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Release Notes for Cisco IOS Release 11.2(11) Software Feature Packs for Cisco 2500 Series Routers

January 26, 1998

These release notes describe the Cisco Internetwork Operating System (Cisco IOS) Release 11.2(11)P feature packs for Cisco 2500 series routers. This document contains the following sections:

- Platforms Supported on page 1
- What Is a Feature Pack? on page 2
- Using Cisco Feature Packs on page 2
- Loading Cisco IOS Release 11.2 Software on CiscoPro Routers on page 16
- Installation Tips on page 17
- Installing the Router Software Using a TFTP Server Application on page 18
- Related Documentation on page 22
- Cisco Connection Online on page 24

Platforms Supported

The RSL supports the following Cisco 2500 series routers:

- CiscoPro CPA2501, CPA2502, CPA2503, CPA2504, CPA2505, CPA2507, CPA2509, CPA2511, CPA2513, CPA2514, CPA2516, CPA2520, CPA2521, CPA2522, CPA2523, and CPA2524
- Cisco 2501, 2502, 2503, 2504, 2505, 2507, 2509, AS2509-RJ, 2510, 2511, AS2511-RJ, 2512, 2513, 2514, 2515, 2516, 2520, 2521, 2522, 2523, 2524, and 2525

Note The Cisco AS2509-RJ and AS2511-RJ only support software images for Cisco IOS Release 11.2(5)P or later.

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA

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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 11.2 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 “Installing the Router Software Using a TFTP Server Application” section of this document.

Note The RSL is designed to work with a PC running Microsoft Windows 95 and is the recommended method for downloading software from the CD-ROM to the router.

Each Cisco IOS Release 11.2 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, “Installation Tips” on page 17. 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 the following sections 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 in the section “Product Numbers” 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 Use Table 3 and Table 4 in the section “Cisco IOS Release 11.2(11)P Feature Sets” to identify which features are supported for a feature set on a specific platform.
- 4 Check the memory required for your feature set against Table 5 in the section “Upgrading Cisco 2500 Memory” to determine the factory-default memory on the router and the available memory upgrades.

Product Numbers

Table 1 lists the Cisco product numbers for the supported feature packs.

Table 1 Feature Pack Product Numbers

Product Number	Feature Pack Description
CD25-C-11.2=	Cisco 2500 IP Feature Pack
CD25-CH-11.2=	Cisco 2500 IP Firewall Feature Pack
CD25-CP/E-11.2=	Cisco 2500 IP Plus Feature Pack
CD25-CW-11.2=	Cisco 2500 IP Plus 40 Feature Pack
CD25-CY-11.2=	Cisco 2500 IP Plus 56 Feature Pack
CD25-B-11.2=	Cisco 2500 IP/IPX/AT/DEC Feature Pack
CD25-BP-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus Feature Pack
CD25-BHP-11.2=	Cisco 2500 IP/IPX/AT/DEC/Firewall Plus Feature Pack
CD25-BW-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus 40 Feature Pack
CD25-BY-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus 56 Feature Pack
CD25-A-11.2=	Cisco 2500 Enterprise Feature Pack
CD25-AP-11.2=	Cisco 2500 Enterprise Plus Feature Pack
CD25-AW-11.2=	Cisco 2500 Enterprise Plus 40 Feature Pack
CD25-AY-11.2=	Cisco 2500 Enterprise Plus 56 Feature Pack
CD25-AHY-11.2=	Cisco 2500 Enterprise/Firewall Plus 56 Feature Pack

Note The feature packs listed here contain Cisco IOS Release 11.2(11)P software images, a selection of earlier images, and Router Software Loader (RSL) Version 6.0.

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.

Table 2 Cisco 2500 Series Feature Packs

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD25-C-11.2=	Cisco 2500 IP Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-i-l.110-18	80031718	8 MB	4 MB	Cisco 2500 IOS IP Feature Set 11.0(18)
		c2500-i-l.112-9	80135409	8 MB	4 MB	Cisco 2500 IOS IP Feature Set 11.2(9)
		c2500-i-l.112-11.P	80135411	8 MB	4 MB	Cisco 2500 IOS IP Feature Set 11.2(11)P

