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Release Notes for Cisco 3600 Series for Cisco IOS Release 12.0 XH

December 1, 2000

These release notes for the Cisco 3600 series routers support Cisco IOS Release 12.0 XH, up to and including Release 12.0(4)XH4. These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode or modem code and related documents.

For a list of the software caveats that apply to Release 12.0(4)XH4, see the “Caveats” section on page 10 and *Caveats for Release 12.0 T*. The caveats document is updated for every maintenance release and is located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.0* on CCO and the Documentation CD-ROM.

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Corporate Headquarters

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

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Introduction

The Cisco 3600 series includes the Cisco 3620 and Cisco 3640 routers. As modular solutions, the Cisco 3620 and Cisco 3640 enable corporations to increase dial-up intensity and take advantage of current and emerging WAN technologies and networking capabilities. The Cisco 3600 series routers are fully supported by Cisco IOS software, which includes dial-up connectivity, LAN-to-LAN routing, data and access security, WAN optimization, and multimedia features.

System Requirements

This section describes the system requirements for Release 12.0(4)XH4 and includes the following sections:

- Memory Recommendations, page 2
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Memory Recommendations

Table 1 Memory Recommendations for the Cisco 3600 Series

Feature Set by Platform		Image Name	Recommended Flash Memory	Recommended DRAM Memory	Runs from
Cisco 3620	IP/H.323, Gatekeeper, Proxy	c3620-ix-mz	8 MB	32 MB	RAM
	Enterprise Plus IPsec 56	c3620-js56i-mz	16 MB	48 MB	RAM
Cisco 3640	IP/H.323, Gatekeeper, Proxy	c3640-ix-mz	8 MB	32 MB	RAM
	Enterprise Plus	c3640-js-mz	16 MB	48 MB	RAM
	Enterprise Plus IPsec 56	c3640-js56i-mz	16 MB	48 MB	RAM

Hardware Supported

Cisco IOS Release 12.0(4)XH4 supports the Cisco 3600 series routers:

- Cisco 3620
- Cisco 3640

Note For important information about the ATM OC3 network modules and compatibility with the Cisco 3620 router, please review the field notice on CCO at:
<http://www.cisco.com/warp/customer/770/51.shtml>

Table 2 Supported Interfaces for the Cisco 3600 Series

Interface, Network Module, or Data Rate	Platforms Supported
Dial Access Network Modules	Cisco 3620 and 3640 series
16- and 32-port Asynchronous network module	Cisco 3620 and 3640 series
6- to 30-port Integrated Digital Modems network module	Cisco 3620 and 3640 series
8- or 16-port Integrated Analog network module	Cisco 3620 and 3640 series
LAN Interfaces	Cisco 3620 and 3640 series
1- and 4-port Ethernet (AUI and 10BaseT)	Cisco 3620 and 3640 series
1-port Fast Ethernet (100BaseTX and 100BaseFX)	Cisco 3620 and 3640 series
Mixed Media Network Modules	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 1-port Channelized/PRI E1 balanced mode	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 1-port Channelized/PRI E1 unbalanced mode	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 1-port Channelized/PRI T1	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 1-port Channelized/PRI T1 with CSU	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 2-port Channelized/PRI E1 balanced mode	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 2-port Channelized/PRI E1 unbalanced mode	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 2-port Channelized/PRI T1	Cisco 3620 and 3640 series
1-port 10/100BaseTX with 2-port Channelized/PRI T1 with CSU	Cisco 3620 and 3640 series
1 Ethernet and 2 WAN card slots	Cisco 3620 and 3640 series
1 Ethernet, 1 Token Ring, and 2 WAN card slots	Cisco 3620 and 3640 series
2 Ethernet and 2 WAN card slots	Cisco 3620 and 3640 series
Voice/Fax Interfaces and Network Modules¹	Cisco 3620 and 3640 series with Voice/Fax network module
1- and 2-port Voice/Fax network module	Cisco 3620 and 3640 series with Voice/Fax network module
2-port E&M Voice interface card	Cisco 3620 and 3640 series
2-port FXO Voice interface card	Cisco 3620 and 3640 series with Voice/Fax network module
2-port FXS Voice interface card	Cisco 3620 and 3640 series with Voice/Fax network module
2-port BRI Voice interface card	Cisco 3620 and 3640 series with Voice/Fax network module

