Cisco IOS Software for NetBeyond and CiscoPro Solutions

This chapter provides information on the Cisco Internetwork Operating System (Cisco IOS) software for NetBeyond and CiscoPro solutions.

Description

Computer networks that run different protocols on a variety of LAN media over a variety of WAN technologies must be able to communicate. The Cisco IOS software provides this capability. The Cisco IOS software runs on internetworking platforms purchased directly from Cisco Systems and from CiscoPro premier resellers.

The Cisco IOS software supports users and applications throughout the enterprise, and provides security and data integrity for the internetwork. The Cisco IOS software cost-effectively manages resources by controlling and unifying complex, distributed network intelligence. It also functions as a flexible vehicle for adding new services, features, and applications to the internetwork.

Features and Benefits

Cisco IOS software for NetBeyond and CiscoPro solutions offers the following features and benefits:

- Reliable and adaptive routing
  - Traffic is routed around network failures.
  - Route filtering and route distribution save network resources by preventing data from being unnecessarily broadcast.
  - Load balancing makes use of all available paths across the internetwork, preserving valuable bandwidth and improving performance.
  - Network applications that require transparent or source-route bridging algorithms are scaled effectively and efficiently.

- WAN optimization
  - Network throughput is increased while reducing delay time.
  - Costs are minimized by eliminating unnecessary traffic.
  - Circuit-switched services such as Integrated Services Digital Network (ISDN) and dial-up telephone lines are seamlessly accommodated.
  - Dial-on-demand routing (DDR) and dial-backup capabilities are supported.
  - Advanced packet-switched services such as X.25 and Frame Relay are supported.
- Network management and security capabilities
  - Integrated management simplifies administrative procedures and shortens the time required to diagnose and fix problems.
  - Automated operations reduce hands-on tasks.
  - Configuration services lower the cost of installing, upgrading, and reconfiguring routers.
  - Comprehensive monitoring and diagnostic services provide ease of use and serviceability.
  - Multidimensional filters prevent users from knowing that other users or resources are even on the network.
  - Encrypted passwords, dial-in authentication, and multilevel configuration permissions reduce security risks.
  - Accounting and logging features provide protection from—and information about—unauthorized access attempts.
  - A diverse tool kit for partitioning resources and prohibiting access to sensitive or confidential information or processes.
- Scalability
  - Provides flexibility in internetworks as organizations evolve
  - Avoids needless congestion using scalable routing protocols
  - Helps overcome inherent protocol limitations
  - Reduces network bandwidth and processing overhead
  - Off-loads servers and conserves resources
  - Eases system configuration tasks
  - Aids filtering, protocol termination and translation, smart broadcasts, and helper address services

Specifications

This section provides information on the Cisco IOS software supported network protocols, supported routed and routing protocols, and supported media.

Supported Network Protocols

Cisco IOS software for CiscoPro can receive and forward packets concurrently from any combination of the following:

- WAN protocols
    - Frame Relay
    - High-Level Data Link Control (HDLC)
    - Integrated Services Digital Networks (ISDN)
    - Point-to-Point Protocol (PPP)
    - Serial Line Internet Protocol (SLIP)—for asynchronous lines
    - Switched Multimegabit Data Service (SMDS)
    - X.25 and its derivatives, including LAPB and DDN X.25
- Network protocols
    - AppleTalk (Phase 1 and Phase 2)
    - Internet Protocol (IP)
    - Novell Internetwork Packet Exchange (IPX)
    - IBM
    - DECnet
- Bridging types
    - Transparent bridging
    - Source-route bridging (SRB)
    - Remote source-route bridging (RSRB)
- Access services
    - Telnet and rlogin
    - Local Area Transport (LAT)
    - TN3270
    - AppleTalk Remote Access (ARA)
    - SLIP and PPP
    - XRemote
    - X.25

Supported Network and Routing Protocols

Cisco IOS software for CiscoPro supports the following network and routing protocols:

- Internet Protocol (IP)
    - Internet Gateway Routing Protocol (IGRP)

- — Enhanced Internet Gateway Routing Protocol (EIGRP)

- — Open Shortest Path First (OSPF)

- — Border Gateway Protocol (BGP)

- — Exterior Gateway Protocol (EGP)

- — Routing Information Protocol (RIP)

- — Next Hop Resolution Protocol (NHRP)

- — Protocol Independent Multicast (PIM)

- — IP multicast

- — Policy-based routing

- — Hot Standby Router Protocol (HSRP)

- AppleTalk

  - — Routing Table Maintenance Protocol (RTMP)

  - — AppleTalk Update-Based Routing Protocol (AURP)

- Novell IPX

  - — Routing Information Protocol (RIP)

  - — Service Advertising Protocol (SAP)

  - — NetWare Link Services Protocol (NLSP)

Supported Media

CiscoPro routers support the following industry-standard networking media:

- Asynchronous serial

- Ethernet—IEEE 802.3 and Type II

- Token Ring—IEEE 802.5

- ISDN Basic Rate Interface (BRI)

- ISDN Primary Rate Interface (PRI)

- Fiber Distributed Data Interface (FDDI)

- Fast Ethernet—100BaseT

- Synchronous serial—V.35, EIA/TIA232, EIA/TIA449, EIA/TIA530, and X.21

Services

Cisco IOS software for NetBeyond and CiscoPro solutions supports the following services:

- Terminal services—connecting asynchronous devices to a LAN or WAN through network and terminal-emulation software including Telnet, rlogin, Digital's Local Area Transport (LAT) protocol, and IBM TN3270.

- Telecommuting services—connecting devices over a telephone network using ARA, Serial Line Internet Protocol (SLIP), compressed SLIP (CSLIP), Point-to-Point Protocol (PPP), and XRemote (NCD's X Windows terminal protocol).

- Protocol translation services—converting one virtual terminal protocol into another protocol.

- Routing services—full-featured Internet Protocol (IP), AppleTalk, and Novell IPX routing. This is the same routing functionality found on router platforms.

Figure 3 illustrates the solutions above.

Figure 3   Cisco IOS Software for NetBeyond and CiscoPro Solutions
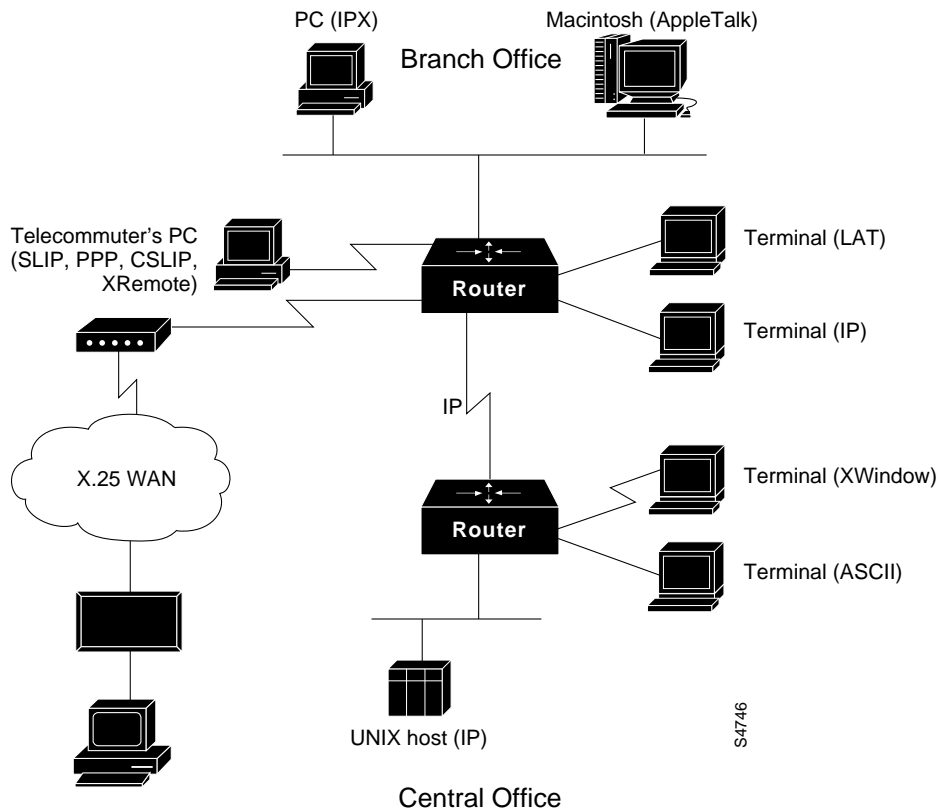
Components

This section describes image components and documentation for Cisco IOS software for NetBeyond and CiscoPro solutions. To order these items, use the product numbers listed in the section "Product Numbers" and in the chapter "Cisco Documentation for NetBeyond and CiscoPro."

