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# Release Notes for Cisco IOS Release 12.0(5)XQ Feature Packs for Cisco 1750 Routers

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**October 4, 1999**

These release notes describe the Cisco IOS Release 12.0(5)XQ feature packs for Cisco 1750 routers and contain the following topics:

- Introduction, page 1
- System Requirements, page 2
- Installation Notes, page 13
- Related Documentation, page 18
- Service and Support, page 23
- Cisco Connection Online, page 24
- Documentation CD-ROM, page 24



**Caution** Only Cisco 1750 routers support Cisco IOS Release 12.0(5)XQ, which includes both data and voice images. Cisco 1720 routers support data images only, which are provided by Cisco IOS Release 12.0(3)T.

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## Introduction

This section explains how to use this document and describes feature pack components.

### 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, “Default Memory and Upgrade Options,” to identify the 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 1750 Series Data-Only Feature Packs,” and Table 4, “Cisco 1750 Series Data and Voice 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 8 to identify which features are supported in a feature set image.

### What Is a Feature Pack?

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

- CD-ROM with the following software:
  - Cisco IOS feature set software images which might include bundled modem firmware
  - Router Software Loader (RSL) program (a Windows 95 application)
  - Trivial File Transfer Protocol (TFTP) server application (for Windows 95 only)
- *Getting Started with the Router Software Loader* CD booklet.
- Release notes (this document)
- 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

The heart of a feature pack is the CD-ROM that contains software images and the RSL, which is a Windows 95 application that loads an image onto an access router or server. Each feature pack CD-ROM contains at least one Cisco IOS feature set. The CD booklet, *Getting Started with the Router Software Loader*, explains how to use the RSL to install the router image. If you cannot use the RSL to load images, you can follow the instructions in the “Alternatives to the RSL” section on page 15.

Before running the RSL, read the “Installing Software Images Using RSL” section on page 14. If you are loading software on a preconfigured router, you should save the router configuration file on your PC before beginning the image download process, as described in *Getting Started with the Router Software Loader*.

## System Requirements

This section describes the following topics:

- Memory Requirements, page 3
- Hardware Supported, page 3
- Software Compatibility, page 3
- Determining Your Software Release, page 3
- Updating to a New Software Release, page 3
- Product Numbers Quick-Reference List, page 4
- Feature Pack Overview Table, page 5
- Feature Set Tables, page 8

## Memory Requirements

Table 1 lists the memory delivered by default and the available memory upgrade options for Cisco 1750 routers for Release 12.0(5)XQ.

**Table 1 Default Memory and Upgrade Options**

Memory Type	Cisco 1750	
	Defaults	Upgrade Options
Flash memory card	4 MB	4-MB to 8 MB upgrade (4 MB): MEM1700-4U8MFC= 4-MB to 16 MB upgrade (12 MB): MEM1700-4U16MFC= 8-MB to 16 MB upgrade (8 MB): MEM1700-8U16MFC=
DRAM	16 MB	16MB to 20MB upgrade (4-MB): MEM1700-16U20D= 16MB to 24MB upgrade (8-MB): MEM1700-16U24D= 16MB to 32MB upgrade (16-MB): MEM1700-16U32D= 16MB to 48MB upgrade (32-MB): MEM1700-16U48D= 24MB to 32MB upgrade (8 MB): MEM1700-24U32D= 24MB to 48MB upgrade (24 MB): MEM1700-24U48D=

## Hardware Supported

Router Software Loader (RSL) Version 7.6 supports many Cisco routers. Specific to the Cisco 1700 series routers, RSL 7.6 supports Cisco 1750 routers.

## Software Compatibility

The feature packs described in these release notes contain Cisco IOS Release 12.0(5)XQ software images, some earlier images, and RSL Version 7.6. Before running RSL, read the “Installing Software Images Using RSL” section on page 14.

