Release Notes for Cisco IOS Release 12.0(5)T Feature Packs for the Cisco 1400 Series

November 22, 1999

These release notes describe the Cisco IOS Release 12.0(5)T feature packs for the Cisco 1400 series and contain the following topics:

Introduction

How to Use These Release Notes

The tables in these release notes contain details about the Cisco feature packs. Use these tables to perform the following tasks before loading a software image onto a router:

1. Use Table 1, "Cisco 1400 Series Default Memory and Upgrade Options," for the feature set memory requirements, factory-default memory, and available memory upgrades for your router.

2. Use Table 2, "Feature Pack Product Numbers Quick-Reference List," to identify the software image you want to load.

3. Use Table 3, "Cisco 1400 Series Feature Packs," to identify your feature pack and the memory required for your feature set, based on the image you load.

4. Use the tables in the "Feature Set Tables" section on page 5 to identify which features are supported in a feature set image.

CISCO SYSTEMS

Feature Pack Components

A feature pack is a box that typically contains the following items:

- A CD-ROM with the following software:
  - Cisco IOS feature set software images that can include bundled modem firmware.
  - Router Software Loader (RSL) program (a Windows 95 application) that loads images onto your router.
  - Trivial File Transfer Protocol (TFTP) server application (for Windows 95 only).
- Getting Started with the Router Software Loader.

  Note Before running RSL, see the "Alternatives to RSL" section on page 9. If you cannot use RSL to load images, you can follow the instructions in the "Alternatives to RSL" section on page 9.

- Release notes (this document).
- Other configuration or command references, if available.
- Software license for using Cisco software in object code form on a single access server or router.
- Documentation CD-ROM that contains all Cisco documentation.

System Requirements

This section describes the following topics:

Memory Defaults and Upgrade Options

Table 1 Cisco 1400 Series Default Memory and Upgrade Options

Memory Type	Cisco 1400 Series Defaults	Upgrade Options
Flash memory	4 MB	6 MB Flash memory card for Cisco 1400: MEM1400-6FC= 8 MB Flash memory card for Cisco 1400: MEM1400-8FC= 12 MB Flash memory card for Cisco 1400: MEM1400-12FC= 16 MB Flash memory card for Cisco 1400: MEM1400-16FC=
DRAM	16 MB	8 MB DRAM SIMM for Cisco 1400: MEM1400-8D= 16 MB DRAM SIMM for Cisco 1400: MEM1400-16D=

Hardware Supported

The following hardware is supported:

- Cisco 1401
- Cisco 1417

Following are some of the key features of the Cisco 1400 series:

- ATM-25 port (Cisco 1401 router)---For connecting through a DSL modem over an ADSL line to a central service provider.
- ADSL port (Cisco 1417 router)---For connecting directly over an ADSL line to a central service provider.
- Console port---For connecting a terminal or PC to configure and manage the router. Supports up to 9600 bps (up to 115.2 kbps for software download).
- Supports IP, IPX, PPP over ATM, and firewall security.
- Supports ATM features such as ATM Adaption Layer 5, ATM PVCs, and RFC 1483.
- Supports SNMP for management over an SNMP network.
- Supports Cisco ATM Management Information Base (MIB).

Software Compatibility

The feature packs described in these release notes contain Cisco IOS Release 12.0(5)T software images, some images from previous software releases, and RSL Version 7.6.

Determining Your Software Release

To determine the version of Cisco IOS software running on your Cisco 1400 series router, log in to the router, and enter the **show version** user EXEC command.

```
router>show version
Cisco Internetwork Operating System Software
IOS (tm) c1400 Software (C1400-ny-mz), Version 12.0(5)T, RELEASE SOFTWARE
```

Updating Your Software Release

For information on upgrading to a new software release, see the product bulletin *Cisco IOS Software Release 12.0 T Upgrade Paths and Packaging Simplification (#819: 1/99)* on CCO at:

Service and Support: Product Bulletins: Software

Under **Cisco IOS 12.0**, click **Cisco IOS Software Release 12.0 T Upgrade (#819: 1/99)**.

