CISCO SYSTEMS

Release Notes for Cisco uBR924 Cable Access Router for Cisco IOS Release 12.0 XI

May 3, 1999

These release notes for the Cisco uBR924 cable access router support Release 12.0(4)XI. 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)XI, see the "Caveats" section on page 10. See also *Caveats for Cisco IOS Release 12.0 T* 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* located on (CCO) and the Documentation CD-ROM.

Contents

These release notes describe the following topics:

1

Introduction

The Cisco uBR924 cable access router is part of a new class of Cisco data-over-cable products. The Cisco uBR924 cable access router is DOCSIS-based and interoperates with any DOCSIS-compliant headend. It integrates a 4-port 10BaseT hub and 2 RJ-11 VoIP telephone jacks into a single compact design. The Cisco uBR924 cable access router can be configured to support data, voice, or a mixture of data and voice.

System Requirements

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

- Memory Requirements, page 2
- Headend Voice Interoperability, page 2
- Hardware Supported, page 3
- Determining the Version of Your Cisco IOS Software Release, page 3
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Memory Requirements

Table 1   Memory Requirements for the Cisco uBR924

Feature Set	Image Name	Flash Memory Required	DRAM Memory Required	Runs From	Feature Status
IP Routing Standard Feature Sets					
Home Office	ubr920-y5-mz	4 MB Flash[1]	16 MB DRAM[1]	RAM	Image available in Release 12.0(4)XI
Home Office with Voice	ubr920-v4y5-mz	4 MB Flash[1]	16 MB DRAM[1]	RAM	Image available in Release 12.0(4)XI

1   These are standard Cisco factory assignments.

Headend Voice Interoperability

To support differentiated voice services should you have Cisco uBR7200 Series headend equipment, use any Cisco IOS Release 12.0(4)XI image or higher. These headend images allow the definition of multiple Service Identifiers (SIDs) on the upstream. Voice traffic can then be designated on higher Quality of Service (QoS) secondary SIDs, while data traffic can be forwarded on a primary SID. That way, higher QoS SIDs receive preferential treatment at the headend for grants over any tiered "best effort" type data SIDs on that upstream.

To configure the Cisco uBR924 cable access router to support multiple classes of service, use the configuration file editor of your choice. DOCSIS configuration files can contain three Classes of Service (CoS) to support voice. The first CoS can be used for data (and voice if no other CoS are defined). The second and third CoS can be used for voice from each of the two telephone ports on the Cisco uBR924 cable access router.

> **Note** The Cisco uBR924 cable access router interoperates with a DOCSIS 1.0 headend that does not support multiple CoS. Because voice and data traffic will be mixed, however, voice traffic will be transmitted on a best effort basis. This may cause poorer voice quality and lower data throughput when calls are being made from the Cisco uBR924 cable access router's telephone ports.

When configured to support voice, the Cisco uBR924 cable access router packetizes and transports voice in compliance with the H.323 protocol. Only version 2 of the H.323 protocol is tested. H.323v2 is integrated in Cisco gatekeeper/gateway products, such as the 2600 and 3600, in Cisco IOS Release 12.0(5)T or higher.

Hardware Supported

Cisco IOS Release 12.0(4)XI supports the following hardware features:

- Cisco uBR924 Cable Access Router

  The Cisco uBR924 cable access router interacts with the Cable Modem Termination System (CMTS)—the cable system headend equipment that enables data connectivity between Internet Protocol (IP) hosts and connected subscribers over the broadband infrastructure. The Cisco uBR924 cable access router interoperates with any DOCSIS-based CMTS that supports the feature set.

  The router ships from the Cisco factory with a Cisco IOS image that supports data only. Should your network support digitized voice over an IP network (VoIP) and you have a valid license, you can download the Cisco IOS image that supports voice from CCO. The router ships from the Cisco factory with the console port enabled to allow local configuration of the unit.

  When configured to support voice, the Cisco uBR924 cable access router uses the H.323 protocol. Other voice protocols will be supported in later releases. The router supports compression and decompression algorithms (vocoders) such as G.729 and G.711.

