



# Release Notes for the Cisco 800 series routers and Cisco 820 Series Routers for Cisco IOS Release 12.2(2)XH

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February 17, 2002

These release notes for the Cisco 800 Series and Cisco 820 Series routers describe the enhancements provided in Cisco IOS Release 12.2(2)XH2. These release notes are updated as needed. Use these release notes with [Cross-Platform Release Notes for Cisco IOS Release 12.2](#) located on [Cisco.com](#) and the Documentation CD-ROM.

For a list of the software caveats that apply to Cisco IOS Release 12.2(2)XH2, see the “[Caveats](#)” section on [page 18](#) and [Caveats for Cisco IOS Release 12.2 T](#). The caveats document is updated for every maintenance release and is located on [Cisco.com](#) and the Documentation CD-ROM.

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# System Requirements

This section describes the system requirements for Release 12.2(2)XH2 and includes the following sections:

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## Memory Requirements

This section describes the memory requirements for the Cisco IOS feature sets supported by Cisco IOS Release 12.2(2)XH2 on Cisco 800 and Cisco 820 Series Routers.

**Table 1** *Memory Requirements for the Cisco 800 Series Routers and Cisco 820 Series Routers*

Platforms	Image Name	Image	Required Flash Memory	Required DRAM Memory	Runs From
Cisco 801–804 routers	Cisco 800 Series IOS IP	c800-y6-mw	8 MB	4 MB	RAM
	Cisco 800 Series IOS IP Plus	c800-sy6-mw	8 MB	8 MB	RAM
	Cisco 800 Series IOS IP/FW	c800-oy6-mw	8 MB	4 MB	RAM
	Cisco 800 Series IOS IP/FW Plus IPSec 3DES	c800-k9osy6-mw	8 MB	12 MB	RAM
	Cisco 800 Series IOS IP/IPX/FW Plus IPSec 3DES	c800-k9nosy6-mw	8 MB	12 MB	RAM
Cisco 805 routers	Cisco 805 Series IOS IP	c805-y6-mw	4 MB	8 MB	RAM
	Cisco 805 Series IOS IP Plus	c805-sy6-mw	4 MB	8 MB	RAM
	Cisco 805 Series IOS IP/FW	c805-oy6-mw	4 MB	8 MB	RAM
	Cisco 805 Series IOS IP/IPX Plus	c805-nsy6-mw	8 MB	8 MB	RAM
	Cisco 805 Series IOS IP/FW Plus IPSec 3DES	c805-k9osy6-mw	8 MB	12 MB	RAM
	Cisco 805 Series IOS IP/IPX/FW Plus IPSec 3DES	c805-k9nosy6-mw	8 MB	12 MB	RAM

**Table 1** Memory Requirements for the Cisco 800 Series Routers and Cisco 820 Series Routers

Platforms	Image Name	Image	Required Flash Memory	Required DRAM Memory	Runs From
Cisco 820 series routers	Cisco 820 Series IOS IP	c820-y6-mz	8MB	16MB	RAM
	Cisco 820 Series IOS IP/Voice	c820-v6y6-mz	8MB	24MB	RAM
	Cisco 820 Series IOS IP Plus	c820-sy6-mz	8MB	20MB	RAM
	Cisco 820 Series IOS IP/Voice Plus	c820-sv6y6-mz	8MB	24MB	RAM
	Cisco 820 Series IOS IP/FW	c820-oy6-mz	8MB	20MB	RAM
	Cisco 820 Series IOS IP/FW/Voice	c820-ov6y6-mz	8MB	24MB	RAM
	Cisco 820 Series IOS IP/FW Plus IPSec 56	c820-k9osy6-mz	8MB	24MB	RAM
	Cisco 820 Series IOS IP/FW/Voice Plus 3DES	c820-k9osv6y6-mz	8MB	32MB	RAM

## Hardware Supported

Cisco IOS Release 12.2(2)XH2 supports the following Cisco 800 and Cisco 820 series routers:

- [Cisco 801–804 Routers](#)
- [Cisco 805 Router](#)
- [Cisco 826, Cisco 827, and Cisco 827-4V Routers](#)

For detailed descriptions of new hardware features, see the “[New and Changed Information](#)” section on [page 15](#).

### Cisco 801–804 Routers

The Cisco 801–804 routers provide the following key hardware features:

- Cisco 802 and Cisco 804 routers have an integrated NT-1, which eliminates the need for an external NT-1 in North America.
- Cisco 803 and Cisco 804 routers provide connection to analog telephones or fax machines, which are connected to telephone services through an ISDN line.
- Flash memory: Default is 8 MB, expandable to 12 MB. (4MB Flash soldered to the motherboard.)



#### Note

To add additional Flash memory to the Cisco 801–804, remove the existing Flash card and install a new one.

- Dynamic RAM: Default is 4 MB, expandable to 12 MB. (4MB Dynamic RAM soldered to the motherboard.)
- ISDN B-channel LEDs are a different color from the other LEDs, which make them easy to distinguish.

- Color-coded ports and cable reduce the chance of cabling errors.
- Routers can be stacked or mounted on a wall.

## Cisco 805 Router

The Cisco 805 router connects small professional offices over serial lines to corporate networks and to the Internet. [Table 2](#) summarizes Cisco 805 router ports.

**Table 2** *Cisco 805 Router Ports*

Port Type	Description
Ethernet Port	One 10BaseT (RJ-45)
Serial Port	One WAN interface (RS-232, RS-449, RS-530 and RS-530A, V.35, and X.21)
Console Port	RJ-45

The Cisco 805 router provides the following key features:

- One serial WAN interface that delivers up to 512 kbps for synchronous serial connections (Frame Relay, leased lines, and X.25) or up to 115 kbps for asynchronous dial-up.
- One Ethernet LAN interface.
- Flash memory: 4 MB default, expandable to 12 MB.
- Dynamic RAM: 8 MB, expandable to 16 MB.
- Color-coded ports and cable reduce the chance of cabling errors.
- Routers can be stacked or mounted on a wall.