Table 2 shows a matrix of Cisco IOS software images that are available for NetBeyond and CiscoPro solutions, and the protocols they support. The feature sets, Internet Protocol (IP), IP/Internet Packet Exchange (IPX)/AppleTalk (AT), IP/AT, and IP/IPX represent the protocols supported by the hardware models.

Table 2   Cisco IOS Software for NetBeyond and CiscoPro Solutions—Feature Set Matrix

Router[1]	IP	IP+	IP/IPX	IP/IPX+	IP/IPX/ AT	IP/IPX/AT+	IP/AT	IP/AT+	IP/IPX IBM	Desktop	Enterprise	RAS
Cisco 700 Series	X	–	X	–	–	–	–	–	–	–	–	–
Cisco 1003/1004	X	–	X	–	–	–	X	–	–	–	–	–
Cisco 1005	X	–	X	–	–	–	X	–	–	–	–	–
Cisco 1600 Series	X	X	X	X	X	X	X	X	–	X	X	–
Cisco 2500 Series	X	–	X	–	X	–	–	–	X	X	X	X
Cisco 3600 Series	X	–	–	–	X	–	–	–	X	X	X	–
Cisco 4500/4700	–	–	–	–	X	–	–	–	X	X	X	X

1. See respective access router chapter for product numbers.

Memory Requirements and Recommendations

This section includes three tables. Table 3 describes the base memory delivered by default for a particular router series and the memory upgrades available for that series; Table 4 lists product numbers for memory upgrades; Table 5 describes memory recommendations for the Cisco 4500 and Cisco 4700 routers, as they are used for specific purposes.

Use Table 3 to identify memory requirements for the feature packs. Check this against Table 4 to determine available memory on the router (factory default), and available upgrades. Refer to Table 5 to determine additional memory requirements for modules available for the Cisco 4500 and Cisco 4700 modular routers.

Table 3   Feature Set Memory Requirements for NetBeyond and CiscoPro Solutions

Feature Set	Description	Flash Memory Requirements	DRAM Memory Requirements	Shared Memory Requirements[1]
Cisco 1000 IP Feature Pack Release 11.1 (CPASW10-A-11.1=)				
IP 1003/1004	IP feature set for Cisco 1003 and Cisco 1004 routers	2 MB (default)	4 MB (default)	–
IP 1005 sync	IP synchronous feature set for Cisco 1005 routers	2 MB (default)	4 MB (default)	–
IP 1005 async	IP asynchronous feature set for Cisco 1005 routers	2 MB (default)	4 MB (default)	–

Feature Set	Description	Flash Memory Requirements	DRAM Memory Requirements	Shared Memory Requirements[1]
Cisco 1000 IP/AppleTalk Feature Pack Release 11.1 (CPASW10-C-11.1=)				
IP/AT 1003/1004	IP/AppleTalk feature set for Cisco 1003 and Cisco 1004 routers	2 MB (default)	4 MB (default)	–
IP/AT 1005	IP/AppleTalk feature set for Cisco 1005 routers	2 MB (default)	4 MB (default)	–
Cisco 1000 IP/IPX Feature Pack Release 11.1 (CPASW10-D-11.1=)				
IP/IPX 1003/1004	IP/IPX feature set for Cisco 1003 and Cisco 1004 routers	2 MB (default)	4 MB (default)	–
IP/IPX 1005 sync	IP/IPX synchronous feature set for Cisco 1005 routers	2 MB (default)	4 MB (default)	–
IP/IPX 1005 async	IP/IPX asynchronous feature set for Cisco 1005 routers	2 MB (default)	4 MB (default)	–
Cisco 1600 IP Feature Pack Release 11.1 (CPASW16-A-11.1=)				
IP	IP feature set for Cisco 1600 Series routers	4 MB (default)	2 MB (default)	–
Cisco 1600 IP+ Feature Pack Release 11.1 (CPASW16-AP-11.1=)				
IP+	IP+ feature set for Cisco 1600 Series routers	6 MB	4 MB	–
Cisco 1600 IP/IPX/AT Feature Pack Release 11.1 (CPASW16-B-11.1=)				
IP/IPX	IP/IPX feature set for Cisco 1600 Series routers	4 MB (default)	2 MB (default)	–
IP/AT	IP/AT feature set for Cisco 1600 Series routers	4 MB (default)	2 MB (default)	–
IP/IPX/AT	IP/IPX/AT feature set for Cisco 1600 Series routers	6 MB	4 MB	–
Cisco 1600 IP/IPX/AT+ Feature Pack Release 11.1 (CPASW16-BP-11.1=)				
IP/IPX/AT+	IP/IPX/AT+ feature set for Cisco 1600 Series routers	6 MB	4 MB	–
Cisco 1600 IP/IPX+ and IP/AT+ Feature Pack Release 11.1 (CPASW16-DP-11.1=)				
IP/IPX+	IP/IPX+ feature set for Cisco 1600 Series routers	6 MB	4 MB	–
IP/AT+	IP/AT+ feature set for Cisco 1600 Series routers	6 MB	4 MB	–
Cisco 2500 IP Feature Pack Release 11.1 (CPASW25-A-11.1=)				
IP	IP feature set for Cisco 2500 Series routers	4 MB (default)	4 MB (default)	_
IP + ISP	IP and Internet service provider feature set for Cisco 2500 Series routers	4 MB (default)	8 MB	–
Cisco 2500 IP/IPX/AppleTalk Feature Pack Release 11.1 (CPASW25-B-11.1=)				
IP/IPX	IP/IPX feature set for Cisco 2500 Series routers	8 MB	4 MB (default)	–

Feature Set	Description	Flash Memory Requirements	DRAM Memory Requirements	Shared Memory Requirements[1]
Optimized IP/IPX/AT	Optimized IP/IPX/AT for Cisco 2500 Series routers	4 MB (default)	4 MB (default)	–
Cisco 2500 IP/IPX IBM Feature Pack Release 11.1 (CPASW25-DS-11.1=)				
IP/IPX IBM	IP/IPX IBM feature set for Cisco 2500 Series routers	8 MB	4 MB (default)	–
Cisco 2500 IP/IPX/AppleTalk Remote Access Server Release 11.1 (CPASW25-E-11.1=)				
RAS	Remote Access Server (RAS) feature set for Cisco 2509, and Cisco 2511 routers	4 MB (default)	4 MB (default)	–
Optimized IP/IPX/ AT + RAS	Optimized IP/IPX/AT and Remote Access Server for Cisco 2509 and Cisco 2511 routers	4 MB (default)	4 MB (default)	–
IP/IPX/AT + RAS + ISDN	Optimized IP/IPX/AT and Remote Access Server for Cisco 2520 and Cisco 2522 routers	8 MB	4 MB (default)	–
Cisco 2500 Desktop Feature Pack Release 11.1 (CPASW25-F-11.1=)				
Desktop	Desktop feature set for Cisco 2500 Series routers	8 MB	4 MB (default)	–
Cisco 2500 Enterprise Feature Pack Release 11.1 (CPASW25-G-11.1=)				
Enterprise	Enterprise feature set for Cisco 2500 Series routers	8 MB	8 MB	–
Cisco 3620 IP Feature Pack Release 11.1 (CPASW362-A-11.1=)				
IP	IP Routing software feature set for Cisco 3620	4 MB (default)	16 MB	–
Cisco 3620 IP/IPX/AT Feature Pack Release 11.1 (CPASW362-B-11.1=)				
IP/IPX/AT	IP/IPX/AT software feature set for Cisco 3620	4 MB (default)	16 MB	–
Cisco 3620 IP/IPX IBM Feature Pack Release 11.1 (CPASW362-DS-11.1=)				
IP/IPX IBM	IP/IPX IBM software feature set for Cisco 3620	4 MB (default)	16 MB	–
Cisco 3620 Desktop Feature Pack Release 11.1 (CPASW362-F-11.1=)				
Desktop	Desktop software feature set for Cisco 3620	4 MB (default)	16 MB	–
Cisco 3620 Enterprise Feature Pack Release 11.1 (CPASW362-G-11.1=)				
Enterprise	Enterprise software feature set for Cisco 3620	4 MB (default)	24 MB	–
Cisco 3640 IP Feature Pack Release 11.1 (CPASW364-A-11.1=)				
IP	IP Routing software feature set for Cisco 3640	4 MB (default)	16 MB	–
Cisco 3640 IP/IPX/AT Feature Pack Release 11.1 (CPASW364-B-11.1=)				
IP/IPX/AT	IP/IPX/AT software feature set for Cisco 3640	4 MB (default)	16 MB	–