Table 2 Supported Interfaces for the Cisco 3600 Series (continued)

Interface, Network Module, or Data Rate	Platforms Supported
WAN Data Rates	
48/56/64 kbps	Cisco 3620 and 3640 series
1.544/2.048 Mbps	Cisco 3620 and 3640 series
Up to 8 Mbps on 4-port Serial network module	Cisco 3620 and 3640 series
52 Mbps max using High-Speed Serial Interface (HSSI) network module	Cisco 3620 and 3640 series
155 Mbps on ATM OC3 network modules	Cisco 3620 and 3640 series
WAN Interfaces and Network Modules	
1- and 2-port Channelized T1 and E1 network module	Cisco 3620 and 3640 series
1-port ATM-25 network modules ²	Cisco 3620 and 3640 series
1-port BRI with NT or S/T WAN interface card	Cisco 3620 and 3640 series
1-port High Speed Serial Interface (HSSI) network module	Cisco 3620 and 3640 series
4- and 8-port BRI network module with NT1	Cisco 3620 and 3640 series
4- and 8-port BRI network module with S/T interface	Cisco 3620 and 3640 series
4- and 8-port Synchronous/Asynchronous	Cisco 3620 and 3640 series
4-port Serial	Cisco 3620 and 3640 series
56/64 kbps DSU/CSU	Cisco 3620 and 3640 series
T1 WAN interface card	Cisco 3620 and 3640 series
T1 with Integrated DSU/CSU	Cisco 3620 and 3640 series
ATM OC3 network module with multimode fiber and OC3 uplink port	Cisco 3620 and 3640 series
ATM OC3 network module with single-mode intermediate reach fiber and OC3 uplink port (VPD)	Cisco 3620 and 3640 series
ATM OC3 network module with single-mode long reach fiber and OC3 uplink port	Cisco 3620 and 3640 series
Other Network Modules	
Compression network module	Cisco 3620 and 3640 series

¹ The Voice/Fax network modules require Cisco IOS Plus feature sets.

² The ATM-25 network modules require Cisco IOS Plus feature sets.