Using Cisco Feature Packs

Table 2 Cisco 2500 Series Feature Packs (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD25-CH-11.2=	Cisco 2500 IP/Firewall Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-io-l.112-11.P	80246301	8 MB	4 MB	Cisco 2500 IOS IP/Firewall Feature Set 11.2(11)P
CD25-CP/E-11.2=	Cisco 2500 IP Plus Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-ir-l.110-18	80031718	8 MB	4 MB	Cisco 2500 IOS IP/IBM Feature Set 11.0(18)
		igs-cd-l.110-18	80032018	8 MB	4 MB	
	(Includes IP/IBM & RAS)	c2500-is-l.112-9	80135509	8 MB	4 MB	Cisco 2500 IOS IP Plus Feature Set 11.2(9)
		c2500-c-l.112-9	80146009	8 MB	4 MB	
		c2500-is-l.112-11.P	80135511	8 MB	4 MB	Cisco 2500 IOS IP Plus Feature Set 11.2(11)P
		c2500-c-l.112-11.P	80146011	8 MB	4 MB	
CD25-CW-11.2=	Cisco 2500 IP Plus 40 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-is40-l.112-7a	80115007	8 MB	4 MB	Cisco 2500 IOS IP Plus 40 Feature Set 11.2(7a)
		c2500-is40-l.112-9	80115009	8 MB	4 MB	Cisco 2500 IOS IP Plus 40 Feature Set 11.2(9)
		c2500-is40-l.112-11.P	80135611	8 MB	4 MB	Cisco 2500 IOS IP Plus 40 Feature Set 11.2(11)P
CD25-CY-11.2=	Cisco 2500 IP Plus 56 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-is56-l.112-7a	80115107	8 MB	4 MB	Cisco 2500 IOS IP Plus 56 Feature Set 11.2(7a)
		c2500-is56-l.112-9	80115109	8 MB	4 MB	Cisco 2500 IOS IP Plus 56 Feature Set 11.2(9)
		c2500-is56-l.112-11.P	80135711	8 MB	4 MB	Cisco 2500 IOS IP Plus 56 Feature Set 11.2(11)P
CD25-B-11.2=	Cisco 2500 IP/IPX/AT/DEC Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-d-l.110-18	80031118	8 MB	4 MB	Cisco 2500 IOS IP/IPX/AppleTalk Feature Set 11.0(18)
		c2500-d-l.112-9	80114109	8 MB	4 MB	Cisco 2500 IOS IP/IPX/AppleTalk/DEC Feature Set 11.2(9)
		c2500-d-l.112-11.P	80135011	8 MB	4 MB	Cisco 2500 IOS IP/IPX/AppleTalk/DEC Feature Set 11.2(11)P

Table 2 Cisco 2500 Series Feature Packs (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD25-BP-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-dr-l.110-18	80031118	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/IBM Feature Set 11.0(18)
		c2500-ds-l.112-9	80114109	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus Feature Set 11.2(9)
		c2500-ds-l.112-11.P	80135011	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus Feature Set 11.2(11)P
CD25-BHP-11.2=	Cisco 2500 IP/IPX/AT/DEC/Firewall Plus Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-dos-l.112-11.P	80246201	16 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC/Firewall Plus Feature Set 11.2(11)P
CD25-BW-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus 40 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-ds40-l.112-7a	80114307	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 40 Feature Set 11.2(7a)
		c2500-ds40-l.112-9	80114309	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 40 Feature Set 11.2(9)
		c2500-ds40-l.112-11.P	80135211	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 40 Feature Set 11.2(11)P
CD25-BY-11.2=	Cisco 2500 IP/IPX/AT/DEC Plus 56 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-ds56-l.112-7a	80114407	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 56 Feature Set 11.2(7a)
		c2500-ds56-l.112-9	80114409	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 56 Feature Set 11.2(9)
		c2500-ds56-l.112-11.P	80135311	8 MB	4 MB	Cisco 2500 IOS IP/IPX/Apple Talk/DEC Plus 56 Feature Set 11.2(11)P

Table 2 Cisco 2500 Series Feature Packs (Continued)

Product Number	CD-ROM Title	Image Name (UNIX)	Image Name (DOS)	Flash Memory Required	Main Memory Required	RSL Installer Description
CD25-A-11.2=	Cisco 2500 Enterprise Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-j-l.110-18	80030918	8 MB	6 MB	Cisco 2500 IOS Enterprise Feature Set 11.0(18)
		c2500-j-l.112-9	80135809	8 MB	6 MB	Cisco 2500 IOS Enterprise Feature Set 11.2(9)
		c2500-j-l.112-11.P	80135811	8 MB	6 MB	Cisco 2500 IOS Enterprise Feature Set 11.2(11)P
CD25-AP-11.2=	Cisco 2500 Enterprise Plus Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	igs-j-l.110-18	80030918	8 MB	6 MB	Cisco 2500 IOS Enterprise Feature Set 11.0(18)
		c2500-js-l.112-9	80115209	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus Feature Set 11.2(9)
		c2500-js-l.112-11.P	80135911	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus Feature Set 11.2(11)P
CD25-AW-11.2=	Cisco 2500 Enterprise Plus 40 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-js40-l.112-7a	80115507	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 40 Feature Set 11.2(7a)
		c2500-js40-l.112-9	80115509	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 40 Feature Set 11.2(9)
		c2500-js40-l.112-11.P	80136011	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 40 Feature Set 11.2(11)P
CD25-AY-11.2=	Cisco 2500 Enterprise Plus 56 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-js56-l.112-7a	80115607	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 56 Feature Set 11.2(7a)
		c2500-js56-l.112-9	80115609	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 56 Feature Set 11.2(9)
		c2500-js56-l.112-11.P	80136111	8 MB	6 MB	Cisco 2500 IOS Enterprise Plus 56 Feature Set 11.2(11)P
CD25-AHY-11.2=	Cisco 2500 Enterprise/Firewall Plus 56 Feature Pack Release 11.2(11)P Router Software Loader Version 6.0	c2500-jos56-I. 112-11.P	80246101	8 MB	16 MB	Cisco 2500 IOS Enterprise/Firewall Plus 56 Feature Set 11.2(11)P

