



Release Notes for Cisco IOS Release 11.3(3)T Feature Packs for Cisco 1600 Series Routers

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These release notes describe the Cisco IOS Release 11.3(3)T feature packs for Cisco 1600 series routers. Table 1 lists the Cisco product numbers for the supported feature packs.

Table 1 Feature Pack Product Numbers

Product Number	Feature Pack Description
CD16-C-11.3=	Cisco 1600 IP Feature Pack
CD16-CH-11.3=	Cisco 1600 IP/FW ¹ Feature Pack
CD16-CP-11.3=	Cisco 1600 IP Plus Feature Pack
CD16-CW-11.3=	Cisco 1600 IP Plus 40 Feature Pack ²
CD16-CY-11.3=	Cisco 1600 IP Plus 56 Feature Pack ²
CD16-CL-11.3=	Cisco 1600 IP Plus IPSEC 56 Feature Pack ²
CD16-B-11.3=	Cisco 1600 IP/IPX Feature Pack
CD16-BP-11.3=	Cisco 1600 IP/IPX Plus Feature Pack
CD16-BHP-11.3=	Cisco 1600 IP/IPX/FW Plus Feature Pack
CD16-Q-11.3=	Cisco 1600 IP/IPX/AT/IBM Feature Pack
CD16-QP-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus Feature Pack
CD16-QW-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus 40 Feature Pack ²
CD16-QY-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus 56 Feature Pack ²
CD16-QL-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus IPSEC 56 Feature Pack ²
CD16-QHY-11.3=	Cisco 1600 IP/IPX/AT/IBM/FW Plus 56 Feature Pack ²
CD16-QHL-11.3=	Cisco 1600 IP/IPX/AT/IBM/FW Plus IPSEC 56 Feature Pack ²

1. FIREWALL (FW).
2. This feature pack contains encryption images.

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Note The feature packs listed here contain Cisco IOS Release 11.3(3)T software images, a selection of earlier images, and Router Software Loader (RSL) Version 7.0.

Note Before running RSL, read the “Installing Software Images Using RSL” section on page 28.

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Platforms Supported

Router Software Loader (RSL) Version 7.0 supports the following Cisco 1600 series routers:

- CiscoPro CPA1601, CPA1602, CPA1603, and CPA1604
- Cisco 1601, 1602, 1603, 1604, and 1605-R

What Is a Feature Pack?

The heart of a Cisco IOS software feature pack is a CD-ROM that contains a software image and the Router Software Loader (RSL), a Windows 95 application that loads the image onto the access router or server. Each Cisco IOS Release 11.3 feature pack CD contains one feature set. The CD booklet, *Getting Started with the Router Software Loader*, explains how to use the RSL to install the router software. Users who cannot use the RSL can load images by following the instructions in the “Alternatives to the RSL” section of this document.

Each Cisco IOS Release 11.3 software feature pack box contains the following:

- CD-ROM with the following software:
 - Feature set software image that includes bundled modem firmware
 - The RSL program (a Windows 95 application)
 - A Trivial File Transfer Protocol (TFTP) server application (for Windows 95 only)
- Instruction booklet for using the RSL
- Release notes (this document), which includes alternatives to using the RSL for loading software images onto a router
- Software license for using Cisco software in-object code form on a single access server or router
- Cisco Documentation CD-ROM, which contains all Cisco IOS software documentation

Before running the RSL, read the section, “Installing Software Images Using RSL” on page 28. If you are loading software on a preconfigured router, you should save the router configuration file on your PC before beginning the download process, as described in the CD booklet *Getting Started with the Router Software Loader*.

Using Cisco Feature Packs

The tables in this release note describe the Cisco feature packs. Use these tables to perform the following tasks before loading a software image onto a router:

- 1 Use Table 1 on page 1 to identify your software image.
- 2 Use Table 2 in the section “Cisco Feature Pack and Memory Descriptions” to identify your feature pack and the memory required for your feature set, based on the image you run.
- 3 Check the memory required for your feature set against Table 3 in the section “Upgrading Cisco 1600 Memory” to determine the factory-default memory on the router and the available memory upgrades.
- 4 Use Table 4 through Table 7 in the section “Cisco IOS Release 11.3(3)T Feature Sets” to identify which features are supported in a feature set image on a specific platform.

Cisco Feature Pack and Memory Descriptions

Table 2 identifies each feature pack as specified on the router software CD-ROM label, describes the feature sets in each feature pack, and lists the following: UNIX and DOS filenames of the images, router platform on which each feature set runs, and memory requirements for each feature set.

Cisco Feature Pack and Memory Descriptions

Table 2 Cisco 1600 Series Feature Pack Image Filenames and Memory Requirements

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD16-C-11.3=	Cisco 1600 IP Feature Pack Release 11.3(3)T	c1600-y-l.112-12.P	80153212	4 MB	2 MB	Cisco 1601-1604 IOS IP Feature Set 11.2(12)P
		c1600-y-mz.112-12.P	80218112	2 MB	8 MB	Cisco 1605-R IOS IP Feature Set 11.2(12)P
		c1600-y-l.112-11.P	80153211	4 MB	2 MB	Cisco 1601-1604 IOS IP Feature Set 11.2(11)P
		c1600-y-mz.112-11.P	80218111	2 MB	8 MB	Cisco 1605-R IOS IP Feature Set 11.2(11)P
		c1600-y-l.113-3.T	80269401	6 MB	2 MB	Cisco 1601-1604 IOS IP Feature Set 11.3(3)T
		c1600-y-mz.113-3.T	80269301	2 MB	8 MB	Cisco 1605-R IOS IP Feature Set 11.3(3)T
CD16-CH-11.3=	Cisco 1600 IP/FW Feature Pack Release 11.3(3)T	c1600-oy-l. 112-11.P	80246901	4 MB	2 MB	Cisco 1601-1604 IOS IP/Firewall Feature Set 11.2(11)P
		c1600-oy-mz. 112-11.P	80246601	2 MB	8 MB	Cisco 1605-R IOS IP/Firewall Feature Set 11.2(11)P
		c1600-oy-l. 113-3.T	80269201	6 MB	4 MB	Cisco 1601-1604 IOS IP/Firewall Feature Set 11.3(3)T
		c1600-oy-mz. 113-3.T	80267201	4 MB	8 MB	Cisco 1605-R IOS IP/Firewall Feature Set 11.3(3)T
CD16-CP-11.3=	Cisco 1600 IP Plus Feature Pack Release 11.3(3)T	c1600-sy-l.112-12.P	80153312	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus Feature Set 11.2(12)P
		c1600-sy-mz.112-12.P	80217812	4 MB	8 MB	Cisco 1605-R IOS IP Plus Feature Set 11.2(12)P
		c1600-sy-l.112-11.P	80153311	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus Feature Set 11.2(11)P
		c1600-sy-mz.112-11.P	80217811	4 MB	8 MB	Cisco 1605-R IOS IP Plus Feature Set 11.2(11)P
		c1600-sy-l.113-3.T	80269101	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus Feature Set 11.3(3)T
		c1600-sy-mz.113-3.T	80269001	4 MB	10 MB	Cisco 1605-R IOS IP Plus Feature Set 11.3(3)T