Product Numbers Quick-Reference List

Table 2   Feature Pack Product Numbers Quick-Reference List

Product Number	Feature Pack Description
CD14-C-12.0.5T=	Cisco 1400 IP Feature Pack
CD14-CP-12.0.5T=	Cisco 1400 IP Plus Feature Pack
CD14-B-12.0.5T=	Cisco 1400 IP/IPX Feature Pack
CD14-BP-12.0.5T=	Cisco 1400 IP/IPX Plus Feature Pack
CD14-BHP-12.0.5T=	Cisco 1400 IP/IPX/FW Plus Feature Pack

Feature Pack Overview Table

Table 3   Cisco 1400 Series Feature Packs

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD14-C-12.0.5T=	Cisco 1400 IP Feature Pack Release 12.0(5)T	c1400-ny-mz	aaa1155	4 MB	16 MB	Cisco 1400 IOS IP Feature Set 12.0(5)T
CD14-CP-12.0.5T=	Cisco 1400 IP Plus Feature Pack Release 12.0(5)T	c1400-nsy-mz	aaa1156	4 MB	16 MB	Cisco 1400 IOS IP Plus Feature Set 12.0(5)T
CD14-B-12.0.5T=	Cisco 1400 IP/IPX Feature Pack Release 12.0(5)T	c1400-ny-mz	aaa1157	4 MB	16 MB	Cisco 1400 IOS IP/IPX Feature Set 12.0(5)T

Table 3   Cisco 1400 Series Feature Packs (continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD14-BP-12.0.5T=	Cisco 1400 IP/IPX Plus Feature Pack Release 12.0(5)T	c1400-nsy-mz	aaa1158	4 MB	16 MB	Cisco 1400 IP/IPX Plus Feature Set 12.0(5)T
CD14-BHP-12.0.5T=	Cisco 1400 IP/IPX/FW Plus Feature Pack Release 12.0(5)T	c1400-nosy-mz	aaa1159	6 MB	16 MB	Cisco 1400 IP/IPX/FW Plus Feature Set 12.0(5)T

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.

For a summary of which feature sets are supported on the Cisco 1400 series, see the previous "Feature Pack Overview Table" section on page 4.

Table 4 lists the features and feature sets supported by the Cisco 1400 series in Cisco IOS Release 12.0(5)T and uses the following conventions to identify features:

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

Note   This feature set table contains only a selected list of features. This table is not a cumulative or complete list of all the features in each image.

Table 4   Feature List by Feature Set for the Cisco 1400 Series

Features	Feature Set				
	IP	IP Plus	IP/IPX	IP/IPX Plus	IP/IPX/ FW Plus
IP Routing					
EIGRP	Yes	Yes	Yes	Yes	Yes
IGRP	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes
LAN Support					
Virtual Private Network (VPN)	No	Yes	No	Yes	Yes
Management					
ATM MIB	Yes	Yes	Yes	Yes	Yes

Table 4 Feature List by Feature Set for the Cisco 1400 Series (continued)

	Feature Set				
Features	IP	IP Plus	IP/IPX	IP/IPX Plus	IP/IPX/ FW Plus
CDP MIB	Yes	Yes	Yes	Yes	Yes
Chassis MIB	Yes	Yes	Yes	Yes	Yes
Configuration/Management MIB	Yes	Yes	Yes	Yes	Yes
Flash MIB	Yes	Yes	Yes	Yes	Yes
IP Multicast MIBs	No	Yes	No	Yes	Yes
Image MIB	Yes	Yes	Yes	Yes	Yes
IP MIB	Yes	Yes	Yes	Yes	Yes
IP Multicast Route MIB	No	Yes	No	Yes	Yes
IPX MIB	Yes	Yes	Yes	Yes	Yes
NLSP MIB	No	Yes	No	Yes	Yes
OSPF MIB	Yes	Yes	Yes	Yes	Yes
Queue MIB	Yes	Yes	Yes	Yes	Yes
Remote Monitoring	Yes	Yes	Yes	Yes	Yes
RSVP MIB	No	Yes	No	Yes	Yes
Round Trip Time Monitor	Yes	Yes	Yes	Yes	Yes
Transparent Bridging MIB	Yes	Yes	Yes	Yes	Yes
IP Static Route MIB	Yes	Yes	Yes	Yes	Yes
VPN MIB	No	Yes	No	Yes	Yes
UPD MIB	Yes	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes
Miscellaneous					
Compression	Yes	Yes	Yes	Yes	Yes
NetFlow Policy Routing	No	Yes	No	Yes	Yes
Protocols					
Border Gateway Protocol (BGP)	No	Yes	No	Yes	Yes
Cisco Discovery Protocol (CDP)	Yes	Yes	Yes	Yes	Yes
ConnectionLess Network Services (CLNS)	No	Yes	No	Yes	Yes
DHCP Client	Yes	Yes	Yes	Yes	Yes
DHCP Relay	Yes	Yes	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes	Yes	Yes
HTTP	Yes	Yes	Yes	Yes	Yes
IP CDP	Yes	Yes	Yes	Yes	Yes
IP Compression	Yes	Yes	Yes	Yes	Yes
IP Multicast	No	Yes	No	Yes	Yes

