i> 	Multiservice Applications Overview Voice Video Broadband
<ul style="list-style-type: none"> • <i>Cisco IOS Quality of Service Solutions Configuration Guide</i> • <i>Cisco IOS Quality of Service Solutions Command Reference</i> 	Quality of Service Overview Classification Congestion Management Congestion Avoidance Policing and Shaping Signaling Link Efficiency Mechanisms Quality of Service Solutions

Table 15 Cisco IOS Release 12.1 Documentation Set (continued)

Books	Major Topics
<ul style="list-style-type: none"> • <i>Cisco IOS Security Configuration Guide</i> • <i>Cisco IOS Security Command Reference</i> 	<ul style="list-style-type: none"> Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Other Security Features
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	<ul style="list-style-type: none"> Cisco IOS Switching Services Overview Cisco IOS Switching Paths Cisco Express Forwarding NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> • <i>Cisco IOS Wide-Area Networking Configuration Guide</i> • <i>Cisco IOS Wide-Area Networking Command Reference</i> 	<ul style="list-style-type: none"> Wide-Area Networking Overview Configuring ATM Configuring Frame Relay Configuring Frame Relay-ATM Interworking Configuring SMDS Configuring X.25 and LAPB
<ul style="list-style-type: none"> • <i>Cisco IOS Configuration Guide Master Index</i> • <i>Cisco IOS Command Reference Master Index</i> • <i>Cisco IOS Debug Command Reference</i> • <i>Cisco IOS Dial Services Quick Configuration Guide</i> • <i>Cisco IOS Software System Error Messages</i> • <i>New Features in 12.1-Based Limited Lifetime Releases</i> • <i>New Features in Release 12.1 T</i> • <i>Release Notes</i> (Release note and caveat documentation for 12.1-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/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

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 with the documents listed in the [“Related Documentation”](#) section on page 22.

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