



Release Notes for Cisco AS5400 Universal Gateway for Cisco IOS Release 12.1 T

June 15, 2001



Note

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

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

For a list of the software caveats that apply to Cisco IOS Release 12.1(5)T8, see *Caveats for Cisco IOS Release 12.1*. The caveats document is updated for every maintenance release and is located on Cisco Connection Online (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

The Cisco AS5400 is a versatile data communications platform that provides high performance, high density, and hot swappability in only two rack units. The Cisco AS5400 is intended for large companies and service providers who require dense and scalable solutions to create new multiservice access networks, replace existing access server hardware, or expand and enhance their current access offering.

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.1(5)T8, see the “New and Changed Information” section on page 5 and the “Related Documentation” section on page 11.

System Requirements

This section describes the system requirements for Cisco IOS Release 12.1 T:

- Memory Recommendations, page 2
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Memory Recommendations

Memory recommendations for the Cisco AS5400 are presented in Table 1.

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

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

Hardware Supported

Cisco IOS Release 12.1 T supports the Cisco AS5400. The supported interfaces and dial feature cards are detailed in Table 2.

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

Table 2 Supported Interfaces for the Cisco AS5400 Universal Gateway

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

Determining the Software Version

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

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.1 Software (c5400-is-mz), Version 12.1(5)T8, 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/pd/iosw/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.



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 3 lists the features and feature sets supported by the Cisco AS5400 in Cisco IOS Release 12.1(5)T and uses the following conventions:

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

- In—The number in the “In” column indicates the Cisco IOS release in which the feature was introduced. For example, (1) means a feature was introduced in 12.1(1)XD.

**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 hardcopy documents were printed. If you have a Cisco.com login account, you can find image and release information regarding features prior to Cisco IOS Release 12.1 T by using the Feature Navigator tool at: <http://www.cisco.com/go/fn>.

Table 3 Feature List by Feature Set for the Cisco AS5400

Feature	In ¹	Software Images by Feature Set	
		IP Plus	Enterprise Plus
Airline Protocol (UTS)		Yes	Yes
Annex G (X.25 over Frame Relay)		Yes	Yes
AutoInstall Using DHCP for LAN Interfaces	(5)	Yes	Yes
Calling Line Identification Screening—Call Discriminator	(5)	Yes	Yes
Cisco IOS DHCP Server		Yes	Yes
Cisco IOS IEEE 802.1Q Support		Yes	Yes
Committed Access Rate (CAR)		Yes	Yes
CUG Selection Facility Suppress Option	(5)	Yes	Yes
DLSw RSVP Bandwidth Reservation		Yes	Yes
DNS based X.25 routing		Yes	Yes
DSLw+ Ethernet Redundancy		Yes	Yes
Dialer DNIS-Group Range	(5)	Yes	Yes
Dialer profiles		Yes	Yes
Dynamic Multiple Encapsulation for Dial-in over ISDN		Yes	Yes
Frame Relay End-to-End Keepalive		Yes	Yes
IP Multicast Multilayer Switching		Yes	Yes
IPX Infrastructure Enhancements		No	Yes
IS-IS Multiarea Support		No	Yes
ISDN LAPB-T		Yes	Yes
ISDN MIB RFC 2127		Yes	Yes
Layer 2 Tunneling Protocol		Yes	Yes
MBGP/MSDP		Yes	Yes
Monitoring Resource Availability on Cisco AS5x00 Universal Access Servers	(5)	Yes	Yes

Table 3 Feature List by Feature Set for the Cisco AS5400

Feature	In ¹	Software Images by Feature Set	
		IP Plus	Enterprise Plus
NAT—Support for NetMeeting Directory (Internet Locator Service—ILS)	(5)	Yes	Yes
NextPort Port Service Management for the Cisco AS5400 Universal Access Server	(3)	Yes	Yes
OSPF Packet Pacing		Yes	Yes
OS_IFSS		Yes	Yes
Parser Cache	(5)	Yes	Yes
Preauthentication with ISDN PRI and Channel-Associated Signaling	(3)	Yes	Yes
RIP		Yes	Yes
SDLC SNRM Timer and Window Size Enhancements	(5)	Yes	Yes
Cisco SS7/CCS7 Dial Access Solution System Integration Guidelines, Release 2		Yes	Yes
Sticky IP	(5)	Yes	Yes
Subnetwork Bandwidth Manager (SBM)		Yes	Yes
TG/COS		No	Yes
Tag Switching (MPLS)		No	Yes
Virtual Console		Yes	Yes
WCCP		Yes	Yes

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

New and Changed Information

The following sections list the new hardware and software features supported by the Cisco AS5400 for Cisco IOS Release 12.1 T.