## Cisco 826, Cisco 827, and Cisco 827-4V Routers

The Cisco 826, Cisco 827, and Cisco 827-4V Series Routers provide the following key hardware features:

- The routers provide connection to an ADSL network or telephones and fax machines through an ADSL port.
- Flash memory: Default is 12 MB and is expandable to 20 MB. If 12 MB is Flash is installed, 8 MB is used for the Cisco IOS images and 4 MB hosts the ROMMON and NVRAM. Additional memory can be added using Flash cards.
- Cisco 826 and Cisco 827 routers Dynamic RAM: Default is 16 MB of DRAM and is expandable to 32 MB.
- Cisco 827-4V router Dynamic RAM: Default is 24 MB and is expandable to 32 MB. The Cisco 827-4V router also contains an 8-MB DIMM card.
- The central processing unit is a 50 MHz MPC 855T RISC processor.
- Color-coded ports and cable reduce the chance of cabling errors.
- Routers can be stacked or mounted on a wall.
- The routers provide locking power connectors and a Kensington-compatible locking slot.

Table 3 lists the supported interfaces for the Cisco 826, Cisco 827, and Cisco 827-4V routers.

**Table 3 Supported Interfaces for the Cisco 826, Cisco 827, and Cisco 827-4V Router**

Router	Ethernet Ports	ADSL Ports	Telephone Ports	Console Ports
Cisco 826	One 10BaseT (RJ-45)	RJ-45	–	RJ-45
Cisco 827	One 10BaseT (RJ-45)	RJ-45	–	RJ-45
Cisco 827-4V	One 10BaseT (RJ-45)	RJ-45	Four (RJ-11)	RJ-45