Cisco IOS Release 11.2(11)P Feature Sets

Table 3 and Table 4 list Cisco IOS software feature sets available in Cisco IOS Release 11.2(11)P. These features are available in specific features sets on specific platforms.

Table 3 and Table 4 use these feature set matrix symbols to identify features:

Feature Set Matrix Symbol	Description
Basic	This feature is offered in the basic feature set.
—	This feature is not offered in the feature set.
Plus	This feature is offered in the Plus feature set, not in the basic feature set.
Encrypt	This feature is offered in the encryption feature sets, which consist of 40-bit (Plus 40) or 56-bit (Plus 56) data encryption feature sets.

Cisco IOS images with 40-bit Data Encryption Standard (DES) support may legally be distributed to any party eligible to receive Cisco IOS software. 40-bit DES is not a cryptographically strong solution and should not be used to protect sensitive data.

Cisco IOS images with 56-bit DES are subject to International Traffic in Arms Regulations (ITAR) controls and have a limited distribution. Images to be installed outside the U.S. require an export license. Customer orders may be denied or subject to delay because of U.S. government regulations. Contact your sales representative or distributor for more information, or send e-mail to export@cisco.com.

Table 3 Cisco 2500 Series Software Feature Sets—Part 1

Feature	Feature Set			
	IP Routing	IP/IPX/IBM/APPN ¹	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise ²
LAN Support				
Apollo Domain	—	—	—	Basic
AppleTalk 1 and 2 ³	—	—	Basic	Basic
Banyan VINES	—	—	—	Basic
Concurrent routing and bridging (CRB)	Basic	Basic	Basic	Basic
DECnet IV	—	—	Basic	Basic
DECnet V	—	—	—	Basic
GRE	Basic	Basic	Basic	Basic
Integrated routing and bridging (IRB) ⁴	Basic	Basic	Basic	Basic
IP	Basic	Basic	Basic	Basic
LAN extension host	Basic	Basic	Basic	Basic
Multiring	Basic	Basic	Basic	Basic
Novell IPX ⁵	—	Basic	Basic	Basic
OSI	—	—	—	Basic
Source-route bridging ⁶	—	—	—	—
Transparent and translational bridging	Basic	Basic	Basic	Basic

Table 3 Cisco 2500 Series Software Feature Sets—Part 1 (Continued)

Feature	Feature Set			Enterprise ²
	IP Routing	IP/IPX/IBM/APPN ¹	Desktop (IP/IPX/AppleTalk/DEC)	
XNS	—	—	—	Basic
WAN Services				
Combinet Packet Protocol (CPP)	Basic	Basic	Basic	Basic
Dialer profiles	Basic	Basic	Basic	Basic
Frame Relay	Basic	Basic	Basic	Basic
Frame Relay SVC Support (DTE)	—	—	—	Basic
Frame Relay traffic shaping	Basic	Basic	Basic	Basic
Half bridge/half router for CPP and PPP	Basic	Basic	Basic	Basic
HDLC	Basic	Basic	Basic	Basic
IPXWAN 2.0	—	Basic	Basic	Basic
ISDN ⁷	Basic	Basic	Basic	Basic
Multichassis Multilink PPP (MMP)	—	—	—	Basic
NetBEUI over PPP	—	—	—	Basic
PPP ⁸	Basic	Basic	Basic	Basic
SMDS	Basic	Basic	Basic	Basic
Switched 56	Basic	Basic	Basic	Basic
Virtual Private Dial-up Network (VPDN)	—	—	Basic	Basic
IOS WCCP Support	Basic	Basic	Basic	Basic
X.25 ⁹	Basic	Basic	Basic	Basic
WAN Optimization				
Bandwidth-on-demand	Basic	Basic	Basic	Basic
Custom and priority queuing	Basic	Basic	Basic	Basic
Dial backup	Basic	Basic	Basic	Basic
Dial-on-demand	Basic	Basic	Basic	Basic
Header ¹⁰ , link and payload compression	Basic	Basic	Basic	Basic
Snapshot routing	Basic	Basic	Basic	Basic
Weighted fair queuing	Basic	Basic	Basic	Basic
IP Routing				
BGP	Basic	Basic	Basic	Basic
BGP4 ¹¹	Basic	Basic	Basic	Basic
EGP	Basic	Basic	Basic	Basic
Enhanced IGRP	Basic	Basic	Basic	Basic
Enhanced IGRP Optimizations	Basic	Basic	Basic	Basic
ES-IS	—	—	—	Basic
IGRP	Basic	Basic	Basic	Basic
IS-IS	—	—	—	Basic
Named IP Access Control List	Basic	Basic	Basic	Basic