  The Cisco uBR924 cable access router is able to implement multiple classes of service on the cable interface. A multiple SID-per-cable access router feature enables the Cisco uBR924 cable access router to use multiple SID queues for differentiated services. The Cisco uBR924 cable access router diverts voice call traffic to the higher QoS secondary SID, while forwarding "best effort" data from the Ethernet interface and MAC messages on the primary SID.

  For more information see the "New and Changed Information" section on page 5.

Determining the Version of Your Cisco IOS Software Release

To determine the version of Cisco IOS software running on your Cisco uBR924 cable access router, log in to the Cisco uBR924 cable access router and enter the **show version** user EXEC command.

```
Router#show ver
Cisco Internetwork Operating System Software
IOS (tm) 920 Software (UBR920-Y5-M), Version 12.0(4)XI, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc2)
TAC:Home:SW:IOS:Specials for info
Copyright (c) 1986-1999 by cisco Systems, Inc.
```

Upgrading to a New Software Release

For information about updating to a new software release, see *Cisco IOS Software Release 12.0 Upgrade Paths and Packaging Simplification* product bulletin located at:

http://www.cisco.com/kobayashi/library/12.0/120MigrPaths.pdf

If you do not have an account on CCO and want general information about upgrading to a new software release, see *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 **Cisco IOS Software Release 11.3 Upgrade Paths (#703: 12/97)**.

This product bulletin does not contain information specific to Cisco IOS Release 12.0(4)XI, but provides generic upgrade information that may apply to Cisco IOS Release 12.0(4)XI.

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 2 lists the features and feature sets supported by Cisco IOS Release 12.0(4)XI for the Cisco uBR924 cable access router. Table 2 uses the following conventions to identify features:

- Yes—The feature is supported in the feature set.

- No—The feature is not supported in the feature set.

- In—The number in the "In" column indicates the Cisco IOS release in which the feature was introduced. For example, (4) means the feature was introduced in 12.0(4)XI. If a cell in this column is empty, the feature was included in the initial base release.

Table 2   Feature List by Feature Set

		Feature Sets	
Feature	**In**	**Home Office**	**Home Office with Voice**
Full and DOCSIS-compliant Bridging	(4)	Yes	Yes
Network Address Translation and Port Address Translation (NAT/PAT), DHCP Server	(4)	Yes	Yes
Routing (RIP V2)	(4)	Yes	Yes
Network Management			
Cable Device MIB	(4)	Yes	Yes
Cisco Standard MIBs	(4)	Yes	Yes
Cisco Voice MIBs	(4)	No	Yes
Radio Frequency Interface (RFI) MIB	(4)	Yes	Yes

New and Changed Information

The following sections list hardware and software features supported by the Cisco uBR924 cable access router for Cisco IOS Release 12.0(4)XI.

New Hardware Features In Release 12.0(4)XI

The following new hardware features are supported in Cisco IOS Release 12.0(4)XI.

Cisco uBR924 Cable Access Router

The Cisco uBR924 cable access router is a bidirectional cable access router that gives a residential or Small Office/Home Office (SOHO) subscriber high-speed Internet or Intranet access and packet telephone services via a shared two-way cable system and IP backbone network. The router is compatible with DOCSIS.

The Cisco uBR924 cable access router is a compact, easy-to-install device that contains:

- A single F-connector interface to the cable system

- Four RJ-45 (10BaseT Ethernet) ports to connect up to four computers directly to the uBR924 cable access router when in bridging or routing mode.

- Two RJ-11 ports to connect up to two telephones to the cable system and IP backbone to support Voice over IP (VoIP) transmission. A two-line telephone can be plugged into the V1+V2 rear connector of the router using a single cable if the cable has four wires. Line 2 behaves as if a single-line telephone is plugged into the second voice port.

- One RJ-11 port to connect to a standard, analog telephone line (optional) to provide a backup Plain Old Telephone Service (POTS) connection to the Public Switched Telephone Network (PSTN) should the cable modem lose power.