Determining the Software Version

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

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) 3620 Software (C3620-JS-MZ), Version 12.0(4)XH4, RELEASE SOFTWARE
```

Upgrading to a New Software Release

For information about upgrading to a new software release, see the *Cisco IOS Software Release 11.3 Upgrade Paths and Packaging Simplification (#703: 12/97)* product bulletin located on CCO at:

Service & Support: Product Bulletins: Software

Under **Cisco IOS 11.3**, click on **Cisco IOS Software Release 11.3 Upgrade Paths (#703: 12/97)**.

Feature Set Tables

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.

Table 3 Feature Sets Supported by the Cisco 3600 Series

Feature Set	Image Name	Feature Set Matrix Term	Software Image	Platforms
IP Standard Feature Sets	IP, H.323 Gtkpr Prxy	Basic, H.323	c3620-ix-mz, c3640-ix-mz	Cisco 3620, Cisco 3640
Enterprise Standard Feature Sets	Enterprise Plus	Plus	c3640-js-mz	Cisco 3640
	Enterprise Plus IPsec 56	Plus, IPsec 56	c3620-js56i-mz, c3640-js56i-mz	Cisco 3620, Cisco 3640



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, purchaser/user must obtain local import and use authorizations for all encryption strengths. Please contact your sales representative or distributor for more information, or send an e-mail to export@cisco.com.

Table 4 list the features and feature sets supported by the Cisco 3600 series in Cisco IOS Release 12.0(4)XH4 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 first introduced. For example, (3) means a feature was introduced in Release 12.0(3)T. If a cell in this column is empty, the feature was included in the initial base release.

Note These feature set tables only contain a selected list of features. This table is not cumulative—nor does it list all the features in each image.

Table 4 Feature Lists by Feature Sets for the Cisco 3600 Series

Features	In	IP	Enterprise Plus	Enterprise Plus IPsec 56i
Connectivity				
Layer 2 Tunnel Protocol (L2TP)		No	Yes	Yes
RIP Enhancements		Yes	Yes	Yes
SNMP version 3		Yes	Yes	Yes
IBM Support				
DLSw+ RSVP		No	Yes	Yes
DLSw+ Enhanced Load Balancing		No	Yes	Yes
DLSw+ Peer Clusters		No	Yes	Yes
Token Ring Interswitch Link		Yes	Yes	Yes
IP Routing				
Easy IP Phase 2- DHCP Server	(1)	Yes	Yes	Yes
Flow Random Early Detection	(3)	Yes	Yes	Yes
OSPF Packet Pacing	(1)	Yes	Yes	Yes
OS_IFSS		Yes	Yes	Yes
Response Time Reporter Enhancements	(3)	Yes	Yes	Yes
Service Provider 1	(3)	No	No	No
NetFlow Policy Infrastructure	(3)	Yes	Yes	Yes
Web Cache Communications Protocol V2 (WCCPv2)	(3)	Yes	Yes	Yes
Management				
IFE2P Network Module	(1)	Yes	Yes	Yes
ISDN MIB RFC 2127	(1)	Yes	Yes	Yes
Process MIB	(3)	Yes	Yes	Yes
Quality of Service				
CLI String Search	(1)	Yes	Yes	Yes
Security				
Cisco IOS Firewall Feature Set Platform Support	(1)	No	No	Yes
IPSec Triple DES	(2)	No	No	No
Switching				
Cisco IOS STP Enhancements	(1)	No	Yes	Yes
Voice				
BRI Voice over IP: VIC-2BRI-S/T-TE	(3)	No	Yes	Yes
Voice Over Frame Relay, FRF.11 and FRF.12	(4)	No	Yes	Yes
Settlement for Packet Voice	(4)XH	No	Yes	Yes

Table 4 Feature Lists by Feature Sets for the Cisco 3600 Series (continued)

Features	In	IP	Enterprise Plus	Enterprise Plus IPsec 56i
Debit Card for Packet Telephony on Cisco Access Platforms	(4)XH	No	Yes	Yes
TCLWare	(4)XH	No	Yes	Yes
Interactive Voice Response for Cisco Access	(4)XH	No	Yes	Yes
H.323 Version 2 Support	(4)XH	No	Yes	Yes
WAN Services				
Annex-G (X.25 over Frame Relay)	(3)	Yes	Yes	Yes
ATM OC3 NM	(3)	No	Yes	Yes
IOS IEEE 802.1Q Support	(1)	No	Yes	Yes
ISDN Dynamic Multiple Encaps for Dial-in	(4)	Yes	Yes	Yes
ISDN LAPB-TA	(4)	Yes	Yes	Yes
Mobile IP	(1)	No	Yes	Yes
Modem over ISDN BRI ¹	(3)	Yes	Yes	Yes
PPP Over Frame Relay	(1)	Yes	Yes	Yes
R2 Signaling	(1)	Yes	Yes	Yes
Time-based Access Lists	(1)	Yes	Yes	Yes
X.25 over ISDN D Channel	(1)	Yes	Yes	Yes
X.25 Load Balancing	(3)	No	No	No

¹ Cisco 3640 routers only

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco 3600 series for Release 12.0(4)XH4.

Settlements for Packet Voice

Internet voice telephony is often used for toll bypass by using an existing data network or the Internet instead of PSTN trunking. Calls of this nature require an originating and terminating gateway to be completed. When the originating and terminating voice gateways are owned by two different carriers, settlement between these carriers is required. The Settlements for Packet Voice project implements a standardized settlement protocol, which can be implemented between different vendors, gateways, and voice settlement servers.

Debit Card for Packet Telephony on Cisco Access Platforms

The Debit Card feature provides the ability to offer calling service with the use of debit accounting to service providers. The Debit Card for Packet Telephony on Cisco Access Platforms is one application supported by the Cisco Interactive Voice Response (IVR) feature. The IVR voice scripts have been modified to use Tool Command Language (TCL) scripts.

TCLWare

The Debit Card for Packet Telephony on Cisco Access Platforms feature requires the use of both Audio Files and TCL Scripts. Unzip and download the files to your TFTP server.

In addition, download the audio files and TCL scripts from the Access Products Service and Support site on CCO at the following “TCLWare” location:

<http://www.cisco.com/kobayashi/sw-center/sw-access.shtml>

