



Release Notes for the Cisco 2600 Series for Cisco IOS Release 12.1 XM

June 13, 2002

Cisco IOS Release 12.1(5) XM7

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These release notes for the Cisco 2600 series describe the enhancements provided in Cisco IOS Release 12.1(5) XM7. These release notes are updated as needed.

For a list of the software caveats that apply to Release 12.1(5) XM7, see the [“Caveats” section on page 15](#) 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.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.1* located on Cisco.com and the Documentation CD-ROM.

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Introduction

Cisco Systems extends enterprise-class and managed services Customer Premises Equipment (CPE) versatility, integration, and power to branch offices with the Cisco 2600 series modular access router family. The widely deployed Cisco 2600 series modular access routers are designed to enable customers to easily adopt future technologies and scale to accommodate network expansion. The Cisco 2600 series shares modular interfaces with the Cisco 1600, Cisco 1700, and Cisco 3600 series, providing a solution to meet today's branch office needs for applications such as:

- Internet/intranet access with Firewall security
- Multiservice voice/data integration
- Analog and digital dial access services
- Virtual Private Network (VPN) access
- Inter-VLAN routing
- Routing with bandwidth management

The Cisco 2600 series modular architecture provides the versatility needed to adapt to changes in network technology as new services and applications become available. Driven by a powerful RISC processor, the Cisco 2600 series supports the advanced Quality of Service (QoS), security, and network integration features required in today's evolving enterprise networks.

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.1(5)XM7, see "New and Changed Information," page 9 and "Related Documentation," page 20.

System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(5) XM7:

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Memory Recommendations

Table 1 lists recommended memory for the Cisco 2600 series routers for Cisco IOS Release 12.1(5) XM7.

Table 1 Minimum Memory Recommendations for the Cisco 2600 Series

Image Name	Software Image	Recommended Flash Memory	Recommended DRAM Memory	Runs From
IP Plus	c2600-is-mz	16 MB	64 MB	RAM
IP Plus IPsec 3DES	c2600-ik2s-mz	16 MB	64 MB	RAM
IP/FW/IDS Plus IPsec 3DES	c2600-ik2o3s-mz	16 MB	64 MB	RAM
IP Plus IPsec 56	c2600-is56i-mz	16 MB	64 MB	RAM
IP/FW/IDS Plus IPsec 56	c2600-io3s56i-mz	16 MB	64 MB	RAM
IP/H323	c2600-ix-mz	8 MB	32 MB	RAM
IP/IPX/AT/DEC Plus	c2600-ds-mz	16 MB	64 MB	RAM
IP/IPX/AT/DEC/FW/IDS Plus	c2600-do3s-mz	16 MB	64 MB	RAM
Enterprise Plus	c2600-js-mz	32 MB	96 MB	RAM
Enterprise Plus IPsec 56	c2600-js56i-mz	32 MB	96 MB	RAM
Enterprise Plus/H323 MCM	c-2600-jsx-mz	32 MB	96 MB	RAM
Enterprise/SNASw Plus	c2600-a3js-mz	32 MB	96 MB	RAM
Enterprise/SNASw Plus IPsec 3DES	c2600-a3jk2s-mz	32 MB	96 MB	RAM
Enterprise/SNASw Plus IPsec 56	c2600-a3js56i-mz	32 MB	96 MB	RAM
Enterprise/FW/IDS Plus IPsec 3DES	c2600-jk2o3s-mz	32 MB	96 MB	RAM
Enterprise/FW/IDS Plus IPsec 56	c2600-jo3s56i-mz	32 MB	96 MB	RAM

Hardware Supported

Cisco IOS Release 12.1(5) XM7 supports the following Cisco 2600 series routers:

- Cisco 2610
- Cisco 2611
- Cisco 2612
- Cisco 2613
- Cisco 2620 and 2621
- Cisco 2650 and 2651

For detailed descriptions of the new hardware features, see the “[New and Changed Information](#)” section on page 9.

Table 2 lists the supported interfaces on the Cisco 2600 series routers for Cisco IOS Release 12.1(5) XM7.

