



# Release Notes for Cisco 2500 Series Routers for Cisco IOS Release 12.1(5)XM

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**February 13, 2002**

These release notes for Cisco 2500 series routers describe the enhancements provided in Cisco IOS Release 12.1(5)XM7. These release notes are updated as needed. Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.1* on Cisco.com and the Documentation CD-ROM.

All caveats in Release 12.1(5)T are also in Release 12.1(5)XM7. For a list of the software caveats that apply to Cisco IOS Release 12.1 T, see *Caveats for Cisco IOS Release 12.1 T* that accompanies these release notes. The caveats document is updated for every maintenance release and is located on Cisco.com and the Documentation CD-ROM.



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You can find the most current Cisco IOS documentation on Cisco.com. These electronic documents might contain updates and modifications made after the hardcopy documents were printed.

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## Early Deployment Releases

These release notes describe the Cisco 2500 series routers for Cisco IOS Release 12.1(5)XM7, which is an early deployment (ED) release based on Cisco IOS Release 12.1 T. Early deployment releases contain fixes for software caveats and support for new Cisco hardware and software features. The following lists shows the recent early deployment releases of the Cisco 2500 series routers:

- Release 11.2 P, up to 11.2(21)P
- Release 11.3 T, up to 11.3(11)T
- Release 12.0 T, up to 12.0(7)T
- Release 12.1 T, up to 12.1(5)T
- Release 12.1(5)XM. up to 12.1(5)XM7

For more information, see the “Platform-Specific Documents” section on page 9 about accessing related release note documents.

## System Requirements

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

- Memory Requirements, page 2
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## Memory Requirements

**Table 1** Memory Requirements for Cisco 2500 Series Routers

Feature Sets	Image Name	Software Image	Recommended Flash Memory	Recommended DRAM Memory	Runs from
IP Feature Sets	IP/H323	c2500-ix-l	16MB	16MB	Flash

## Hardware Supported

Cisco IOS Release 12.1(5)XM7 supports the Cisco 2500 series routers:

- Single LAN routers—Models 2502, 2503, 2504, 2520, 2521, 2522 and 2523
- Mission-specific, entry-level routers—Models 2501CF, 2502CF, 2503I, 2504I, 2520CF, 2520LF, 2521CF, 2521LF, 2522CF, 2522LF, 2523CF and 2523LF
- Router/hub combinations—Models 2505, 2507 and 2516
- Access servers—Models 2509 to 2512

- Dual LAN routers—Models 2513, 2514 and 2515
- Modular routers—Models 2524 and 2525 (optional integrated DSU/CSU or NT-1)

For detailed descriptions of the new hardware features, see “New and Changed Information” section on page 6.

**Table 2** Supported Interfaces for the Cisco 2500 Series

Interface, Network Module, or Data Rate	Product Description	Platforms Supported
LAN Interfaces	Ethernet (AUI)	Cisco 2501, 2503, 2509, 2511, 2513, 2514, 2520, 2522, and 2524 only
	Ethernet (10BaseT)	Cisco 2505, 2507, 2516, and 2524 only
	4-Mbps Token Ring	Cisco 2502, 2504, 2513, 2515, 2521, 2523, and 2525 only
	16-Mbps Token Ring	Cisco 2502, 2504, 2513, 2515, 2521, 2523, and 2525 only)
WAN Data Rates	48/56/64 kbps	Cisco 2500 series
	128 kbps	Cisco 2500 series
	1.544/2.048 Mbps	Cisco 2500 series
WAN Interfaces	EIA/TIA-232	Cisco 2500 series
	EIA/TIA-449	Cisco 2500 series
	EIA-530	Cisco 2500 series
	X.21	Cisco 2500 series
	V.35	Cisco 2500 series
	Serial, synchronous	Cisco 2500 series
	Serial, synchronous, and asynchronous	Cisco 2520, 2521, 2522, and 2523 only
	ISDN BRI S/T	Cisco 2503, 2504, 2516, 2520, 2521, 2522, 2523, 2524, and 2525 only
ISDN BRI U	Cisco 2524 and 2525 only	