- One RJ-45 console port to connect to an ASCII terminal when locally troubleshooting or reconfiguring the cable access router. A console kit is available separately that enables remote site troubleshooting.

New Software Features In Release 12.0(4)XI

The following software features are supported in Cisco IOS Release 12.0(4)XI.

Cable Device MIB

The Cable Device MIB is for DOCSIS-compliant cable access routers and CMTS. The Cable Device MIB records statistics related to the configuration and status of the Cisco uBR924 cable access router. Statistics include an events log and device status. The following list details the components of the Cable Device MIB:

- The **docsDevBase** group extends the MIB-II "system" group with objects needed for cable device system management.

- The **docsDevNmAccess** group provides a minimum level of SNMP access security.

- The **docsDevSoftware** group provides information for network downloadable software upgrades.

- The **docsDevServer** group provides information about the progress of interaction with various provisioning servers.

- The **docsDevEvent** group provides information about the progress of reporting.

- The **docsDevFilter** group configures filters at link layer and IP layer for bridge data traffic.

The Cable Device MIB is very similar to the RFI MIB in that both allow access to statistics; they are different in that the Cable Device MIB reports statistics on the Cisco uBR924 cable access router, and the RFI MIB reports statistics on the radio frequency transmissions over the cable television line.

Cisco Standard MIBs

The Cisco Standard MIBs consists of the following components:

- CISCO-PRODUCT-MIB

- CISCO-SYSLOG-MIB

- CISCO-FLASH-MIB

- BRIDGE-MIB

- IF-MIB

- CiscoWorks/CiscoView

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

Cisco Voice MIBs

The Cisco Voice MIBs consists of the following components:

- VOICE-IF-MIB

- VOICE-DIAL-CONTROL-MIB

- VOICE-ANALOG-MIB

- DIAL-CONTROL-MIB

- CISCO-DIAL-MIB

Full and DOCSIS-Compliant Bridging

Full and DOCSIS-Compliant Bridging for the Cisco uBR924 cable access router is compatible with the DOCSIS standards for interoperable cable access routers and supports two modes of transparent bridging:

- The current full transparent bridging is supported in Cisco IOS Release 12.0 and configured by using the command line interface.

- DOCSIS-compliant transparent bridging is configured automatically at startup only. The DOCSIS bridging mode is set as the default for the Cisco uBR924 cable access router. A command line interface command is provided to disable automatic DOCSIS-compliant configuration after the next reload.

Home Office with Voice Support

Acceptable voice quality and reduction in network bandwidth usage are achieved by using several voice processing techniques. Digital Signal Processors (DSPs), in combination with DSP firmware in the Cisco uBR924 cable access router, provide the stream-to-packet and packet-to-stream conversion, as well as voice processing capabilities. Typical voice processing services include echo cancellation, voice compression, Voice Activity Detection (VAD) or silence compression and Dual Tone Multi-Frequency (DTMF) tone detection and generation. Supported vocoders include:G.711 A Law 64000 bps, G.711 u Law 64000 bps, G.723.1 5300 bps, G.723.1 6300 bps, G.726 16000 bps, G.726 24000 bps, G.726 32000 bps, G.728 16000 bps, G.729 Annex-A 8000 bps, G.729 8000 bps.

Use of the H.323 protocol typically involves a dial plan and mapper at the headend to map IP addresses to telephone numbers. You can also set static routes. Use dial peer commands to define local and remote peers. For the backup POTS port, define port and E.164 addresses. For remote peers', define remote peers IP address and E.164 address.

Note If you have Cisco Network Registrar (CNR) version 2.5 with TCL script, you can assign E.164 addresses to local ports and use a gatekeeper to resolve the remote peers' IP addresses. CNR uses the DHCP option (merit dump file) containing an ASCII string which defines the E.164 address-to-port assignments. The Cisco uBR924 cable access router software creates dial-peers, starts H.323 RAS gateway support, and registers the E.164 addresses with the gatekeeper. Functionality is augmented in Cisco IOS Release 12.0(5)T and higher.