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

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

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

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

AutoInstall Using DHCP for LAN Interfaces (CSCdr88175)

The AutoInstall Using DHCP for LAN Interfaces feature replaces the use of the Bootstrap Protocol (BOOTP) with the use of the Dynamic Host Configuration Protocol (DHCP) for Cisco IOS AutoInstall over LAN interfaces. AutoInstall is a Cisco IOS software feature that provides for the configuration of a new routing device automatically when the device is initialized. DHCP (defined in RFC 2131) is based on the Bootstrap Protocol, which provides the framework for passing configuration information to hosts on a TCP/IP network. DHCP adds the capability of automatic allocation of reusable network addresses and additional configuration options. In Cisco IOS release 12.1(5)T, the IP address procurement phase of the AutoInstall process is now accomplished using DHCP for Ethernet, Token Ring, and FDDI interfaces. Before this release, IP addresses for LAN interfaces were obtained using BOOTP during the AutoInstall process. The AutoInstall Using DHCP for LAN Interfaces feature also allows the routing device to recognize IP address allocation messages coming from regular BOOTP servers, providing a seamless transition for those devices already using BOOTP servers for AutoInstall. Additionally, this feature allows for the uploading of configuration files using unicast Trivial File Transfer Protocol (TFTP).

For further details, please see:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121t/121t5/dt_dhcpa.htm

IGMP Version 3

Internet Group Management Protocol (IGMP) is a protocol used by IPv4 systems to report IP multicast group memberships to neighboring multicast routers. On networks with hosts directly attached, IGMP Version 3 (IGMPv3) adds support for “source filtering,” which enables a multicast receiver to signal to a router which groups it wants to receive multicast traffic from, and from which source(s) this traffic is expected. Based on this membership information, Cisco IOS software only forwards traffic that is requested by the host (or by other routers via Protocol Independent Multicast [PIM]) to that network. In addition to restricting traffic on the network of the receiver host, IGMPv3 membership information can be propagated to multicast routing protocols to enable the forwarding of traffic from permitted sources or to restrict traffic from denied sources along the entire multicast data delivery path.

In the Source Specific Multicast (SSM) feature, introduced in Cisco IOS Release 12.1(5)T, hosts must explicitly include sources when joining a multicast group (this is known as “channel subscription”). IGMPv3 is the industry-designated standard protocol for hosts to signal channel subscriptions in SSM. In deployment cases where IGMPv3 cannot be used (for example, if it is not supported by the receiver host or its applications), there are two other mechanisms to enable SSM: URL Rendezvous Directory (URD) and IGMP v3lite. Both of these features were introduced with SSM in Cisco IOS Release 12.1(5)T.

Interface Index Persistence

One of the most commonly used identifiers in SNMP-based network management applications is the Interface Index (ifIndex) value. IfIndex is a unique identifying number associated with a physical or logical interface; as far as most software is concerned, the ifIndex is the “name” of the interface. Although there is no requirement in the relevant Requests for Comments (RFC) that the correspondence between particular ifIndex values and their interfaces be maintained across reboots, applications such as device inventory, billing, and fault detection increasingly depend on the maintenance of this correspondence.

Cisco IOS Release 12.1(5)T8 adds support for an ifIndex value that can persist across reboots, enabling users to avoid the workarounds previously required for consistent interface identification. The Interface Index Persistence feature allows for greater accuracy when collecting and processing network management data by uniquely identifying input and output interfaces for traffic flows and SNMP

statistics. Relating each interface to a known entity (such as an ISP customer) enables network management data to be used more effectively. See the following document for further information: <http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121t/121t5/dt5ifidx.htm>.