Table 2 Cisco 1600 Series Feature Pack Image Filenames and Memory Requirements (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD16-CW-11.3=	Cisco 1600 IP Plus 40 Feature Pack	c1600-sy40-l.112-12.P	80153412	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus 40 Feature Set 11.2(9)P
		c1600-sy40-mz.112-12.P	80217912	4 MB	8 MB	Cisco 1605-R IOS IP Plus 40 Feature Set 11.2(9)P
		c1600-sy40-l.113-3.T	80268901	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus 40 Feature Set 11.3(3)T
		c1600-sy40-mz.113-3.T	80268801	4 MB	10 MB	Cisco 1605-R IOS IP Plus 40 Feature Set 11.3(3)T
CD16-CY-11.3=	Cisco 1600 IP Plus 56 Feature Pack Release 11.3(3)T	c1600-sy56-l.112-12.P	80153512	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus 56 Feature Set 11.2(12)P
		c1600-sy56-mz.112-12.P	80218012	4 MB	8 MB	Cisco 1605-R IOS IP Plus 56 Feature Set 11.2(12)P
		c1600-sy56-l.112-11.P	80153511	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus 56 Feature Set 11.2(11)P
		c1600-sy56-mz.112-11.P	80218011	4 MB	8 MB	Cisco 1605-R IOS IP Plus 56 Feature Set 11.2(11)P
		c1600-sy56-l.113-3.T	80268701	6 MB	4 MB	Cisco 1601-1604 IOS IP Plus 56 Feature Set 11.3(3)T
		c1600-sy56-mz.113-3.T	80268601	4 MB	10 MB	Cisco 1605-R IOS IP Plus 56 Feature Set 11.3(3)T
CD16-CL-11.3=	Cisco 1600 IP Plus IPSEC 56 Feature Pack Release 11.3(3)T	c1600-sy56i-l.113-3.T	80268501	8 MB	4 MB	Cisco 1601-1604 IOS IP Plus IPSEC 56 Feature Set 11.3(3)T
		c1600-sy56i-mz.113-3.T	80268401	4 MB	10 MB	Cisco 1605-R IOS IP Plus IPSEC 56 Feature Set 11.3(3)T
CD16-B-11.3=	Cisco 1600 IP/IPX Feature Pack Release 11.3(3)T	c1600-ny-l.112-12.P	80154012	4 MB	2 MB	Cisco 1601-1604 IOS IP/IPX Feature Set 11.2(12)P
		c1600-ny-mz.112-12.P	80217712	2 MB	8 MB	Cisco 1605-R IOS IP/IPX Feature Set 11.2(12)P
		c1600-ny-l.112-11.P	80154011	4 MB	2 MB	Cisco 1601-1604 IOS IP/IPX Feature Set 11.2(11)P

Cisco Feature Pack and Memory Descriptions

Table 2 Cisco 1600 Series Feature Pack Image Filenames and Memory Requirements (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
		c1600-ny-mz.112-11.P	80217711	2 MB	8 MB	Cisco 1605-R IOS IP/IPX Feature Set 11.2(11)P
		c1600-ny-l.113-3.T	80268301	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX Feature Set 11.3(3)T
		c1600-ny-mz.113-3.T	80268201	4 MB	8 MB	Cisco 1605-R IOS IP/IPX Feature Set 11.3(3)T
CD16-BP-11.3=	Cisco 1600 IP/IPX Plus Feature Pack Release 11.3(3)T	c1600-nsy-l.112-12.P	80154112	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX Plus Feature Set 11.2(12)P
		c1600-nsy-mz.112-12.P	80217412	4 MB	8 MB	Cisco 1605-R IOS IP/IPX Plus Feature Set 11.2(12)P
		c1600-nsy-l.112-11.P	80154111	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX Plus Feature Set 11.2(11)P
		c1600-nsy-mz.112-11.P	80217411	4 MB	8 MB	Cisco 1605-R IOS IP/IPX Plus Feature Set 11.2(11)P
		c1600-nsy-l.113-3.T	80268101	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX Plus Feature Set 11.3(3)T
		c1600-nsy-mz.113-3.T	80268001	4 MB	10 MB	Cisco 1605-R IOS IP/IPX Plus Feature Set 11.3(3)T
CD16-BHP-11.3=	Cisco 1600 IP/IPX/FW Plus Feature Pack Release 11.3(3)T	c1600-nosy-l. 112-11.P	80246801	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX/Firewall Plus Feature Set 11.2(11)P
		c1600-nosy-mz. 112-11.P	80246501	4 MB	10 MB	Cisco 1605-R IOS IP/IPX/Firewall Plus Feature Set 11.2(11)P
		c1600-nosy-l. 113-3.T	80267901	6 MB	4 MB	Cisco 1601-1604 IOS IP/IPX/Firewall Plus Feature Set 11.3(3)T
		c1600-nosy-mz. 113-3.T	80269601	4 MB	10 MB	Cisco 1605-R IOS IP/IPX/Firewall Plus Feature Set 11.3(3)T
CD16-Q-11.3=	Cisco 1600 IP/IPX/AT/IBM Feature Pack Release 11.3(3)T	c1600-bnr2y-l. 113-3.T	80267801	8 MB	4 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM Feature Set 11.3(3)T
		c1600-bnr2y-mz. 113-3.T	80267701	4 MB	12 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM Feature Set 11.3(3)T

Table 2 Cisco 1600 Series Feature Pack Image Filenames and Memory Requirements (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD16-QP-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus Feature Pack Release 11.3(3)T	c1600-bnr2sy-I. 113-3.T	80267601	8 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM Plus Feature Set 11.3(3)T
		c1600-bnr2sy-mz. 113-3.T	80267501	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM Plus Feature Set 11.3(3)T
CD16-QW-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus 40 Feature Pack Release 11.3(3)T	c1600-bnr2sy40-I. 113-3.T	80267401	8 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM Plus 40 Feature Set 11.3(3)T
		c1600-bnr2sy40-mz. 113-3.T	80267301	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM Plus 40 Feature Set 11.3(3)T
CD16-QY-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus 56 Feature Pack Release 11.3(3)T	c1600-bnr2sy56-I. 113-3.T	80267101	8 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM Plus 56 Feature Set 11.3(3)T
		c1600-bnr2sy56-mz. 113-3.T	80267001	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM Plus 56 Feature Set 11.3(3)T
CD16-QL-11.3=	Cisco 1600 IP/IPX/AT/IBM Plus IPSEC 56 Feature Pack Release 11.3(3)T	c1600-bnr2sy56i-I. 113-3.T	80266901	12 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM Plus IPSEC 56 Feature Set 11.3(3)T
		c1600-bnr2sy56i-mz. 113-3.T	80266801	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM Plus IPSEC 56 Feature Set 11.3(3)T