Table 4   Feature List by Feature Set for the Cisco 1400 Series (continued)

Features	Feature Set				
	IP	IP Plus	IP/IPX	IP/IPX Plus	IP/IPX/ FW Plus
IP Multicast NAT	No	Yes	No	Yes	Yes
IP NAT	Yes	Yes	Yes	Yes	Yes
IP NHRP	Yes	Yes	Yes	Yes	Yes
IPX	Yes	Yes	Yes	Yes	Yes
IPX Compression	Yes	Yes	Yes	Yes	Yes
IPX EIGRP	Yes	Yes	Yes	Yes	Yes
IPX NHRP	No	Yes	No	Yes	Yes
IPX NLSP	No	Yes	No	Yes	Yes
Network Address Translation (NAT)	Yes	Yes	Yes	Yes	Yes
Next Hop Reservation Protocol (NHRP)	Yes	Yes	Yes	Yes	Yes
Network Time Protocol (NTP)	No	Yes	No	Yes	Yes
Resource Reserve Protocol (RSVP)	No	Yes	No	Yes	Yes
Simple Network Time Protocol (SNTP)	Yes	Yes	Yes	Yes	Yes
Serial Tunneling (STP)	Yes	Yes	Yes	Yes	Yes
Source Route Bridging (SRB)	Yes	Yes	Yes	Yes	Yes
Transparent Bridging	Yes	Yes	Yes	Yes	Yes
Security					
Access Lists	Yes	Yes	Yes	Yes	Yes
Cisco IOS Firewall: Context-Based Access Control	No	No	No	No	Yes
IPX Access Lists	Yes	Yes	Yes	Yes	Yes
NETBIOS Access Lists	Yes	Yes	Yes	Yes	Yes
Radius	Yes	Yes	Yes	Yes	Yes
TACACS	Yes	Yes	Yes	Yes	Yes
TACACS+	Yes	Yes	Yes	Yes	Yes
WAN Services					
Cisco Discovery Protocol over PPP (CCP)	Yes	Yes	Yes	Yes	Yes
IPX over WAN	Yes	Yes	Yes	Yes	Yes
Layer 2 Forwarding (L2F)	No	Yes	No	Yes	Yes
Layer Tunnel Protocol (L2TP)	No	Yes	No	Yes	Yes
PPP over ATM	Yes	Yes	Yes	Yes	Yes
Traffic Shaping	Yes	Yes	Yes	Yes	Yes
Virtual Profiles	Yes	Yes	Yes	Yes	Yes
Virtual Template	Yes	Yes	Yes	Yes	Yes

Installation Notes

This section describes the following topics:

- Image Installation Tips and Troubleshooting When Using RSL, page 8
- Alternatives to RSL, page 9

Image Installation Tips and Troubleshooting When Using RSL

Image Installation Tips

The following information about RSL operations can help you with the installation process:

- If you are loading software on a preconfigured router, save the router configuration file on your PC before running RSL.

- If you have added any static entries to the PC Address Resolution Protocol (ARP) table, one or more of them may be deleted by RSL. Manually re-enter any deleted entries in the PC ARP table.

- During a connection, if the router's running configuration is not the same as its startup configuration, the exact configuration is not restored. Any changes that you made since the last time you entered **copy running-config startup-config** or **write memory** commands are lost.