Interface Range Specification

The Interface Range Specification feature allows specification of a range of interfaces to which subsequent commands are applied and supports definition of macros that contain an interface range. The Interface Range Specification feature is implemented with the **range** keyword, which is used with the **interface** command. In the interface configuration mode with the **range** keyword, all entered commands are applied to all interfaces within the range until you exit interface configuration mode.

Monitoring Resource Availability on Cisco AS5300, AS5400, and AS5800 Universal Access Servers

This feature provides enhancements to improve the visibility into the line and modem status for the network access server (NAS).

NAS modem health is supported by the following features:

- DS-0 Busyout Traps
- ISDN PRI Requested Channel Not Available Traps
- Modem Health Traps
- Show Controllers Timeslots
- DS-1 Loopback Traps

These features have been developed to monitor the NAS health conditions at the digital signal level zero (DS-0) level, Primary Rate Interface (PRI) bearer channel level, and modem level.

This combined set of features provides the following benefits:

- Improved visibility into the line status for the NAS for comprehensive health monitoring and notification capability.
- Improved troubleshooting and diagnostics for large dial networks.

NAT—Support for NetMeeting Directory (Internet Locator Service—ILS)

Microsoft NetMeeting is a Windows-based application that enables multiuser interaction and collaboration from a user's PC over the Internet or an intranet. Support for the NetMeeting Directory (ILS) allows connections by name from the directory built into the NetMeeting application. Destination IP addresses do not need to be known in order for a connection to be made.

Parser Cache

The Parser Cache feature optimizes the parsing (translation) of Cisco IOS software configuration command lines by remembering how to parse recently encountered command lines. This feature was developed to improve the scalability of the Cisco IOS software command-line interface (CLI) parser when processing large configuration files. This improvement is especially useful for those cases in which thousands of virtual circuits must be configured for interfaces, or hundreds of access control lists (ACLs) are required. The parser chain cache can rapidly recognize and translate configuration lines that differ slightly from previously used configuration lines (for example, pvc 0/100, pvc 0/101, and so on). Testing indicates an improvement to load time of between 30% and 36% for large configuration files when using the parser cache.

The parser cache is enabled by default on all platforms using Cisco IOS 12.1(5)T8 or later. A new command, **[no] parser cache**, allows the disabling or reenabling of this feature.

PIM Dense Mode State Refresh

The PIM Dense Mode State Refresh feature keeps the pruned state in PIM dense mode from timing out by periodically forwarding a control message down the source-based distribution tree. The control message refreshes the prune state on the outgoing interfaces of each router in the distribution tree.

Router-Port Group Management Protocol (CSCdp11190)

The Router-Port Group Management Protocol (RGMP) feature introduces a Cisco protocol that restricts IP multicast traffic in switched networks. RGMP is a Layer 2 protocol that enables a router to communicate to a switch (or a networking device that is functioning as a Layer 2 switch) the multicast group for which the router would like to receive or forward traffic.

New Hardware Features in Cisco IOS Release 12.1(3a)T1

There are no new hardware feature in the Cisco AS5400 for Cisco IOS Release 12.1(3a)T1.

New Software Features in Cisco IOS Release 12.1(3a)T1

The following new software features are supported by the Cisco AS5400 for Cisco IOS Release 12.1(3a)T1:

NextPort Port Service Management for the Cisco AS5400 Universal Access Server

The NextPort port service management feature implements digital service port technology for the Cisco AS5400. Ports on the Nextport modem carrier module support both modem and digital services. Ports can be addressed aggregated at the slot level of the Nextport module, the Service Processing Element (SPE) level within the Nextport module, and the individual port level. The Service Processing Element (SPE) is an addressable group of six modems. The Nextport dial feature card is supported by Service Processing Element (SPE) operating software.

Benefits include the following:

- Modem or digital service at the port level resulting in greater flexibility of network configuration
- Addressability at the slot, SPE, or port level resulting in ease and scale of configuration tasks
- Higher port density in the platform resulting in economies of scale
- SPE layer buffers the platform architecture from future changes and advances in port level technology
- Modular architecture with resulting ease and economy of maintenance
- The Nextport architecture is designed to be extended to additional port services and other Cisco access server platforms.