Cisco Feature Pack and Memory Descriptions

Table 2 Cisco 1600 Series Feature Pack Image Filenames and Memory Requirements (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD16-QHY-11.3=	Cisco 1600 IP/IPX/AT/IBM/FW Plus 56 Feature Pack Release 11.3(3)T	c1600-bnor2sy56-I. 112-11.P	80246711	8 MB	4 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM/Firewall Plus 56 Feature Set 11.2(11)P
		c1600-bnor2sy56-mz. 112-11.P	80246411	4 MB	12 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM/Firewall Plus 56 Feature Set 11.2(11)P
		c1600-bnor2sy56-I. 113-3.T	80266701	12 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM/ Firewall Plus 56 Feature Set 11.3(3)T
		c1600-bnor2sy56-mz. 113-3.T	80266601	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM/Firewall Plus 56 Feature Set 11.3(3)T
CD16-QHL-11.3=	Cisco 1600 IP/IPX/AT/IBM/FW Plus IPSEC 56 Feature Pack Release 11.3(3)T	c1600-bnor2sy56i-I. 113-3.T	80266501	12 MB	6 MB	Cisco 1601-1604 IOS IP/IPX/Apple Talk/IBM/ Firewall Plus IPSEC 56 Feature Set 11.3(3)T
		c1600-bnor2sy56i-mz. 113-3.T	80266401	4 MB	16 MB	Cisco 1605-R IOS IP/IPX/Apple Talk/IBM/Firewall Plus IPSEC 56 Feature Set 11.3(3)T

Upgrading Cisco 1600 Memory

Table 3 describes the memory delivered by default and the available memory upgrades.

Table 3 Cisco 1600 Series Default Memory and Upgrade Options

Memory Type	Cisco 1601-1604 Defaults	Cisco 1605-R Defaults	Upgrade Options
Flash memory card	4 MB	2 MB	2-MB upgrade for Cisco 1605-R: MEM1600R-2FC= 4-MB upgrade: MEM1600-4FC= 6-MB upgrade: MEM1600-6FC= 8-MB upgrade: MEM1600-8FC= 12-MB upgrade: MEM1600-12FC=
DRAM	2 MB	8 MB	2-MB upgrade: MEM1600-2D= 4-MB upgrade: MEM1600-4D= 8-MB upgrade: MEM1600-8D= 16-MB upgrade: MEM1600-16D=

Cisco IOS Release 11.3(3)T Feature Sets

The Cisco IOS software is packaged into “feature sets” (also called “software images”). There are many different feature sets available, and each feature set contains a specific subset of Cisco IOS features. The following conventions are used to identify feature sets:

- Plus: a value-added feature set with additional features depending on the hardware platform selected.
- Plus 40: a value-added feature set with additional features, including 40-bit data encryption, depending on the hardware platform selected.
- Plus 56: a value-added feature set with additional features, including 56-bit data encryption, depending on the hardware platform selected.

Cisco IOS images with strong encryption (including, but not limited to, 56-bit DES) are subject to U.S. government export controls and have a limited distribution. Images to be installed outside the U.S. require an export license. Customer orders might be denied or subject to delay due to U.S. government regulations. Contact your sales representative or distributor for more information, or send e-mail to export@cisco.com.

The following list shows which feature sets are supported on the Cisco 1600 series routers and access servers. These feature sets only apply to Cisco IOS Release 11.3 T:

- IP
- IP/FW
- IP Plus
- IP Plus 40
- IP Plus 56
- IP Plus IPSEC 56
- IP/IPX
- IP/IPX Plus

- IP/IPX/FW Plus
- IP/IPX/ AT/IBM
- IP/IPX/ AT/IBM Plus
- IP/IPX/AT/IBM Plus 40
- IP/IPX/AT/IBM Plus 56
- IP/IPX/AT/IBM Plus IPSEC 56
- IP/IPX/AT/IBM/FW Plus 56
- IP/IPX/AT/IBM/FIREWAL Plus IPSEC 56

Note The Plus 40 and Plus 50 encryption images listed above are not available in Releases 11.3(1)T and 11.3(2)T. If you need encryption images, refer to the major release, Cisco IOS Release 11.3.

Feature Set Tables

To determine what features are available with each feature set (software image), see Table 4. The table summarizes the features you can use when running a specific feature set on the Cisco 1600 series routers for Cisco IOS Release 11.3 T. The feature set table uses the following symbol conventions to identify features:

- Yes: the feature is offered in the feature set.
- No: the feature is not offered in the feature set.

Table 4 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSEC C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
IBM Support									
APPN High Performance Routing	No	No	No	No	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No	No	No	No	No
Bisync Enhancements, includes: — Bisync 3780 Support — BSC Extended Addressing — Block Serial Tunneling (BSTUN) over Frame Relay	No	No	No	No	Yes	No	No	Yes	Yes
Cisco MultiPath Channel (CMPC)	No	No	No	No	No	No	No	No	No

Table 4 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
DLSw+ Enhancements, includes: — Backup Peer Extensions for Encapsulation Types — DLSw+ Border Peer Caching — DLSw+ MIB Enhancements — DLSw+ SNA Type of Service — LLC2-to-SDLC Conversion between PU4 Devices — NetBIOS Dial-on-Demand Routing — UDP Unicast Enhancement	No	No	No	No	Yes	No	No	Yes	Yes
FRAS Enhancements, includes: — FRAS Boundary Network Node Enhancement — FRAS Dial Backup over DLSw+ — FRAS DLCI Backup — FRAS Host — FRAS MIB — SRB over Frame Relay	No	No	No	No	Yes	No	No	Yes	Yes
RIF Passthru in DLSw+	No	No	No	No	No	No	No	Yes	Yes
SRB over FDDI on Cisco 4000, 4500, and 4700 Series Routers	No	No	No	No	No	No	No	No	No
TN3270 LU Nailing	No	No	No	No	No	No	No	No	No
TN3270 Server Enhancements	No	No	No	No	No	No	No	No	No
Token Ring LANE	No	No	No	No	No	No	No	No	No
Tunneling of Asynchronous Security Protocols	No	No	No	No	Yes	No	No	Yes	Yes
Internet									
DRP Server Agent	No	No	No	No	No	No	No	No	No
IP Routing									
Easy IP (Phase 1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hot Standby Router Protocol (HSRP) over ISL in Virtual LAN Configurations	No	No	No	No	No	No	No	No	No