## Determining Your Software Release

To determine the version of Cisco IOS software currently running on your Cisco 1750 router, log in to the Cisco 1750 router and enter the **show version EXEC** command. The following sample output from the **show version** command indicates the version number on the second output line:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) c1750 Software (c1700-sv3y-mz.120-5.XQ), Version 12.0(5)XQ, RELEASE SOFTWARE
```

Additional command output lines include more information, such as processor revision numbers, memory amounts, hardware IDs, and partition information.

## Updating to a New Software Release

For information on upgrading to a new software release, refer to the *Cisco IOS Software Release 12.0T Upgrade Paths and Packaging Simplification* product bulletin #819 located on CCO. On CCO, follow this path: **Service & Support: Product Bulletins**. Scroll to **Software**. Under **Cisco IOS 12.0**, click the upgrade paths bulletin: *Cisco IOS Software Release 12.0T Upgrade (#819: 1/99)*.

## Product Numbers Quick-Reference List

Table 2 lists the Cisco feature pack product numbers supported for the Cisco 1750 router.

**Table 2 Feature Pack Product Numbers Quick-Reference List**

Image Type	Product Number	Feature Pack Description
Data Only	CD17-C-12.0.5=	Cisco 1700 IP Feature Pack Release 12.0(5)XQ
	CD17-CP-12.0.5=	Cisco 1700 IP Plus Feature Pack Release 12.0(5)XQ
	CD17-CH-12.0.5=	Cisco 1700 IP/FW Feature Pack Release 12.0(5)XQ
	CD17-CL-12.0.5=	Cisco 1700 IP Plus IPsec 56 Feature Pack Release 12.0(5)XQ
	CD17-CK2-12.0.5=	Cisco 1700 IP Plus IPsec 3DES Feature Pack Release 12.0(5)XQ
	CD17-CHL-12.0.5=	Cisco 1700 IP/FW Plus IPsec 56 Feature Pack Release 12.0(5)XQ
	CD17-CHK2-12.0.5=	Cisco 1700 IP/FW Plus 3DES Feature Pack Release 12.0(5)XQ
	CD17-B-12.0.5=	Cisco 1700 IP/IPX Feature Pack Release 12.0(5)XQ
	CD17-BHP-12.0.5=	Cisco 1700 IP/IPX/FW Plus Feature Pack Release 12.0(5)XQ
	CD17-Q-12.0.5=	Cisco 1700 IP/IPX/AT/IBM Feature Pack Release 12.0(5)XQ
	CD17-QP-12.0.5=	Cisco 1700 IP/IPX/AT/IBM Plus Feature Pack Release 12.0(5)XQ
	CD17-QHL-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/FW Plus IPsec 56 Feature Pack Release 12.0(5)XQ
Data and Voice	CD17-CVP-12.0.5=	Cisco 1700 IP/Voice Plus Feature Pack Release 12.0(5)XQ
	CD17-CHV-12.0.5=	Cisco 1700 IP/FW/Voice Plus Feature Pack Release 12.0(5)XQ
	CD17-CVL-12.0.5=	Cisco 1700 IP/Voice Plus IPsec 56 Feature Pack Release 12.0(5)XQ
	CD17-CVK2-12.0.5=	Cisco 1700 IP/Voice Plus IPsec 3DES Feature Pack Release 12.0(5)XQ
	CD17-CHVL-12.0.5=	Cisco 1700 IP/FW/Voice Plus IPsec 56 Feature Pack Release 12.0(5)XQ
	CD17-CHVK2-12.0.5=	Cisco 1700 IP/FW/Voice Plus 3DES Feature Pack Release 12.0(5)XQ
	CD17-BHPV-12.0.5=	Cisco 1700 IP/IPX/FW/Voice Plus Feature Pack Release 12.0(5)XQ

**Table 2 Feature Pack Product Numbers Quick-Reference List (continued)**

Image Type	Product Number	Feature Pack Description
Data and Voice (continued)	CD17-QHVL-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/FW/Voice Plus IPsec 56 Feature Pack Release 12.0(5)XQ
	CD17-QHVK2-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/FW/Voice Plus 3DES Feature Pack Release 12.0(5)XQ

## Feature Pack Overview Table

Table 3 (Data-Only) and Table 4 (Voice and Data), identify each feature pack as specified on the router software CD-ROM label, the feature sets in each feature pack, and UNIX and DOS filenames of the images, memory requirements, and RSL installer descriptions.

**Table 3 Cisco 1750 Series Data-Only Feature Packs**

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD17-C-12.0.5=	Cisco 1700 IP Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-y-mz.120-5.XQ	aaa0811	4 MB	16 MB	Cisco IOS 1700 Series IP Feature Set 12.0(5)XQ
CD17-CP-12.0.5=	Cisco 1700 IP Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-sy-mz.120-5.XQ	aaa0812	8 MB	20 MB	Cisco 1700 IOS IP Plus Feature Set 12.0(5)XQ
CD17-CH-12.0.5=	Cisco 1700 IP/FW Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-oy-mz.120-5.XQ	aaa0813	4 MB	16 MB	Cisco 1700 IOS IP/FW Feature Set 12.0(5)XQ
CD17-CL-12.0.5=	Cisco 1700 IP Plus IPsec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-sy56i-mz.120-5.XQ	aaa0816	8 MB	24 MB	Cisco 1700 IOS IP Plus IPsec 56 Feature Set 12.0(5)XQ
CD17-CK2-12.0.5=	Cisco 1700 IP Plus IPsec 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-k2sy-mz.120-5.XQ	aaa0817	8 MB	24 MB	Cisco 1700 IOS IP Plus IPsec 3DES Feature Set 12.0(5)XQ