For complete information about NextPort Port Service Management for the Cisco AS5400 Universal Access Server, see the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121newft/121t/121t3/nextport/dtnxptxd.htm>

Preauthentication with ISDN PRI and Channel-Associated Signaling

The Preauthentication with ISDN PRI and Channel-Associated Signaling feature allows a Cisco network access server (NAS) to determine if an incoming call may be answered on the basis of the called number, the calling number, or the call type. With an ISDN PRI (Primary Rate Interface), or with Channel-Associated Signaling (CAS), information about an incoming call is available to the NAS before the call is answered. The available call information includes the called station ID (DNIS), the calling station ID (CLID), and the bearer capability (call type).

When an incoming call arrives from the public network switch, but before it is answered, this feature enables the NAS to send the DNIS, CLID, and call type to a RADIUS server for authorization. If the server authorizes the call, then the NAS accepts the call. If the server does not authorize the call, then the NAS sends a disconnect message to the public network switch to reject the call. This feature supports the use of attribute 44 by the RADIUS server application, which allows user authentication based on the CLID at the same time.

This feature also supports the use of new RADIUS attributes. These RADIUS attributes are configured in the RADIUS preauthentication profiles to specify preauthentication behavior. They may also be used, for instance, to specify whether subsequent authentication should occur and, if so, what authentication method should be used.

In the event that the RADIUS server application becomes unavailable, this feature allows a guard timer to be set in the NAS. When the timer expires, the NAS uses a configurable parameter to accept or reject the incoming call without the authorization.

Limitations and Restrictions

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

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

Table 4 *Deprecated and Replacement MIBs (continued)*

Deprecated MIB	Replacement
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

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 Information

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

Caveat CSCds63752

Channelized T3 (CT3) modules on Cisco AS5400 series universal access servers select the T1 controller for clocking but when using the **dial-tdm-clock** global configuration command to configure the time-division multiplexing clock, if T1 controller one is selected to be the master, the software selects port two.

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

Last Maintenance Release of Cisco IOS Release 12.1 T

The last maintenance release of the 12.1 T release train is 12.1(5)T8. The migration path for customers who need bug fixes for the 12.1 T features is the 12.2 mainline release. The 12.2 mainline release has the complete feature content of 12.1 T and will eventually reach general deployment.

The last maintenance release was renamed from 12.1(4)T to 12.1(5)T8 to synchronize with its parent software base, the 12.1(5) mainline release, and to reflect that 12.1(5)T8 has all the bug fixes of the 12.1(5) mainline release. The 12.1 T release train is a superset of the 12.1 mainline release; hence any defect fixed in the 12.1 mainline is also fixed in 12.1 T. The set of features for 12.1(4)T is the same as that for 12.1(5)T. There was no change in the feature content of the release. The release was renamed so that the releases would be consistent with the Cisco release process.

Caveats

For a list of the software caveats that apply to Cisco IOS Release 12.1(5)T8, see *Caveats for Cisco IOS Release 12.1*. The caveats document is updated for every maintenance release and is located on Cisco Connection Online (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.



Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, go to Cisco.com and press **Login**. Then go to **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools>.

Related Documentation

The following sections describe the documentation available for the Cisco AS5400. These documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

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

Use these release notes with these documents:

- Release-Specific Documents, page 11
- Feature Modules, page 12
- Cisco IOS Software Documentation Set, page 12

Release-Specific Documents

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

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

On Cisco.com at:

Technical Documents: 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 T*

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 Cisco IOS 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



Note If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, go to Cisco.com and press **Login**. Then go to **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools>.

Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On Cisco.com at:

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

On the Documentation CD-ROM at:

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

Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents 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 if ordered.



Note

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

On Cisco.com at:

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

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"> <i>Cisco IOS Configuration Fundamentals Configuration Guide</i> <i>Cisco IOS Configuration Fundamentals Command Reference</i> 	Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS 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> 	Using Cisco IOS Software Overview of SNA Internetworking Bridging IBM Networking

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

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

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

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

**Note**

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Spanish	tac@cisco.com
Thai	thai-tac@cisco.com

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