Table 4 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/AT/IBM	IP/IPX/AT/IBM Plus
IP Enhanced IGRP Route Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCP Enhancements, includes: — TCP Selective Acknowledgment — TCP Timestamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAN Support									
AppleTalk Access List Enhancements	No	No	No	No	Yes	No	No	No	Yes
DECnet Accounting	No	No	No	No	No	No	No	No	No
IPX Named Access Lists	No	No	No	No	Yes	Yes	Yes	Yes	Yes
IPX SAP-after-RIP	No	No	No	No	Yes	Yes	Yes	Yes	Yes
NLSP Enhancements	No	No	No	No	Yes	No	Yes	No	Yes
NLSP Multicast Support	No	No	No	No	Yes	No	Yes	No	Yes
Management									
Cisco Call History MIB Command Line Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cisco IOS Internationalization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB, Phase 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv2C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Profiles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB and Syslog Facility	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Multimedia									
IP Multicast Load Splitting across Equal-Cost Paths	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
IP Multicast over ATM Point-to-Multipoint Virtual Connections	No	No	No	No	No	No	No	No	No
IP Multicast over Token Ring LANs	No	No	No	No	No	No	No	No	No
PIM Version 2	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Stub IP Multicast Routing	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Quality of Service									
RTP Header Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security									
Additional Vendor-Proprietary RADIUS Attributes	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Certificate Authority Interoperability	No	No	No	No	Yes	No	No	No	No

Table 4 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/AT/IBM	IP/IPX/AT/IBM Plus
Cisco IOS Firewall: Context-Based Access Control	No	No	No	No	No	No	No	No	No
Double Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encrypted Kerberized Telnet	No	No	No	No	No	No	No	No	No
HTTP Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	No	No	Yes	Yes	Yes	No	No	No	No
IPSec Network Security	No	No	Yes	Yes	Yes	No	No	No	No
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-User Configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reflexive Access Lists	No	No	No	No	No	No	No	No	No
TCP Intercept	No	No	No	No	No	No	No	No	No
Vendor-Proprietary RADIUS Attributes	No	No	No	No	No	No	No	No	No
Switching									
AppleTalk Routing over ISL and IEEE 802.10 in Virtual LANs	No	No	No	No	No	No	No	No	No
CLNS and DECnet Fast Switching over PPP	No	No	No	No	No	No	No	No	No
DECnet/VINES/XNS over ISL, includes: — Banyan VINES Routing over ISL Virtual LANs — DECnet Routing over ISL Virtual LANs — XNS Routing over ISL Virtual LANs	No	No	No	No	No	No	No	No	No
Fast-Switched Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPX Routing over ISL Virtual LANs	No	No	No	No	No	No	No	No	No
VIP Distributed Switching Support for IP Encapsulated in ISL	No	No	No	No	No	No	No	No	No
Terminal Services									
Virtual Templates for Protocol Translation	No	No	No	No	No	No	No	No	No
WAN Optimization									
ATM MIB Enhancements	No	No	No	No	No	No	No	No	No
PAD Enhancements	No	No	No	No	No	No	No	No	No
PAD Subaddressing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 4 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/AT/IBM	IP/IPX/AT/IBM Plus
WAN Services									
Always On/Dynamic ISDN (AO/DI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth Allocation Control Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Local Management Interface (ELMI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay MIB Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Router ForeSight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Advice of Charge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	No	No	No	No	No	No	No	No	No
Layer 2 Forwarding—Fast Switching	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Leased Line ISDN at 128 kbps	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Microsoft Point-to-Point Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPP over ATM	No	No	No	No	No	No	No	No	No
Stackable Home Gateway	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Telnet Extensions for Dialout	No	No	No	No	No	No	No	No	No
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	No	No	No	No	No	No	No	No	No
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.28 Emulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. This image is not available in Releases 11.3(1)T and 11.3(2)T. It is available in Release 11.3(3)T and later 11.3 T releases.

2. This image is available in Release 11.3(3)T and later releases.

Table 5 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
IBM Support							
APPN High Performance Routing	No	No	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No	No	No
Bisync Enhancements, includes: — Bisync 3780 Support — BSC Extended Addressing — Block Serial Tunneling (BSTUN) over Frame Relay	Yes	Yes	Yes	No	No	Yes	Yes
Cisco MultiPath Channel (CMPC)	No	No	No	No	No	No	No
DLSw+ Enhancements, includes: — Backup Peer Extensions for Encapsulation Types — DLSw+ Border Peer Caching — DLSw+ MIB Enhancements — DLSw+ SNA Type of Service — LLC2-to-SDLC Conversion between PU4 Devices — NetBIOS Dial-on-Demand Routing — UDP Unicast Enhancement	Yes	Yes	Yes	No	No	Yes	Yes
FRAS Enhancements, includes: — FRAS Boundary Network Node Enhancement — FRAS Dial Backup over DLSw+ — FRAS DLCI Backup — FRAS Host — FRAS MIB — SRB over Frame Relay	Yes	Yes	Yes	No	No	Yes	Yes
RIF Passthru in DLSw+	Yes	Yes	Yes	No	No	Yes	Yes
SRB over FDDI on Cisco 4000, 4500, and 4700 Series Routers	No	No	No	No	No	No	No
TN3270 LU Nailing	No	No	No	No	No	No	No
TN3270 Server Enhancements	No	No	No	No	No	No	No

Table 5 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
Token Ring LANE	No	No	No	No	No	No	No
Tunneling of Asynchronous Security Protocols	Yes	Yes	Yes	No	No	Yes	Yes
Internet							
DRP Server Agent	No	No	No	No	No	No	No
IP Routing							
Easy IP (Phase 1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hot Standby Router Protocol (HSRP) over ISL in Virtual LAN Configurations	No	No	No	No	No	No	No
IP Enhanced IGRP Route Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCP Enhancements, includes: — TCP Selective Acknowledgment — TCP Timestamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAN Support							
AppleTalk Access List Enhancements	Yes	Yes	Yes	No	No	Yes	Yes
DECnet Accounting	No	No	No	No	No	No	No
IPX Named Access Lists	Yes	Yes	Yes	No	Yes	Yes	Yes
IPX SAP-after-RIP	Yes	Yes	Yes	No	Yes	Yes	Yes
NLSP Enhancements	Yes	Yes	Yes	No	Yes	Yes	Yes
NLSP Multicast Support	Yes	Yes	Yes	No	Yes	Yes	Yes
Management							
Cisco Call History MIB Command Line Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cisco IOS Internationalization	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB, Phase 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv2C	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Profiles	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB and Syslog Facility	Yes	Yes	Yes	No	Yes	Yes	Yes
Multimedia							
IP Multicast Load Splitting across Equal-Cost Paths	Yes	Yes	Yes	No	Yes	Yes	Yes
IP Multicast over ATM Point-to-Multipoint Virtual Connections	No	No	No	No	No	No	No