Table 2 Supported Interfaces on the Cisco 2600 Series

Interface, Network Module, or Data Rate ¹	Platforms Supported	
LAN Interfaces²	1- or 2-port Ethernet (10BaseT)	All Cisco 2600 series platforms
	1-port Token Ring (RJ-45)	Cisco 2612, Cisco 2613
	1- or 2-port 10/100 Mbps Ethernet	Cisco 2620, Cisco 2621, Cisco 2650, Cisco 2651 ³
LAN Network Modules	1-port Ethernet	All Cisco 2600 series platforms
	4-port Ethernet	All Cisco 2600 series platforms
Serial Network Modules	16- or 32-port asynchronous serial low speed (128 kbps max; NM-16A and NM-32A)	All Cisco 2600 series platforms
	4- or 8-port asynchronous/synchronous serial low speed (128 kbps max)	All Cisco 2600 series platforms
ATM Network Modules⁴	4-port T1 ATM network module with IMA (NM-4T1-IMA)	All Cisco 2600 series platforms
	4-port E1 ATM network module with IMA (NM-4E1-IMA)	All Cisco 2600 series platforms
	8-port T1 ATM network module with IMA (NM-8T1-IMA)	All Cisco 2600 series platforms
	8-port E1 ATM network module with IMA (NM-8E1-IMA)	All Cisco 2600 series platforms
	1-port ATM T3 network module (NM-1A-T3)	All Cisco 2600 series platforms
	1-port ATM E3 network module (NM-1A-E3)	All Cisco 2600 series platforms
	1-port ATM-25 RJ-45 interface	All Cisco 2600 series platforms
Digital T1 Packet Voice Trunk Network Modules and Spare Components	1-port, 24-channel T1 voice/fax module, supports 24 channels of medium-complexity codecs: G.729a/b, G.726, G.711 and fax or 12 channels of G.726, G.729, G.723.1, G.728, G.729a/b, G.711, and fax. Consists of one NM-HDV, two PVDM-12s, and one VWIC-1MFT-T1 ⁴ . Part number: NM-HDV-1T1-24	All Cisco 2600 series platforms
	1-port, enhanced 24-channel T1 voice/fax module, supports 24 channels of high- and medium-complexity codecs: G.729a/b, G.726, G.729, G.728, G.723.1, G.711, and fax. Consists of one NM-HDV, four PVDM-12s, and one VWIC-1MFT-T1 ⁴ . Part number: NM-HDV-1T1-24E	All Cisco 2600 series platforms
	2-port, 48-channel T1 voice/fax module, supports add/drop multiplexing (drop and insert); 48 channels of medium-complexity codecs: G.729a/b, G.726, G.711, and fax; or 24 channels of G.726, G.729, G.723.1, G.728, G.729a/b, G.711, and fax. Consists of one NM-HDV, four PVDM-12, and one VWIC-2MFT-T1-DI ⁴ . Part number: NM-HDV-2T1-48	All Cisco 2600 series platforms
	High-density voice/fax network module spare (NM-HDV)	Digital T1/E1 packet voice trunk network modules spare component

Table 2 Supported Interfaces on the Cisco 2600 Series (continued)

Interface, Network Module, or Data Rate ¹	Platforms Supported	
Digital T1 Packet Voice Trunk Network Modules and Spare Components (continued)	12-channel packet voice DSP ⁵ module upgrade spare (PVDM-12)	Digital T1/E1 packet voice trunk network modules spare component
	1-port RJ-48 multiflex trunk - T1 (VWIC-1MFT-T1) ⁴	Digital T1/E1 packet voice trunk network modules spare component
	2-port RJ-48 multiflex trunk - T1 (VWIC-2MFT-T1) ⁴	Digital T1/E1 packet voice trunk network modules spare component
	2-port RJ-48 multiflex trunk with drop and insert - T1 (VWIC-2MFT-T1-DI) ⁴	Digital T1/E1 packet voice trunk network modules spare component
Digital E1 Packet Voice Network Modules	1-port 30-channel E1 high-density voice network module (NM-HDV-1E1-30)	All Cisco 2600 series platforms
	1-port enhanced 30-channel E1 high-density voice network module (NM-HDV-1E130E)	All Cisco 2600 series platforms
	2-port 60-channel high-density voice network module (NM-HDV-2E1-60)	All Cisco 2600 series platforms
Dial, ISDN and Channelized Serial Network Modules	1- or 2-port channelized T1/ISDN PRI	All Cisco 2600 series platforms
	1- or 2-port channelized T1/ISDN PRI with ⁶	All Cisco 2600 series platforms
	1- or 2-port channelized E1 ⁷ PRI balanced	All Cisco 2600 series platforms
	1- or 2-port channelized E1/ISDN PRI unbalanced	All Cisco 2600 series platforms
	4-or 8-port ISDN BRI ⁸ S/T interface	All Cisco 2600 series platforms
	4- or 8-port ISDN BRI U (NT1) interface	All Cisco 2600 series platforms
	8- or 16-port analog modems	All Cisco 2600 series platforms
T1/E1 Multiflex Voice/WAN Interface Cards⁹	1-port T1 multiflex trunk interface (VWIC-1MFT-T1)	All Cisco 2600 series platforms
	1-port E1 multiflex trunk interface (VWIC-1MFT-E1)	All Cisco 2600 series platforms
	2-port T1 multiflex trunk interface (VWIC-2MFT-T1)	All Cisco 2600 series platforms
	2-port E1 multiflex trunk interface (VWIC-2MFT-E1)	All Cisco 2600 series platforms
	2-port T1 multiflex trunk interface with drop and insert (VWIC-2MFT-T1-DI)	All Cisco 2600 series platforms
	2-port E1 multiflex trunk interface with drop and insert (VWIC-2MFT-E1-DI)	All Cisco 2600 series platforms

Table 2 Supported Interfaces on the Cisco 2600 Series (continued)