Interactive Voice Response for Cisco Access

Cisco is building voice gateways to connect more traditional telephone networks to voice over IP (VoIP) networks. Customers who are installing VoIP networks often need a mechanism at the gateway to present a customized interface to the caller. The Interactive Voice Response (IVR) feature was first made available to customers with Cisco IOS Release 11.(3)NA2 with the Service Provider VoIP feature set. IVR, with the addition of scripts using Tool Command Language (TCL), is being introduced with Cisco IOS Release 12.0(4)XH. These TCL IVR scripts are the default scripts that must be used with the IVR application in Cisco IOS Release 12.0(4)XH and future releases.

IVR consists of simple voice prompting and digit collection to gather caller information for authenticating the user and identifying the destination. IVR provides the ability to:

- Play customized prompts
- Collect account numbers and PINs
- Collect destination phone numbers
- Perform Authentication, Authorization, Accounting (AAA) tasks interacting with a variety of servers

H.323 Version 2 Support

H.323 Version 2 Support upgrades Cisco IOS software to comply with the mandatory requirements in the Version 2 specification. This upgrade enhances the existing Voice Over IP GateWay, the Multimedia Conference Manager (GateKeeper and Proxy), and the DTMF digital relay by using H.245.

DTMF is the tone generated on a touch-tone phone when you press keypad digits. The tones are compressed into a single stream at one end of a call and decompressed at the other end by using H.245 messages. However, doing this can lead to distortion, depending upon the CODEC used. Thus, the DTMF-relay is used to configure a method to transport DTMF tones generated after the call is established out-of-band. The three methods are:

- The standard H.323 out-of-band method uses H.245 to send digits as audible DTMF tones with voice; (the “h245-signal” option).
- The H.245 “alphanumeric” method (the “h245-alphanumeric” option) also uses User Input Indication as part of a control channel, and is another standard H.245 transmission method.
- The “cisco-rtp” method sends the voice stream but with an identifier indicating that the DTMF tones are added.

H.323 Version 2 defines a lightweight registration procedure that requires full registration for initial registration, but uses an abbreviated renewal procedure to update the gatekeeper and minimize overhead. Lightweight registration requires each endpoint to specify a TimeToLive (TTL) value in its Registration Request (RRQ) message.

The H.323 Version 2 gateway supports the registration of fully-qualified E.164 numbers with the gatekeeper for phones connected directly to the gateway. Tunneling through H.225 User-to-User Information Element (UUIE) facilitates transparent handling of supplementary services between two endpoints through a VoIP network. This eliminates the need to interpret various supplementary signaling messages in the VoIP gateways.

The H.323 Version 2 gatekeeper selects a destination gateway by choosing a gateway from among all gateways registered in a zone by allowing you to assign selection priorities to these gateways based on the dialed prefix. Gateway resource reporting allows the gateway to notify the gatekeeper when H.323 resources are getting low. The gatekeeper uses this information to determine which gateway it will use to complete a call and maintains a separate gateway list ordered by priority for each of its zone-prefixes.

Important Notes

This section contains important information about using your Cisco IOS Release 12.0(4)XH4 software.

Note For important information about the ATM OC3 network modules and compatibility with the Cisco 3620 router, please review the field notice on CCO at:
<http://www.cisco.com/warp/customer/770/51.shtml>

Caveat CSCdr91706 and IOS HTTP Vulnerability

A defect in multiple releases of Cisco IOS software will cause a Cisco router or switch to halt and reload if the IOS HTTP service is enabled, browsing to `http://router-ip/anytext?/` is attempted, and the enable password is supplied when requested. This defect can be exploited to produce a denial of service (DoS) attack.

The vulnerability, identified as Cisco bug ID CSCdr91706, affects virtually all mainstream Cisco routers and switches running Cisco IOS software releases 12.0 through 12.1, inclusive. This is not the same defect as CSCdr36952.

The vulnerability has been corrected and Cisco is making fixed releases available for free to replace all affected IOS releases. Customers are urged to upgrade to releases that are not vulnerable to this defect as shown in detail below.

This vulnerability can only be exploited if the enable password is known or not set.

You are strongly encouraged to read the complete advisory, which is available at <http://www.cisco.com/warp/public/707/ioshttpserverquery-pub.shtml>.

Deprecated MIBs

Old Cisco Management Information Bases (MIBs) will be replaced in a future release. OLD-CISCO-* MIBs are currently being migrated 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 the following table.

Table 5 **Deprecated MIBs**

Deprecated MIB	Replacement
OLD-CISCO-APPLETALK-MIB	RFC1243-MIB
OLD-CISCO-CHASSIS-MIB	ENTITY-MIB
OLD-CISCO-CPUK-MIB	In development
OLD-CISCO-DECNET-MIB	
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	