Table 5 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
IP Multicast over Token Ring LANs	No	No	No	No	No	No	No
PIM Version 2	Yes	Yes	Yes	No	Yes	Yes	Yes
Stub IP Multicast Routing	Yes	Yes	Yes	No	Yes	Yes	Yes
Quality of Service							
RTP Header Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security							
Additional Vendor-Proprietary RADIUS Attributes	Yes	Yes	Yes	No	Yes	Yes	Yes
Certificate Authority Interoperability	No	No	Yes	No	No	No	Yes
Cisco IOS Firewall: Context-Based Access Control	No	No	No	Yes	Yes	Yes	Yes
Double Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encrypted Kerberized Telnet	No	No	No	No	No	No	No
HTTP Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	Yes	Yes	Yes	No	No	Yes	Yes
IPSec Network Security	Yes	Yes	Yes	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-User Configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reflexive Access Lists	No	No	No	No	No	No	No
TCP Intercept	No	No	No	No	No	No	No
Vendor-Proprietary RADIUS Attributes	No	No	No	No	No	No	No
Switching							
AppleTalk Routing over ISL and IEEE 802.10 in Virtual LANs	No	No	No	No	No	No	No
CLNS and DECnet Fast Switching over PPP	No	No	No	No	No	No	No
DECnet/VINES/XNS over ISL, includes: — Banyan VINES Routing over ISL Virtual LANs — DECnet Routing over ISL Virtual LANs — XNS Routing over ISL Virtual LANs	No	No	No	No	No	No	No

Table 5 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
Fast-Switched Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPX Routing over ISL Virtual LANs	No	No	No	No	No	No	No
VIP Distributed Switching Support for IP Encapsulated in ISL	No	No	No	No	No	No	No
Terminal Services							
Virtual Templates for Protocol Translation	No	No	No	No	No	No	No
WAN Optimization							
ATM MIB Enhancements	No	No	No	No	No	No	No
PAD Enhancements	No	No	No	No	No	No	No
PAD Subaddressing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WAN Services							
Always On/Dynamic ISDN (AO/DI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth Allocation Control Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Local Management Interface (ELMI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay MIB Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Router ForeSight	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Advice of Charge	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	No	No	No	No	No	No	No
Layer 2 Forwarding—Fast Switching	Yes	Yes	Yes	No	Yes	Yes	Yes
Leased Line ISDN at 128 kbps	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Microsoft Point-to-Point Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPP over ATM	No	No	No	No	No	No	No
Stackable Home Gateway	Yes	Yes	Yes	No	Yes	Yes	Yes
Telnet Extensions for Dialout	No	No	No	No	No	No	No
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	No	No	No	No	No	No	No

Table 5 Cisco IOS Software Feature Sets for the Cisco 1601-1604 Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.28 Emulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. This image is not available in Releases 11.3(1)T and 11.3(2)T. It is available in Release 11.3(3)T and later 11.3 T releases.

2. This image is available in Release 11.3(3)T and later releases.

Table 6 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
IBM Support									
APPN High Performance Routing	No	No	No	No	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No	No	No	No	No
Bisync Enhancements, includes: — Bisync 3780 Support — BSC Extended Addressing — Block Serial Tunneling (BSTUN) over Frame Relay	No	No	No	No	Yes	No	No	Yes	Yes
Cisco MultiPath Channel (CMPC)	No	No	No	No	No	No	No	No	No
DLSw+ Enhancements, includes: — Backup Peer Extensions for Encapsulation Types — DLSw+ Border Peer Caching — DLSw+ MIB Enhancements — DLSw+ SNA Type of Service — LLC2-to-SDLC Conversion between PU4 Devices — NetBIOS Dial-on-Demand Routing — UDP Unicast Enhancement	No	No	No	No	Yes	No	No	Yes	Yes

Table 6 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/AT/IBM	IP/IPX/AT/IBM Plus
FRAS Enhancements, includes: — FRAS Boundary Network Node Enhancement — FRAS Dial Backup over DLSw+ — FRAS DLCI Backup — FRAS Host — FRAS MIB — SRB over Frame Relay	No	No	No	No	Yes	No	No	Yes	Yes
RIF Passthru in DLSw+	No	No	No	No	No	No	No	Yes	Yes
SRB over FDDI on Cisco 4000, 4500, and 4700 Series Routers	No	No	No	No	No	No	No	No	No
TN3270 LU Nailing	No	No	No	No	No	No	No	No	No
TN3270 Server Enhancements	No	No	No	No	No	No	No	No	No
Token Ring LANE	No	No	No	No	No	No	No	No	No
Tunneling of Asynchronous Security Protocols	No	No	No	No	Yes	No	No	Yes	Yes
Internet									
DRP Server Agent	No	No	No	No	No	No	No	No	No
IP Routing									
Easy IP (Phase 1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hot Standby Router Protocol (HSRP) over ISL in Virtual LAN Configurations	No	No	No	No	No	No	No	No	No
IP Enhanced IGRP Route Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TCP Enhancements, includes: — TCP Selective Acknowledgment — TCP Timestamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAN Support									
AppleTalk Access List Enhancements	No	No	No	No	Yes	No	No	No	Yes
DECnet Accounting	No	No	No	No	No	No	No	No	No
IPX Named Access Lists	No	No	No	No	Yes	Yes	Yes	Yes	Yes
IPX SAP-after-RIP	No	No	No	No	Yes	Yes	Yes	Yes	Yes
NLSP Enhancements	No	No	No	No	Yes	No	Yes	No	Yes
NLSP Multicast Support	No	No	No	No	Yes	No	Yes	No	Yes

Table 6 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
Management									
Cisco Call History MIB Command Line Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cisco IOS Internationalization	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB, Phase 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv2C	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Profiles	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB and Syslog Facility	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Multimedia									
IP Multicast Load Splitting across Equal-Cost Paths	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
IP Multicast over ATM Point-to-Multipoint Virtual Connections	No	No	No	No	No	No	No	No	No
IP Multicast over Token Ring LANs	No	No	No	No	No	No	No	No	No
PIM Version 2	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Stub IP Multicast Routing	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Quality of Service									
RTP Header Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security									
Additional Vendor-Proprietary RADIUS Attributes	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Cisco IOS Firewall: Context-Based Access Control	No	No	No	No	No	No	No	No	No
Certificate Authority Interoperability	No	No	No	No	Yes	No	No	No	No
Double Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encrypted Kerberized Telnet	No	No	No	No	No	No	No	No	No
HTTP Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	No	No	Yes	Yes	Yes	No	No	No	No
IPSec Network Security	No	No	Yes	Yes	Yes	No	No	No	No
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-User Configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reflexive Access Lists	No	No	No	No	No	No	No	No	No