Interface, Network Module, or Data Rate ¹	Platforms Supported	
Voice/Fax Interface Cards	1- or 2-voice interface card slots	All Cisco 2600 series platforms
	1-slot high-density T1/E1 voice interface card slots ¹⁰	All Cisco 2600 series platforms
	2-port analog voice interface (VIC2-DID)	All Cisco 2600 series platforms
	2-port FXS ¹¹ voice/fax interface card ¹²	All Cisco 2600 series platforms with voice/fax network modules
	2-port E&M ¹³ voice/fax interface card ³	All Cisco 2600 series platforms with voice/fax network modules
	2-port FXO ¹⁴ voice/fax interface card ³	All Cisco 2600 series platforms with voice/fax network modules
WAN Interface Cards	1-port ISDN BRI S/T interface (requires external NT1)	All Cisco 2600 series platforms
	1-port ISDN BRI (NT1) U	All Cisco 2600 series platforms
	1-port 56/64-kbps DSU/CSU ¹⁵	All Cisco 2600 series platforms
	1-port T1/fractional T1 with DSU/CSU	All Cisco 2600 series platforms
	1-port high-speed serial (up to 2.048 Mbps)	All Cisco 2600 series platforms
	2-port dual high-speed serial (up to 2.048 Mbps; asynchronous/ synchronous support)	All Cisco 2600 series platforms
	2-port asynchronous/ synchronous (up to 128 kbps)	All Cisco 2600 series platforms
Advanced Integration Module (AIM)	Data compression AIM (up to 8.192 Mbps)	All Cisco 2600 series platforms
	Hardware Encryption AIM	All Cisco 2600 series platforms

- The voice/fax and ATM-25 network modules require Cisco IOS Plus feature sets.
- The 1- or 2-port 10/100 Ethernet LAN interface for the Cisco 2620 and Cisco 2621 series routers is only available in Cisco IOS Release 12.0 XC and later.
- Cisco 2650 and 2651 routers require Cisco IOS Release 12.1(3a)T1 or later.
- See T1/E1 multiflex voice/WAN interface cards in this table.
- DSP = digital signal processor
- CSU = channel service unit
- ISDN = integrated services digital network
- BRI = basic rate interface
- T1 multiflex voice/WAN interface cards can be used in a chassis slot or installed in a digital T1 packet voice trunk module. E1 multiflex voice/WAN interface cards can be installed in a chassis slot.
- Uses the VWIC-MFT T1/E1 interface cards.
- FXS = foreign exchange station
- Requires the NM-1V or NM-2V network module.
- E & M = recEiver and transMitter (or Ear and Mouth)
- FXO = foreign exchange office
- DSU/CSU = data service unit/channel service unit