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	
OLD-CISCO-VINES-MIB	CISCO-VINES-MIB
OLD-CISCO-XNS-MIB	

Limitations and Restrictions

The Settlement for Packet Voice feature is offered only in crypto images, so that Cisco can provide export controls.

Before you can download 56-bit or 56i encryption images, the image must first go through the entitlement process. This process makes sure that the image is from a registered DNS address and that the images are not coming from an encryption-restricted country (Iraq, Libya, etc.). You can entitle yourself by filling out the forms located at the following URL:

<http://www.cisco.com/kobayashi/library/12.0>

Once you are entitled, you can see crypto images in the upgrade planner. You do not have to entitle yourself again, unless you come from a different host. You do not have to entitle yourself for every release. Entitlement is good for all releases.

If there are any problems with your entitlement, you will either be directed to help on DNS registration (if that is your problem), or your case will be escalated to David Moore in ECRA who will review it himself.

Also, all users **MUST** be entitled before they can receive 56 or 56i images. Never give a 56 or 56i image to a customer if you are uncertain about their entitlement status.

Caveats

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious.

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

All caveats in Release 12.0 and Release 12.0T are also in Release 12.0(4)XH4.

For information on caveats in Cisco IOS Release 12.0, see *Caveats for Cisco IOS Release 12.0*, which lists severity 1 and 2 caveats, and is located on CCO and the Documentation CD-ROM.

For information on caveats in Cisco IOS Release 12.0T, see *Caveats for Cisco IOS Release 12.0T* on CCO and the Documentation CD-ROM.

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on CCO at **Service & Support: Online Technical Support: Software Bug Toolkit II** or at <http://www.cisco.com/support/bugtools>.

Open Caveats—Release 12.0(4)XH4

This section describes possibly unexpected behavior by Release 12.0(4)XH4 and describes only severity 1 and 2 caveats:

Miscellaneous

- CSCdm47603
The router configured as the standby gatekeeper fails to complete the call after the primary gatekeeper is shutdown. The h225 channel is terminated with error number 134.
- CSCdm28316
H323 traffic is taking a data path to the destination when an ASR path is configured.

Resolved Caveats—Release 12.0(4)XH4

The following caveat has been resolved in Cisco IOS Release 12.0(4)XH4.

- CSCdp11237
Callgen remains in SETUP state while making a call through an E&M interface.

Related Documentation

The following sections describe the documentation available for the Cisco 3600 series. Typically, these documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online on CCO and the Documentation CD-ROM.

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

- Release-Specific Documents, page 12
- Platform-Specific Documents, page 12
- Feature Modules, page 13
- Cisco IOS Software Documentation Set, page 13

Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.0T, and are located on CCO and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.0*

On CCO at:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

- Product bulletins, field notices, and other release-specific documents on CCO at:

Service & Support: Technical Documents

- *Caveats for Cisco IOS Release 12.0 T, which contains caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.0 T.*

On CCO at:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on CCO at: **Service & Support: Online Technical Support: Software Bug Toolkit** or at <http://www.cisco.com/support/bugtools>.

Platform-Specific Documents

The documents listed below are available for the Cisco 3600 series routers. These documents are also available online at Cisco Connection Online (CCO) and on the Documentation CD-ROM:

- *Cisco 3600 Series Hardware Installation Guide*
- *Software Configuration Guide*
- *Network Module Hardware Installation Guide*
- *Update to Network Module Hardware and Software Guides*
- *WAN Interface Cards Hardware Installation Guide*
- *Update to WAN Interface Cards Hardware Installation Guide*
- *Cisco Modular Access Router Cable Specifications*
- Redundant Power Systems
- *Regulatory Compliance and Safety Info for the Cisco 3600 Series*
- Cisco 3600 Series Configuration Notes
- Digital Modem Portware documents

- Analog Modem Firmware documents
- Release notes

On CCO at:

Service & Support: Documentation Home Page: Access Servers and Access Routers: Modular Access Routers: Cisco 3600 Series Routers

On the Documentation CD-ROM at:

Access Servers and Access Routers: Modular Access Routers: Cisco 3600 Series Routers

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.0T 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 CCO at:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation

On the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: 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, 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 CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

You can reach these documents on CCO at:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

You can reach these documents on the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