## Determining Your Software Release

To determine the version of Cisco IOS software currently running on your Cisco 1700 series router, log in to the router and enter the **show version EXEC** command. The following sample output from the **show version** command indicates the version number on the second output line:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) c1700 Software (c1700-y-mz), Release 12.2(2)XH2, RELEASE SOFTWARE
```

## Upgrading to a New Software Release

For general information about upgrading to a new software release, see *Upgrading the Cisco IOS Software Release in Cisco Routers and Modems*:

<http://www.cisco.com/warp/public/620/6.html>

## Feature Set Tables

The Cisco IOS software is packaged in feature sets consisting of software images—depending on the platform. Each feature set contains a specific set of Cisco IOS features. Release 12.2(2)XH2 supports the same feature sets as Releases 12.2 and 12.2 T, but Release 12.2(2)XH2 can include new features supported by the Cisco 800 series and the Cisco 820 series routers. Table 4 lists the feature sets supported by the Cisco 800 series and Cisco 820 series routers.

**Table 4 Feature Sets Supported by the Cisco 800 Series and Cisco 820 Series Routers**

Image Name	Feature Set Matrix Terms	Software Image	Platform
Cisco 800 Series IOS IP	IP	c800-y6-mw	Cisco 801–804 routers
Cisco 800 Series IOS IP Plus	IP, Plus	c800-sy6-mw	
Cisco 800 Series IOS IP/FW	IP, FW	c800-oy6-mw	
Cisco 800 Series IOS IP/FW Plus IPsec 3DES	IP, FW, Plus, IPsec, 3DES	c800-k9osy6-mw	
Cisco 800 Series IOS IP/IPX/FW Plus IPsec 3DES	IP, IPX, FW, Plus, IPsec, 3DES	c800-k9nosy6-mw	
Cisco 805 Series IOS IP	IP	c805-y6-mw	Cisco 805 routers
Cisco 805 Series IOS IP Plus	IP, Plus	c805-sy6-mw	
Cisco 805 Series IOS IP/FW	IP, FW	c805-oy6-mw	
Cisco 805 Series IOS IP/IPX Plus	IP, IPX, Plus	c805-nsy6-mw	

**Table 4** Feature Sets Supported by the Cisco 800 Series and Cisco 820 Series Routers (continued)

Image Name	Feature Set Matrix Terms	Software Image	Platform
Cisco 805 Series IOS IP/FW Plus IPSec 3DES	IP, FW, Plus, IPSec, 3DES	c805-k9osy6-mw	Cisco 805 routers (continued)
Cisco 805 Series IOS IP/IPX/FW Plus IPSec 3DES	IP, IPX, FW, Plus, IPSec, 3DES	c805-k9nosy6-mw	
Cisco 820 Series IOS IP	IP	c820-y6-mz	Cisco 820 Series Routers
Cisco 820 Series IOS IP/Voice	IP/Voice	c820-v6y6-mz	
Cisco 820 Series IOS IP Plus	IP Plus	c820-sy6-mz	
Cisco 820 Series IOS IP/Voice Plus	IP/Voice Plus	c820-sv6y6-mz	
Cisco 820 Series IOS IP/FW	IP/FW	c820-oy6-mz	
Cisco 820 Series IOS IP/FW/Voice	IP/FW/Voice	c820-ov6y6-mz	
Cisco 820 Series IOS IP Plus IPSec 56	IP Plus IPSec 56	c820-k9osy6-mz	
Cisco 820 Series IOS IP/FW/Voice Plus 3DES	IP/FW/Voice Plus 3DES	c820-k9osv6y6-mz	

Table 5 through Table 8 list the features and feature sets supported in Cisco IOS Release 12.2(2)XH2:

- Table 5 and Table 6—Cisco 801–804 routers
- Table 7—Cisco 805 routers
- Table 8—Cisco 826, Cisco 827, and Cisco 827 -4V routers

The tables use the following conventions:

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

**Note**

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

**Table 5** Feature List by Feature Set for the Cisco 801–804 Routers

Features	Feature Set				
	IP	IP/Plus	IP/FW	IP/FW/ Plus/ IPSec/ 3DES	IP/IPX/ FW/Plus/ IPSec/ 3DES
<b>Address Conservation</b>					
PAT (NAT Overload)	Yes	Yes	Yes	Yes	Yes
NAT	Yes	Yes	Yes	Yes	Yes
NAT with H.323	No	No	No	No	No
<b>Advanced Telephone Features<sup>1</sup></b>					
Call Forward (Sweden and Finland only)	Yes	Yes	Yes	Yes	Yes
Call Forward Variable (North America, Denmark, and Finland only)	Yes	Yes	Yes	Yes	Yes

Table 5 Feature List by Feature Set for the Cisco 801–804 Routers (continued)

Features	Feature Set				
	IP	IP/Plus	IP/FW	IP/FW/ Plus/ IPSec/ 3DES	IP/IPX/ FW/Plus/ IPSec/ 3DES
Call Hold Retrieve (North America, Denmark, and Finland only)	Yes	Yes	Yes	Yes	Yes
Call Transfer (North America and Finland only)	Yes	Yes	Yes	Yes	Yes
Call Waiting	Yes	Yes	Yes	Yes	Yes
Caller ID Number delivery to POTS ports (North America, Denmark, Sweden, and Finland only)	Yes	Yes	Yes	No	Yes
Caller ID Name delivery to POTS ports (North America only)	No	No	No	No	No
Caller ID Restriction (Denmark, Finland, and Sweden only)	Yes	Yes	Yes	Yes	Yes
Calling Line Identification Restriction (CLIR) – Temporary Mode (Denmark and Finland only)	Yes	Yes	Yes	Yes	Yes
Data-Over-Voice Bearer (North America only)	Yes	Yes	Yes	Yes	Yes
Distinctive Ringing	Yes	Yes	Yes	Yes	Yes
ISDN-Voice Priority	Yes	Yes	Yes	Yes	Yes
Prefix Dialing <sup>2</sup>	Yes	Yes	Yes	Yes	Yes
<b>Basic Services</b>					
GRE Tunneling	No	Yes	No	Yes	Yes
NAT	Yes	Yes	Yes	Yes	Yes
PAP, CHAP, MSCHAP, Local Password	Yes	Yes	Yes	Yes	Yes
<b>Dial</b>					
Common Application Programming Interface (CAPI) (available only for NET3 image)	Yes	Yes	Yes	Yes	Yes
<b>Ease of Use and Deployment</b>					
Auto SPID / Switch Detection	Yes	Yes	Yes	Yes	Yes
Cisco ConfigMaker	Yes	Yes	Yes	Yes	Yes
Cisco FastStep	Yes	Yes	Yes	Yes	Yes
Easy IP Phase I and II (IPCP Address Negotiation and DHCP Server)	Yes	Yes	Yes	Yes	Yes
TFTP Client and Server	Yes	Yes	Yes	Yes	Yes