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

Determining the Software Version

To determine the version of Cisco IOS software running on a Cisco 2600 series router, log in to the router and enter the **show version** EXEC command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) 2600 Software (c2600-i-mz), Version 12.1(5) XM7, RELEASE SOFTWARE
```

Other Firmware Code

The latest version of analog modem firmware for the Cisco 2600 series supports the internal analog modems (both NM-16AM and NM-8AM) in a wide range of countries, starting with Cisco IOS Release 11.3(5)T and later releases. The latest firmware (version 1.2.0) also supports dial-out and fax-out.

On Cisco.com, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Access Servers and Access Routers: Modular Access Routers: Cisco 2600 Series Routers: Analog Modem Firmware

On the Documentation CD-ROM at:

Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 2600 Series Routers: Analog Modem Firmware

Feature Set Tables

The following sections list the new hardware and software features supported by the Cisco 2600 for Cisco IOS Release 12.1(5) XM7.



Caution

Cisco IOS images with strong encryption (including, but not limited to 168-bit [3DES] data encryption feature sets) are subject to United States government export controls and have limited distribution. Strong encryption images to be installed outside the United States are likely to require an export license. Customer orders may be denied or subject to delay due to United States government regulations. When applicable, you 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.

Tables 3, [Part 1](#) and 3, [Part 2](#) list the features and feature sets supported by the Cisco 2600 series in Cisco IOS Release 12.1(5) XM7 and use the following conventions:

- Yes—The feature is supported in the software image.
- No—The feature is not supported in the software image.



Note

This table might not be cumulative or list all the features in each image. You can find the most current Cisco IOS documentation on Cisco.com. These electronic documents may contain updates and modifications made after the hard-copy documents were printed. For a list of the T-train features in this platform, refer to Feature Navigator. For more information about Feature Navigator, see the [“Feature Navigator” section on page 22](#).

Table 3, Part 1 Feature List by Feature Set for the Cisco 2600 Series

Features	Feature Sets							
	IP/ FW/IDS Plus IPSec 56	IP H323	IP Plus	IP Plus IPSec 3DES	IP Plus IPSec 56	IP/ FW/IDS Plus IPSec 3DES	IP/ IPX/ AT/ DEC Plus	IP/ IPX/ AT/ DEC/ FW/IDS Plus
Analog DID for Cisco 2600 and Cisco 3600 Series Routers	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
High Performance Gatekeeper	No	Yes	Yes	No	No	No	No	No
MGCP CAS PBX and AAL2 PVC ¹	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
MGCP Basic CLASS and Operator Services	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
SIP Diversion Header Implementation for Redirecting Number	Yes	Yes	Yes	Yes	Yes	Yes	No	No
SIP Gateway support for Third Party Call Control	Yes	Yes	Yes	Yes	Yes	Yes	No	No
SIP User Agent MIB	Yes	Yes	Yes	Yes	Yes	Yes	No	No
WT-2750 Multipoint Broadband Wireless System	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

1. AAL2 PVC is not implemented in this release.

Table 3, Part 2 Feature List by Feature Set for the Cisco 2600 Series

Features	Feature Sets							
	Enter- prise Plus	Enter- prise Plus IPSec 56	Enter- prise/ SNASw Plus	Enter- prise/ SNASw Plus IPSec 3DES	Enter- prise/ SNASw Plus IPSec 56	Enter- prise/ FW/IDS Plus IPSec 3DES	Enter- prise/ FW/IDS Plus IPSec 56	Enter- prise Plus / H323 MCM
Analog DID for Cisco 2600 and Cisco 3600 Series Routers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
High Performance Gatekeeper	Yes	No	No	No	No	No	No	No
MGCP CAS PBX and AAL2 PVC ¹	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MGCP Basic CLASS and Operator Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3, Part 2 Feature List by Feature Set for the Cisco 2600 Series (continued)

Features	Feature Sets							
	Enterprise Plus	Enterprise Plus IPsec 56	Enterprise/ SNASw Plus	Enterprise/ SNASw Plus IPsec 3DES	Enterprise/ SNASw Plus IPsec 56	Enterprise/ FW/IDS Plus IPsec 3DES	Enterprise/ FW/IDS Plus IPsec 56	Enterprise Plus / H323 MCM
SIP Diversion Header Implementation for Redirecting Number	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP Gateway support for Third Party Call Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP User Agent MIB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WT-2750 Multipoint Broadband Wireless System	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. AAL2 PVC is not implemented in this release.

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco 2600 series for Release 12.1(5) XM7.

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

There are no new hardware and software features in the Cisco 2600 series for Cisco IOS Release 12.1(5) XM7.

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

Cisco IOS Release 12.1(5) XM6 does not support the Cisco 2600 series .

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

Cisco IOS Release 12.1(5) XM5 does not support the Cisco 2600 series .

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

There are no new hardware and software features in the Cisco 2600 series 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 2600 series for Cisco IOS Release 12.1(5) XM3.

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

There are no new hardware and software features in the Cisco 2600 series for Cisco IOS Release 12.1(5) XM2.

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

There are no new hardware and software features in the Cisco 2600 series for Cisco IOS Release 12.1(5) XM1.

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

The following new hardware features are supported by the Cisco 2600 series for Cisco IOS Release 12.1(5)XM.

2-Port Analog DID Voice Interface (VIC2-DID)