- RSL restores the router's startup configuration, but some running configuration commands are not restored. To restore the exact running configuration, reboot the router. The following interface configuration commands are not restored to the running configuration:

  - **no shutdown**
  - **no ringspeed**
  - **media-type aui**

Recovering from a Connection Error

If any of the following elements apply to your installation, modify the Short Timeout value from the Options dialog box in RSL:

- You are connecting to a router or access server that has a large configuration file.
- You are connecting to a Cisco AS5200 access server.
- You see the following error message:

  ```
  "Failed to configure the router to enable the Cisco IOS software image and configuration
  file upload and download operations. You may want to check the router to make sure that
  the selected interface exists."
  ```

If you are connecting to a Cisco AS5200, increase the Short Timeout value to 60 seconds. The Cisco AS5200 requires up to 45 seconds to write a configuration to nonvolatile random-access memory (NVRAM) due to the number of interfaces the it must check during this process.

If you are connecting to any other router or access server, increase the Short Timeout to a value over 25 seconds.

> **Note** If you change the timeout value, you must do so before connecting to the router, or the new value will not be used. Also, increasing the Short Timeout value can increase the time it takes for RSL to connect to the target router.

Restoring the Startup Configuration

In some cases, RSL is unable to restore the startup configuration. If this happens, follow these steps:

Step 1 Ensure that all cables are properly attached to both the router and the PC.

Step 2 Restart RSL and connect by using the **Preconfigured router** option.

Step 3 When asked if you want to overwrite the existing startup configuration file, choose **no**.

Step 4 When asked if you want to continue, choose **yes**.

Step 5 When the router is connected, select **Download Router Configuration** in the Router Software Loader dialog box.

Step 6 Select the appropriate file and click the radio button beside **Copy configuration to the router nonvolatile memory**. The router should now contain the startup configuration it had before the initial RSL connection.

Step 7 Exit RSL.

> **Note** In the steps above, the router configuration register (**config-register 0x***nnnn*) is not restored.

> **Note** If you press **Ctrl-Alt-Delete** to quit RSL, the router configuration and the configuration register are not restored. However, the configuration file is not deleted from the PC. To restore the configuration file, follow the steps above, beginning with Step 2.

Alternatives to RSL

RSL is designed to work with a PC running Microsoft Windows 95 and is the recommended method for downloading software to the router; however, two alternatives are available for installing router software:

- Installing the Router Software by Using the Console
- Installing the Router Software by Using a TFTP Server Application

> **Note** The sample prompts and output shown in the following sections may not be identical to the prompts displayed on the router console.

Installing the Router Software by Using the Console

This section explains how to use the **copy xmodem flash** command to install the router software from the CD-ROM onto the router.

The following example shows how to use the **copy xmodem flash** command on a Cisco 1400 series router:

```
Router# copy xmodem flash
                          **** WARNING ****
    x/ymodem is a slow transfer protocol limited to the current speed
    settings of the auxiliary/console ports. The use of the auxilary
    port for this download is strongly recommended.
    During the course of the download no exec input/output will be
    available.
                          ---- ******* ----
    Proceed? [confirm] yes
    Use crc block checksumming? [confirm] yes
    Max Retry Count [10]:
    Perform image validation checks? [confirm] yes
    Xmodem download using crc checksumming with image validation
    Continue? [confirm] yes
    Partition    Size    Used      Free      Bank-Size   State         Copy Mode
      1          4096K   3259K     836K      4096K       Read/Write    Direct
      2          4096K   0K        4095K     4096K       Read/Write    Direct

    [Type ?<no> for partition directory; ? for full directory; q to abort]
    Which partition? [default = 1] 2

    System flash directory, partition 2:
    File   Length    Name/status
      1    68        TESTFILE
    [132 bytes used, 4194172 available, 4194304 total]
    Destination file name? c1400-ny-mz.120-5T
    Erase flash device before writing? [confirm] yes
    Flash contains files. Are you sure you want to erase? [confirm] yes

    Copy '' from server
      as 'c1400-ny-mz.120-5T' into Flash WITH erase? [yes/no] yes
    Erasing device... eeeeeeeeeeeeeeee ...erased
    Ready to receive file...........C
    Verifying checksum...  OK (0x5DE8)
    Flash device copy took 00:12:06 [hh:mm:ss]
```

Installing the Router Software by Using a TFTP Server Application

Use this TFTP server application method as an alternative method to install the router software from the CD-ROM. You can perform this procedure by using a PC (running Microsoft Windows 95 or Microsoft Windows 3.1), a Macintosh, or a UNIX system. You can use either the **copy tftp flash** or **copy rcp flash** command to download the router software to the router.