Table 3 Cisco 2500 Series Software Feature Sets—Part 1 (Continued)

Feature	Feature Set			
	IP Routing	IP/IPX/IBM/APPN ¹	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise ²
Network Address Translation (NAT)	Plus	—	Plus	Plus
NHRP	Basic	Basic	Basic	Basic
On Demand Routing (ODR)	Basic	Basic	Basic	Basic
OSPF	Basic	Basic	Basic	Basic
OSPF Not-So-Stubby-Areas (NSSA)	Basic	Basic	Basic	Basic
OSPF On Demand Circuit (RFC 1793)	Basic	Basic	Basic	Basic
PIM	Basic	Basic	Basic	Basic
Policy-based routing	Basic	Basic	Basic	Basic
RIP	Basic	Basic	Basic	Basic
RIP Version 2	Basic	Basic	Basic	Basic
Other Routing				
AURP	—	—	Basic	Basic
IPX RIP	—	Basic	Basic	Basic
NLSP	—	Basic	Basic	Basic
RTMP	—	—	Basic	Basic
SMRP	—	—	Basic	Basic
S RTP	—	—	—	Basic
Multimedia and Quality of Service				
Generic traffic shaping	Basic	Basic	Basic	Basic
Random Early Detection (RED)	Basic	Basic	Basic	Basic
Resource Reservation Protocol (RSVP) ¹²	Basic	Basic	Basic	Basic
Management				
AutoInstall	Basic	Basic	Basic	Basic
Automatic modem configuration	Basic	Basic	Basic	Basic
HTTP Server	Basic	Basic	Basic	Basic
RMON events and alarms ¹³	Basic	Basic	Basic	Basic
RMON full	Plus	Plus	Plus	Plus
SNMP	Basic	Basic	Basic	Basic
Telnet	Basic	Basic	Basic	Basic
Security				
Access lists	Basic	Basic	Basic	Basic
Access security	Basic	Basic	Basic	Basic
Extended access lists	Basic	Basic	Basic	Basic
Kerberized login	—	—	—	Basic
Kerberos V client support	—	—	—	Basic
Lock and key	Basic	Basic	Basic	Basic

Table 3 Cisco 2500 Series Software Feature Sets—Part 1 (Continued)

Feature	Feature Set			
	IP Routing	IP/IPX/IBM/APPN ¹	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise ²
MAC security for hubs ¹⁴	Basic	Basic	Basic	Basic
MD5 routing authentication	Basic	Basic	Basic	Basic
Router authentication and network layer encryption (40-bit or export controlled 56-bit DES)	Encrypt	—	Encrypt	Encrypt
RADIUS	Basic	Basic	Basic	Basic
TACACS+ ¹⁵	Basic	Basic	Basic	Basic
IBM Support				
APPN ²	—	Basic	—	Basic
BAN for SNA Frame Relay support	Plus	Basic	Plus	Basic
Bisync	Plus	Basic	Plus	Basic
Caching and filtering	Plus	Basic	Plus	Basic
DLSw+ ¹⁶	Plus	Basic	Plus	Basic
Downstream PU concentration (DSPU)	Plus	Basic	Plus	Basic
Frame Relay SNA support (RFC 1490)	Plus	Basic	Plus	Basic
Native Client Interface Architecture (NCIA) Server	Plus	Basic	Plus	Basic
NetView Native Service Point	Plus	Basic	Plus	Basic
QLLC	Plus	Basic	Plus	Basic
Response Time Reporter (RTR)	Plus	Basic	Plus	Basic
SDLC integration	Plus	Basic	Plus	Basic
SDLC transport (STUN)	Plus	Basic	Plus	Basic
SDLC-to-LAN conversion (SDLLC)	Plus	Basic	Plus	Basic
SNA and NetBIOS WAN optimization via local acknowledgment	Plus	Basic	Plus	Basic
SRB/RSRB ¹⁷	Plus	Basic	Plus	Basic
SRT	Plus	Basic	Plus	Basic
TG/COS	—	—	—	Basic
TN3270	—	—	—	Basic
Protocol Translation				
LAT	—	—	—	Basic
Rlogin	—	—	—	Basic
Remote Node				
ARAP 1.0/2.0	—	—	Basic	Basic
Asynchronous master interfaces	Basic	Basic	Basic	Basic
ATCP	—	—	Basic	Basic
CPPP	Basic	Basic	Basic	Basic
CSLIP	Basic	Basic	Basic	Basic