## Determining the Software Release

To determine the version of Cisco IOS software running on your Cisco 2500 series router, log in to the router and enter the **show version EXEC** command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) Software (c2500-ix-1), Version 12.1(5)XM7, RELEASE SOFTWARE
```

## Upgrading to a New Software Release

For general information about upgrading to a new software release, see *Cisco IOS Upgrade Ordering Instructions* located at:

[http://www.cisco.com/warp/public/cc/cisco/mkt/ios/prodlit/957\\_pp.htm](http://www.cisco.com/warp/public/cc/cisco/mkt/ios/prodlit/957_pp.htm)

## Feature Set Tables

The Cisco IOS software is packaged in feature sets consisting of software images—depending on the platform. Each feature set contains a specific set of Cisco IOS features.

Cisco IOS Release 12.1(5)XM7 supports the same feature sets as Cisco IOS Release 12.1 T, but Release 12.1(5)XM7 can include new features supported by the Cisco 2500 series routers.



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

Table 3 lists the features and feature sets supported by the Cisco 2500 series routers 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.
- In—The number in the “In” column indicates the Cisco IOS release in which the feature was introduced. For example, (2) means a feature was introduced in 12.1(2)T. If a cell in this column is empty, the feature was included in the initial base release.



### Note

These feature set tables contain only the features specific to the 12.1(5)XM7-train. For a more complete list of features, see the feature set tables in the mainline release notes on Cisco.com:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121relnt/xprn121/121feats.htm>

**Table 3** Feature List by Feature Set for the Cisco 2500 Series

Features	In	Feature Sets
		IP/H323
<b>Configuration Fundamentals</b>		
Circuit Interface Identification MIB	(3)	Yes
Event MIB	(3)	Yes
Individual SNMP Trap Support	(3)	Yes

**Table 3 Feature List by Feature Set for the Cisco 2500 Series (continued)**

Features	In	Feature Sets
		IP/H323
<b>IP Multicast</b>		
Bidirectional PIM	(2)	Yes
Source Specific Multicast	(3)	Yes
<b>IP Routing Protocols</b>		
OSPF Flooding Reduction	(2)	Yes
<b>Management</b>		
Service Assurance Agent Enhancements		Yes
<b>Miscellaneous</b>		
AutoInstall Using DHCP for LAN Interfaces	(5)	Yes
Class-Based Quality of Service Management Information Base	(5)	Yes
Closed User Group Selection Facility Suppress Option	(5)	Yes
IGMP Version 3	(5)	Yes
Interface Index Persistence	(5)	Yes
NAT - Enhanced H.225/H.245 Forwarding Engine	(5)	No
NAT - Support for NetMeeting Directory (Internet Locator Service - ILS)	(5)	Yes
NAT - Support of H.323 v2 Call Signalling (FastConnect)	(5)	No
NAT - Support of IP Phone to Cisco Call Manager	(5)	Yes
NTP MIB	(5)	Yes
Parser Cache	(5)	Yes
PIM Dense Mode State Refresh	(5)	Yes
Router-Port Group Management Protocol	(5)	Yes
SDLC SNRM Timer and Window Size Enhancements	(5)	No
State-Refresh		Yes
<b>Multiservice Applications—Voice</b>		
Gatekeeper to Gatekeeper Redundancy and Load-Sharing	(2)	Yes
High-Performance Gatekeeper	(5)XM	Yes
<b>Quality of Service</b>		
Express Resource Transport Protocol and TCP Header Compression (CRTP)		Yes
<b>Reliability</b>		
Pragmatic General Multicast (PGM)		No
<b>WAN</b>		
Frame Relay ILMI Address Registration	(3)	Yes
Frame Relay Switching Enhancements: Shaping and Policing	(2)	Yes

# New and Changed Information

## New Software Features in Cisco IOS Releases 12.1(5)XM and 12.1(5)XM1

The following new software feature is supported by Cisco 2500 series routers for Release 12.1(5)XM. No new software features are supported by Cisco 2500 series routers for Release 12.1(5)XM7

### High-Performance Gatekeeper

Cisco IOS Release 12.1(5)XM supports the following High-Performance Gatekeeper (GK) enhancements:

- Increased support for back-end applications.
- Increased performance on a single gatekeeper.
- Alternate GK support: each alternate GK, or GK node, shares its local zone information so the cluster can manage all of the local cluster zones. Each alternate GK has a unique local zone.

Cisco IOS Release 12.1(5)XM also supports Cisco H.323 Multimedia Conference Manager (MCM) enhancements that provide the network administrator with the ability to identify H.323 traffic and to apply appropriate policies. The Cisco MCM is implemented on Cisco IOS software and enables a network manager to do the following:

- Limit H.323 traffic on a 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.
- Implement security for H.323 communications.

## Limitations and Restrictions

### 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-ENV-MIB	CISCO-ENVMON-MIB
OLD-CISCO-FLASH-MIB	CISCO-FLASH-MIB
OLD-CISCO-INTERFACES-MIB	IF-MIB CISCO-QUEUE-MIB

**Table 4** *Deprecated and Replacement MIBs (continued)*

Deprecated MIB	Replacement
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-VINES-MIB	CISCO-VINES-MIB

**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**.

## Important Notes

The following sections contain important notes about Cisco IOS Release 12.1(5)XM7 that can apply to the Cisco 2500 series routers.

### Caveat CSCdr91706 and IOS HTTP Vulnerability

A defect in multiple releases of Cisco IOS software causes a Cisco router or switch to halt and reload if the IOS HTTP service is enabled and you browse to `http://router-ip/anytext?/` and enter the enable password when it is requested. This defect can be exploited to produce a denial of service (DoS) attack. This vulnerability can only be exploited if the enable password is known or not set.

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. Cisco urges all customers to upgrade to releases that are not vulnerable to this defect as listed in the complete advisory, which is available at: <http://www.cisco.com/warp/public/707/ioshttpserverquery-pub.shtml>. You are strongly encouraged to read the complete advisory.

# Caveats

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

All caveats in Release 12.1(5)T are also in Release 12.1(5)XM7. For information on caveats in Cisco IOS Release 12.1(5)T, refer to the *Caveats for Cisco IOS Release 12.1 T* document. For information on caveats in Cisco IOS Release 12.1, refer to the *Caveats for Cisco IOS Release 12.1* document. These publications, located on Cisco.com and the Documentation CD-ROM, list severity 1 and 2 caveats, and select severity 3 caveats.

**Note**

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

## Resolved Caveats - Release 12.1(5)XM7

This section describes unexpected behavior that is fixed in Release 12.1(5)XM7.