This Direct Inward Dial (DID) voice interface enables a Cisco 2600 series router to provide DID service to extensions on a PBX.

Wireless Network Module

The NM-WMDA wireless network module installs in the network module slot of a Cisco 2600 series router. Installing a wireless network module enables the Cisco 2600 series router to act as a subscriber unit (SU) in a point-to-multipoint wireless network. It is configured through the router's system console or via the CiscoView network management system. The network module provides the control and data interface between the Cisco 2600 series digital motherboard and the radio frequency (RF) subsystem in the wireless transverter. It also provides the up/down conversion from baseband to intermediate frequency (IF). One network module supports one or two wireless transverters (main and diversity).

Microcode software images ship in Flash memory along with the system software image. When the router starts, the system software unpacks the microcode software bundle and loads the proper software on all the interface linecards.

It is possible to use a later version of microcode software than the one shipped with the Cisco IOS software from the factory. The microcode software in Flash memory is mapped to the linecards. Unless you fully understand how Cisco IOS software uses microcode software, it is important to keep the factory configuration.

The multipoint wireless modem card requires external microcode software. Information about this microcode software is available (with a Cisco.com login) at:

<http://www.cisco.com/cgi-bin/tablebuild.pl/rsu>.

For further information regarding the network module, refer to the *Cisco Network Modules Hardware Installation Guide* (for Cisco 2600 series routers) for detailed installation instructions, and the *Software Configuration Guide* (for Cisco 2600 series routers) for an overview of network module configuration procedures and information on configuring specific network modules.

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

The following new software features are supported by the Cisco 2600 series for Cisco IOS Release 12.1(5)XM.

Analog DID for Cisco 2600 and Cisco 3600 Series Routers

Direct Inward Dialing (DID) is a service offered by telephone companies that enables callers to dial directly to an extension on a Private Branch Exchange (PBX) without the assistance of an operator or automated call attendant. This service makes use of DID trunks, which forward only the last three to five digits of a phone number to the PBX. If, for example, a company has a PBX with extensions 555-1000 to 555-1999, and a caller dials 555-1234, the local CO would forward 234 to the PBX. The PBX would then ring extension 234. This entire process is transparent to the caller.

When this feature is configured, a voice-enabled Cisco 2600 and Cisco 3600 series router can receive calls from a DID trunk and connect them to the appropriate extensions.

High Performance Gatekeeper

The High Performance Gatekeeper feature provides the network administrator the ability to identify H.323 traffic and apply appropriate policies.

The High Performance Gatekeeper feature is implemented on Cisco IOS software and enables a network manager to:

- Limit the H.323 traffic on the LAN and WAN.
- Provide user accounting for records based on the service utilization.
- Inject QoS for the H.323 traffic generated by applications such as VoIP, data conferencing and video conferencing.
- Provides the mechanism to implement security for H.323 communications.

MGCP CAS PBX and AAL2 PVC

The MGCP CAS PBX and AAL2 PVC feature set extends the earlier Simple Gateway Control Protocol (SGCP) CAS and AAL2 support onto the merged SGCP/MGCP software base. These features enable various service provider solutions, including Integrated Access, IP PBX, Residential Cable Access, and Voice over DSL. The added AAL2 PVC features are not implemented in this release.

MGCP Basic CLASS and Operator Services

The MGCP Basic CLASS and Operator Services feature is a set of calling features, sometimes called “custom calling” features, that use MGCP to transmit voice, video, and data over the IP network. These features are usually found in circuit-based networks. MGCP BCOS brings them to the Cisco IOS gateways on packet-based networks.

The MGCP BCOS software supports MGCP 0.1 and the earlier protocol versions Simple Gateway Control Protocol (SGCP) 1.1 and 1.5.

The following MGCP BCOS features are available on Residential Gateways (RGWs):

- Distinctive Power Ring
- Visual Message Waiting Indicator
- Caller ID
- Caller ID with Call Waiting
- Call Forwarding
- Ring Splash
- Distinctive Call Waiting Tone
- Message Waiting Tone
- Stutter Dial Tone
- Off-Hook Warning Tone

The following two features can be run as RGW or trunking gateway (TGW) features:

- 911 Calls - This feature is supported in SGCP mode on Cisco uBR924, 3660, and AS5300 platforms and in MGCP mode on the 2600, 3600, MC3810, 530 and uBR924 platforms.
- Three-Way Calling - This feature is supported on the Cisco 3660 and AS5300 TGW platforms and on the Cisco MC3810, 2600, and uBR924 RGW platforms. This feature is supported on G.711 only.

SIP Diversion Header Implementation for Redirecting Number

The SIP Diversion Header Implementation for Redirecting Number feature provides support for a new Session Initiation Protocol (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, and is typically used for Unified Messaging and voice mail services to identify the recipient of a message. SIP gateway support has also been enhanced to process a SIP 3xx Redirection response after the receipt of a SIP 18x Information response. More information about this feature is available at:

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

More information about the Session Initiation Protocol Gateway Call Flows is available at:

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

SIP Gateway Support for Third Party Call Control