Network Address Translation and Port Address Translation (NAT/PAT)

Network Address Translation (NAT):

- allows customers to maintain their own private networks while giving them full Internet access through the use of one or more global IP addresses.

- allows several private IP addresses to use the same global IP address by using address overloading.

- facilitates configuration and permits a large network of users to reach the network by using one Cisco uBR924 cable access router and the same DOCSIS cable interface IP address.

- eliminates the need to readdress all hosts with existing private network addresses (one-to-one translation) or by enabling all internal hosts to share a single registered IP address (many-to-one translation, also known as Port Address Translation [PAT]).

- enables packets to be routed correctly to and from the outside world by using the Cisco uBR924 cable access router.

- allows personal computers on the Ethernet interface to have IP addresses to be mapped to the cable interface's IP address.

Routing protocols will run on the Ethernet interface instead of the cable interface, and all packets received are translated to the correct private network IP address and routed out the Ethernet interface. This eliminates the need to run RIP on the cable interface.

To implement the Cisco uBR924 cable access router, the Ethernet interface is configured with an "inside" address and the cable interface is configured with an "outside" address. The Cisco uBR924 cable access router also supports configuration of static connections, dynamic connections, and address pools.

Radio Frequency Interface MIB

The Radio Frequency Interface (RFI) MIB module is for DOCSIS-compliant radio frequency interfaces in cable access routers and cable access router termination systems. On the cable access router, RFI MIB entries provide:

- upstream and downstream channel characteristics

- class of service attributes

- physical signal quality of the downstream channels

- attributes of cable access router MAC interface

- status of several MAC layer counters

The RFI MIB includes tables describing both the cable access router termination system and the cable access router side of the cable interface. All cable access router tables are implemented.

Routing (RIP V2)

A routing configuration for the Cisco uBR924 cable access router is most likely used when the cable access router is being added to an existing personal computer network or when the cable access router is being configured for five or more personal computers. The Cisco uBR924 cable access router will automatically configure the headend's IP address as its IP default gateway. When the IP host-routing is being configured, this automatic configuration of the headend's IP address as its IP default gateway will allow the Cisco uBR924 cable access router to send packets not intended for the Ethernet interface to the headend.

RIP V2 routing is useful for small internetworks in that it enables optimization of NIC-assigned IP addresses by defining VLSMs for network addresses, and it allows CIDR addressing schema.

Limitations and Restrictions

This section describes warnings and cautions about using Cisco IOS Release 12.0(4)XI software.

Important Notes

This section contains important information about use of your Cisco IOS Release 12.0(4) XI software.

Bridging Mode

When configured to support voice in a bridging mode, the uBR924 cable access router must be communicating with a routing headend. This is corrected in Cisco IOS Release 12.0(5)T or higher.

Deprecated MIBs

Older Cisco Management Information Bases (MIBs) will be replaced in a future release. OLD-CISCO-* MIBS are currently migrated into more scalable MIBs, without affecting existing Cisco IOS products or NMS applications. Application developers should update from deprecated MIBs to the replacement MIBs as shown in.

Table 3   Deprecated and Replacement 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	

Caveats

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 are the most severe 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 12.0 T are also in Release 12.0(4)XI.

For information on caveats in Cisco IOS Release 12.0, see *Caveats for Cisco IOS Release 12.0*.

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

Note   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: **Software & Support: Online Technical Support: Bug Toolkit.** You can also find Bug Navigator II at: http://www.cisco.com/support/bugtools.

Caveats for Release 12.0(4)XI

This section describes possibly unexpected behavior by Release 12.0(4)XI. Unless otherwise noted, these caveats apply to all 12.0 releases up to and including 12.0(4)XI.

- CSCdm28470

    Values selected for Initial Ranging backoffs are not random enough. This can cause several Cisco uBR924 cable access routers that are powered on at the same time to take a long time to get through initial ranging and bring the cable interface up.