Release 12.0 Documentation Set

Table 6 describes the contents of the Cisco IOS Release 12.0 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 CCO and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hard-copy documents were printed.

To reach the Cisco IOS documentation set from CCO, click on this path:

Service & Support: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0

To reach the Cisco IOS documentation set on the Documentation CD-ROM, click on this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0

Table 6 Cisco IOS Software Release 12.0 Documentation Set

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Configuration Fundamentals Configuration Guide</i> • <i>Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</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 NCI/Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
<ul style="list-style-type: none"> • <i>Dial Solutions Configuration Guide</i> • <i>Dial Solutions Command Reference</i> 	Dial-In Port Setup Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions ISDN X.25 over ISDN VPDN 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

Table 6 Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 1</i> • <i>Network Protocols Command Reference, Part 1</i> 	IP Addressing IP Services IP Routing Protocols
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 2</i> • <i>Network Protocols Command Reference, Part 2</i> 	AppleTalk Novell IPX
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 3</i> • <i>Network Protocols Command Reference, Part 3</i> 	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> • <i>Security Configuration Guide</i> • <i>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 Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Voice, Video, and Home Applications Configuration Guide</i> • <i>Voice, Video, and Home Applications Command Reference</i> 	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Video Support Universal Broadband Features
<ul style="list-style-type: none"> • <i>Quality of Service Solutions Configuration Guide</i> • <i>Quality of Service Solutions Command Reference</i> 	Classification Scheduling Packet Drop Traffic Shaping ATM QoS SNA QoS Line Protocols
<ul style="list-style-type: none"> • <i>Cisco IOS Software Command Summary</i> • <i>Dial Solutions Quick Configuration Guide</i> • <i>System Error Messages</i> • <i>Debug Command Reference</i> 	

Service and Support

For service and support for a product purchased from a reseller, contact the reseller. Resellers offer a wide variety of Cisco service and support programs, which are described in the section “Service and Support” in the information packet that shipped with your product.

Note If you purchased your product from a reseller, you can reach CCO as a guest. CCO is Cisco Systems’ primary real-time support channel. Your reseller offers programs that include direct access to CCO services.

For service and support for a product purchased directly from Cisco, use CCO.

Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a CCO login account, you can access the following URL, which contains links and helpful tips on configuring your Cisco products:

http://www.cisco.com/kobayashi/serv_tips.shtml

This URL is subject to change without notice. If it changes, point your Web browser to CCO and click on this path: **Products & Technologies: Products: Technical Tips.**

The following sections are provided from the Technical Tips page:

- Access Dial Cookbook—Contains common configurations or recipes for configuring various access routes and dial technologies.
- Field Notices—Designed to notify you of any critical issues regarding Cisco products. These notices include problem descriptions, safety or security issues, and hardware defects.
- Hardware—Technical Tips related to specific hardware platforms.
- Hot Tips—Popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC Fax-on-demand service. To reach Fax-on-demand and receive documents at your fax machine from the United States, call 888-50-CISCO (888-502-4726). From other areas, call 650-596-4408.
- Internetworking Features—Tips on using and deploying Cisco IOS software features and services.
- Sample Configurations—Actual configuration examples that are complete with topology and annotations.
- Software Products—MultiNet & Cisco Suite 100, Network Management, Cisco IOS Software Bulletins, and CiscoPro Configurations.
- Special Collections—Other Helpful Documents, including Case Studies, References & Request for Comments (RFCs), and Security Advisories.

Cisco Connection Online

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

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

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can reach CCO in the following ways:

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

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

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@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, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>. Translated documentation can be accessed at http://www.cisco.com/public/countries_languages.shtml.

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This document is to be used with documents mentioned in the "Related Documentation" section on page 11.

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