Table 3 Cisco 2500 Series Software Feature Sets—Part 1 (Continued)

Feature	Feature Set			
	IP Routing	IP/IPX/IBM/APPN ¹	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise ²
DHCP	Basic	Basic	Basic	Basic
IP pooling	Basic	Basic	Basic	Basic
IPX and ARAP on virtual async interfaces	—	—	—	Basic
IPXCP ¹⁰	—	Basic	Basic	Basic
MacIP	—	—	Basic	Basic
NASI	—	Basic	Basic	Basic
PPP	Basic	Basic	Basic	Basic
SLIP	Basic	Basic	Basic	Basic
Terminal Services				
LAT ¹⁸	—	—	—	Basic
Rlogin	Basic	Basic	Basic	Basic
Telnet	Basic	Basic	Basic	Basic
TN3270	—	—	—	Basic
X.25 PAD	Basic	Basic	Basic	Basic
Xremote	—	—	—	Basic

1. This feature set has no additional options. It offers a low-end APPN solution for this set of hardware platforms. This feature set is not available for AccessPro PC Cards.
2. Enterprise is available with APPN in a separate feature set. APPN includes APPN Central Registration (CRR) and APPN over DLSw+. APPN is not available on the AccessPro PC Card.
3. Includes AppleTalk load balancing.
4. IRB supports IP, IPX, and AppleTalk; it is supported for transparent bridging, but not for SRB; it is supported on all media-type interfaces except X.25 and ISDN bridged interfaces; and IRB and concurrent routing and bridging (CRB) cannot operate at the same time.
5. The Novell IPX feature includes display SAP by name, IPX Access Control List violation logging, and plain-English IPX access lists.
6. Translational bridging is fast switched by default but can be disabled.
7. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
8. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, Multilink PPP, and PPP compression.
9. X.25 includes X.25 switching.
10. IPX header compression (RFC 1553) is available in the feature sets that support IPX.
11. BGP4 includes soft configuration, multipath support, and prefix filtering with inbound route maps.
12. The RMON events and alarms groups are supported on all interfaces. Full RMON support is available with the Plus feature sets.
13. The RMON events and alarms groups are supported on all interfaces. Full RMON support is available with the Plus feature sets.
14. MAC security for hubs is applicable to the following Cisco 2500 series Ethernet hub models: Cisco 2505, Cisco 2507, Cisco 2516, and Cisco 2518.
15. TACACS+ Single Connection and TACACS+ SENDAUTH enhancements are supported.
16. Cisco IOS Release 11.2 introduces several DLSw+ enhancements available in the Plus, Plus 40, and Plus 56 feature sets.
17. SRB/RSRB is fast switched. This enhancement is on by default, but can be disabled.
18. Use of LAT requires terminal license (FR-L8-10.X= for an 8-user license or FR-L16-10.X= for a 16-user license).

Table 4 Cisco 2500 Series Software Feature Sets—Part 2

Feature	Feature Set				
	ISDN	CFRAD	LAN FRAD	OSPF LANFRAD ¹	Remote Access Server
Platforms Supported					
Cisco 2500 series routers: models 2501, 2502, 2505, 2507, 2509–2515, 2524, and 2525	—	—	—	—	—
Cisco 2503I, Cisco 2504I	Basic	—	—	—	—
Cisco 2501CF, Cisco 2502CF, Cisco 2520CF–2523CF	—	Basic	—	—	—
Cisco 2501LF, Cisco 2502LF, Cisco 2520LF–2523LF	—	—	Basic	Basic	—
Cisco 2509–2512, Cisco AS5100	—	—	—	—	Basic
LAN Support					
AppleTalk 1 and 2 ²	Basic	—	—	—	Basic
Concurrent routing and bridging (CRB)	—	—	—	—	—
DECnet IV	—	—	—	—	—
GRE	Basic	—	Basic	Basic	Basic
Integrated routing and bridging (IRB) ³	Basic	Basic	Basic	Basic	Basic
IP	Basic	Basic	Basic	Basic	Basic
Multiring	Basic	—	Basic	Basic	Basic
Novell IPX ⁴	Basic	—	Basic	Basic	Basic
Source-route bridging	—	Basic	Basic	Basic	—
Transparent bridging	—	Basic	Basic	Basic	Basic
Transparent and translational bridging ⁵	Basic	Basic	Basic	Basic	Basic
WAN Services					
Combinet Packet Protocol (CPP)	Basic	Basic	Basic	Basic	Basic
Dialer profiles	Basic	Basic	Basic	Basic	Basic
Frame Relay	—	Basic	Basic	Basic	Basic
Frame Relay traffic shaping	Basic	Basic	Basic	Basic	Basic
Half bridge/half router for CPP and PPP	Basic	Basic	Basic	Basic	Basic
HDLC	—	—	—	—	Basic
IPXWAN 2.0	—	—	Basic	Basic	Basic
ISDN ⁶	Basic	—	—	—	—
Multichassis Multilink PPP (MMP)	—	—	—	—	Basic
NetBEUI over PPP	—	—	—	—	Basic
PPP ⁷	Basic	Basic	Basic	Basic	Basic
SMDS	—	—	—	—	—
Switched 56	—	—	—	—	Basic