    To avoid this problem, configure the headend to specify a larger ranging backoff start value. To do this on the Cisco uBR7200 Series headend equipment, specify the ranging-backoff command on the correct upstream for the Cisco uBR924 cable access router.

    ```
    HE1#config t
    Enter configuration commands, one per line.  End with CNTL/Z.
    HE1(config)#int c 4/0
    HE1(config-if)#cable upstream 0 range-backoff 4 6
    ```

    Note   By changing these values, you will be changing all cable modems/cable access routers–not just the uBR924–attached to that upstream.

- CSCdm34966

    After receiving a UCC request, the Cisco uBR924 cable access router can complete initial ranging too soon. This can cause the router to fail in secondary ranging because the unit took too long to get through secondary ranging. In most instances, the Cisco uBR924 cable access router will get to the correct channel.

    If a timeout occurs first, however, the router will do a MAC reset and come back up on the upstream that it was first able to range on. To work around this problem, put the desired upstream channel for the router in the DOCSIS configuration file. The Cisco uBR924 cable access router will come up initially on the desired upstream channel and a UCC will not be required.

Related Documentation

The following sections describe the documentation available for the Cisco uBR924 cable access router and related documents. 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 these documents:

- Release-Specific Documentation, page 11
- Platform-Specific Documents, page 11
- Feature Modules, page 12
- Cisco IOS Software Documentation Set, page 13

Release-Specific Documentation

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

- *Release Notes for Cisco IOS Release 12.0*

  You can reach *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 for Cisco IOS Release 12.0

  You can reach *Cross-Platform Release Notes for Cisco IOS Release 12.0* on the Documentation CD-ROM at:

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

- Product bulletins, field notices, and other release-specific documents

  You can reach these documents on CCO at:

  Service & Support: Technical Documents

- *Caveats for Cisco IOS Release 12.0 T*

  As a supplement to the caveats listed in "Caveats" section on page 10 in these release notes, see *Caveats for Cisco IOS 12.0 T*, which contains caveats applicable to all platforms for all maintenance releases of Release 12.0 XI.

  You can reach the caveats document on CCO at:

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

  You can reach the caveats document on the Documentation CD-ROM at:

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

Platform-Specific Documents

The following documents are available for the Cisco uBR924. These documents are also available on CCO and the Documentation CD-ROM.

- *Cisco uBR924 Cable Access Router Quick Start Guide*

- *Cisco uBR924 Cable Access Router Installation and Configuration Guide*

- *Bridging and Routing Features for the Cisco uBR924 Cable Access Router*

- *Regulatory Compliance and Safety Info. for the Cisco uBR924 Cable Access Router*

- *Troubleshooting Tips for the Cisco uBR924 Cable Access Router*

You can reach Cisco uBR924 documentation on CCO at:

Software & Support: **Documentation**: **Cisco Documentation**: **Cisco Product Documentation**: **Broadband/Cable Solutions: Cisco uBR900 Series Cable Access Routers**

You can reach Cisco uBR924 documentation on the Documentation CD-ROM (projected availability June 1999) at:

Cisco Product Documentation: Broadband/Cable Solutions: Cisco uBR900 Series Cable Access Routers

Feature Modules

Feature modules describe new features supported by Release 12.0 XI, and 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.

You can reach the feature modules on CCO at:

Service & Support: **Documentation Home Page**: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**: **New Feature Documentation**: **New Features in 12.0-Based Limited Lifetime Releases**: **New Features in Release 12.0 XI**

You can reach the feature modules on the Documentation CD-ROM at:

Cisco Product Documentation: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**: **New Feature Documentation**: **New Features in 12.0-Based Limited Lifetime Releases**: **New Features in Release 12.0 XI**:

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, and Cisco IOS software functionality and contain comprehensive configuration examples.

Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

On 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**: **Cisco IOS Interface Configuration Guide** or **Cisco IOS Interface Command Reference**

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**: **Cisco IOS Interface Configuration Guide** or **Cisco IOS Interface Command Reference**

Release 12.0 Documentation Set

Table 4 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 the latest Documentation CD-ROM and on the Web. These electronic documents may contain updates and modifications made after the paper documents were printed.