Feature Set	Description	Flash Memory Requirements	DRAM Memory Requirements	Shared Memory Requirements[1]
Cisco 3640 IP/IPX IBM Feature Pack Release 11.1 (CPASW364-DS-11.1=)				
IP/IPX IBM	IP/IPX IBM software feature set for Cisco 3640	4 MB (default)	16 MB	–
Cisco 3640 Desktop Feature Pack Release 11.1 (CPASW364-F-11.1=)				
Desktop	Desktop software feature set for Cisco 3640	4 MB (default)	16 MB	–
Cisco 3640 Enterprise Feature Pack Release 11.1 (CPASW364-G-11.1=)				
Enterprise	Enterprise software feature set for Cisco 3640	4 MB (default)	24 MB	–
Cisco 4500 and Cisco 4700 IP/IPX IBM Feature Pack Release 11.1 (CPASW45-DS-11.1=)				
IP/IPX IBM	IP/IPX IBM feature set for Cisco 4500 and Cisco 4700 routers	4 MB (default)	16 MB	8 MB (default)[2]
Cisco 4500 and CPA4700 IP/IPX/AppleTalk Remote Access Server Release 11.1 (CPASW45-E-11.1=)				
IP (ISP)	IP feature set for Cisco 4500 and Cisco 4700 routers	4 MB (default)	8 MB (default)[2]	8 MB (default)[2]
IP/IPX	IP/IPX feature set for Cisco 4500 and Cisco 4700 routers	4 MB (default)	8 MB (default)[2]	8 MB (default)[2]
Optimized IP/IPX/AT + RAS	Optimized IP/IPX/AT and Remote Access Server for Cisco 4500 and Cisco 4700 routers	4 MB (default)	8 MB (default)[2]	8 MB (default)[2]
Cisco 4500 and Cisco 4700 Desktop Feature Pack Release 11.1 (CPASW45-F-11.1=)				
Desktop	Desktop feature set for Cisco 4500 and Cisco 4700 routers	4 MB (default)	16 MB[2]	8 MB (default)[2]
Cisco 4500 and Cisco 4700 Enterprise Feature Pack Release 11.1 (CPASW45-G-11.1=)				
Enterprise	Enterprise feature set for Cisco 4500 and Cisco 4700 routers	4 MB (default)	16 MB[2]	8 MB (default)[2]

1. Refers to Cisco 4500 and Cisco 4700 routers only.
2. Refer to Table 5 for recommendations on the amount of memory to use for specific Cisco 4500 and Cisco 4700 router applications.

Table 4 lists the amount of Flash and main base memory delivered by default for each Cisco router series. It also lists the available memory upgrades for each router series.

Table 4   Cisco Access Base and Memory Upgrade Options for NetBeyond and CiscoPro Solutions

Router	Base Memory	Upgrade Options	Product Numbers
Cisco 1000 Series			
Flash	2 MB	4-MB upgrade	CPA010-MEM4F=
Main	4 MB	8-MB upgrade	CPA010-MEM8D=
Cisco 1600 Series			
Flash	2 MB	6-MB upgrade 8-MB upgrade 12-MB upgrade	CPA016-MEM6FC= CPA016-MEM8FC= CPA016-MEM12FC=

Router	Base Memory	Upgrade Options	Product Numbers
Main	4 MB	2-MB upgrade 4-MB upgrade 8-MB upgrade 16-MB upgrade	CPA016-MEM2D= CPA016-MEM4D= CPA016-MEM8D= CPA016-MEM16D=
Cisco 2500 Series			
Flash	4 MB	8-MB upgrade	CPA025-MEM8F=
Main	4 MB	8-MB upgrade 16-MB upgrade	CPA025-MEM8D= CPA025-MEM16D=
Cisco 3600 Series			
Flash	4 MB	4-MB upgrade 8-MB upgrade	CPAMEM3600-4FS= CPAMEM3600-8FS=
Main (Cisco 3620)	16 MB	4-MB upgrade 8-MB upgrade 16-MB upgrade	CPAMEM3620-4D= CPAMEM3620-8D= CPAMEM3620-16D=
Main (Cisco 3640)	16 MB	4-MB upgrade 8-MB upgrade 16-MB upgrade 32-MB upgrade	CPAMEM3640-4D= CPAMEM3640-8D= CPAMEM3640-16D= CPAMEM3640-32D=
Cisco 4500/4700			
Flash	4 MB	8-MB upgrade 16-MB upgrade	CPA045-MEM8F= CPA045-MEM16F=
Main	8 MB (Cisco 4500) 16 MB (Cisco 4700)	16-MB upgrade 32-MB upgrade 64-MB upgrade[1]	CPA045-MEM16M= CPA045-MEM32M= CPA047-MEM64M=
Shared	8 MB	8-MB upgrade 16-MB upgrade	CPA045-MEM8S= CPA045-MEM16S=

1. Applies to Cisco 4700 only.

Table 5 lists memory recommendations for Cisco 4500 and Cisco 4700 routers based on the purpose for which the router is used. These recommendations are application-specific; they do not correspond to memory requirements given for feature sets for the Cisco 4500 and Cisco 4700 router shown in Table 3.

For example, if you route optimized IP, IPX, and AppleTalk concurrently, it is recommended that 16 MB of main memory be available on the router even though the minimum requirement shown in Table 3 for this feature set is 8 MB of DRAM. If you maintain more than 24 WAN virtual circuits on a router running any of the Cisco IOS Release 11.1 feature sets for CiscoPro routers, it is recommended that 16 MB of RAM be available on the router, even though each of the feature sets for the Cisco 4500 and Cisco 4700 routers that include WAN support services, as listed in Table 3, show various main memory requirements.

Use the Cisco 4500 and Cisco 4700 routers for one or more purposes, and refer to the memory recommendations in Table 5 for single or combined applications. These router usages and recommended memory sizes are not mutually exclusive. For example, if you connect directly to an Internet backbone, we recommend that you have 32 MB of main

memory available on your router. If you also maintain more than 24 WAN virtual circuits on the same router, we recommend that you have available on the router 48 MB of RAM, the sum of recommended memory amounts accommodating both applications.

For more comprehensive information on memory recommendations for the Cisco 4500 and Cisco 4700 modular routers, see the Product Bulletin #419 available on the Web (www.cisco.com).