Table 6 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
TCP Intercept	No	No	No	No	No	No	No	No	No
Vendor-Proprietary RADIUS Attributes	No	No	No	No	No	No	No	No	No
Switching									
AppleTalk Routing over ISL and IEEE 802.10 in Virtual LANs	No	No	No	No	No	No	No	No	No
CLNS and DECnet Fast Switching over PPP	No	No	No	No	No	No	No	No	No
DECnet/VINES/XNS over ISL, includes: — Banyan VINES Routing over ISL Virtual LANs — DECnet Routing over ISL Virtual LANs — XNS Routing over ISL Virtual LANs	No	No	No	No	No	No	No	No	No
Fast-Switched Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPX Routing over ISL Virtual LANs	No	No	No	No	No	No	No	No	No
VIP Distributed Switching Support for IP Encapsulated in ISL	No	No	No	No	No	No	No	No	No
Terminal Services									
Virtual Templates for Protocol Translation	No	No	No	No	No	No	No	No	No
WAN Optimization									
ATM MIB Enhancements	No	No	No	No	No	No	No	No	No
PAD Enhancements	No	No	No	No	No	No	No	No	No
PAD Subaddressing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WAN Services									
Always On/Dynamic ISDN (AO/DI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth Allocation Control Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Local Management Interface (ELMI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay MIB Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Router ForeSight	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Advice of Charge	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 1

Feature	Feature Set								
	IP	IP Plus	IP Plus 40 ¹	IP Plus 56 ¹	IP Plus IPSE C 56 ²	IP/IPX	IP/IPX Plus	IP/IPX/ AT/IBM	IP/IPX/ AT/IBM Plus
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	No	No	No	No	No	No	No	No	No
Layer 2 Forwarding—Fast Switching	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Leased Line ISDN at 128 kbps	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Microsoft Point-to-Point Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPP over ATM	No	No	No	No	No	No	No	No	No
Stackable Home Gateway	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Telnet Extensions for Dialout	No	No	No	No	No	No	No	No	No
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	No	No	No	No	No	No	No	No	No
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.28 Emulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. This image is not available in Releases 11.3(1)T and 11.3(2)T. It is available in Release 11.3(3)T and later 11.3 T releases.

2. This image is available in Release 11.3(3)T and later releases.

Table 7 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE-WALL ²	IP/ IPX/ FIRE-WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
IBM Support							
APPN High Performance Routing	No	No	No	No	No	No	No
APPN MIB Enhancements	No	No	No	No	No	No	No
APPN over Ethernet LAN Emulation	No	No	No	No	No	No	No
APPN Scalability Enhancements	No	No	No	No	No	No	No
Bisync Enhancements, includes: — Bisync 3780 Support — BSC Extended Addressing — Block Serial Tunneling (BSTUN) over Frame Relay	Yes	Yes	Yes	No	No	Yes	Yes
Cisco MultiPath Channel (CMPC)	No	No	No	No	No	No	No

Table 7 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
DLSw+ Enhancements, includes: — Backup Peer Extensions for Encapsulation Types — DLSw+ Border Peer Caching — DLSw+ MIB Enhancements — DLSw+ SNA Type of Service — LLC2-to-SDLC Conversion between PU4 Devices — NetBIOS Dial-on-Demand Routing — UDP Unicast Enhancement	Yes	Yes	Yes	No	No	Yes	Yes
FRAS Enhancements, includes: — FRAS Boundary Network Node Enhancement — FRAS Dial Backup over DLSw+ — FRAS DLCI Backup — FRAS Host — FRAS MIB — SRB over Frame Relay	Yes	Yes	Yes	No	No	Yes	Yes
RIF Passthru in DLSw+	Yes	Yes	Yes	No	No	Yes	Yes
SRB over FDDI on Cisco 4000, 4500, and 4700 Series Routers	No	No	No	No	No	No	No
TN3270 LU Nailing	No	No	No	No	No	No	No
TN3270 Server Enhancements	No	No	No	No	No	No	No
Token Ring LANE	No	No	No	No	No	No	No
Tunneling of Asynchronous Security Protocols	Yes	Yes	Yes	No	No	Yes	Yes
Internet							
DRP Server Agent	No	No	No	No	No	No	No
IP Routing							
Easy IP (Phase 1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hot Standby Router Protocol (HSRP) over ISL in Virtual LAN Configurations	No	No	No	No	No	No	No
IP Enhanced IGRP Route Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
TCP Enhancements, includes: — TCP Selective Acknowledgment — TCP Timestamp	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAN Support							
AppleTalk Access List Enhancements	Yes	Yes	Yes	No	No	Yes	Yes
DECnet Accounting	No	No	No	No	No	No	No
IPX Named Access Lists	Yes	Yes	Yes	No	Yes	Yes	Yes
IPX SAP-after-RIP	Yes	Yes	Yes	No	Yes	Yes	Yes
NLSP Enhancements	Yes	Yes	Yes	No	Yes	Yes	Yes
NLSP Multicast Support	Yes	Yes	Yes	No	Yes	Yes	Yes
Management							
Cisco Call History MIB Command Line Interface	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cisco IOS Internationalization	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entity MIB, Phase 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMPv2C	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Virtual Profiles	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VPDN MIB and Syslog Facility	Yes	Yes	Yes	No	Yes	Yes	Yes
Multimedia							
IP Multicast Load Splitting across Equal-Cost Paths	Yes	Yes	Yes	No	Yes	Yes	Yes
IP Multicast over ATM Point-to-Multipoint Virtual Connections	No	No	No	No	No	No	No
IP Multicast over Token Ring LANs	No	No	No	No	No	No	No
PIM Version 2	Yes	Yes	Yes	No	Yes	Yes	Yes
Stub IP Multicast Routing	Yes	Yes	Yes	No	Yes	Yes	Yes
Quality of Service							
RTP Header Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Security							
Additional Vendor-Proprietary RADIUS Attributes	Yes	Yes	Yes	No	Yes	Yes	Yes
Cisco IOS Firewall: Context-Based Access Control	No	No	No	Yes	Yes	Yes	Yes

Table 7 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
Certificate Authority Interoperability	No	No	Yes	No	No	No	Yes
Double Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Encrypted Kerberized Telnet	No	No	No	No	No	No	No
HTTP Security	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Internet Key Exchange Security Protocol	Yes	Yes	Yes	No	No	Yes	Yes
IPSec Network Security	Yes	Yes	Yes	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-User Configuration	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reflexive Access Lists	No	No	No	No	No	No	No
TCP Intercept	No	No	No	No	No	No	No
Vendor-Proprietary RADIUS Attributes	No	No	No	No	No	No	No
Switching							
AppleTalk Routing over ISL and IEEE 802.10 in Virtual LANs	No	No	No	No	No	No	No
CLNS and DECnet Fast Switching over PPP	No	No	No	No	No	No	No
DECnet/VINES/XNS over ISL, includes: — Banyan VINES Routing over ISL Virtual LANs — DECnet Routing over ISL Virtual LANs — XNS Routing over ISL Virtual LANs	No	No	No	No	No	No	No
Fast-Switched Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPX Routing over ISL Virtual LANs	No	No	No	No	No	No	No
VIP Distributed Switching Support for IP Encapsulated in ISL	No	No	No	No	No	No	No
Terminal Services							
Virtual Templates for Protocol Translation	No	No	No	No	No	No	No
WAN Optimization							
ATM MIB Enhancements	No	No	No	No	No	No	No
PAD Enhancements	No	No	No	No	No	No	No