The SIP Gateway Support for Third-Party Call Control feature enables one endpoint (for example, a call controller) to create, modify, or terminate calls between other endpoints via delayed media negotiation. A delayed media negotiation is one where the Session Description Protocol (SDP) information is not completely advertised in the initial call setup. Third-party call control is often used for operator services (creating a call connecting two parties together) and conferencing. SIP gateway support has also been enhanced to allow SIP gateways to route using a Fully Qualified Domain Name (FQDN) in addition to using an IP address. More information about this feature is available at:

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

More information about the Session Initiation Protocol Gateway Call Flows is available at:

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

SIP User Agent MIB

The SIP User Agent MIB adds the ability to manage a Session Initiation Protocol (SIP) network via an SNMP-based network management platform.

WT-2750 Multipoint Broadband Wireless System

The Cisco broadband fixed wireless point-to-multipoint system is an integrated solution consisting of one headend and multiple subscriber units. The fixed wireless point-to-multipoint subscriber unit is designed to receive radio frequency (RF) signals from the headend. It also transmits a return signal to the headend. This return signal is a point-to-point signal, so a properly installed subscriber antenna must be correctly oriented with the headend antenna to which it is transmitting. For more information about the fixed wireless point-to-multipoint headend feature, see *Point-to-Multipoint Support for the Cisco uBR7200 Series Universal Broadband Router*.

Important Notes

The following sections contain important notes about Cisco IOS Release 12.1(5) XM7 that can apply to the Cisco 2600 series.

Non-Software Caveats - UNII Configuration

- CSCds89481

A shift in frequency-locked loop (FLL) control voltage causes a 24-MHz reference signal drift on the wireless multipoint network module with diversity (NM-WMDA). As a result, a large-frequency offset occurs in unlicensed national information infrastructure (UNII) outdoor unit (ODU) receive (Rx) and transmit (Tx) oscillators, which are locked on to the 24 MHz reference coming from the NM-WMDA. That causes signal-to-noise ratio (SNR) degradations for both upstream and downstream signals.

The SNR degradation is insignificant in multichannel multipoint distribution service (MMDS) links. However, in UNII links the degradation can be significant, since the local oscillator (LO) multiplication ratio is much higher for UNII frequencies.

Workaround for UNII: The shift in the 24 MHz reference must be minimized by imposing a maximum 2 ms continuous burst size. This is achieved by not using the following slow upstream modulation profiles:

- 1.5 MHz modulation profiles
- 3 MHz, 4.4 Mbps modulation profiles

In addition to eliminating slow upstream modulation profiles, it is also necessary to set the maximum packet concatenation size to 1522 bytes for all supported modulation profiles. This is done by setting sub-TLV 6 (Maximum Upstream Channel Transmit Burst Configuration Setting), which is part of TLV 4 (Class of Service Configuration Setting), to 1522, which is the maximal number of bytes that can be concatenated. Note that the “Maximum Upstream Channel Transmit Burst Configuration Setting” has to be set for the customer-premise equipment (CPE) to be operational, so the above-mentioned modification is minimal.

Product Number Change

Beginning with Cisco IOS Release 12.0(7)XK, Cisco changed the product numbers used to order a specific Cisco IOS software image. In short, Cisco will remove the periods separating the release train, maintenance release, and build number. The following table provides some examples.

Old Product Number	New Product Number	Release	Image Description
S364AR1K2-12.0.7XK=	S364AR1K2-12007XK=	Cisco IOS Release 12.0(7)XK	Cisco 3640 Series IOS Enterprise/SNA SW PLUS IPSEC 3DES
S26CP-12.1.3=	S26CP-12103=	Cisco IOS Release 12.1(3)	Cisco 2600 Series IOS IP Plus

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 decided
OLD-CISCO-DECNET-MIB	To be decided
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 decided
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 decided
OLD-CISCO-VINES-MIB	CISCO-VINES-MIB
OLD-CISCO-XNS-MIB	To be decided



Note

Note Cisco Management Information Base (MIB) User Quick Reference is no longer published. If you have an account with Cisco.com, you can find the current list of MIBs supported by Cisco. To reach the Cisco Network Management Toolkit, go to Cisco.com, press Login, and click to Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIB.

Caveats

Caveats describe unexpected behavior or defects 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.

For information on caveats in Cisco IOS Release 12.1(5) XM7, see this “Caveats” section as well as *Caveats for Cisco IOS Release 12.1* and *Caveats for Cisco IOS Release 12.1T*. These documents list severity 1 and 2 caveats and select severity 3 caveats for Cisco IOS Releases 12.1 and 12.1T and are located on Cisco.com and the Documentation CD-ROM.

All caveats in Cisco IOS Release 12.1(5)T are also in Cisco IOS Release 12.1(5) XM7.

Caveat numbers and brief descriptions are listed in [Table 5](#). For details about a particular caveat, go to Bug Toolkit at:

<http://www.cisco.com/kobayashi/bugs/bugs.html>

To access this location, you must have an account on Cisco.com. For information about how to obtain an account, go to the “[Feature Navigator](#)” section on page 22.



Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. Click on this path: **Software Center: Cisco IOS Software: Cisco IOS Bug Toolkit: Cisco Bug Navigator II**. You can also find Bug Navigator II at <http://www.cisco.com/support/bugtools>.

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 5](#) are open in Cisco IOS Release 12.1(5) XM7. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 5 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 and Resolved Caveats for Release 12.1(5) XM6