CD17-CHL-12.0.5=	Cisco 1700 IP/FW Plus IPsec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-osy56i-mz.120-5.XQ	aaa0818	8 MB	24 MB	Cisco 1700 IOS IP/FW Plus IPsec 56 Feature Set 12.0(5)XQ

## System Requirements

**Table 3 Cisco 1750 Series Data-Only Feature Packs (continued)**

CD17-CHK2-12.0.5=	Cisco 1700 IP/FW Plus 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-k2osy-mz.120-5.XQ	aaa0819	8 MB	24 MB	Cisco 1700 IOS IP/FW Plus 3DES Feature Set 12.0(5)XQ
CD17-B-12.0.5=	Cisco 1700 IP/IPX Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-ny-mz.120-5.XQ	aaa0820	4 MB	16 MB	Cisco 1700 IOS IP/IPX Feature Set 12.0(5)XQ
CD17-BHP-12.0.5=	Cisco 1700 IP/IPX/FW Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-nosy-mz.120-5.XQ	aaa0821	8 MB	20 MB	Cisco 1700 IOS IP/IPX/FW Plus Feature Set 12.0(5)XQ
CD17-Q-12.0.5=	Cisco 1700 IP/IPX/AT/IBM Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bnr2y-mz.120-5.XQ	aaa0822	8 MB	20 MB	Cisco 1700 IOS IP/IPX/AT/IBM Feature Set 12.0(5)XQ
CD17-QP-12.0.5=	Cisco 1700 IP/IPX/AT/IBM Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bnr2sy-mz.120-5.XQ	aaa0823	8 MB	24 MB	Cisco 1700 IOS IP/IPX/AT/IBM Plus Feature Set 12.0(5)XQ
CD17-QHL-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/ FW Plus IPsec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bnor2sy56i-mz.120-5.XQ	aaa0824	8 MB	32 MB	Cisco 1700 IOS IP/IPX/AT/IBM/ FW Plus IPsec 56 Feature Set 12.0(5)XQ
CD17-QHK2-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/ FW Plus 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bk2nor2sy-mz.120-5.XQ	aaa0825	8 MB	32 MB	Cisco 1700 IOS IP/IPX/AT/IBM/ FW Plus 3DES Feature Set 12.0(5)XQ

Table 4 Cisco 1750 Series Data and Voice Feature Packs

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD17-CVP-12.0.5=	Cisco 1700 IP/Voice Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-sv3y-mz.120-5.XQ	aaa0826	8 MB	24 MB	Cisco 1700 IOS IP/Voice Plus Feature Set 12.0(5)XQ
CD17-CVH-12.0.5=	Cisco 1700 IP/FW/Voice Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-osv3y-mz.120-5.XQ	aaa0827	8 MB	24 MB	Cisco 1700 IOS IP/FW/Voice Plus Feature Set 12.0(5)XQ
CD17-CVL-12.0.5=	Cisco 1700 IP/Voice Plus IPSec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-sv3y56i-mz.120-5.XQ	aaa0830	8 MB	32 MB	Cisco 1700 IOS IP/Voice Plus IPSec 56 Feature Set 12.0(5)XQ
CD17-CVK2-12.0.5=	Cisco 1700 IP/Voice Plus IPSec 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-k2sv3y-mz.120-5.XQ	aaa0831	8 MB	32 MB	Cisco 1700 IOS IP/Voice Plus IPSec 3DES Feature Set 12.0(5)XQ
CD17-CHVL-12.0.5=	Cisco 1700 IP/FW/Voice Plus IPSec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-osv3y56i-mz.120-5.XQ	aaa0832	8 MB	32 MB	Cisco 1700 IOS IP/FW/Voice Plus IPSec 56 Feature Set 12.0(5)XQ
CD17-CHVK2-12.0.5=	Cisco 1700 IP/FW/Voice Plus 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-k2osv3y-mz.120-5.XQ	aaa0833	8 MB	32 MB	Cisco 1700 IOS IP/FW/Voice Plus 3DES Feature Set 12.0(5)XQ
CD17-BHPV-12.0.5=	Cisco 1700 IP/IPX/FW/Voice Plus Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-nosv3y-mz.120-5.XQ	aaa0834	8 MB	24 MB	Cisco 1700 IOS IP/IPX/FW/Voice Plus Feature Set 12.0(5)XQ

## System Requirements

**Table 4 Cisco 1750 Series Data and Voice Feature Packs (continued)**

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD17-QHVL-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/ FW/Voice Plus IPSec 56 Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bnor2sv3y56i-mz.120-5.XQ	aaa0835	8 MB	32 MB	Cisco 1700 IOS IP/IPX/AT/IBM/ FW/Voice Plus IPSec 56 Feature Set 12.0(5)XQ
CD17-QHVK2-12.0.5=	Cisco 1700 IP/IPX/AT/IBM/ FW/Voice Plus 3DES Feature Pack Release 12.0(5)XQ RSL Version 7.6	c1700-bk2nor2sv3y-mz.120-5.XQ	aaa0849	8 MB	32 MB	Cisco 1700 IOS IP/IPX/AT/IBM/ FW/Voice Plus 3DES Feature Set 12.0(5)XQ

## 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. Release 12.0(5)XQ supports the same feature sets as Releases 12.0 and 12.0 T, but Release 12.0(5)XQ can include new features supported by the Cisco 1750 router. Table 5 lists the feature sets supported by the Cisco 1750 router.

**Table 5 Feature Sets Supported by the Cisco 1750 Router**

Feature Sets	Image Name	Feature Set Matrix Terms	Software Image	Platform	In <sup>1</sup>
Data-Only Images	IP	Basic <sup>2</sup>	c1700-y-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP Plus	Plus <sup>3</sup>	c1700-sy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP Plus IPSec 56	Plus, IPSec 56 <sup>4</sup>	c1700-sy56i-mz	Cisco 1720 Cisco 1750	12.0(3)T