Table 5   Cisco 4500 and Cisco 4700 Memory Recommendation

Usage	Main Memory	Shared Memory	Flash Memory
Running Cisco IOS 11.1 with 1PRI or 4BRI or 8BRI module	16 MB	–	–
Running IP, IPX, AppleTalk simultaneously	16 MB	–	–
Running Desktop or Enterprise feature set	16 MB	–	–
Connecting directly to internet backbone	32 MB	–	–
Maintaining routing data for more than 50 networks	32 MB	–	–
Using 1PRI or 8BRI module	–	8 MB	–
Maintaining more than 24 WAN virtual circuits	–	16 MB	–
Using any two of 1PRI or 4BRI or 8BRI modules	–	16 MB	–
Storing multiple versions of Cisco IOS feature sets on the router	–	–	16 MB

Cisco IOS Release 11.1 Feature Sets for NetBeyond and CiscoPro Solutions

This section identifies specific features, within a category of features, supported on a particular router platform. Features marked with "Yes" are supported on the platform; features marked with "—" are not. Use the feature set tables in this chapter in conjunction with the information provided in the feature pack to determine which features a particular feature set supports on a platform.

Feature Sets and Supported Features for the Cisco 1003 and Cisco 1004 Routers

This section describes the features in the feature packs supported by CPA1000 Series platforms. Table 6 lists specific features supported for IP, IP/IPX, and IP/AT on Cisco 1003 and Cisco 1004 routers.

Table 6   Cisco IOS Release 11.1 Feature Sets for Cisco 1003 and Cisco 1004 Routers

Feature	IP	IP/IPX	IP/AT
LAN Support			
IP	Yes	Yes	Yes
GRE	Yes	Yes	Yes
IPX	–	Yes	–
AppleTalk Versions 1 and 2	–	–	Yes
Bridging			
Transparent and translational	Yes	Yes	Yes
Wide Area Support: Services			
HDLC	Yes	Yes	Yes
PPP	Yes	Yes	Yes
ISDN	Yes	Yes	Yes
Wide Area Support: Optimization			
Compression	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes
Bandwidth-on-demand	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes
Custom/priority/weighted fair queuing	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes
IP: Host Services			
Telnet	Yes	Yes	Yes
ARP	Yes	Yes	Yes
FTP	Yes	Yes	Yes
IP: Routing Protocols			
RIP v1, v2	Yes	Yes	Yes
IGRP/Enhanced IGRP	Yes	Yes	Yes
Other Routing			
IPX RIP	–	Yes	–
AT RTMP	–	–	Yes
Management			
CDP	Yes	Yes	Yes
SNMP	Yes	Yes	Yes
Security			
Access lists	Yes	Yes	Yes
Access security	Yes	Yes	Yes
Lock and key	Yes	Yes	Yes
Interface Support: LAN			
Ethernet 10BaseT	Yes	Yes	Yes

Feature	IP	IP/IPX	IP/AT
Interface Support: WAN			
ISDN BRI	Yes	Yes	Yes

Feature Sets and Supported Features for the Cisco 1005 Routers

This section describes the features in the feature packs supported by CPA1000 Series platforms. Table 7 lists specific features supported for IP, IP/ IPX, and IP/AT on Cisco 1005 routers.

Table 7   Cisco IOS Release 11.1 Feature Sets for Cisco 1005 Routers

Feature	IP	IP/IPX	IP/AT
LAN Support			
IP	Yes	Yes	Yes
GRE	Yes	Yes	Yes
IPX	–	Yes	–
AppleTalk Versions 1 and 2	–	–	Yes
Bridging			
Transparent and translational	Yes	Yes	Yes
Wide Area Support: Services			
HDLC	Yes	Yes	Yes
PPP	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes
X.25	Yes	–	–
LAP-B	Yes	–	–
SMDS	Yes	Yes	Yes
SW56	Yes	Yes	Yes
Wide Area Support: Optimization			
Compression	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes
Bandwidth-on-demand	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes
Custom/priority/weighted fair queuing	Yes	Yes	Yes
IP: Host Services			
Telnet	Yes	Yes	Yes
ARP	Yes	Yes	Yes
FTP	Yes	Yes	Yes
IP: Routing Protocols			
RIP v1, v2	Yes	Yes	Yes
IGRP/Enhanced IGRP	Yes	Yes	Yes

Feature	IP	IP/IPX	IP/AT
Other Routing			
IPX RIP	–	Yes	–
AT RTMP	–	–	Yes
Management			
CDP	Yes	Yes	Yes
SNMP	Yes	Yes	Yes
Security			
Access lists	Yes	Yes	Yes
Access security	Yes	Yes	Yes
Lock and key	Yes	Yes	Yes
Interface Support: LAN			
Ethernet 10BaseT	Yes	Yes	Yes
Interface Support: WAN			
Synchronous serial	Yes	Yes	Yes

Feature Sets and Supported Features for Cisco 1600 Series Routers

This section describes the features in the feature packs supported by CPA1600 Series platforms. Table 8 lists specific features supported for IP, IP/IPX, IP/AT, IP/IPX/AT, IP+, IP/IPX+, IP/AT+, and IP/IPX/AT+ on Cisco 1600 Series routers. Plus feature sets are noted as "plus" in the tables.

Table 8   Cisco IOS Release 11.1 Feature Sets for Cisco 1600 Routers

Supported Features	IP	IP/IPX	IP/AT	IP/IPX/AT
LAN Support				
Apollo Domain	–	–	–	–
AppleTalk 1 and 2	–	–	Yes	Yes
Banyan VINES	–	–	–	–
Concurrent routing and bridging	–	–	–	–
DECnet IV	–	–	–	–
DECnet V	–	–	–	–
GRE tunneling	Yes	Yes	Yes	Yes
Integrated routing and bridging (IRB)	–	–	–	–
IP	Yes	Yes	Yes	Yes
LAN extension host	–	–	–	–
Multiring	Yes	Yes	–	–
Novell IPX	–	Yes	–	Yes
OSI	–	–	–	–

Supported Features	IP	IP/IPX	IP/AT	IP/IPX/AT
Source-route bridging	–	–	–	–
Transparent bridging	Yes	Yes	–	–
Translational bridging	–	–	–	–
XNS	–	–	–	–
WAN Services				
Asynchronous	Yes	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes
IPXWAN 2.0	Plus	Plus	Plus	Plus
ISDN	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes
Switched 56	Yes	Yes	Yes	Yes
X.25	Yes	Yes	Yes	Yes
SLIP asynchronous only	Yes	Yes	Yes	Yes
WAN Optimization				
Bandwidth-on-demand	Yes	Yes	Yes	Yes
Custom and priority queuing	Yes	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes	Yes
Header, link and payload compression	Yes	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes	Yes
Weighted fair queuing	Yes	Yes	Yes	Yes
IPX and SPX spoofing	–	Yes	–	Yes
IP Routing				
AT SMRP Multicast	–	–	Yes	Yes
BGP	–	–	–	–
EGP	–	–	–	–
Enhanced IGRP	Yes	Yes	Yes	Yes
OSPF	Plus	Plus	Plus	Plus
OSPF On Demand Circuit	Plus	Plus	Plus	Plus
IP Multicast (PIM)	Plus	Plus	Plus	Plus
ES-IS	–	–	–	–
IGRP	Yes	Yes	Yes	Yes
IS-IS	–	–	Yes	Yes
NHRP	–	–	Plus	Plus