Cisco IOS Release 12.1(5) XM6 does not support the Cisco 2600 series .

Open and Resolved Caveats for Release 12.1(5) XM5

Cisco IOS Release 12.1(5) XM5 does not support the Cisco 2600 series .

Open Caveats for Release 12.1(5) XM4

All the caveats listed in [Table 6](#) 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 6 *Open Caveats for Release 12.1(5)XM4*

Caveat ID Number	Description
CSCdt61467	Need a way to change the default value of VPDN parameters

Resolved Caveats for Release 12.1(5) XM4

All the caveats listed in [Table 7](#) 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 7 *Closed and Resolved Caveats for Release 12.1(5) XM4*

Caveat ID Number	Description
CSCdr86101	Trunk does not come up after booting
CSCds14059	Support for untagged Radius tunnel attributes (attr.69 et al)
CSCds49195	Change EIGRP delay or bandwidth parameters causes memory corruption
CSCds55510	Memory Leak with AAA route download
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
CSCdt11503	IOS crashes when large OID (>256 fields) is received
CSCdt41888	Add dlcx functionality as hidden command
CSCdt46181	Redzone corruption in pptp_tcp_readf()
CSCdt63518	FIB-4-PUNTINTF msg for L2F/MP bundle member w no ip route-cache cef
CSCdt69055	B-channels IN_SERVICE after RESTART when L1 is DEACTIVATED
CSCdt89495	24th channel of T1 0 stays busied-out
CSCdt92989	Redirect number is not passed to the VoIP leg
CSCdt96253	CRC-32 compensation vulnerability
CSCdt96945	Resource threshold information lost on GK after element failure

Table 7 *Closed and Resolved Caveats for Release 12.1(5) XM4 (continued)*

Caveat ID Number	Description
CSCdu05205	Memory corruption crash
CSCdu05236	Default disabling of parser cache should not be nvgened
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
CSCdu25007	clear spe with calls running could have negative effects
CSCdu25644	Traceback when clear counters command given
CSCdu27780	AS5300 Suspend message not sent on H323 side with fax configured
CSCdu34741	Term GW doesnt disconnect call which arrives after RLM is down
CSCdu42219	Throttle 21 fails to bring up B channels after reboot w/SS7
CSCdu62721	12.1(5)XM4 candidate fails to bring up B-channels

Open Caveats for Release 12.1(5) XM3

All the caveats listed in [Table 6](#) 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 8 *Open Caveats for Release 12.1(5) XM3*

Caveat ID Number	Description
CSCdt55318	Long hostname-domain name crashes mgcpapp on RSIP
CSCds52536	ISDN sync call rejected/failed caller id screening/workaround>reload
CSCds70303	show isdn stat shows hanging CCBs (CCBs without active calls)

Resolved Caveats for Release 12.1(5) XM3

All the caveats listed in [Table 7](#) 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 9 *Closed and Resolved Caveats for Release 12.1(5) XM3*

Caveat ID Number	Description
CSCds73763	Router crashes when clear counter command is given
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

Table 9 *Closed and Resolved Caveats for Release 12.1(5) XM3 (continued)*

Caveat ID Number	Description
CSCdt38813	H323 GW leaks RTCP ports with signal only call
CSCdt78196	Cisco 3640 router crashes at L3_ProcessInternal

Open Caveats for 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.

- CSCdr62997
During brief periods of high-traffic activity on the subscriber-unit router and with the router's CPU overloaded, the radio "link-metrics" (continuous codeword error statistics) might not be collected because network-packet traffic has priority over the radio "link-metrics" on the CPU. This might cause the "link-metrics" tables to show zeros only and/or error messages to be generated. There is no workaround.
- CSCds51507
The system will accept a statistic parameter for a second antenna even though it is a single-antenna system.
Workaround: Disregard data for the second antenna.
- 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.

Closed and Resolved Caveats for 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.

Open Caveats for Release 12.1(5) XM1

The caveats listed in this section are open in Cisco IOS Release 12.1(5) XM1.

- CSCds50077

GKTMP does not retry the backend server for five minutes when the connection is dropped due to link integrity or stress conditions. The problem may occur because of the backend server not being able to keep up with the gatekeeper(s) it is serving. The gatekeeper (GK) will send all requests to the server but because of a slow link or processor capacity, the server does not respond in time. In this case, the GK may mark the server as unreachable and drop the connection. Once the connection is dropped it will not be re-established for another five minutes if there were static triggers configured by the CLI.

Symptom: Server connection is dropped and is not retried for another five minutes.

Workaround: None. Try to match server capacity to process requests with the number and capacities of the gatekeepers it is serving.

- CSCds51507

The system will accept a statistic parameter for a second antenna even though it is a single-antenna system.

Workaround: Disregard data for the second antenna.

- CSCdr62997

During brief periods of high-traffic activity on the subscriber-unit router and with the router's CPU overloaded, the radio "link-metrics" (continuous codeword error statistics) might not be collected because network-packet traffic has priority over the radio "link-metrics" on the CPU. This might cause the "link-metrics" tables to show zeros only and/or error messages to be generated. There is no workaround.

- CSCds92198

FXS VIC and DID VIC fail to recognize on-hook.

Closed and Resolved Caveats for Release 12.1(5) XM1

All the caveats listed in this section are resolved in Cisco IOS Release 12.1(5) XM1. This section describes only severity 1 and 2 caveats and select severity 3 caveats. All caveats that are closed and resolved in Release 12.1(5)T are also closed and resolved in Release 12.1(5) XM1.

- CSCds51025

A Cisco 2600 series router Signaling Link Terminal (SLT) produces the following message on the console:

```
* <timestamp>: %PQUICC=1-TOOSMALL: PQUICC(0/0), packet was less than 2 bytes
```

As a result of this unexpected behavior, the SS7 link goes in and out of service until the SLT is reloaded. There is no workaround.

This caveat has been resolved in Cisco IOS Release 12.1(5)XM1.

Open Caveats for Release 12.1(5) XM

The caveats listed in this section are open in Cisco IOS Release 12.1(5) XM.

- CSCdr62997

During brief periods of high-traffic activity on the subscriber-unit router and with the router's CPU overloaded, the radio "link-metrics" (continuous codeword error statistics) might not be collected because network-packet traffic has priority over the radio "link-metrics" on the CPU. This might cause the "link-metrics" tables to show zeros only and/or error messages to be generated. There is no workaround.

- CSCds51507

The system will accept a statistic parameter for a second antenna even though it is a single-antenna system.

Workaround: Disregard data for the second antenna.

Resolved Caveats for Release 12.1(5) XM

There are no open 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 2600 series. 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 20](#)
- [Platform-Specific Documents, page 21](#)
- [Feature Modules, page 22](#)
- [Cisco IOS Software Documentation Set, page 22](#)

Release-Specific Documents

The following documents are specific to or support Cisco IOS Release 12.1(5) XM7 and are located on Cisco.com and the Documentation CD-ROM:

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

On Cisco.com, beginning under the **Service & Support** heading:

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

To reach these documents, refer to the Service & Support section at this path on Cisco.com:

Technical Documents

- *Caveats for Cisco IOS Release 12.1*

On Cisco.com, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Caveats: Caveats for Cisco IOS Release 12.1

On the Documentation CD-ROM at:

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



Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. Click on this path: **Software Center: Cisco IOS Software: Cisco IOS Bug Toolkit: Cisco Bug Navigator II**. You can also find Bug Navigator II at <http://www.cisco.com/support/bugtools>.

Platform-Specific Documents

These documents are available for the Cisco 2600 series on Cisco.com and the Documentation CD-ROM:

- *Quick Start Guide Cisco 2600 Series Cabling and Setup*
- *Cisco 2600 Series Hardware Installation Guide*
- *Cisco Network Modules Hardware Installation Guide*
- *Update to Cisco Network Modules Hardware Installation Guide*
- *Cisco WAN Interface Cards Hardware Installation Guide*
- *Update to WAN Interface Cards Hardware Installation Guide*
- *Software Configuration Guide For Cisco 3600 and Cisco 2600 Series Routers*
- *New and Changed Show Commands for the Cisco 2600 Series Routers*
- *Regulatory Compliance and Safety Info for the Cisco 2600 Series*
- *International Regulatory Compliance Information for Telecommunications Equipment*
- *Cisco 2600 Series Configuration Notes*
- *Cisco Modular Access Router Cable Specifications*
- *Redundant Power Systems*
- *Data Compression AIM for the Cisco 2600 Series Routers*
- *Digital Modem Portware*
- *Analog Modem Firmware*
- *Voice Features for Cisco 2600 Series Routers*

On Cisco.com, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Access Servers and Access Routers: Modular Access Routers: Cisco 2600 Series Routers

On the Documentation CD-ROM at:

Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 2600 Series Routers

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1(5) XM7 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, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: 12.1-Based Limited Lifetime Releases: New Features in 12.1 X Releases: New Features in Release 12.1 XM: New Features in Release 12.1(5)XM

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

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: 12.1-Based Limited Lifetime Releases: New Features in 12.1 X Releases: New Features in Release 12.1 XM: New Features in Release 12.1(5)XM

Feature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image.

Feature Navigator is available 24 hours a day, 7 days a week. To access Feature Navigator, 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 establish an account.

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

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. It contains feature information about mainline-, T-, S-, and P-trains. You can access Feature Navigator 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 which are 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 two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, 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 and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

On Cisco.com, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References

On the Documentation CD-ROM at:

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

Release 12.1 Documentation Set

[Table 10](#) describes the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form upon request.

**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, beginning under the **Service & Support** heading:

Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References

You can reach the Cisco IOS documentation set on the Documentation CD-ROM at:

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

Table 10 Cisco IOS Software Release 12.1 Documentation Set

Books	Chapter 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 File Management System Management
<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> 	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
<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> 	X.25 over ISDN AppleTalk Remote Access Asynchronous Callback, DDR, PPP, SLIP Bandwidth Allocation Control Protocol ISDN Basic Rate Service ISDN Caller ID Callback PPP Callback for DDR Channelized E1 & T1 Dial Backup for Dialer Profiles Dial Backup Using Dialer Watch Dial Backup for Serial Lines Peer-to-Peer DDR with Dialer Profiles DialOut Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Dialup Networks Dial Business Solutions and Examples
<ul style="list-style-type: none"> • <i>Cisco IOS Interface Configuration Guide</i> • <i>Cisco IOS Interface Command Reference</i> 	Interface Configuration Overview LAN Interfaces Logical Interfaces Serial Interfaces

Table 10 Cisco IOS Software Release 12.1 Documentation Set (continued)

Books	Chapter Topics
<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 Overview IP Addressing and Services IP Routing Protocols
<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 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> 	Network Protocols Overview Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> • <i>Cisco IOS Security Configuration Guide</i> • <i>Cisco IOS Security Command Reference</i> 	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	Switching Services Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
<ul style="list-style-type: none"> • <i>Cisco IOS Wide-Area Networking Configuration Guide</i> • <i>Cisco IOS Wide-Area Networking Command Reference</i> 	Wide-Area Network Overview ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Cisco IOS Multiservice Applications Configuration Guide</i> • <i>Cisco IOS Multiservice Applications Command Reference</i> 	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Frame Relay-ATM Internetworking Synchronized Clocks Video Support Universal Broadband Features

Table 10 Cisco IOS Software Release 12.1 Documentation Set (continued)

Books	Chapter Topics
<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> 	Policy-Based Routing QoS Policy Propagation via BGP Committed Access Rate Weighted Fair Queueing Custom Queueing Priority Queueing Weighted Random Early Detection Scheduling Signaling RSVP Packet Drop Frame Relay Traffic Shaping Link Fragmentation RTP Header Compression
<ul style="list-style-type: none"> • <i>Cisco IOS Command Reference Master Index</i> • <i>Cisco IOS Configuration Guide Master Index</i> • <i>Cisco IOS Dial Services Quick Configuration Guide</i> • <i>Cisco IOS New Feature Index</i> • <i>Cisco IOS System Error Messages</i> • <i>Cisco IOS Debug Command Reference</i> 	



Note

Cisco Management Information Base (MIB) User Quick Reference is no longer published. For the latest list of MIBs supported by Cisco, see *Cisco Network Management Toolkit* on Cisco Connection Online. From Cisco.com, click on the following path: **Service & Support: Software Center: Network Mgmt Products: Cisco Network management Toolkit: Cisco MIB.**

Obtaining Documentation

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at <http://www.cisco.com>. Translated documentation can be accessed at http://www.cisco.com/public/countries_languages.shtm.

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. Therefore, it is probably 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, for your convenience many documents contain a response card behind the front cover. Otherwise, you can mail your comments to the following address:

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

We appreciate your comments.

Obtaining Technical Assistance

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 20](#).

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