<b>IP Routing Protocols</b>					
OSPF Flooding Reduction	No	No	No	No	No
<b>LAN</b>					
AppleTalk	No	No	No	No	No
IP	Yes	Yes	Yes	Yes	Yes
IPX	No	No	No	No	Yes

Table 5 Feature List by Feature Set for the Cisco 801–804 Routers (continued)

Features	Feature Set				
	IP	IP/Plus	IP/FW	IP/FW/ Plus/ IPSec/ 3DES	IP/IPX/ FW/Plus/ IPSec/ 3DES
NetBIOS Access Lists	Yes	Yes	Yes	Yes	Yes
Transparent Bridging	Yes	Yes	Yes	Yes	Yes
<b>Management</b>					
Cisco View	Yes	Yes	Yes	Yes	Yes
Service Assurance Agent	No	Yes	No	Yes	Yes
SNMP, Telnet, Console Port	Yes	Yes	Yes	Yes	Yes
SNTP	Yes	Yes	Yes	Yes	Yes
Syslog	No	Yes	No	Yes	Yes
<b>Routing</b>					
BGP	No	No	No	No	No
EGP	No	No	No	No	No
IGRP	No	No	No	No	No
IP Enhanced IGRP (IP-EIGRP)	No	Yes	No	Yes	Yes
IPX Enhanced IGRP (IPX-EIGRP)	No	No	No	No	No
IP Multicast (relay only)	No	Yes	No	Yes	Yes
IP-Policy Routing	No	Yes	No	Yes	Yes
IPXWAN	No	No	No	No	Yes
OSPF	No	No	No	No	No
RIP, RIPv2, Triggered RIP	Yes	Yes	Yes	Yes	Yes
XOT	No	No	No	No	No
<b>Security</b>					
AAA Radius	No	No	No	No	No
AAA TACACS+	No	Yes	No	Yes	Yes
Additional Vendor-Proprietary RADIUS Attributes	No	No	No	No	No
Authenticating ACL	No	No	No	No	No
Automated Double Authentication (server functionality)	No	No	No	No	No
Certificate Authority Interoperability	No	No	No	Yes	Yes
Internet Key Exchange Security Protocol	No	No	No	Yes	Yes
IPSec Network Security	No	No	No	Yes	Yes

**Table 5** Feature List by Feature Set for the Cisco 801–804 Routers (continued)

Features	Feature Set				
	IP	IP/Plus	IP/FW	IP/FW/ Plus/ IPSec/ 3DES	IP/IPX/ FW/Plus/ IPSec/ 3DES
Cisco IOS Firewall Phase I					
– Context Based Access Control Lists	No	No	Yes	Yes	Yes
– Java Blocking	No	No	Yes	Yes	Yes
– Denial of Service Detection and Prevention	No	No	Yes	Yes	Yes
– Real-time Alerts and Audit Trails	No	No	Yes	Yes	Yes
IPSec Encryption with 56 bit DES	No	No	No	Yes	Yes
IPSec Encryption with 168 bit DES (3DES)	No	No	No	Yes	Yes
Lock and Key	Yes	Yes	Yes	Yes	Yes
L2TP	No	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	No	No	No	No	No
Route and Router Authentication	Yes	Yes	Yes	Yes	Yes
Token Card - Double Authentication	Yes	Yes	Yes	Yes	Yes
<b>WAN</b>					
Frame Relay Encapsulation (for ISDN LL and ISDN Dial with PVC)	Yes	Yes	Yes	Yes	Yes
ISDN Digital Subscriber Line (IDSL, up to 144 kbps) (Cisco 802 & Cisco 804 only)	Yes	Yes	Yes	Yes	Yes
Frame Relay Inverse ARP	Yes	Yes	Yes	Yes	Yes
ISDN	Yes	Yes	Yes	Yes	Yes
ISDN Leased Line (up to 144 kbps)	Yes	Yes	Yes	Yes	Yes
ML-PPP, PPP Compression	Yes	Yes	Yes	Yes	Yes
PPP over Frame Relay (RFC 1973)	No	No	No	No	No
<b>WAN Optimization</b>					
Always On/Dynamic ISDN (AO/DI)	No	Yes	No	Yes	Yes
Bandwidth on Demand (BOD)	Yes	Yes	Yes	Yes	Yes
Dial on Demand (DDR)	Yes	Yes	Yes	Yes	Yes
HSRP	Yes	Yes	Yes	Yes	Yes
IPX and SPX Spoofing	No	No	No	No	Yes
ISDN Caller ID Callback	Yes	Yes	Yes	Yes	Yes
Snapshot Routing	Yes	Yes	Yes	Yes	Yes

**Table 5 Feature List by Feature Set for the Cisco 801–804 Routers (continued)**

Features	Feature Set				
	IP	IP/Plus	IP/FW	IP/FW/ Plus/ IPSec/ 3DES	IP/IPX/ FW/Plus/ IPSec/ 3DES
Stac Compression	Yes	Yes	Yes	Yes	Yes
Time-based Access Lists	Yes	Yes	Yes	Yes	Yes
X.25 ID	No	Yes	No	Yes	Yes

1. Advanced Telephone Features are available on the Cisco 803 and 804 routers only. These features require supplementary services from a telephone company.
2. Prefix Dialing is supported on Cisco 803 and Cisco 804 routers only.

**Table 6 Additional Features Supported by Cisco 801–804 Routers**

Feature	IP	IP/Plus	IP/FW	IP/FW/Plus /IPSec/ 3DES	IP/IPX/FW/ Plus/IPSec/ 3DES
Routed Protocol	IP	IP	IP	IP	IP/IPX
Routing Protocol	RIP Snapshot	RIP/IP- EIGRP Snapshot	RIP/IP- EIGRP Snapshot	RIP/IP- EIGRP Snapshot	RIP/IP- EIGRP Snapshot
Tunneling		GRE		GRE	GRE
XXX PAD	No	Yes	No	Yes	Yes
X.25 over B and D	No	Yes	No	Yes	Yes
SNTP (Simple Network Time Protocol)	SNTP	SNTP	SNTP	SNTP	SNTP
Multicast		IP Multicast Forwarding		IP Multicast Forwarding	IP Multicast Forwarding
Management	SNMP	SNMP/ SYSLOG	SNMP	SNMP/ SYSLOG	SNMP/ SYSLOG
Manual ISDN Calls (see reference for commands)	Yes	Yes	Yes	Yes	Yes

Table 7 Feature List by Feature Set for the Cisco 805 Router

Features	Feature Set				
	IP	IP Plus	IP/FW	IP/FW Plus IPSec 3DES	IP/IPX/ FW Plus IPSec 3DES
<b>Address Conservation</b>					
PAT (NAT Overload)	Yes	Yes	Yes	Yes	Yes
NAT	Yes	Yes	Yes	Yes	Yes
NAT with H.323	No	No	No	Yes	Yes
<b>Basic Services</b>					
GRE Tunneling	No	Yes	No	Yes	Yes
NAT	Yes	Yes	Yes	Yes	Yes
PAP, CHAP, MSCHAP, Local Password	Yes	Yes	Yes	Yes	Yes
<b>Ease of Use and Deployment</b>					
Cisco ConfigMaker	Yes	Yes	Yes	Yes	Yes
Cisco FastStep	Yes	Yes	Yes	Yes	Yes
Easy IP Phase I and II (IPCP Address Negotiation and DHCP Server)	Yes	Yes	Yes	Yes	Yes
TFTP Client and Server	Yes	Yes	Yes	Yes	Yes
<b>LAN</b>					
IP	Yes	Yes	Yes	Yes	Yes
IPX	No	No	No	No	Yes
NetBIOS Access Lists	Yes	Yes	Yes	Yes	Yes
Transparent Bridging	Yes	Yes	Yes	Yes	Yes
<b>Management</b>					
Cisco View	Yes	Yes	Yes	Yes	Yes
Service Assurance Agent	No	Yes	No	Yes	Yes
SNMP, Telnet, Console Port	Yes	Yes	Yes	Yes	Yes
SNTP	Yes	Yes	Yes	Yes	Yes
Syslog	No	Yes	No	Yes	Yes
<b>Routing</b>					
BGP	No	No	No	No	No
EGP	No	No	No	No	No
IGRP	No	No	No	No	No
IP Enhanced IGRP (IP-EIGRP)	No	Yes	No	Yes	Yes