Supported Features	IP	IP/IPX	IP/AT	IP/IPX/AT
Policy-based routing	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes
RIP Version 2	Yes	Yes	Yes	Yes
Other Routing				
AURP	–	–	Plus	Plus
IPX RIP	–	Yes	–	Yes
NLSP	–	Plus	–	Plus
RTMP	–	–	Yes	Yes
SMRP	–	–	Plus	Plus
SRTP	–	–	–	–
Management				
AutoInstall	Yes	Yes	Yes	Yes
Automatic modem configuration	Yes	Yes	Yes	Yes
RMON events and alarms	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes
Security				
Access lists	Yes	Yes	Yes	Yes
Access security	Yes	Yes	Yes	Yes
Extended access lists	Yes	Yes	Yes	Yes
Kerberized login	–	–	–	–
Kerberos V client support	–	–	–	–
Lock and key	Yes	Yes	Yes	Yes
MAC security for hubs	–	–	–	–
MD5 routing authentication	–	–	–	–
RADIUS	–	–	–	–
TACACS+	Yes	Yes	Yes	Yes
IBM Support (Optional)				
APPN (Optional)	–	–	–	–
BAN for SNA Frame Relay support	–	–	–	–
Bisync	–	–	–	–
Caching and filtering	–	–	–	–
DLSw+	–	–	–	–
Downstream PU concentration (DSPU)	–	–	–	–

Supported Features	IP	IP/IPX	IP/AT	IP/IPX/AT
Frame Relay SNA Support (RFC 1490)	–	–	–	–
NetView Native Service Point	–	–	–	–
QLLC	–	–	–	–
SDLC integration	–	–	–	–
SDLC transport (STUN)	–	–	–	–
SDLC-to-LAN conversion (SDLLC)	–	–	–	–
SNA and NetBIOS WAN optimization via local acknowledgment	–	–	–	–
SRB/RSRB	–	–	–	–
SRT	–	–	–	–
TG/COS	–	–	–	–
Protocol Translation				
LAT	–	–	–	–
PPP	–	–	–	–
Rlogin	–	–	–	–
Telnet	–	–	–	–
TN3270	–	–	–	–
X.25	–	–	–	–
Remote Node				
ARAP 1.0/2.0	–	–	–	–
Asynchronous master interfaces	–	–	–	–
ATCP	–	–	–	–
CPPP	–	–	–	–
CSLIP	–	–	–	–
DHCP	Yes	Yes	Yes	Yes
IP pooling	–	–	–	–
IPX and ARAP on virtual asynch interfaces	–	–	–	–
IPXCP	–	–	–	–
MacIP	–	–	–	–
NASI	–	–	–	–
NetBEUI over PPP	–	–	–	–
PPP	Yes	Yes	Yes	Yes
SLIP	Yes	Yes	Yes	Yes

Supported Features	IP	IP/IPX	IP/AT	IP/IPX/AT
Terminal Services				
LAT	–	–	–	–
Rlogin	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes
TN3270	–	–	–	–
X.25 PAD	–	–	–	–
Xremote	–	–	–	–

Feature Sets and Supported Features for Cisco 2500 Series Routers

This section describes the features in the feature packs supported by CPA2500 Series platforms. Table 9 lists features supported for the standard images (that is, images that are equal to an enterprise counterpart) for IP, IP/IPX, Remote Access Server (RAS), IP/IPX IBM, Desktop, and Enterprise feature sets for Cisco CPA2500 Series routers. Table 10 lists features supported for the optimized images that were developed to operate in the Cisco CPA2500 default memory configuration.

Table 9   Cisco IOS Release 11.1 Feature Sets for Cisco 2500 Series Routers–Standard Images

Features	IP	IP/IPX	IP/IPX IBM	Desktop	Enterprise	RAS
SNMP	Yes	Yes	Yes	Yes	Yes	Yes
RMON[1]	–	–	–	–	–	–
Asynchronous support (SLIP)	Yes	Yes	Yes	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes	Yes	Yes	Yes
ARAP	–	–	–	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes	Yes	–
X.25	Yes	Yes	Yes	Yes	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes	–
PPP	Yes	Yes	Yes	Yes	Yes	Yes
CPPP	Yes	Yes	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes	Yes	Yes
IP	Yes	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes	Yes
RIPv2	Yes	Yes	Yes	Yes	Yes	Yes
IGRP	Yes	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes	–
BGP	Yes	Yes	Yes	Yes	Yes	Yes

Features	IP	IP/IPX	IP/IPX IBM	Desktop	Enterprise	RAS
EGP	Yes	Yes	Yes	Yes	Yes	–
PIM	Yes	Yes	Yes	Yes	Yes	Yes
NHRP	Yes	Yes	Yes	Yes	Yes	–
ES-IS	–	–	–	–	Yes	–
IS-IS	–	–	–	–	Yes	–
Snapshot routing	Yes	Yes	Yes	Yes	Yes	Yes
NTP	Yes	Yes	Yes	Yes	Yes	Yes
Bridging (transparent and translational)	Yes	Yes	Yes	Yes	Yes	–
Multiring	Yes	Yes	Yes	Yes	Yes	Yes
LAN extension host	Yes	Yes	Yes	Yes	Yes	–
IPX	–	Yes	Yes	Yes	Yes	Yes
NLSP	–	Yes	Yes	Yes	Yes	–
IPXWAN 2.0	–	Yes	Yes	Yes	Yes	Yes
RTMP	–	–	–	Yes	Yes	Yes
SMRP	–	–	–	Yes	Yes	Yes
SRTP	–	–	–	–	Yes	Yes
AppleTalk Versions 1 and 2	–	–	–	Yes	Yes	Yes
AURP	–	–	–	Yes	Yes	Yes
DECnet IV	–	–	–	Yes	Yes	–
DECnet V	–	–	–	–	Yes	–
Apollo Domain	–	–	–	–	Yes	–
Banyan VINES	–	–	–	–	Yes	–
ISO CLNS	–	–	–	–	Yes	–
XNS	–	–	–	–	Yes	–
Lock-and-Key	Yes	Yes	Yes	Yes	Yes	Yes
MD5 routing authentication	Yes	Yes	Yes	Yes	Yes	Yes
Kerberized login	–	–	–	–	Yes	–
V.120	–	–	–	–	Yes	–
SRB	–	–	Yes	–	Yes	–
RSRB	–	–	Yes	–	Yes	–
APPN	–	–	–	–	–	–
FRAS BAN	–	–	Yes	–	Yes	–
DLSw (RFC 1795)	–	–	Yes	–	Yes	–
DLSw+	–	–	Yes	–	Yes	–
SDLC	–	–	Yes	–	Yes	–
SDLLC	–	–	Yes	–	Yes	–
STUN	–	–	Yes	–	Yes	–

Features	IP	IP/IPX	IP/IPX IBM	Desktop	Enterprise	RAS
TG/COS	–	–	–	–	Yes	–
QLLC	–	–	Yes	–	Yes	–
Bisync	–	–	Yes	–	Yes	–
DSPU	–	–	–	–	Yes	–
NetView Native Service Point	–	–	–	–	Yes	–
Protocol translation	–	–	–	–	Yes	Yes
TN3270	–	–	–	–	Yes	Yes
LAT	–	–	–	–	Yes	Yes
SRT Bridging	–	–	Yes	–	Yes	–
XRemote	–	–	–	–	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes	Yes
PAD	Yes	Yes		Yes	Yes	Yes
AutoInstall	Yes	Yes	Yes	Yes	Yes	Yes
Modem auto- configuring	–	–	–	–	Yes	Yes
Router monitoring	Yes	Yes	Yes	Yes	Yes	Yes
DHCP	Yes	Yes	Yes	Yes	Yes	Yes
NASI	–	–	–	–	–	Yes
NetBEUI over PPP	–	–	–	–	–	Yes

1. All feature sets include RMON alarm and events groups. Full, nine-group RMON support is included in the feature sets indicated.