### Management

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>

## Related Documentation

The following sections describe the documentation available for the Cisco 2500 series routers. 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 9
- Platform-Specific Documents, page 9
- Feature Modules, page 10
- Cisco IOS Software Documentation Set, page 10

## Release-Specific Documents

The following documents apply to 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 at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes**

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

**Technical Documents**

- *Caveats for Cisco IOS Release 12.1*

See *Caveats for Cisco IOS Release 12.1* and *Caveats for Cisco IOS Release 12.1 T*, which contain caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.1 and Release 12.1 T:

- On Cisco.com at:

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

- On the Documentation CD-ROM at:

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




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

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## Platform-Specific Documents

These individual and groups of documents are available for the Cisco 2500 series routers on Cisco.com and the Documentation CD-ROM:

- *Cisco 2524 and Cisco 2525 Public Network Certification*
- *Installing WAN Modules in the Cisco 2524 and Cisco 2525 Routers*
- *Cisco 2524 and Cisco 2525 Router User Guide*
- Release notes for Cisco 2500 series routers
- *Redundant Power Systems*

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 2500 Series Routers**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 2500 Series Routers**

## Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 T and above, 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.

The online-only feature module specific to Release 12.1(5)XM7 is located on Cisco.com at:

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

On the Documentation CD-ROM at:

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

## 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](mailto:cdbadmin@cisco.com). If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to set up an account.

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. 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 that 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 at:  
**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 Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

## Cisco IOS Release 12.1 Documentation Set

Table 5 describes the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form ordered.



Note

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

On Cisco.com at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

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

**Table 5** *Cisco IOS Software Release 12.1 Documentation Set*

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

Table 5 Cisco IOS Software Release 12.1 Documentation Set (continued)

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

Table 5 Cisco IOS Software Release 12.1 Documentation Set (continued)

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Other Security Features
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	Cisco IOS Switching Services Overview Cisco IOS Switching Paths Cisco Express Forwarding NetFlow Switching MPLS Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	Wide-Area Networking Overview Configuring ATM Configuring Frame Relay Configuring Frame Relay-ATM Interworking Configuring SMDS Configuring X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>New Features in 12.1-Based Limited Lifetime Releases</i></li> <li>• <i>New Features in Release 12.1 T</i></li> <li>• Release Notes (Release note and caveat documentation for 12.1-based releases and various platforms)</li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Dial Services Quick Configuration Guide</i></li> </ul>	

**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 CC, press **Login**, and click to **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>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

## Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly. 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

Registered Cisco.com users can order the Documentation CD-ROM and other Cisco Product documentation through our online Subscription Services at <http://www.cisco.com/cgi-bin/subcat/kaojump.cgi>.

Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco's corporate headquarters (California, USA) at 408 526-4000 or, in North America, call 800 553-NETS (6387).

## Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Warranty or maintenance contract customers can use the Technical Assistance Center. All customers can submit technical feedback on Cisco documentation using the web, e-mail, a self-addressed stamped response card included in many printed documents, or by sending mail to Cisco.

## Cisco.com

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  - From North America, call 408 526-8070
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Language	E-mail Address
English	<a href="mailto:tac@cisco.com">tac@cisco.com</a>
Hanzi (Chinese)	<a href="mailto:chinese-tac@cisco.com">chinese-tac@cisco.com</a>
Kanji (Japanese)	<a href="mailto:japan-tac@cisco.com">japan-tac@cisco.com</a>
Hangul (Korean)	<a href="mailto:korea-tac@cisco.com">korea-tac@cisco.com</a>
Spanish	<a href="mailto:tac@cisco.com">tac@cisco.com</a>
Thai	<a href="mailto:thai-tac@cisco.com">thai-tac@cisco.com</a>

In North America, TAC can be reached at 800 553-2447 or 408 526-7209. For other telephone numbers and TAC e-mail addresses worldwide, consult the following web site:  
<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

## Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a Cisco.com log-in account, you can access the following URL, which contains links and tips on configuring your Cisco products:

[http://www.cisco.com/public/technotes/tech\\_sw.html](http://www.cisco.com/public/technotes/tech_sw.html)

This URL is subject to change without notice. If it changes, point your Web browser to Cisco.com, press **Login**, and click on this path: **Technical Assistance Center: 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—Notifies you of any critical issues regarding Cisco products and includes problem descriptions, safety or security issues, and hardware defects.

- **Frequently Asked Questions**—Describes the most frequently asked technical questions about Cisco hardware and software.
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