Table 7 Cisco IOS Software Feature Sets for the Cisco 1605-R Routers, Part 2

Feature	Feature Set						
	IP/IPX/ AT/IBM Plus 40 ¹	IP/IPX/ AT/IBM Plus 56 ¹	IP/IPX/ AT/IBM Plus IPSEC 56 ²	IP/ FIRE- WALL ²	IP/ IPX/ FIRE- WALL Plus ²	IP/IPX/ AT/IBM/FW Plus 56 ²	IP/IPX/ AT/IBM/ FIREWAL Plus IPSEC 56 ²
PAD Subaddressing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
WAN Services							
Always On/Dynamic ISDN (AO/DI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth Allocation Control Protocol	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dialer Watch	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced Local Management Interface (ELMI)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay MIB Extensions	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay Router ForeSight	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Advice of Charge	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ISDN NFAS	No	No	No	No	No	No	No
Layer 2 Forwarding—Fast Switching	Yes	Yes	Yes	No	Yes	Yes	Yes
Leased Line ISDN at 128 kbps	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Microsoft Point-to-Point Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MS Callback	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPP over ATM	No	No	No	No	No	No	No
Stackable Home Gateway	Yes	Yes	Yes	No	Yes	Yes	Yes
Telnet Extensions for Dialout	No	No	No	No	No	No	No
X.25 Enhancements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.25 on ISDN	No	No	No	No	No	No	No
X.25 Switching between PVCs and SVCs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
X.28 Emulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes

1. This image is not available in Releases 11.3(1)T and 11.3(2)T. It is available in Release 11.3(3)T and later 11.3 T releases.

2. This image is available in Release 11.3(3)T and later releases.

Loading Cisco IOS Release 11.3 Software on CiscoPro Routers

The RSL has an upgrade utility to permanently modify a CiscoPro router so that it accepts Cisco IOS Release 11.3 software images. The utility changes the router SysObjectID Simple Network Management Protocol (SNMP) MIB value (used for network management) to that of a Cisco router. The software banner also changes and no longer identifies the router as a CiscoPro product.

Note After this upgrade, CiscoVision cannot recognize your router. If you choose the permanent upgrade, CiscoWorks for Windows is a recommended replacement for network management purposes. To upgrade your CiscoVision software to CiscoWorks Windows 2.1, order one of the following: CPW-CVCW-U to Upgrade CiscoVision to CiscoWorks Windows (managing up to 50 nodes) or CPW-CVCW-ENT-U to Upgrade CiscoVision to CiscoWorks Windows (managing up to 500 nodes). For general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

If you select a Cisco IOS Release 11.3 image from the image list and are connected to a CiscoPro CPA1600 series router, a message box tells you that the router requires a permanent upgrade to load this image. You can either select **yes** to have the RSL upgrade the router and continue loading the selected image or select **no** to cancel the load operation.

After you select **yes**, the RSL utility downloads, performs the upgrade, reboots the router, and issues a message to confirm the upgrade. Confirm this message. The RSL then downloads the selected image.

The upgrade utility must be located in the Images directory. If it is not, the upgrade utility informs you that the image is not present.

The Cisco 1600 series upgrade utility filename is `cpa1600-upgrade-l.112-3.P`. The upgrade utility is a special file, not a Cisco IOS run-time image. RSL only installs valid software releases on Cisco 1600 routers.

Installing Software Images Using RSL

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

Recovering From a Connection Error

Try increasing the Short Timeout value in the Options dialog box if you receive the following message when trying to connect to the router:

```
"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."
```

This connection recovery method is particularly applicable when you are connecting to one of the following devices:

- A router that has a large configuration file.
- A Cisco AS5200. Note that a Cisco AS5200 requires up to 45 seconds to write a configuration to nonvolatile random-access memory (NVRAM) due to the number 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 the RSL to connect to the target router.

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 enter **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.

Helpful Hints

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 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 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 issue 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 1600 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 auxiliary
port for this download is strongly recommended.
During the course of the download no exec input/output will be
available.
                                     ---- *----- ----
Proceed? [confirm]y
Use crc block checksumming? [confirm]y
Max Retry Count [10]:
Perform image validation checks? [confirm]y
Xmodem download using crc checksumming with image validation
Continue? [confirm]y
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? c3620-i-mz.0918
Erase flash device before writing? [confirm]y
Flash contains files. Are you sure you want to erase? [confirm]y

Copy '' from server
  as 'c3620-i-mz.0918' into Flash WITH erase? [yes/no]y
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 an rcp server. Use the RSL or the TFTP server included on the feature pack CD-ROM to install the router software only 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, and substitute rcp for TFTP in the instructions. 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** 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 that includes a check box beside the word Server. To configure the local PC as a server, select this check box.

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 also applies if you are using rcp instead of TFTP.

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 25, 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
```

Note If you are upgrading a CiscoPro CPA1600 series router running from an image in Flash memory, the router reloads to ROM monitor mode because of an interaction between the Flash Load Helper and the cpa1600-upgrade-l.112-3.P image.

Step 7 Enter **yes** in response to the prompt asking if the system configuration has been modified:

```
# 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 If you are *not* upgrading a CiscoPro CPA1600 router, go to Step 19.

Step 11 At the router prompt, enter the following command to copy the router upgrade utility from the PC CD-ROM drive to the router:

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

Note If you are using rcp, enter **copy rcp flash** instead.

Step 12 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 the router. (Note that you can obtain your PC IP address from the DOS prompt in the windows directory by entering **winipcfg**, as follows: C:\WINDOWS> **winipcfg**.)

Step 13 When prompted, enter the filename of the image to be copied to the router as in the following example:

```
Source file name? cpa1600-upgrade-1.112-3.P
```

Note The upgrade image file on the Feature Pack CD has a long filename (cpa1600-upgrade-1.112-3.P); note that DOS displays it in 8.3 format as cpa1600~1.P. The upgrade utility is a special file, not a Cisco IOS run-time image.

Step 14 In response to the following prompt, enter the destination filename, and press Enter.

```
Destination file name [cpa1600-upgrade-1.112-3.P]?  
cpa1600-upgrade-1.112-3.P
```

(This is the name of the image file on the router, not the full pathname of the image on the PC CD-ROM.)