Table 10 Cisco IOS Release 11.1 Feature Sets for Cisco CPA2500 Routers–Optimized Images

	Optimized		
	IP/IPX/AT	P/IPX/AT+RAS	P/IPX/AT+RAS+ISDN
SNMP	Yes	Yes	Yes
RMON[1]	–	–	–
Asynchronous support (SLIP)	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes
ARAP	–	Yes	Yes
Frame Relay	Yes	Yes	Yes
SMDS	Yes	–	–
X.25	Yes	Yes	Yes
ISDN	Yes	–	Yes
PPP	Yes	Yes	Yes
CPPP	Yes	Yes	Yes
HDLC	Yes	Yes	Yes

	Optimized		
	IP/IPX/AT	**P/IPX/AT+RAS**	**P/IPX/AT+RAS+ISDN**
IP	Yes	Yes	Yes
RIP	Yes	Yes	Yes
RIPv2	Yes	Yes	Yes
IGRP	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes
OSPF	Yes	Yes	Yes
BGP	–	–	–
EGP	–	–	–
PIM	–	–	–
NHRP	–	–	–
ES-IS	–	–	–
IS-IS	–	–	–
Snapshot routing	Yes	Yes	Yes
NTP	Yes	Yes	Yes
Bridging (transparent and translational)	Yes	Yes	Yes
Multiring	–	–	–
LAN extension host	–	–	–
IPX	Yes	Yes	Yes
NLSP	Yes	Yes	Yes
IPXWAN 2.0	Yes	Yes	Yes
RTMP	Yes	Yes	Yes
SMRP	–	–	–
SRTP	–	–	–
AppleTalk Versions 1 and 2	Yes	Yes	Yes
AURP	Yes	Yes	Yes
DECnet IV	–	–	–
DECnet V	–	–	–
Apollo Domain	–	–	–
Banyan VINES	–	–	–
ISO CLNS	–	–	–
XNS	–	–	–
Lock-and-Key	Yes	Yes	Yes
MD5 routing authentication	Yes	Yes	Yes
Kerberized login	–	–	–
V.120	Yes	–	Yes

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	Optimized		
	IP/IPX/AT	**P/IPX/AT+RAS**	**P/IPX/AT+RAS+ISDN**
SRB	–	–	–
RSRB	–	–	–
APPN	–	–	–
FRAS BAN	–	–	–
DLSw (RFC 1795)	–	–	–
DLSw+	–	–	–
SDLC	–	–	–
SDLLC	–	–	–
STUN	–	–	–
TG/COS	–	–	–
QLLC	–	–	–
Bisync	–	–	–
DSPU	–	–	–
NetView Native Service Point	–	–	–
Protocol translation	–	Yes	Yes
TN3270	–	Yes	Yes
LAT	–	Yes	Yes
SRT Bridging	–	–	–
XRemote	–	Yes	Yes
Telnet	Yes	Yes	Yes
PAD	Yes	Yes	Yes
AutoInstall	Yes	Yes	Yes
Modem auto configuration	–	–	–
Router monitoring	Yes	Yes	Yes
DHCP	Yes	Yes	Yes
NASI	–	–	–
NetBEUI over PPP	–	Yes	Yes

1. All feature sets except CFRAD include RMON alarm and events groups. Full, nine-group RMON support is included in the feature sets indicated.

Feature Sets and Supported Features for Cisco 3600 Series Routers

This section describes the features in the feature packs supported by CPA3600 Series platforms. Table 10 lists specific features supported for IP, IP/IPX/AT, IP/IPX IBM, Desktop, and Enterprise feature sets on Cisco 3600 Series routers.

Table 10   Cisco IOS Release 11.1 Feature Sets for Cisco 3600 Series Routers

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
LAN Support					
Apollo Domain	–	–	–	–	Yes
AppleTalk 1 and 2	–	–	Yes	Yes	Yes
Banyan VINES	–	–	–	–	Yes
Concurrent routing and bridging	Yes	Yes	Yes	Yes	Yes
DECnet IV	–	–	–	Yes	Yes
DECnet V	–	–	–	–	Yes
GRE tunneling	Yes	Yes	Yes	Yes	Yes
Integrated routing and bridging (IRB)	–	–	–	–	–
IP	Yes	Yes	Yes	Yes	Yes
LAN extension host	Yes	Yes	Yes	Yes	Yes
Multiring	Yes	Yes	–	Yes	Yes
Novell IPX	–	Yes	Yes	Yes	Yes
OSI	–	–	–	–	Yes
Source-route bridging	Yes	Yes	–	Yes	Yes
Transparent bridging	Yes	Yes	Yes	Yes	Yes
Translational bridging	Yes	Yes	Yes	Yes	Yes
XNS	–	–	–	–	Yes
WAN Services					
Asynchronous	Yes	Yes	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes	Yes	Yes
HDLC	Yes	Yes	Yes	Yes	Yes
IPXWAN 2.0	–	Yes	Yes	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	Yes	Yes	Yes
Switched 56	Yes	Yes	Yes	Yes	Yes
X.25	Yes	Yes	Yes	Yes	Yes
SLIP asynchronous only	Yes	Yes	Yes	Yes	Yes
WAN Optimization					
Bandwidth-on-demand	Yes	Yes	Yes	Yes	Yes
Custom and priority queuing	Yes	Yes	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes	Yes	Yes
Header, link and payload compression	Yes	Yes	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes	Yes	Yes
Weighted fair queuing	Yes	Yes	Yes	Yes	Yes

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
IPX and SPX spoofing	–	Yes	Yes	Yes	Yes
IP Routing					
AppleTalk SMRP Multicast	–	–	–	–	–
BGP	Yes	Yes	Yes	Yes	Yes
EGP	Yes	Yes	Yes	Yes	Yes
Enhanced IGRP	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes
OSPF On Demand Circuit	–	–	–	–	–
IP Multicast (PIM)	Yes	Yes	Yes	Yes	Yes
ES-IS	–	–	–	–	Yes
IGRP	Yes	Yes	Yes	Yes	Yes
IS-IS	–	–	–	–	Yes
Policy-based routing	Yes	Yes	Yes	Yes	Yes
RIP	Yes	Yes	Yes	Yes	Yes
RIP Version 2	Yes	Yes	Yes	Yes	Yes
Other Routing					
AURP	–	–	Yes	Yes	Yes
IPX RIP	–	Yes	Yes	Yes	Yes
NLSP	–	Yes	Yes	Yes	Yes
RTMP	–	–	Yes	Yes	Yes
SMRP	–	–	Yes	Yes	Yes
SRTP	–	–	–	–	Yes
Management					
AutoInstall	Yes	Yes	Yes	Yes	Yes
Automatic modem configuration	Yes	Yes	Yes	Yes	Yes
RMON events and alarms	Yes	Yes	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
Security					
Access lists	Yes	Yes	Yes	Yes	Yes
Access security	Yes	Yes	Yes	Yes	Yes
Extended access lists	Yes	Yes	Yes	Yes	Yes
Kerberized login	–	–	–	–	Yes
Kerberos V client support	–	–	–	–	–
Lock and key	Yes	Yes	Yes	Yes	Yes
MAC security for hubs	–	–	–	–	–
MD5 routing authentication	Yes	Yes	Yes	Yes	Yes
RADIUS	–	–	–	–	Yes

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
TACACS+	Yes	Yes	Yes	Yes	Yes
IBM Support					
APPN (Optional)	–	–	–	–	Yes
BAN for SNA Frame Relay support	–	Yes	–	–	Yes
Bisync	–	Yes	–	–	Yes
Caching and filtering	–	Yes	–	–	Yes
DLSw+	–	Yes	–	–	Yes
Downstream PU concentration (DSPU)	–	–	–	–	–
Frame Relay SNA Support (RFC 1490)	–	Yes	–	–	Yes
NetView Native Service Point	–	Yes	–	–	Yes
QLLC	–	Yes	–	–	Yes
SDLC integration	–	Yes	–	–	Yes
SDLC transport (STUN)	–	Yes	–	–	Yes
SDLC-to-LAN conversion (SDLLC)	–	Yes	–	–	Yes
SNA and NetBIOS WAN optimization via local acknowledgment	–	Yes	–	–	Yes
SRB/RSRB	–	Yes	–	–	Yes
SRT	–	Yes	–	–	Yes
TG/COS	–	–	–	–	Yes
Protocol Translation					
LAT	–	–	Yes	–	Yes
PPP	–	–	Yes	–	Yes
Rlogin	–	–	Yes	–	Yes
Telnet	–	–	Yes	–	Yes
TN3270	–	–	Yes	–	Yes
X.25	–	–	Yes	–	Yes
Remote Node					
ARAP 1.0/2.0	–	–	Yes	Yes	Yes
Asynchronous master interfaces	Yes	Yes	Yes	Yes	Yes
ATCP	–	–	Yes	Yes	Yes
CPPP	Yes	Yes	Yes	Yes	Yes
CSLIP	Yes	Yes	Yes	Yes	Yes
DHCP	Yes	Yes	Yes	Yes	Yes
IP pooling	Yes	Yes	Yes	Yes	Yes
IPX and ARAP on virtual asynch interfaces	–	–	–	–	Yes
IPXCP	–	Yes	Yes	Yes	Yes
MacIP	–	–	Yes	Yes	Yes
NASI	–	Yes	Yes	Yes	Yes