First, obtain a TFTP application or a remote copy protocol (rcp) application to set up your computer as a TFTP server or an rcp server. If you are using a PC running Windows 95, you can use RSL or the TFTP server included on the feature pack CD-ROM to install the router software. For other operating systems, a number of TFTP or rcp applications are available from independent software vendors or as shareware on the World Wide Web.

> **Note**   To use an rcp application, follow the same procedure below, but substitute "rcp" for "TFTP"and use the **copy rcp flash** command instead of the **copy tftp flash** command.

Step 1   Install any TFTP server application on the PC. (A PC application is included on the feature pack CD-ROM for Microsoft Windows 95 only.)

Step 2 Start the TFTP server application on the PC by double-clicking the application icon or its .exe filename.

Step 3 Set up the PC as a TFTP server by using the TFTP server application setup or configuration facility.

Most TFTP server applications include a setup facility that allows you to specify the PC as a server. For example, from the TFTP menu of one application, select **Settings** to display a panel. To configure the local PC as a server, select the Server checkbox.

Select a root directory where the Cisco IOS files reside (for example, d:\cpswinst\images).

⚠️
Caution Make sure you set up your local PC as a TFTP server. If you do not, you cannot perform the copy procedure. This caution applies to both TFTP and rcp.

Step 4 Establish a console session from your local PC (which is now configured as a TFTP server) to the Cisco router by using one of these methods:

- Connect the PC com port to the router console port.

  This is the recommended method. When you reload the router with the new image in Step 10, you remain connected to the router.

- Establish a Telnet session from the PC to the router. If you choose to use Telnet, your connection to the router will be lost when it is reloaded.

⚠️
Caution Make sure that your PC is set up to communicate with the connected device through its network port.

Step 5 Connect your PC's LAN port to the corresponding LAN port on the router. If you are making a direct connection to the router via Ethernet or Fast Ethernet, use an Ethernet crossover cable. If connecting to the router via an Ethernet or Fast Ethernet hub or Token Ring MAU (hub), use straight-through cable.

✎
Note We recommend that you back up the router configuration before upgrading the router software.

Step 6 At the prompt, enter the IP address of your PC, as shown in the following example:

```
Address or name of remote host [255.255.255.255]? 131.108.1.1
```

This is the IP address of your local PC, not that of the router.

Step 7 At the prompt, enter the filename of the Cisco IOS Release 12.0 image to be copied to the router, as shown in the following example:

```
Source file name? 80153209.bin
```

This example specifies the DOS image name of the IP feature set for Cisco 1400 series routers (as shown in Table 3 in the "Feature Pack Overview Table" section on page 4).

Step 8 At the prompt, enter the destination UNIX image filename and press **Enter**.

This is the name of the image file on the router—not the full pathname of the image on the CD-ROM attached to the PC. Refer to Table 3 in the "Feature Pack Overview Table" section on page 4 for the UNIX image filename.

```
Destination file name [80153209.bin]? c1400-ny-mz
```

During the transfer process, the software displays messages indicating that it has accessed the file you have specified and is loading it.

Step 9 At the prompt, enter **yes** if you want to erase the existing image copy resident in the router Flash memory before copying the new one.

```
Erase flash device before writing? [confirm] yes
```

The entire copying process takes several minutes and differs from network to network.

The exclamation point (!) indicates that the copy process is taking place. Each exclamation point (!) indicates that ten packets have been transferred successfully. A checksum verification of the image occurs after the image is written to Flash memory.

Step 10 Enter the **reload** command to reload the router:

```
Router# reload
```

After the reload is complete, the router should be running the required Cisco IOS image. Use the **show version** command to verify it.