IPX Enhanced IGRP (IPX-EIGRP)	No	No	No	No	No
IP-Policy Routing	No	Yes	No	Yes	Yes
IPXWAN	No	No	No	No	Yes

Table 7 Feature List by Feature Set for the Cisco 805 Router (continued)

Features	Feature Set				
	IP	IP Plus	IP/FW	IP/FW Plus IPSec 3DES	IP/IPX/FW Plus IPSec 3DES
OSPF	No	No	No	No	No
PIM for IP	No	Yes	No	Yes	Yes
RIP, RIPv2, Triggered RIP	Yes	Yes	Yes	Yes	Yes
XOT	No	Yes	No	Yes	Yes
<b>Security</b>					
AAA Radius	No	No	No	No	No
AAA TACACS+	No	Yes	No	Yes	Yes
Additional Vendor-Proprietary RADIUS Attributes	No	No	No	No	No
Authenticating ACL	No	No	No	No	No
Automated Double Authentication (server functionality)	No	No	No	No	No
Certificate Authority Interoperability	No	No	No	Yes	Yes
Internet Key Exchange Security Protocol	No	No	No	Yes	Yes
IPSec Network Security	No	No	No	Yes	Yes
Cisco IOS Firewall Phase I					
– Context Based Access Control Lists	No	No	Yes	Yes	Yes
– Java Blocking	No	No	Yes	Yes	Yes
– Denial of Service Detection and Prevention	No	No	Yes	Yes	Yes
– Real-time Alerts and Audit Trails	No	No	Yes	Yes	Yes
IPSec Encryption with 56 bit DES	No	No	No	Yes	Yes
IPSec Encryption with 168 bit DES (3DES)	No	No	No	Yes	Yes
Lock and Key	Yes	Yes	Yes	Yes	Yes
L2TP	No	No	No	Yes	Yes
Named Method Lists for AAA Authentication & Accounting	No	No	No	No	No
Route and Router Authentication	Yes	Yes	Yes	Yes	Yes
Token Card - Double Authentication	Yes	Yes	Yes	Yes	Yes
<b>WAN</b>					
Frame Relay Encapsulation	Yes	Yes	Yes	Yes	Yes
Frame Relay Inverse ARP	Yes	Yes	Yes	Yes	Yes
ML-PPP, PPP Compression	Yes	Yes	Yes	Yes	Yes
PPP over Frame Relay (RFC 1973)	No	No	No	No	No
<b>WAN Optimization</b>					
Bandwidth on Demand (BOD)	No	No	No	No	No
Dial on Demand (DDR)	No	No	No	No	No

**Table 7** Feature List by Feature Set for the Cisco 805 Router (continued)

Features	Feature Set				
	IP	IP Plus	IP/FW	IP/FW Plus IPSec 3DES	IP/IPX/ FW Plus IPSec 3DES
HSRP	Yes	Yes	Yes	Yes	Yes
IPX and SPX Spoofing	No	No	No	No	Yes
Snapshot Routing	No	No	No	No	No
Stac Compression	Yes	Yes	Yes	Yes	Yes
Time-based Access Lists	Yes	Yes	Yes	Yes	Yes
X.25 ID	Yes	Yes	Yes	Yes	Yes

**Table 8** Feature List by Feature Set for the Cisco 820 Series Routers

Features	Feature Sets							
	IP	IP/ Voice	IP Plus	IP/Voice Plus	IP/FW	IP/FW/ Voice	IP /FW Plus IPSec 56	IP/FW/ Voice Plus 3DES
<b>Address Conservation</b>								
DHCP Client Address Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPCP Address Negotiation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAT Many to One (PAT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NAT Many to Many (Multi-NAT)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Bandwidth Optimization</b>								
NetBIOS Name Caching	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
STAC Compression	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Business-Class Quality of Service</b>								
ATM TX Ring Programming	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CBR, VBRrt, VBRnrt, UBR Traffic Classes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Class-Based Weighted Fair Queuing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LFI/LLQ	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-Virtual Circuit Queuing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Per-Virtual Circuit Shaping	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weighted Random Early Detection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 8 Feature List by Feature Set for the Cisco 820 Series Routers (continued)

Features	Feature Sets							
	IP	IP/ Voice	IP Plus	IP/Voice Plus	IP/FW	IP/FW/ Voice	IP /FW Plus IPSec 56	IP/FW/ Voice Plus 3DES
<b>Business-Class Security</b>								
GRE Tunneling	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP (and IPX when applicable) Basic and Extended Access Lists	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NetBIOS Access Lists	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PAP, CHAP, Local Password	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Route and Router Authentication	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Ease of Use and Deployment</b>								
Cisco Fast Step Software	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Easy IP Phase I and II	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PPPoE MTU Adjustment	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Enhanced Security</b>								
Cisco IOS Firewall	No	No	Yes	Yes	No	Yes	Yes	Yes
Context-Based Access Control Lists	No	No	Yes	Yes	No	Yes	Yes	Yes
Denial-of-Service Detection	No	No	Yes	Yes	No	Yes	Yes	Yes
IPSec Encryption with 3DES and L2TP	No	No	No	No	No	Yes	Yes	Yes
Java Blocking	No	No	Yes	Yes	No	Yes	Yes	Yes
Real-Time Alerts	No	No	Yes	Yes	No	Yes	Yes	Yes
<b>LAN</b>								
IP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPX	No	No	No	No	Yes	No	Yes	No
Transparent Bridging	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Management</b>								
CiscoView	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNTP	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMP, Telnet, Console Port	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Syslog	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TACACS+ (also a security feature)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TFTP Client and Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Routing</b>								