Features	IP	IP/IPX IBM	IP/IPX/AT	Desktop	Enterprise
NetBEUI over PPP	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes
SLIP	Yes	Yes	Yes	Yes	Yes
Terminal Services					
LAT	–	–	Yes	–	Yes
Rlogin	Yes	Yes	Yes	Yes	Yes
Telnet	Yes	Yes	Yes	Yes	Yes
TN3270	–	–	Yes	–	Yes
X.25 PAD	Yes	Yes	Yes	Yes	Yes
Xremote	–	–	Yes	–	Yes

Feature Sets and Supported Features for Cisco 4500 and Cisco 4700 Routers

This section describes the features in the feature packs supported by CPA4500 and CPA4700 platforms. Table 11 lists specific features supported for IP, IP/IPX, optimized IP/IPX/AT, Remote Access Server (RAS), optimized RAS, optimized RAS/ISDN, IP/IPX IBM, Desktop, and Enterprise feature sets on Cisco 4500 and Cisco 4700 routers.

Optimized feature sets have been developed to operate in the router default memory configuration.

Table 11   Cisco IOS Release 11.1 Feature Sets for Cisco 4500 and Cisco 4700 Modular Routers

Feature	IP (ISP)	IP/IPX	Optimized IP/IPX/AT RAS	IP/IPX IBM	Desktop	Enterprise
LAN Support						
IP	Yes	Yes	Yes	Yes	Yes	Yes
GRE	Yes	Yes	Yes	Yes	Yes	Yes
IPX	–	Yes	Yes	Yes	Yes	Yes
AppleTalk Versions 1 and 2	–	–	Yes	–	Yes	Yes
DECnet IV	–	–	–	–	Yes	Yes
DECnet V	–	–	–	–	–	Yes
OSI CLNS	Yes	–	–	–	–	Yes
Banyan VINES	–	–	–	–	–	Yes
XNS	–	–	–	–	–	Yes
Apollo Domain	–	–	–	–	–	Yes
Bridging						
Transparent and translational	–	Yes	Yes	Yes	Yes	Yes
Concurrent routing and bridging	–	Yes	Yes	Yes	Yes	Yes
LAN extension host	Yes	Yes	Yes	Yes	Yes	Yes
SRB	–	–	–	Yes	–	Yes

Feature	IP (ISP)	IP/IPX	Optimized IP/IPX/AT RAS	IP/IPX IBM	Desktop	Enterprise
SRT	–	–	–	Yes	–	Yes
SR/TLB	–	–	–	Yes	–	Yes
Multiring	Yes	Yes	–	Yes	Yes	Yes
Wide Area Support: Services						
HDLC	Yes	Yes	Yes	Yes	Yes	Yes
PPP	Yes	Yes	Yes	Yes	Yes	Yes
Frame Relay	Yes	Yes	Yes	Yes	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes	Yes
X.25	Yes	Yes	Yes	Yes	Yes	Yes
LAP-B	Yes	Yes	Yes	Yes	Yes	Yes
SMDS	Yes	Yes	–	Yes	Yes	Yes
SW56	Yes	Yes	Yes	Yes	Yes	Yes
IPXWAN 2.0	–	Yes	Yes	Yes	Yes	Yes
ATM-DXI	Yes	Yes	–	Yes	Yes	Yes
Wide Area Support: Optimization						
Compression	Yes	Yes	Yes	Yes	Yes	Yes
Dial-on-demand	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth-on-demand	Yes	Yes	Yes	Yes	Yes	Yes
Dial backup	Yes	Yes	Yes	Yes	Yes	Yes
Custom/priority/weighted fair queuing	Yes	Yes	Yes	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes	Yes	Yes	Yes
IP: Host Services						
Telnet	Yes	Yes	Yes	Yes	Yes	Yes
ARP	Yes	Yes	Yes	Yes	Yes	Yes
FTP	Yes	Yes	Yes	Yes	Yes	Yes
NTP	Yes	Yes	Yes	Yes	Yes	Yes
IP: Routing Protocols						
RIP v1, v2	Yes	Yes	Yes	Yes	Yes	Yes
IGRP/Enhanced IGRP	Yes	Yes	Yes	Yes	Yes	Yes
OSPF	Yes	Yes	Yes	Yes	Yes	Yes
BGP/EGP	Yes	Yes	–	Yes	Yes	Yes
ES-IS	–	–	–	–	–	Yes
IS-IS	–	–	–	–	–	Yes
NHRP	Yes	Yes	–	Yes	Yes	Yes
PIM	Yes	Yes	–	Yes	Yes	Yes
IP multicast	Yes	Yes	–	Yes	Yes	Yes
Policy-based routing	Yes	Yes	–	Yes	Yes	Yes
HSRP	Yes	Yes	Yes	Yes	Yes	Yes
Other Routing						
IPX RIP	–	Yes	Yes	Yes	Yes	Yes

Feature	IP (ISP)	IP/IPX	Optimized IP/IPX/AT RAS	IP/IPX IBM	Desktop	Enterprise
IPX NLSP	–	Yes	Yes	Yes	Yes	Yes
AT RTMP	–	–	Yes	–	Yes	Yes
AT AURP	–	–	Yes	–	Yes	Yes
AT SMRP	–	–	–	–	Yes	Yes
VINES SRTP	–	–	–	–	–	Yes
IBM Support						
SRB/RSRB	–	–	–	Yes	–	Yes
DLSw+	–	–	–	Yes	–	Yes
SNA and NetBIOS WAN optimized	–	–	–	Yes	–	Yes
SDLC	–	–	–	Yes	–	Yes
SDLLC	–	–	–	Yes	–	Yes
STUN	–	–	–	Yes	–	Yes
QLLC	–	–	–	Yes	–	Yes
Bisync	–	–	–	Yes	–	Yes
FR SNA support - RFC 1490	–	–	–	Yes	–	Yes
BAN for SNA FR support	–	–	–	Yes	–	Yes
TG/COS	–	–	–	–	–	Yes
DSPU	–	–	–	–	–	Yes
Management						
AutoInstall	Yes	Yes	Yes	Yes	Yes	Yes
CDP	Yes	Yes	–	Yes	Yes	Yes
SNMP	Yes	Yes	Yes	Yes	Yes	Yes
RMON: events & alarms	Yes	Yes	–	Yes	Yes	Yes
Auto modem configuration	–	–	–	Yes	–	Yes
NetView native service point	–	–	–	Yes	–	Yes
Security						
Access lists	Yes	Yes	Yes	Yes	Yes	Yes
Access security	Yes	Yes	Yes	Yes	Yes	Yes
TACACS+	Yes	Yes	Yes	Yes	Yes	Yes
RADIUS	Yes	–	–	Yes	–	Yes
MD5 routing authentication	Yes	Yes	Yes	Yes	Yes	Yes
Lock and key	Yes	Yes	–	Yes	Yes	Yes
Kerberized login	–	–	–	–	–	Yes
Protocol Translation						
Telnet/rlogin	–	–	Yes	–	–	Yes
LAT	–	–	Yes	–	–	Yes
TN3270	–	–	Yes	–	–	Yes
X.25	–	–	Yes	–	–	Yes
PPP	–	–	Yes	–	–	Yes
Remote Node: Access Protocols						
SLIP/CSLIP	Yes	Yes	Yes	Yes	Yes	Yes