Related Documentation

The following sections describe the documentation available for the Cisco 1400 series. These documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

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

Use these release notes with these documents:

- Release-Specific Documents, page 12
- Platform-Specific Documents, page 13
- Feature Modules, page 13
- Cisco IOS Documentation Set, page 14

Release-Specific Documents

The following documents are specific to Release12.0 T. They are located on CCO and the Documentation CD-ROM:

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

  On CCO at:

  Service and Support: **Technical Documents**: **Documentation Home Page**: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**: **Release Notes**: **Cross-Platform Release Notes for Cisco IOS Release 12.0 T**

  On the Documentation CD-ROM at:

  Cisco IOS Software Configuration: **Cisco IOS Release 12.0**: **Release Notes**: **Cross-Platform Release Notes for Cisco IOS Release 12.0 T**

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

  On CCO at:

  Service & Support: **Technical Documents**

- *Caveats for Cisco IOS Release 12.0 T*

  For caveat details, see the *Caveats for Cisco IOS Release 12.0 T* document, which contains caveats applicable to all platforms for all maintenance releases of Release 12.0 T.

  On CCO at:

  Service and Support: **Technical Documents**: **Documentation Home Page**: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**: **Release Notes**: **Caveats**: **Caveats for Cisco IOS Release 12.0 T**

  On the Documentation CD-ROM at:

  Cisco IOS Software Configuration: **Cisco IOS Release 12.0**: **Release Notes**: **Caveats**: **Caveats for Cisco IOS Release 12.0 T**

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

Platform-Specific Documents

These documents are available for the Cisco 1400 series on CCO and the Documentation CD-ROM:

- *Installing Your Cisco 1401 Router*
- *Installing Your Cisco 1417 Router*
- *Cisco 1400 Series Router Installation and Configuration Guide*
- *Regulatory Compliance and Safety Information*
- *Upgrading DRAM SIMMs in Cisco 1400 Series Routers*
- Release notes for Cisco 1400 series routers

On CCO at:

Service and Support: **Documentation Home Page**: **DSL Products**: **Cisco 1400 Series Routers**

On the Documentation CD-ROM at:

Cisco Product Documentation: **DSL Products**: **Cisco 1400 Series Routers**

Feature Modules

Feature modules describe new features supported by Release 12.0 T 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 features modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On CCO at:

Service and Support: **Technical Documents**: **Documentation Home Page**: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**: **New Feature Documentation**

On the Documentation CD-ROM at:

Cisco IOS Software Configuration: **Cisco IOS Release 12.0**: **New Feature Documentation**

Cisco IOS Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents, which are shipped with your order in electronic form on the Documentation CD-ROM—unless you specifically ordered the printed versions.

Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

You can reach these documents on CCO at:

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

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

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

Release 12.0 Documentation Set

Table 5 describes the contents of the Cisco IOS Release 12.0 software documentation set, which is available in electronic form and also in printed form upon request.

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

You can reach the Cisco IOS documentation set on CCO at:

Service and Support: **Technical Documents**: **Documentation Home Page**: **Cisco IOS Software Configuration**: **Cisco IOS Release 12.0**

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

Cisco IOS Software Configuration: **Cisco IOS Release 12.0**

Table 5   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*	Dial-In Port Setup Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions ISDN X.25 over ISDN VPDN Dial Business Solutions and Examples
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	Interface Configuration Overview
• *Network Protocols Configuration Guide, Part 1* • *Network Protocols Command Reference, Part 1*	IP Addressing IP Services IP Routing Protocols
• *Network Protocols Configuration Guide, Part 2* • *Network Protocols Command Reference, Part 2*	AppleTalk Novell IPX
• *Network Protocols Configuration Guide, Part 3* • *Network Protocols Command Reference, Part 3*	Apollo Domain Banyan VINES DECnet ISO CLNS XNS

Table 5   Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
• *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 Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
• *Wide-Area Networking Configuration Guide* • *Wide-Area Networking Command Reference*	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 Video Support Universal Broadband Features
• Quality of Service Solutions Configuration Guide • Quality of Service Solutions Command Reference	Classification Scheduling Packet Drop Traffic Shaping ATM QoS SNA QoS Line Protocols
• *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 the Cisco Network Management Toolkit on Cisco Connection Online. From CCO, click on the following path: **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 Technical Tips page provides the following sections:

- Configuration Cookbooks—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.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 12.