	IP Plus IPSec 3DES	Plus, IPSec, 3DES <sup>5</sup>	c1700-k2sy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/FW	Basic	c1700-oy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/IPX/FW Plus	Plus	c1700-nosy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/FW Plus IPSec 56	Plus, IPSec 56	c1700-osy56i-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/FW Plus IPSec 3DES	Plus, IPSec, 3DES	c1700-k2osy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/IPX	Basic	c1700-ny-mz	Cisco 1720 Cisco 1750	12.0(1)XA3



Table 5 Feature Sets Supported by the Cisco 1750 Router (continued)

Feature Sets	Image Name	Feature Set Matrix Terms	Software Image	Platform	In <sup>1</sup>
<b>Data-Only Images (continued)</b>	IP/IPX/AT/IBM	Basic	c1700-bnr2y-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/IPX/AT/IBM Plus	Plus	c1700-bnr2sy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/IPX/AT/IBM/FW Plus IPsec 56	Plus, IPsec 56	c1700-bnor2sy56i-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
	IP/IPX/AT/IBM/FW Plus IPsec 3DES	Plus, IPsec, 3DES	c1700-bk2nor2sy-mz	Cisco 1720 Cisco 1750	12.0(1)XA3
<b>Data and Voice Images</b>	IP/Voice Plus	Plus, Voice <sup>6</sup>	c1700-sv3y-mz.120-5.XQ	Cisco 1750	
	IP/Voice Plus IPsec 56	Plus, Voice, IPsec 56	c1700-sv3y56i-mz.120-5.XQ	Cisco 1750	
	IP/Voice Plus IPsec 3DES	Plus, Voice, IPsec, 3DES	c1700-k2sv3y-mz.120-5.XQ	Cisco 1750	
	IP/FW/Voice Plus	Plus, FW, Voice	c1700-osv3y-mz.120-5.XQ	Cisco 1750	
	IP/FW/Voice Plus IPsec 56	Plus, FW, Voice, IPsec 56	c1700-osv3y56i-mz.120-5.XQ	Cisco 1750	
	IP/FW/Voice Plus IPsec 3DES	Plus, FW, Voice, 3DES	c1700-k2osv3y-mz.120-5.XQ	Cisco 1750	
	IP/IPX/FW/Voice Plus	Plus, IPX, FW, Voice	c1700-nosv3y-mz.120-5.XQ	Cisco 1750	
	IP/IPX/AT/IBM/FW/Voice Plus IPsec 56	Plus, IPX, AT, IBM, FW, Voice, IPsec 56	c1700-bnor2sv3y56i-mz.120-5.XQ	Cisco 1750	
	IP/IPX/AT/IBM/FW/Voice Plus IPsec 3DES	Plus, IPX, AT, IBM, FW, Voice, 3DES	c1700-bk2nor2sv3y-mz.120-5.XQ	Cisco 1750	

1 The number in the "In" column indicates the Cisco IOS release in which the feature was introduced. For example, 12.0(3)T means a feature was introduced in Release 12.0(3)T. If a cell in this column is empty, the feature was included in the initial base release.

2 This set of features is provided in the basic feature set.

3 This set of features is provided in the Plus feature set.

4 This set of features is provided in the IPsec 56-bit (Plus IPsec 56) data encryption feature sets.

5 This set of features is provided in the Triple DES (3DES) Encryption data encryption feature sets.

6 This set of features is provided in the Voice feature sets.



**Caution** Cisco IOS images with strong encryption (including, but not limited to, 56-bit data encryption feature sets) are subject to United States government export controls and limited distribution. Images to be installed outside the United States require an export license. Customer orders may be denied or subject to delay because of United States government regulations. Contact your sales representative or distributor for more information, or send e-mail to [export@cisco.com](mailto:export@cisco.com).

Table 6 lists the features and feature sets supported by the Cisco 1750 router in Cisco IOS Release 12.0(5)XQ. The table uses the following conventions:

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

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**Note** These feature set tables only contain a selected list of features. These tables are not cumulative—nor do they list all the features in each image.

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Table 6 Part 1, Feature List by Feature Set for the Cisco 1750 Routers

Features	Feature Sets					
	IP	IP Plus	IP Plus 56	IP Plus IPSec 3DES	IP/FW	IP/IPX/ FW Plus
<b>Connectivity</b>						
L2TP Dial-Out	Yes	Yes	Yes	Yes	No	Yes
<b>IBM Support</b>						
Bridging Code Rework	Yes	Yes	Yes	Yes	Yes	Yes
DSLw+ Ethernet Redundancy	No	No	No	No	No	No
<b>IP Routing</b>						
IP Type of Service and Precedence for GRE Tunnels	Yes	Yes	Yes	Yes	Yes	Yes
OSPF Point to Multipoint	Yes	Yes	Yes	Yes	Yes	Yes
<b>Management</b>						
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes	Yes	Yes
Conditionally Triggered Debugging	Yes	Yes	Yes	Yes	Yes	Yes
Process MIB	Yes	Yes	Yes	Yes	Yes	Yes
<b>Multimedia</b>						
Protocol-Independent Multicasts Version 2	Yes	Yes	Yes	Yes	Yes	Yes
<b>Switching</b>						
WCCPv2	No	Yes	Yes	Yes	No	Yes
<b>Voice Services</b>						
Voice over IP	No	No	No	No	No	No
<b>WAN Services</b>						
Always On/Direct ISDN	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes
DLSw+ Enhancements	No	No	No	No	No	No
DLSw+ RSVP	No	No	No	No	No	No