Feature	IP (ISP)	IP/IPX	Optimized IP/IPX/AT RAS	IP/IPX IBM	Desktop	Enterprise
PPP/CPPP	Yes	Yes	Yes	Yes	Yes	Yes
NetBEUI over PPP	Yes	Yes	Yes	Yes	Yes	Yes
IPXCP	–	Yes	Yes	Yes	Yes	Yes
NASI	–	–	–	–	–	Yes
ATCP	–	–	Yes	–	Yes	Yes
ARAP 1.0/2.0	–	–	Yes	–	–	–
Remote Node: Access Services						
DHCP/IP address pooling	Yes	Yes	Yes	Yes	Yes	Yes
Async master interfaces	Yes	Yes	Yes	Yes	Yes	Yes
MacIP	–	–	Yes	–	Yes	Yes
LPD	Yes	Yes	Yes	Yes	Yes	Yes
Menus	Yes	Yes	Yes	Yes	Yes	Yes
CHAT scripts	Yes	Yes	Yes	Yes	Yes	Yes
Terminal Services						
Telnet/rlogin	Yes	Yes	Yes	Yes	Yes	Yes
X.25 PAD	Yes	Yes	Yes	Yes	Yes	Yes
Mop	–	–	–	–	Yes	Yes
LAT	–	–	Yes	–	–	Yes
TN3270	–	–	Yes	–	–	Yes
XRemote	–	–	Yes	–	–	Yes
Interface Support: LAN						
Ethernet AUI/Ethernet 10BaseT	Yes	Yes	Yes	Yes	Yes	Yes
4/16-Mbps Token Ring	Yes	Yes	–	Yes	Yes	Yes
FDDI	Yes	Yes	–	Yes	Yes	Yes
Interface Support: WAN						
Synchronous serial	Yes	Yes	Yes	Yes	Yes	Yes
ISDN BRI	Yes	Yes	Yes	Yes	Yes	Yes
Channelized T1/E1/ISDN PRI	Yes	Yes	Yes	Yes	Yes	Yes
G.703	Yes	Yes	Yes	Yes	Yes	Yes
ATM	Yes	Yes	–	Yes	Yes	Yes

Product Numbers

Table 1 lists the product numbers for Cisco IOS software for NetBeyond and CiscoPro Solutions.

Table 1   Cisco IOS Software for NetBeyond and CiscoPro Solutions—Product Numbers

Description	Product Number
Cisco 700 Series Internet router feature pack	CPASW070-IR-3.2=
Cisco 700 Series SOHO feature pack	CPASW070-SO-3.2=

Description	Product Number
Cisco 700 Series Remote Office feature pack	CPASW070-RO-3.2=
Cisco 760[1] family SOHO feature set, U.S. and Canada	CPASW760-US-3.2=
Cisco 760 family SOHO feature set, Europe	CPASW760-CE-3.2=
Cisco 760 family SOHO feature set, Australia	CPASW760-AU-3.2=
Cisco 760 family SOHO feature set, Japan	CPASW760-JP-3.2=
Cisco 760 family Remote Office feature set, U.S. and Canada	CPASW760RO-US-3.2=
Cisco 760 family Remote Office feature set, Europe	CPASW760RO-CE-3.2=
Cisco 760 family Remote Office feature set, Australia	CPASW760RO-AU-3.2=
Cisco 760 family Remote Office feature set, Japan	CPASW760RO-JP-3.2=
Cisco 1000 IP software feature pack	CPASW10-A-11.1=
Cisco 1000 IP/AT software feature pack	CPASW10-C-11.1=
Cisco 1000 IP/IPX software feature pack	CPASW10-D-11.1=
Cisco 1600 IP software feature pack	CPASW16-A-11.1=
Cisco 1600 IP+ software feature pack	CPASW16-AP-11.1=
Cisco 1600 IP/IPX/AT software feature pack	CPASW16-B-11.1=
Cisco 1600 IP/IPX/AT+ software feature pack	CPASW16-BP-11.1=
Cisco 1600 IP/IPX+ and IP/AT+ software feature pack	CPASW16-DP-11.1=
Cisco 2500 IP software feature pack	CPASW25-A-11.1=
Cisco 2500 IP/IPX/AT software feature pack	CPASW25-B-11.1=
Cisco 2500 IP/IPX IBM Remote Access Server software feature pack	CPASW25-DS-11.1=
Cisco 2500 IP/IPX/AT Remote Access Server software feature pack	CPASW25-E-11.1=
Cisco 2500 Desktop software feature pack	CPASW25-F-11.1=
Cisco 2500 Enterprise software feature pack	CPASW25-G-11.1=
Cisco 3620 IP software feature pack	CPASW362-A-11.1=
Cisco 3620 IP/IPX/AT software feature pack	CPASW362-B-11.1=
Cisco 3620 IP/IPX IBM software feature pack	CPASW362-DS-11.1=
Cisco 3620 Desktop software feature pack	CPASW362-F-11.1=
Cisco 3620 Enterprise software feature pack	CPASW362-G-11.1=
Cisco 3640 IP software feature pack	CPASW364-A-11.1=
Cisco 3640 IP/IPX/AT software feature pack	CPASW364-B-11.1=
Cisco 3640 IP/IPX IBM software feature pack	CPASW364-DS-11.1=
Cisco 3640 Desktop software feature pack	CPASW364-F-11.1=
Cisco 3640 Enterprise software feature pack	CPASW364-G-11.1=
Cisco 4500/4700 IP/IPX IBM Remote Access Server software feature pack	CPASW45-DS-11.1=
Cisco 4500/4700 IP/IPX/AT Remote Access Server software feature pack	CPASW45-E-11.1=

Description	Product Number
Cisco 4500/4700 Desktop software feature pack	CPASW45-F-11.1=
Cisco 4500/4700 Enterprise software feature pack	CPASW45-G-11.1=

1. Cisco 760 Series access routers use Cisco IOS software with a different command syntax from other Cisco IOS software products.

Documentation

Cisco IOS documentation is available as a complete set (use product number DOC-SRIOS11.1=) or as individual documents.

Table 2   Cisco IOS Release 11.1 Software—Documentation

Description	Product Number
Standard Router Software Documentation Release 11.1	DOC-SRIOS11.1=
Access Services Configuration Guide	DOC-ASCG11.1=
Access Services Command Reference	DOC-ASCR11.1=
Cisco Access Connection Guide	DOC-CACG11.1=
Cisco IOS Software Command Summary	DOC-CIOSCS11.1=
Cisco Management Information Base (MIB) User Quick Reference	DOC-MIBQR11.1=
System Error Messages	DOC-SYSEM11.1=
Debug Command Reference	DOC-DEBUGCR11.1=
Wide-Area Networking Configuration Guide	DOC-WANCG11.1=
Wide-Area Networking Command Reference	DOC-WANCR11.1=
Network Protocols Configuration Guide, Part 1	DOC-NPCG1-11.1=
Network Protocols Configuration Guide, Part 2	DOC-NPCG2-11.1=
Network Protocols Command Reference, Part 1	DOC-NPCR1-11.1=
Network Protocols Command Reference, Part 2	DOC-NPCR2-11.1=
Bridging and IBM Networking Configuration Guide	DOC-IBMNCG11.1=
Bridging and IBM Networking Command Reference	DOC-IBMNCR11.1=

Cisco documentation and additional literature are available in a CD-ROM package, which ships with the product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly; therefore, it might be more up-to-date than printed documentation.

The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at http://www.cisco.com, http://www-china.cisco.com, or http://www-europe.cisco.com.

To order additional copies of the Documentation CD-ROM, contact your local sales representative or the customer service department.

For additional information, see the chapter "Cisco Documentation for NetBeyond and CiscoPro."