IP Enhanced IGRP	No	No	Yes	Yes	No	Yes	Yes	No
IP Multicast (relay only)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP-Policy Routing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

**Table 8** Feature List by Feature Set for the Cisco 820 Series Routers (continued)

Features	Feature Sets							
	IP	IP/ Voice	IP Plus	IP/Voice Plus	IP/FW	IP/FW/ Voice	IP /FW Plus IPSec 56	IP/FW/ Voice Plus 3DES
IPX RIP/SAP IPX WAN	No	No	No	No	Yes	No	Yes	No
RIP, RIPv2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Voice Features (Cisco 827-4V only)</b>								
G.711, G.729a, G.723.1 Codecs with High-Performance DSP Support	No	Yes	No	Yes	Yes	No	No	Yes
Loop-Start Key-System or Direct Phone Support	No	Yes	No	Yes	Yes	No	No	Yes
RAS Gatekeeper Communications Protocol	No	Yes	No	Yes	Yes	No	No	Yes
VoIP H.323	No	Yes	No	Yes	Yes	No	No	Yes

## New and Changed Information

The following sections list the new software features supported by the Cisco 800 series and Cisco 820 series routers for Release 12.2(2)XH2 and above.

### New Software Features in Release 12.2(2)XH1

The following sections list the new software features supported by the Cisco 800 series and Cisco 820 series routers for Release 12.2(2)XH1.

#### IP Named Access Lists

Cisco 805 routers now support the IP Named Access Lists feature. Using this feature, you can identify IP access lists with an alphanumeric string (a name) rather than a number. Named access lists enable you to configure more IP access lists in a router than numbered access lists. This feature is required to support the Virtual Private Network (VPN) Solution Center, which does not operate with numbered access lists.



**Note**

Release 12.2(2)XH supports the IP Named Access Lists feature on Cisco 801–804 routers only. Release 12.2(2)XH1 is required to use the IP Named Access Lists feature on Cisco 805 routers.

### New Software Features in Release 12.2(2)XH

The following sections list the new software features supported by the Cisco 800 series and Cisco 820 series routers for Release 12.2(2)XH. Information is included for any changed or new command line interface (CLI) commands associated with the new features.

## Committed Access Rate

Cisco 826, Cisco 827, and Cisco 827-4V routers now support Committed Access Rate (CAR). CAR can be used to rate-limit traffic based on certain matching criteria such as incoming interface, IP precedence, QoS group, or IP access list criteria. CAR provides configurable actions, such as transmit, drop, set precedence, or set QoS group, when traffic conforms to or exceeds the rate limit.

The CAR feature performs the following functions:

- Limits the input or output transmission rate on an interface or subinterface based on a flexible set of criteria.
- Classifies packets by setting the IP precedence or Quality of Service (QoS) group, which is a class identifier that is internal to the router.

## IP Named Access Lists

Cisco 801–804 routers now support the IP Named Access Lists feature. Using this feature, you can identify IP access lists with an alphanumeric string (a name) rather than a number. Named access lists enable you to configure more IP access lists in a router than numbered access lists. This feature is required to support the Virtual Private Network (VPN) Solution Center, which does not operate with numbered access lists.

## New Software Features in Release 12.2 T

For information regarding the features supported in Cisco IOS Release 12.2 T, refer to the Cross-Platform Release Notes and New Feature Documentation links at the following location on Cisco.com:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122t/index.htm>

This URL is subject to change without notice. If it changes, point your web browser to Cisco.com, and click on the following path:

**Service & Support: Technical Documents: Release 12.2** (from the **Cisco IOS Software** drop-down list)

## Important Notes

The following sections contain important notes about Cisco IOS Release 12.2(2)XH2 and above that can apply to the Cisco 800 series and Cisco 820 series routers. (Also, see the “[Caveats](#)” section on page 18.)

## PPPoE MTU Adjustment Command Syntax Change

The syntax of the **ip adjust-mss** command has changed to the following command syntax:

**ip tcp adjust-mss** *mss*

where *mss* must be 1452 or less to fix the PPPoE Maximum Transmission Unit (MTU) problem.

## Cisco 820 Series Memory Management When Using WFQ

When weighted fair queuing (WFQ) is used on the Dialer interface, or when WFQ is used in the default class of a service policy, the following parameters need to be set to the values shown because of the limited amount of memory on the router:

- Congestive Discard Threshold: 64 or less
- Number Dynamic Conversation Queues: 64 or less
- Total maximum output packets: 64 or less

For example, if you apply WFQ to the Dialer interface, configure it as follows:

```
interface Dialer 1
 fair-queue 64 64 0
 hold-queue 64 out
```

In this example, the command **fair-queue 64 64 0** limits the number of conversations to 64, and sets the discard threshold to 64. The command **hold-queue 64 out** limits the maximum number of output packets to 64.

In another example, if you configure a service policy, and WFQ is used on the default class, configure the policy as follows:

```
policy-map mypolicy
 class voice
  priority 100
 class class-default
  fair-queue 64
  queue-limit 64

int dialer 1
 service-policy out mypolicy
 hold-queue 64 out
```

Here, the command **fair-queue 64** limits the number of conversations to 64, and the command **queue-limit 64** sets the discard threshold to 64. The command **hold-queue 64 out** limits the maximum number of output packets to 64. Failure to configure the above parameters may cause the router to display out-of-memory messages when a large amount of mixed traffic is transmitted from Ethernet to ATM.

## Cisco 820 Series Router Clock—CSCdp09409

To run IPSec successfully, the Cisco 820 series router clock needs to be set accurately. Cisco 820 series router clocks are set and maintained using Simple Network Time Protocol (SNTP). For best results, set up a Network Time Protocol (NTP) server to periodically send time information messages to Cisco 820 series routers. See the SNTP configuration and command reference documentation for configuration instructions. If you do not have an NTP server, you must reset the Cisco 820 series router clock using the command **clock set** each time you restart the router.

The SNTP configuration documentation is available in the chapter “Monitoring the Router and Network” volume of the *Configuration Fundamentals Configuration Guide* in the Cisco IOS documentation set. The SNTP command reference documentation is available in the chapter “Router and Network Monitoring Commands” in the ““System Management Commands” volume of the *Configuration Fundamentals Command Reference* manual of the Cisco IOS documentation set.

## CiscoView Application Support

The CiscoView application supports the Cisco 820 series routers. The CiscoView application provides dynamic status, statistics, and comprehensive configuration information for Cisco switches, routers, concentrators, and adapters. It displays a graphical view of Cisco devices. This network management tool also provides configuring and monitoring functions and offers basic troubleshooting tips.

## Downloading Images

Before attempting to download new images, you must first delete files in the router Flash memory. Be sure to use the **delete** command, not command **erase**, to free up space. Entering **erase** removes all files, including the configuration.

## Multilink PPP and Interleaving

Multilink PPP fragments large data packets so that small voice packets can be interleaved within them. However, apart from first-in-first-out (FIFO) queuing, no other kind of output queuing mechanisms are currently supported with PPP over ATM. Consequently, when multilink PPP is configured on the Cisco 827 routers, the big packets are fragmented, but interleaving of small voice packets within them does not occur.

## NAT Support for H.323 Signaling

Currently, NAT does not support alerting H.225 messages. Therefore, NAT communication cannot be established between the router end points. NAT support for H.323 signaling is limited to the Netmeeting application.

## Phone Mate Answering Machine Model 9200

A Phone Mate answering machine model 9200 fails to recognize the ringing signal sent by AMD R79 ringing SLIC. This was confirmed by testing against Phone Mate model 3750 and newer model 9300.

## ROM Monitor set stop-bits Parameter

This release supports the setting of 1 only, for the ROM monitor **set stop-bits** parameter.

## Caveats

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats, severity 2 caveats are less serious, and severity 3 caveats are the least serious of these three severity levels.

Caveats in Cisco IOS Releases 12.2 and 12.2 T are also in Cisco IOS Release 12.2(2)XH2. For information on caveats in Cisco IOS Release 12.2, see [Caveats for Cisco IOS Release 12.2](#). For information on caveats in Cisco IOS Release 12.2 T, see [Caveats for Cisco IOS Release 12.2 T](#). These two documents list severity 1 and 2 caveats and are located on [Cisco.com](http://Cisco.com) and the Documentation CD-ROM.

**Note**

If you have an account with Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to Cisco.com and click **Service & Support: Technical Assistance Center: Tool Index: Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

## Resolved Caveats - Release 12.2(2)XH2

This section describes unexpected behavior that is fixed in Release 12.2(2)XH2.

### Management

#### CSCdw65903

An error can occur with management protocol processing. Please use the following URL for further information:

<http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903>

## Caveats for Release 12.2(2)XH

This section describes possibly unexpected behavior by software Release 12.2(2)XH.

#### CSCdu29516

Normally, the **no ip route-cache** command is applied to the dialer interface for the Ethernet interface to rate-limit incoming traffic. However, in this case, the dialer interface does not rate-limit incoming or outgoing traffic when ATM encapsulation AAL5 Point-to-Point Protocol (PPP) is used.

The workaround is to issue the **ip route-cache** command on the Ethernet interface if you are running ATM encapsulation PPP over Ethernet. All interfaces will then be able to rate-limit incoming and outgoing traffic.

#### CSCdu44295

On an intermittent basis, traceback occurs on the Cisco 801–804 routers that are running the 12.2(2)XH release. However, the traceback does not affect any other functionality.

## Related Documentation

The following sections describe the documentation available for the Cisco 820 Series Routers. Typically, these documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

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

Use these release notes with the documents listed in the following sections:

- [Release-Specific Documents](#)
- [Platform-Specific Documents](#)
- [Feature Modules](#)
- [Cisco IOS Software Documentation Set](#)

## Release-Specific Documents

The following documents are specific to Release 12.2 and apply to Release 12.2(2)XH2. They are located on Cisco.com and the Documentation CD-ROM:

- [Release Notes for Cisco IOS Release 12.2\(2\)XH](#)
  - To reach the *Release Notes for the Cisco IOS Release 12.2(2)XH* from Cisco.com, click this path (under the heading **Service & Support**):  
**Technical Documents: Cisco IOS Software: Release 12.2: Release Notes: <platform> Routers: <platform> Series - Release Notes for Release 12.2(2)XH**
  - To reach the *Release Notes for the Cisco 800 Series Routers for Cisco IOS Release 12.2(2)XH* on the Documentation CD-ROM, click this path:  