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB Feature	No	Yes	Yes	Yes	No	Yes

## System Requirements

**Table 6 Part 2, Feature List by Feature Set for the Cisco 1750 Routers**

Features	Feature Sets						
	IP/FW Plus IPSec 56	IP/FW Plus IPSec 3DES	IP/IPX	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus	IP/IPX/ AT/IBM/ FW Plus IPSec 56	IP/IPX/ AT/IBM/ FW Plus IPSec 3DES
<b>Connectivity</b>							
L2TP Dial-Out	Yes	Yes	No	No	Yes	Yes	Yes
<b>IBM Support</b>							
Bridging Code Rework	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DSLw+ Ethernet Redundancy	No	No	No	Yes	Yes	Yes	Yes
<b>IP Routing</b>							
IP Type of Service and Precedence for GRE Tunnels	No	Yes	Yes	Yes	Yes	Yes	Yes
OSPF Point to Multipoint	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Management</b>							
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Conditionally Triggered Debugging	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Process MIB	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Multimedia</b>							
Protocol-Independent Multicasts Version 2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Switching</b>							
WCCPv2	Yes	Yes	No	No	Yes	Yes	Yes
<b>Voice Services</b>							
Voice over IP	No	No	No	No	No	No	No
<b>WAN Services</b>							
Always On/Direct ISDN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DLSw+ Enhancements	No	No	No	Yes	Yes	Yes	Yes
DLSw+ RSVP	No	No	No	No	Yes	Yes	Yes
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB Feature	Yes	Yes	No	No	Yes	Yes	Yes

Table 6 Part 3, Feature List by Feature Set for the Cisco 1750 Routers

Features	Feature Sets				
	IP/Voice Plus	IP/Voice Plus IPSec 56	IP/Voice Plus IPSec 3DES	IP/FW/Voice Plus	IP/FW/Voice Plus IPSec 56
<b>Connectivity</b>					
L2TP Dial-Out	Yes	Yes	Yes	Yes	Yes
<b>IBM Support</b>					
Bridging Code Rework	Yes	Yes	Yes	Yes	Yes
DSLw+ Ethernet Redundancy	No	No	No	No	No
<b>IP Routing</b>					
IP Type of Service and Precedence for GRE Tunnels	Yes	Yes	Yes	No	No
OSPF Point to Multipoint	Yes	Yes	Yes	Yes	Yes
<b>Management</b>					
Cisco IOS File System	Yes	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes	Yes
Conditionally Triggered Debugging	Yes	Yes	Yes	Yes	Yes
Process MIB	Yes	Yes	Yes	Yes	Yes
<b>Multimedia</b>					
Protocol-Independent Multicasts Version 2	Yes	Yes	Yes	Yes	Yes
<b>Switching</b>					
WCCPv2	Yes	Yes	Yes	Yes	Yes
<b>Voice Services</b>					
Voice over IP	Yes	Yes	Yes	Yes	Yes
<b>WAN Services</b>					
Always On/Direct ISDN	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes
DLSw+ Enhancements	No	No	No	No	No
DLSw+ RSVP	No	No	No	No	No
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes
VPDN MIB Feature	Yes	Yes	Yes	Yes	Yes

**Table 6 Part 4, Feature List by Feature Set for the Cisco 1750 Routers**

Features	Feature Sets			
	IP/FW/Voice Plus IPSec 3DES	IP/IPX/FW/ Voice Plus	IP/IPX/AT/IBM/FW/V oice Plus IPSec 56	IP/IPX/AT/IBM/FW/Voice Plus IPSec 3DES
<b>Connectivity</b>				
L2TP Dial-Out	Yes	Yes	Yes	Yes
<b>IBM Support</b>				
Bridging Code Rework	Yes	Yes	Yes	Yes
DSLw+ Ethernet Redundancy	No	No	Yes	Yes
<b>IP Routing</b>				
IP Type of Service and Precedence for GRE Tunnels	Yes	Yes	Yes	Yes
OSPF Point to Multipoint	Yes	Yes	Yes	Yes
<b>Management</b>				
Cisco IOS File System	Yes	Yes	Yes	Yes
Entity MIB	Yes	Yes	Yes	Yes
Expression MIB	Yes	Yes	Yes	Yes
Conditionally Triggered Debugging	Yes	Yes	Yes	Yes
Process MIB	Yes	Yes	Yes	Yes
<b>Multimedia</b>				
Protocol-Independent Multicasts Version 2	Yes	Yes	Yes	Yes
<b>Switching</b>				
WCCPv2	Yes	Yes	Yes	Yes
<b>Voice Services</b>				
Voice over IP	Yes	Yes	Yes	Yes
<b>WAN Services</b>				
Always On/Direct ISDN	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes
DLSw+ Enhancements	No	No	Yes	Yes
DLSw+ RSVP	No	No	Yes	Yes
MPPC-MS PPP Compression	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes
VPDN MIB Feature	Yes	Yes	Yes	Yes

## Installation Notes

This section describes the following topics:

- Installing Software Images Using RSL, page 14
- Alternatives to the RSL, page 15

## Installing Software Images Using RSL

This section describes some solutions to problems you might encounter when installing software images using the RSL. These solutions are additions to the RSL online help.

### Recovering From a Connection Error

This installation tip provides a possible recovery solution if you are unable to connect to your access server or router. You can skip this section unless you are experiencing a connection error.

In some cases, you might receive the following error message while connecting to the target access server:

```
"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 encounter this message, especially if one of the following situations applies, try increasing the Short Timeout value higher than 25 seconds in the Options dialog box:

- You are connecting to an access server that has a large configuration file.
- You are connecting to a Cisco AS5200 access server. A Cisco AS5200 requires up to 45 seconds to write a configuration to nonvolatile random-access memory (NVRAM), due to the amount of interfaces that must be checked during this process. Increase the Short Timeout value to 60 seconds.

---

**Note** Increasing the Short Timeout value might increase the time it takes for RSL to connect to the target access server.

---

### Restoring the Startup Configuration

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

- Step 1** Ensure that all cables are properly attached to both the router and the PC.
- Step 2** Restart the 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. You can now exit the RSL.

---

**Note** In the previous situation, the router configuration register (**config-register 0xnnnn**) is not restored.

---

---

**Note** If you press **Ctrl-Alt-Delete** to terminate the RSL, the router configuration and configuration register are not restored. However, in this case, the configuration file is not deleted from the PC, so you can restore it using the previous steps, beginning with Step 2.

---

### Installation Tips

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

- If you have added any static entries to the PC Address Resolution Protocol (ARP) table, one or more of them might be deleted by the RSL. You need to manually re-enter any deleted entries in the PC ARP table.
- If the router's running configuration at connection time is not the same as its startup configuration, the exact configuration is not restored. Any changes that you have made since the last time a **copy running-config startup-config** or **write memory** command was entered are lost.
- The 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**, and **media-type aui**.

## Alternatives to the RSL

The RSL is designed to work with a PC running Microsoft Windows 95 and is the recommended method for downloading software to the router. The booklet included with the CD-ROM explains how to perform this simple install process; however, two alternatives are available for installing router software:

- Using the console or auxiliary port
- Using a TFTP server application

### Installing the Router Software Using the Console or Auxiliary Port

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

---

**Note** The transfer takes place only on the port at which you enter the command. If you download via the console, all console output is discarded for the duration of the transfer. You can only download files to the router; you cannot copy files from the router. Cisco recommends using the auxiliary port for this type of software download. The auxiliary port has hardware flow control and full modem control. In addition, the transfer does not occupy the system console so it is free for other uses.

---



The following example shows how to use the **copy xmodem flash** command on a Cisco 1750 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 auxiliary
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? c1700-y-mz.0918
Erase flash device before writing? [confirm] yes
Flash contains files. Are you sure you want to erase? [confirm]y

Copy '' from server
  as 'c1700-y-mz.0918' into Flash WITH erase? [yes/no] yes
Erasing device... eeeeeeeeeeeeeeeeeee ...erased
Ready to receive file.....C
Verifying checksum... OK (0x5DE8)
Flash device copy took 00:12:06 [hh:mm:ss]
```

### Installing the Router Software Using a TFTP Server Application

Use this TFTP server application method as an alternative to using the RSL to install the router software from the CD-ROM. You can perform this procedure 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 a rcp server. Only use the RSL or the TFTP server included on the feature pack CD-ROM to install the router software if you are using a PC running Windows 95. For other operating systems, a number of TFTP or rcp applications are available from independent software vendors or available as shareware from public sources on the World Wide Web.

---

**Note** To use an rcp application, follow the same procedure below, substituting “rcp” for “TFTP” and using 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** Launch the TFTP server application on the PC, usually 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, you can select **Settings** to display a panel, and configure the local PC as a server by selecting the Server checkbox.

The TFTP server also allows the selection of a “root” directory. You must select the directory in which 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 overlook this step, you cannot perform the copy procedure. This reminder 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 16, you remain connected to the router. (If you use Telnet, you lose connection to the router.)

- Establish a Telnet session from the PC to the router.



**Caution** Make sure your PC is set up to communicate with the 10BaseT Ethernet port on the router.

**Step 5** Connect your PC Ethernet port to the corresponding router LAN port. Use the 10BaseT crossover cable to connect to an Ethernet port. Use straight-through cables if you are connecting via a 10BaseT hub or a 100BaseT hub.

---

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

---

**Step 6** Enter the following commands to set the configuration register to 0x2101 and reload to the bootstrap image:

```
Router# config terminal
Router(config)# config-reg 0x2101
Router(config)# end
Router# reload
```

**Step 7** When asked whether the system configuration has been modified, enter **yes**:

```
# System configuration has been modified. Save? yes
```

**Step 8** If the password prompt appears, enter the password.

```
Password: <password>
```

**Step 9** At the router prompt, enter **enable** and then the password:

```
Router(boot)> enable
Password: <password>
```

- Step 10** At the router prompt, enter the following command to copy the new software image from the PC CD-ROM drive to the router:

```
Router(boot)(config)# copy tftp flash
```

In the next series of steps, you download the Cisco IOS Release 12.0(5)XQ images that you want installed on your router.

- Step 11** When prompted, enter the IP address of your PC, as 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 12** When prompted, enter the filename of the Cisco IOS Release 12.0(5)XQ image to be copied to the router, as in the following example:

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

This example specifies the DOS image name of the IP feature set for Cisco 1750 routers (as shown in Table 3 and Table 4 in the section, “Feature Pack Overview Table”).

- Step 13** In response to 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 and Table 4 in the section, “Feature Pack Overview Table” for the UNIX image filename.

```
Destination file name [80153209.bin]? c1700-sv3y-mz
```

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

- Step 14** Enter **yes** in response to the prompt asking 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 15** Enter the following commands to reset the configuration register to 0x2102.

```
Router(boot)(config)# config terminal
Router(boot)(config)# config-reg 0x2102
Router(boot)(config)# end
```

- Step 16** Enter the **reload** command to reload the router:

```
Router# reload
```

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

## Related Documentation

This section describes the documentation related to the Cisco 1750 router, typically including hardware installation guides, software installation guides, Cisco IOS configuration and command references, system error messages, and feature modules that are updates to the Cisco IOS documentation set. Documentation is available as printed manuals or electronic documents, except for the feature modules, which are available online only.

The most up-to-date documentation can be found on the Web via Cisco Connection Online (CCO) and on the latest Documentation CD-ROM. These electronic documents might contain updates and modifications made after the paper documents were printed. See the “Cisco Connection Online” section on page 24 and the “Documentation CD-ROM” section on page 24 for more information.

This section contains the following subsections:

- Release-Specific Documents, page 19
- Platform-Specific Documents, page 20
- Feature Modules, page 20
- Cisco IOS Documentation Set, page 20

## Release-Specific Documents

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

- *Release Notes for Cisco IOS Release 12.0 T*

To access the cross-platform *Release Notes for Cisco IOS Release 12.0 T* on CCO, follow this path:

**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**

To access the cross-platform *Release Notes for Cisco IOS Release 12.0 T* on the Documentation CD-ROM, follow this path:

**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

To access these documents, refer to the Software Center at this path on CCO:

**Service & Support: Technical Documents**

- Caveat documents

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.

To access the caveat document on CCO, follow this path:

**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**

To access the caveat document on the Documentation CD-ROM, follow this path:

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

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

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## Platform-Specific Documents

The following list contains the documents specific to the Cisco 1750 router. These documents are available on CCO and the Documentation CD-ROM.

- *Cisco 1750 Router Hardware Installation Guide*
- *Cisco 1750 Router Voice over IP Configuration Guide*
- *Voice-over-IP Quick Start Guide*
- *Safety Information for Cisco 1600 and 1700 Routers*

To access these documents on CCO, follow this path:

**Service and Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Access Servers and Access Routers: Modular Access Routers: Cisco 1750 Router**

To access these documents on the Documentation CD-ROM, follow this path:

**Cisco IOS Software Configuration: Access Servers and Access Routers: Cisco 1750 Router**

## Feature Modules

Feature modules describe new features introduced in 12.0 T releases and are updates to the Cisco IOS documentation set. As updates, the features modules are available online only. The feature module information will be added to the Cisco IOS documentation set before the next printing. Feature modules have a brief overview of the feature, benefits, configuration tasks, and a command reference.

To access the feature modules on CCO, follow this path:

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

To access the feature modules on the documentation CD-ROM, follow this path:

**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. These documents 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. Each configuration guide can be used in conjunction with its corresponding command reference.

To access these documents on CCO, follow this path:

**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**

To access these documents on the Documentation CD-ROM, follow this path:

**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 7 details the contents of the Cisco IOS Release 12.0 software documentation set. The document set is available in electronic form, and also in printed form upon request.

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**Note** The most current Cisco IOS documentation can be found on the latest Documentation CD-ROM and on the Web. These electronic documents might contain updates and modifications made after the paper documents were printed.

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To access the Cisco IOS documentation set on CCO, follow this path:

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

To access the Cisco IOS documentation set on the Documentation CD-ROM, follow this path:

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

**Table 7 Cisco IOS Software Release 12.0 Documentation Set**

<b>Books</b>	<b>Chapter Topics</b>
<ul style="list-style-type: none"><li>• <i>Configuration Fundamentals Configuration Guide</i></li><li>• <i>Configuration Fundamentals Command Reference</i></li></ul>	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
<ul style="list-style-type: none"><li>• <i>Bridging and IBM Networking Configuration Guide</i></li><li>• <i>Bridging and IBM Networking Command Reference</i></li></ul>	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

**Table 7 Cisco IOS Software Release 12.0 Documentation Set (continued)**

<b>Books</b>	<b>Chapter Topics</b>
<ul style="list-style-type: none"> <li>• <i>Dial Solutions Configuration Guide</i></li> <li>• <i>Dial Solutions Command Reference</i></li> </ul>	Dial-In Port Setup Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions ISDN X.25 over ISDN VPDN Dial Business Solutions and Examples
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	Interface Configuration Overview
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 1</i></li> <li>• <i>Network Protocols Command Reference, Part 1</i></li> </ul>	IP Addressing IP Services IP Routing Protocols
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 2</i></li> <li>• <i>Network Protocols Command Reference, Part 2</i></li> </ul>	AppleTalk Novell IPX
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 3</i></li> <li>• <i>Network Protocols Command Reference, Part 3</i></li> </ul>	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> <li>• <i>Security Configuration Guide</i></li> <li>• <i>Security Command Reference</i></li> </ul>	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
<ul style="list-style-type: none"> <li>• <i>Wide-Area Networking Configuration Guide</i></li> <li>• <i>Wide-Area Networking Command Reference</i></li> </ul>	ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Voice, Video, and Home Applications Configuration Guide</i></li> <li>• <i>Voice, Video, and Home Applications Command Reference</i></li> </ul>	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Video Support Universal Broadband Features

**Table 7 Cisco IOS Software Release 12.0 Documentation Set (continued)**

<b>Books</b>	<b>Chapter Topics</b>
<ul style="list-style-type: none"><li>• <i>Quality of Service Solutions Configuration Guide</i></li><li>• <i>Quality of Service Solutions Command Reference</i></li></ul>	Classification Scheduling Packet Drop Traffic Shaping ATM QoS SNA QoS Line Protocols
<ul style="list-style-type: none"><li>• <i>Cisco IOS Software Command Summary</i></li><li>• <i>Dial Solutions Quick Configuration Guide</i></li><li>• <i>System Error Messages</i></li><li>• <i>Debug Command Reference</i></li></ul>	

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**Note** The *Cisco Management Information Base (MIB) User Quick Reference* publication is no longer being published. For the latest list of MIBs supported by Cisco, see the *Cisco Network Management Toolkit* on Cisco Connection Online. On CCO, go to **Software and Support: Software Center: Network Management Products: Cisco Network Management Toolkit: Cisco MIBs**.

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## Service and Support

The following URL contains links and helpful tips on configuring your Cisco products:  
[http://www.cisco.com/kobayashi/serv\\_tips.shtml](http://www.cisco.com/kobayashi/serv_tips.shtml).

This URL is subject to change without notice. You can also access this page by following this path from CCO:

### **Products & Technologies: Technical Tips**

“Hot Tips” are 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 access FAX-on-demand and receive documents at your FAX machine, from the USA, call 888-50-CISCO (888-502-4726). From other areas, call 415-596-4408.

The following sections are provided from the Technical Tips page:

- **Access Dial Cookbook**—Offers easy-to-follow “recipes” for sample router configurations. The first cookbook contains network diagrams, sample configurations, and troubleshooting commands for helping you set up and use dial technologies on Cisco access routers.
- **Field Notices**—Designed to provide notification of any critical issues regarding Cisco products. These include problem descriptions, safety or security issues, and hardware defects.
- **Hardware**—Technical Tips related to specific hardware platforms.
- **Internetworking Features**—Tips on using and deploying Cisco IOS software features and services.
- **Sample Configurations**—Actual configuration examples complete with topology and annotations.



- Software Products—MultiNet & Cisco Suite 100, Network Management, Cisco IOS Software Bulletins, and CiscoPro Configurations.
- Special Collections—Other Helpful Documents, Frequently Asked Questions, Security Advisories, References & RFCs, Case Studies, and the CiscoPro Documentation CD-ROM.

## 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](http://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](mailto:cco-help@cisco.com). For additional information, contact [cco-team@cisco.com](mailto:cco-team@cisco.com).

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**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](mailto: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](mailto:cs-rep@cisco.com).

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## 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.

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This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 18.

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