Table 4 Cisco 2500 Series Software Feature Sets—Part 2 (Continued)

Feature	Feature Set				
	ISDN	CFRAD	LAN FRAD	OSPF LANFRAD ¹	Remote Access Server
Virtual Private Dial-up Network (VPDN)	—	—	—	—	Basic
IOS WCCP Support	—	—	—	—	—
X.25 ⁸	—	—	—	—	Basic
WAN Optimization					
Bandwidth-on-demand ⁹	Basic	—	—	—	Basic
Custom and priority queuing	Basic	Basic	Basic	Basic	Basic
Dial backup	Basic	—	—	—	Basic
Dial-on-demand	Basic	—	—	—	Basic
Header ¹⁰ , link and payload compression ¹¹	—	Basic	Basic	Basic	Basic
Header ¹¹ and link compression	Basic	—	—	—	—
Snapshot routing	Basic	—	—	—	Basic
Weighted fair queuing	Basic	Basic	Basic	Basic	Basic
IP Routing					
BGP	Basic	—	—	—	—
BGP4 ¹²	Basic	Basic	—	—	—
EGP	Basic	—	—	—	—
Enhanced IGRP	Basic	Basic	Basic	Basic ¹³	Basic
Enhanced IGRP Optimizations	Basic	Basic	Basic	Basic ¹¹	Basic
IGRP	Basic	Basic	Basic	Basic	Basic
NHRP	Basic	—	—	—	—
On Demand Routing (ODR)	Basic	Basic	Basic	Basic	Basic
OSPF	Basic	Basic	—	Basic	—
OSPF Not-So-Stubby-Areas (NSSA)	Basic	Basic	—	Basic	—
OSPF On Demand Circuit (RFC 1793)	Basic	Basic	—	Basic	—
PIM	Basic	—	—	—	Basic
Policy-based routing	Basic	—	—	—	Basic
RIP	Basic	Basic	Basic	Basic	Basic
RIP Version 2	Basic	Basic	Basic	Basic	Basic
Other Routing					
AURP	Basic	—	—	—	Basic
IPX RIP	Basic	—	Basic	Basic	Basic
NLSP	—	—	—	—	—
RTMP	Basic	—	—	—	Basic
Multimedia and Quality of Service					
Generic traffic shaping	Basic	Basic	Basic	Basic	Basic
Random Early Detection (RED)	Basic	Basic	Basic	Basic	Basic
Resource Reservation Protocol (RSVP)	Basic	Basic	Basic	Basic	Basic

Table 4 Cisco 2500 Series Software Feature Sets—Part 2 (Continued)