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

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

Table 4   Cisco IOS Software Release 12.0 Documentation Set

Books	Chapter Topics
• *Configuration Fundamentals Configuration Guide* • *Configuration Fundamentals Command Reference*	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
• *Bridging and IBM Networking Configuration Guide* • *Bridging and IBM Networking Command Reference*	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
• *Dial Solutions Configuration Guide* • *Dial Solutions Command Reference*	X.25 over ISDN Appletalk Remote Access Asynchronous Callback, DDR, PPP, SLIP Bandwidth Allocation Control Protocol ISDN Basic Rate Service ISDN Caller ID Callback PPP Callback for DDR Channelized E1 & T1 Dial Backup for Dialer Profiles Dial Backup Using Dialer Watch Dial Backup for Serial Lines Peer-to-Peer DDR with Dialer Profiles DialOut Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Dialup Networks Dial Business Solutions and Examples
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	Interface Configuration Overview LAN Interfaces Logical Interfaces Serial Interfaces
• *Network Protocols Configuration Guide, Part 1* • *Network Protocols Command Reference, Part 1*	IP Overview IP Addressing and Services IP Routing Protocols
• *Network Protocols Configuration Guide, Part 2* • *Network Protocols Command Reference, Part 2*	AppleTalk Novell IPX

Table 4   Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
• *Network Protocols Configuration Guide, Part 3* • *Network Protocols Command Reference, Part 3*	Network Protocols Overview Apollo Domain Banyan VINES DECnet ISO CLNS XNS
• *Security Configuration Guide* • *Security Command Reference*	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
• *Cisco IOS Switching Services Configuration Guide* • *Cisco IOS Switching Services Command Reference*	Switching Services Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
• *Wide-Area Networking Configuration Guide* • *Wide-Area Networking Command Reference*	Wide-Area Network Overview ATM Frame Relay SMDS X.25 and LAPB
• *Voice, Video, and Home Applications Configuration Guide* • *Voice, Video, and Home Applications Command Reference*	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Frame Relay-ATM Internetworking Synchronized Clocks Video Support Universal Broadband Features
• *Quality of Service Solutions Configuration Guide* • *Quality of Service Solutions Command Reference*	Policy-Based Routing QoS Policy Propagation via BGP Committed Access Rate Weighted Fair Queueing Custom Queueing Priority Queueing Weighted Random Early Detection Scheduling Signaling RSVP Packet Drop Frame Relay Traffic Shaping Link Fragmentation RTP Header Compression
• *Cisco IOS Software Command Summary* • *Dial Solutions Quick Configuration Guide* • *System Error Messages* • *Debug Command Reference*	

> **Note** The *Cisco Management Information Base (MIB) User Quick Reference* publication is no longer published. For the latest list of MIBs supported by Cisco, see *Cisco Network Management Toolkit* on CCO at: **Service & Support**: **Software Center**: **Network Mgmt Products**: **Cisco Network Management Toolkit**: **Cisco MIBs**.

Service and Support

For service and support for a product purchased from a reseller, contact the reseller, who offers a wide variety of Cisco service and support programs described in "Service and Support" of *Cisco Information Packet* shipped with your product.

> **Note** If you purchased your product from a reseller, you can access 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 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—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.

- Hardware—Provides technical tips related to specific hardware platforms.

- Hot Tips—Describes 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—Lists tips on using and deploying Cisco IOS software features and services.

- Sample Configurations—Provides actual configuration examples that are complete with topology and annotations.

- Software Products—Contains Cisco IOS Software Bulletins, Cisco TCP/IP Suite 100, General Cisco IOS, Internet/Intranet Applications and Software, Network Management, Network Protection Software Tips, and WAN Switching Products and Software.

- Special Collections—Lists 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 access CCO in the following ways:

- WWW: http://www.cisco.com

- WWW: http://www-europe.cisco.com

- WWW: http://www-china.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, http://www-china.cisco.com, or http://www-europe.cisco.com.

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