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

If the file is not found, check the following:

- The filename is correct.
- The TFTP server is enabled.
- The correct root directory is selected.
- There is IP connectivity between the router and TFTP server.

If the file is still not found, create a temporary directory called C:\temp and copy the CiscoPro upgrade file into the directory. Select the C:\temp directory as the root directory.

Step 15 Enter **yes** in response to the prompt asking if you want to erase the existing image 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. If you see three or more periods (...), the transfer might fail. If the transfer fails, use the **ping** command to check IP connectivity between the router and TFTP server.

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

```
Router (boot) # reload
```

Do not save the configuration.

After reload is complete, your CiscoPro router has been upgraded to a Cisco Enterprise router. Because the original Cisco IOS image that resided in Flash memory was erased during the upgrade process, the router is now running in bootstrap mode.

- Step 17** If the password prompt appears, enter the password.

```
Password: <password>
```

- Step 18** At the router prompt, enter **enable** and then the password:

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

- Step 19** 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 11.3 images that you want installed on your router.

- Step 20** 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 21** When prompted, enter the filename of the Cisco IOS Release 11.3 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 1600 series routers (as shown in Table 2 in the section, “Cisco Feature Pack and Memory Descriptions”).

- Step 22** 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 2 in the section, “Cisco Feature Pack and Memory Descriptions” for the UNIX image filename.

```
Destination file name [80153209.bin]? c1600-i-1
```

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

- Step 23** 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 24** 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 25 Enter the **reload** command to reload the router:

```
Router# reload
```



Caution If you upgraded a CiscoPro CPA1600 router, do not save the configuration when prompted.

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

Related Documentation

All documents mentioned in this section are available in printed or electronic format. (See the section “Online Navigation” for more information on accessing electronic documentation.)

The following sections describe the documentation related to these release notes:

- Cisco 1600 Series-Specific Documentation
- Cisco IOS Documentation Set and Related Supporting Documents
- Software Configuration Tips on the Cisco TAC Home Page

Cisco 1600 Series-Specific Documentation

The following documents are specific to the Cisco 1600 series routers:

- *Cisco 1600 Series Hardware Installation Guide*
- *Cisco 1600 Series Software Configuration Guide*
- *Installing WAN Interface Cards in Cisco 1600 Series Routers*
- *Cisco 1600 Series Router Configuration Notes*
- *Regulatory Compliance and Safety Information for the Cisco 1600*

Cisco IOS Documentation Set and Related Supporting Documents

The following documents apply to the Cisco 1600 series routers:

- *Release Notes for Cisco IOS Release 11.3*
- Product-Specific Release Notes
- *Cisco IOS 11.3 Dial Solutions Quick Configuration Guide*
- Cisco IOS Release 11.3 Configuration Guides, Command References
- Cisco IOS 11.3 T New Features
- *Cisco IOS 11.3 Command Summary*
- *Cisco IOS 11.3 System Error Messages*
- *Debug Command Reference*
- *Access Services Quick Configuration Guide*
- *Cisco IOS Software Release 11.3 and 11.3 T Caveats*

- *CIP Microcode Release Note and Upgrade Instructions*
- *Cisco IOS 11.3 Debug Command Reference*

Note Due to a production problem, many source-route bridging commands were omitted from the printed version of the *Cisco IOS Software Command Summary* (78-4746-01, DOC-CIOSCS11.3=). For complete documentation of all source-route bridging commands, refer to the *Bridging and IBM Networking Command Reference* (78-4743-01). You can also obtain the most current documentation on the Documentation CD-ROM or Cisco Connection Online (CCO).

The Cisco IOS configuration guides, command references, and chapter topics are as follows:

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Configuration Fundamentals Configuration Guide</i> • <i>Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management Interface Configuration System Management
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 1</i> • <i>Network Protocols Command Reference, Part 1</i> 	IP Addressing IP Services IP Routing Protocols
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 2</i> • <i>Network Protocols Command Reference, Part 2</i> 	AppleTalk Novell IPX
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 3</i> • <i>Network Protocols Command Reference, Part 3</i> 	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Security Configuration Guide</i> • <i>Security Command Reference</i> 	AAA Security Services Security Server Protocols Traffic Filtering Network Data Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Dial Solutions Configuration Guide</i> • <i>Dial Solutions Command Reference</i> 	Dial Business Solutions and Examples Dial-In Port Setup DDR and Dial Backup Remote Node and Terminal Service Cost-Control and Large-Scale Dial Solutions VPDN
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	Switching Paths for IP Networks <ul style="list-style-type: none"> • Fast Switching • Autonomous Switching • NetFlow Switching • Optimum Switching Virtual LAN (VLAN) Switching and Routing <ul style="list-style-type: none"> • Inter-Switch Link Protocol Encapsulation • IEEE 802.10 Encapsulation • LAN Emulation
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</i> 	Transparent Bridging Source-Route Bridging 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 NCIA Client/Server Topologies IBM Channel Attach
<ul style="list-style-type: none"> • <i>Cisco IOS Software Command Summary</i> • <i>Dial Solutions Quick Configuration Guide</i> • <i>System Error Messages</i> • <i>Debug Command Reference</i> 	

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*, select *Software Center*, and click *Network Management Products*. Next, select *Cisco Network Management Toolkit*, and click *Cisco MIBs*.

Software Configuration Tips on the Cisco TAC Home Page

The following URL contains links to access helpful 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 <http://www.cisco.com/>, and follow this path: *Software & Support*, *Technical Tips* (button on left margin).

“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:

- **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.

Online Navigation

The Cisco IOS software documentation set is available as printed manuals or electronic documents. You can access Cisco 1600 series-specific documentation and Cisco IOS software documentation at Cisco Connection Online (CCO) on the World Wide Web and on the Cisco Documentation CD-ROM:

- Cisco 1600 series manuals and configuration notes:
 - Using a web browser, go to <http://www.cisco.com/>, click *Products & Ordering*, select *Cisco Documentation*, go to *Access Servers and Access Routers*, select *Modular Access Routers*, and click *Cisco 1600 Series Routers*.
 - On the Documentation CD-ROM, go to *Cisco Product Documentation*, select *Access Servers and Access Routers*, go to *Modular Access Routers*, and click *Cisco 1600 Series Routers*.

- Cisco IOS documentation set and supporting documents:
 - On the Documentation CD-ROM, go to *Cisco Product Documentation*, select *Cisco IOS Software Configuration*, and then select *Cisco IOS Release 11.3*.
 - On CCO, go to *Software and Support*, and select *Documentation*. Next, select *Documentation*, click *Cisco IOS Software Configuration*, and then click *Cisco IOS Release 11.3*.

For additional information about the Documentation CD-ROM and CCO, refer to the sections “Cisco Connection Online” and “Documentation CD-ROM” at the end of these release notes.

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.

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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.

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This document is to be used in conjunction with the Cisco IOS configuration guide and command reference publications.

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