Feature	Feature Set				
	ISDN	CFRAD	LAN FRAD	OSPF LANFRAD ¹	Remote Access Server
Management					
AutoInstall	—	Basic	Basic	Basic	Basic
Automatic modem configuration	—	—	—	—	Basic
HTTP Server	Basic	Basic	Basic	Basic	Basic
RMON events and alarms ¹⁴	Basic	Basic	Basic	Basic	Basic
SNMP	Basic	Basic	Basic	Basic	Basic
Telnet	Basic	Basic	Basic	Basic	Basic
Security					
Access lists	Basic	Basic	Basic	Basic	Basic
Access security	Basic	Basic	Basic	Basic	Basic
Extended access lists	Basic	Basic	Basic	Basic	Basic
Kerberos V client support	Basic	Basic	Basic	Basic	Basic
Lock and Key	Basic	Basic	Basic	Basic	Basic
MAC security for hubs ¹⁵	—	—	—	—	—
MD5 routing authentication	Basic	Basic	Basic	Basic	Basic
TACACS+ ¹⁶	Basic	Basic	Basic	Basic	Basic
IBM Support					
BAN for SNA Frame Relay support	—	Basic	Basic	Basic	—
Bisync	—	Basic	Basic	Basic	—
Caching and filtering	—	Basic	Basic	Basic	—
DLSw+ ¹⁷	—	Basic	Basic	Basic	—
Frame Relay SNA support (RFC 1490)	—	Basic	Basic	Basic	—
Native Client Interface Architecture (NICA) Server	—	—	—	—	—
NetView Native Service Point	—	Basic	Basic	Basic	—
Polled async (ADT, ADPLEX)	—	Basic	Basic	Basic	—
QLLC	—	Basic	Basic	Basic	—
DLSw (RFC 1795)	—	Basic	Basic	Basic	—
RSRB	—	Basic	—	—	—
SDLC integration	—	Basic	Basic	Basic	—
SDLC transport (STUN)	—	Basic	Basic	Basic	—
SDLC-to-LAN conversion (SDLLC)	—	Basic	Basic	Basic	—
SNA and NetBIOS WAN optimization via local acknowledgment	—	Basic	Basic	Basic	—
SRB/RSRB ¹⁸	—	—	Basic	Basic	—
SRT	—	—	Basic	Basic	—

Table 4 Cisco 2500 Series Software Feature Sets—Part 2 (Continued)

Feature	Feature Set				Remote Access Server
	ISDN	CFRAD	LAN FRAD	OSPF LANFRAD ¹	
Protocol Translation					
LAT	—	—	—	—	Basic
PPP	—	—	—	—	Basic
Rlogin	—	—	—	—	Basic
Telnet	—	—	—	—	Basic
TN3270	—	—	—	—	Basic
X.25	—	—	—	—	Basic
Remote Node¹⁹					
ARAP 1.0/2.0	—	—	—	—	Basic
Asynchronous master interfaces	—	—	—	—	Basic
ATCP	—	—	—	—	Basic
CPPP	—	—	—	—	Basic
CSLIP	—	—	—	—	Basic
DHCP	—	—	—	—	Basic
IP pooling	—	—	—	—	Basic
IPX and ARAP on virtual async interfaces	—	—	—	—	Basic
IPXCP ²⁰	—	—	—	—	Basic
MacIP	—	—	—	—	Basic
PPP	—	—	—	—	Basic
SLIP	—	—	—	—	Basic
Terminal Services¹⁹					
LAT ²¹	—	—	—	—	Basic
Rlogin	—	—	—	—	Basic
Telnet	—	—	—	—	Basic
TN3270	—	—	—	—	Basic

Table 4 Cisco 2500 Series Software Feature Sets—Part 2 (Continued)

Feature	Feature Set				Remote Access Server
	ISDN	CFRAD	LAN FRAD	OSPF LANFRAD ¹	
X.25 PAD	—	—	—	—	Basic
Xremote	—	—	—	—	Basic

1. The OSPF LANFRAD feature set is available in Release 11.2(4) and later.
2. Includes AppleTalk load balancing.
3. IRB supports IP, IPX, and AppleTalk; it is supported for transparent bridging, but not for SRB; it is supported on all media-type interfaces except X.25 and ISDN bridged interfaces; and IRB and concurrent routing and bridging (CRB) cannot operate at the same time.
4. The Novell IPX feature includes display SAP by name, IPX Access Control List violation logging, and plain-English IPX access lists.
5. Translational bridging is fast switched, but this can be disabled.
6. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
7. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, PPP compression, and Multilink PPP.
8. X.25 includes X.25 switching.
9. Bandwidth-on-demand means two B channels calls to the same destination.
10. IPX header compression (RFC 1553) is available in the feature sets that support IPX.
11. X.25 and Frame Relay payload compression.
12. BGP4 includes soft configuration, multipath support, and prefix filtering with inbound route maps.
13. Enhanced IGRP in the OSPF LANFRAD feature set is only available in Release 11.2(4).
Cisco does not support this functionality in any releases of the OSPF LANFRAD feature set, and this feature is subject to removal without notice.
14. RMON events and alarms is supported on all interfaces.
15. Applicable to the following Cisco 2500 series Ethernet hub models: Cisco 2505, Cisco 2507, Cisco 2516, and Cisco 2518.
16. TACACS+ Single Connection and TACACS+ SENDAUTH enhancements are supported.
17. Cisco IOS Release 11.2 introduces several DLSw+ enhancements available in the Plus, Plus 40, and Plus 56 feature sets.
18. SRB/RSRB is fast switched. This enhancement is on by default, but can be disabled.
19. Remote node and terminal services supported on access servers (with limited support on router auxiliary ports).
20. IPX header compression (RFC 1553) is available in the feature sets that support IPX.
21. Use of LAT requires terminal license (FR-L8-10.X= or FR-L16-10.X=).

Upgrading Cisco 2500 Memory

Table 5 describes the memory delivered by default and the available memory upgrades.

Table 5 Cisco 2500 Series Default Memory and Upgrade Options

Memory Type	Default	Upgrade Options
Flash	8 MB	4-MB upgrade: MEM4F= 8-MB upgrade: MEM8F=
Main	4 MB	8-MB upgrade: MEM8D= 16-MB upgrade: MEM16D=

Note The actual default memory configuration on your particular router might vary depending on when the router was purchased.

Loading Cisco IOS Release 11.2 Software on CiscoPro Routers

The RSL has an upgrade utility to permanently modify a CiscoPro router so that it accepts Cisco IOS Release 11.2 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.

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 2500 series upgrade utility filename is `cpa25-upgrade-l.112-3.P`.

Installation Tips

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 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.

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 of them might be deleted by the RSL. You need to manually re-enter this entry into 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**.

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 checkbox beside the word Server. To configure the local PC as a server, click this 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 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 CPA2500 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 cpa2500-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:
```

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

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

- Step 10** If you are *not* upgrading a CiscoPro CPA2500 router, skip 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? cpa2500-upgrade-1.112-3.P
```

Note The upgrade image file on the Feature Pack CD has a long filename (cpa2500-upgrade-l.112-3.P); note that DOS displays it in 8.3 format as cpa2500~1.P. The upgrade utility is a special file, not a Cisco IOS runtime image.

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

```
Destination file name [cpa2500-upgrade-1.112-3.P]?
cpa2500-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, check IP connectivity between the router and TFTP server by using the **ping** command.

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 should now be running in bootstrap mode.

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

```
Password:
```

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

```
Router (boot) # enable
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 11.2 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 11.2 image to be copied to the router, as in the following example:

```
Source file name? 80031718.bin
```

This example specifies the DOS image name of the IP feature set for Cisco 2500 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 [80031718.bin]? c2500-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 CPA2500 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

For a list of documentation related to the Cisco 2500, refer to the *Release Notes for the 2500 Series for Cisco IOS Release 11.2P*. Release notes and other Cisco documentation are on the Cisco Documentation CD-ROM and at Cisco Connection Online (CCO) on the World Wide Web:

- On the Documentation CD-ROM, go to *Cisco Product Documentation*, select *Cisco IOS Software Configuration*, and then select *Cisco IOS Release 11.2*.
- On CCO, go to <http://www.cisco.com/>, click on *Software and Support*, and select *Documentation*. Next, select *Documentation*, go to *Cisco IOS Software Configuration*, and then click on *Cisco IOS Release 11.2*.

Online documentation for Release 11.2 includes:

- Release Notes
- Feature Guides including new features for Cisco IOS Release 11.2(10)P
- Configuration Guides and Command References
- Command Summary
- System Error Messages
- MIB User Quick Reference
- Debug Command Reference
- Caveats

For Cisco IOS Release 11.2, the Cisco IOS documentation set consists of eight documentation modules. Each documentation module has a configuration guide, a command reference, and five supporting documents.

The books 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> 	<ul style="list-style-type: none"> Access Server and Router Product Overview User Interface System Images and Configuration Files Using ClickStart, AutoInstall, and Setup Interfaces System Management
<ul style="list-style-type: none"> • <i>Security Configuration Guide</i> • <i>Security Command Reference</i> 	<ul style="list-style-type: none"> Network Access Security Terminal Access Security Accounting and Billing Traffic Filters Controlling Router Access Network Data Encryption with Router Authentication
<ul style="list-style-type: none"> • <i>Access Services Configuration Guide</i> • <i>Access Services Command Reference</i> 	<ul style="list-style-type: none"> Terminal Lines and Modem Support Network Connections AppleTalk Remote Access SLIP and PPP XRemote LAT Telnet TN3270 Protocol Translation Configuring Modem Support and Chat Scripts X.3 PAD Regular Expressions

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	<ul style="list-style-type: none"> ATM Dial-on-Demand Routing (DDR) Frame Relay ISDN LANE PPP for Wide-Area Networking SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 1</i> • <i>Network Protocols Command Reference, Part 1</i> 	<ul style="list-style-type: none"> IP IP Routing
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 2</i> • <i>Network Protocols Command Reference, Part 2</i> 	<ul style="list-style-type: none"> 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> 	<ul style="list-style-type: none"> Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</i> 	<ul style="list-style-type: none"> 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 Support 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>Access Services Quick Configuration Guide</i> • <i>System Error Messages</i> • <i>Debug Command Reference</i> • <i>Cisco Management Information Base (MIB) User Quick Reference</i> 	

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- 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.

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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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