**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Release Notes: Cisco 800 Series Routers: Cisco 800 Series - Release Notes for Release 12.2(2)XH**
- [Release Notes for Cisco IOS Release 12.2](#)
  - To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2* from Cisco.com, click this path (under the heading **Service & Support**):  
**Technical Documents: Cisco IOS Software: Release 12.2: Release Notes: Cross-Platform Release Notes (Cisco IOS Release 12.2)**
  - To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.2* on the Documentation CD-ROM, click this path:  
**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Release Notes: Cross-Platform Release Notes**
- Product bulletins, field notices, and other release-specific documents  
To reach these documents from Cisco.com, click this path (under the heading **Service & Support**):  
**Technical Documents: Product Bulletins**
- [Caveats for Cisco IOS Release 12.2 and 12.2 T](#)  
The *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2 T* documents contain caveats applicable to all platforms for all maintenance releases of Release 12.2.
  - To reach the caveats document from Cisco.com, click this path (under the heading **Service & Support**):  
**Technical Documents: Cisco IOS Software: Release 12.2: Caveats**

- To reach the caveats document on the Documentation CD-ROM, click this path:  
**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Caveats**

**Note**

If you have an account with Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to Cisco.com and click **Service & Support: Technical Assistance Center: Tool Index: Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

## Platform-Specific Documents

The following documents are available for the Cisco 820 Series Routers on Cisco.com and the Documentation CD-ROM:

### Cisco 801–804 Routers

These documents are available for the Cisco 800 series on Cisco.com and the Documentation CD-ROM:

- *Cisco 800 Series Router Quick Start Guide*
- *Cisco 800 Series Routers Hardware Installation Guide*
- *Cisco 800 Series Routers Software Configuration Guide*
- *Release Notes for Cisco 800 Series Routers*
- *Configuring Cisco IOS Software Features*
- *Cisco 800 Fast Step Quick Start Guide*
- *Cisco Fast Step documentation for the 800 series routes*
- *Regulatory Compliance and Safety Information*
- *Upgrading Memory in the Cisco 800 Series Routers*

From Cisco.com or on the Documentation CD, click this path:

**Technical Documents** (under the heading **Service & Support**): **Fixed Configuration Access Routers** (under **Access Servers & Routers**): **Cisco 801–804 Routers**

### Cisco 805 Routers

These documents are available for the Cisco 805 router on Cisco.com and the Documentation CD-ROM.

- *Cisco 805 Router Hardware Installation Guide*
- *Quick Start Guide — Setting up the Cisco 805 Router*
- *Cisco 805 Router Software Configuration Guide*
- *Regulatory Compliance and Safety Info For the Cisco 805 Router*
- *Release Notes for the Cisco 805 Router*

From Cisco.com or on the Documentation CD, click this path:

**Technical Documents** (under the heading **Service & Support**): **Fixed Configuration Access Routers** (under **Access Servers & Routers**): **Cisco 805 Router**

## Cisco 826 Router

These documents are available for the Cisco 826 router on Cisco.com and the Documentation CD-ROM:

- *Quick Start Guide - Setting up the Cisco 826 Router*
- *Cisco 826 Router Hardware Installation Guide*
- *Software Enhancements for the Cisco 826 and 827 Routers*
- *Regulatory Compliance and Safety Information for the Cisco 826 Router*

From Cisco.com or on the Documentation CD, click this path:

**Technical Documents** (under the heading **Service & Support**): **Fixed Configuration Access Routers** (under **Access Servers & Routers**): **Cisco 826 Routers**

## Cisco 827 and Cisco 827 4-V Routers

These documents are available for the Cisco 827 and Cisco 827 4-V routers on Cisco.com and the Documentation CD-ROM:

- *Quick Start Guide - Setting Up the Cisco 827 Routers*
- *Cisco 827 Routers Hardware Installation Guide*
- *Cisco 827 Routers Software Configuration Guide*
- *Release Notes for Cisco 827 Routers*
- *Upgrading Memory in Cisco 800 Series Routers*

From Cisco.com or on the Documentation CD, click this path:

**Technical Documents** (under the heading **Service & Support**): **Fixed Configuration Access Routers** (under **Access Servers & Routers**): **Cisco 827 Routers**

## Feature Modules

Feature modules describe new features supported by Release 12.2 and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

To reach the Release 12.2 feature modules:

- From Cisco.com, click this path (under the heading **Service & Support**):

**Technical Documents: Cisco IOS Software: Release 12.2: New Feature Documentation: New Features in 12.2-Based Limited Lifetime Releases: New Features in 12.2X Releases**

- From the Documentation CD-ROM, click this path:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: New Feature Documentation: New Features in 12.2-Based Limited Lifetime Releases: New Features in 12.2X Releases**

## Feature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image. Feature Navigator is available 24 hours a day, 7 days a week.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at [cdbadmin@cisco.com](mailto:cdbadmin@cisco.com). If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to set up an account.

To use Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript support and enabling instructions for other browsers, check with the browser vendor.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. You can access Feature Navigator at the following URL:

<http://www.cisco.com/go/fn>

## Cisco IOS Software Documentation Set

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

### Documentation Modules

Each module in the Cisco IOS documentation set consists of one or more configuration guides and one or more corresponding command references. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference. The Cisco IOS software documentation set is available on Cisco.com and on the Documentation CD-ROM.

On [Cisco.com](http://www.cisco.com) (under the heading **Service & Support**) at:

**Technical Documents: Cisco IOS Software: Release 12.2: Configuration Guides and Command References**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2: Configuration Guides and Command References**

## Release 12.2 Documentation Set

Table 9 lists the contents of the Cisco IOS Release 12.2 software documentation set, which is available in both electronic and printed form.



**Note**

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

On [Cisco.com](http://Cisco.com) (under the heading **Service & Support**) at:

**Technical Documents: Cisco IOS Software: Release 12.2**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.2**

**Table 9 Cisco IOS Release 12.2 Documentation Set**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Fundamentals Configuration Guide</i></li> <li>• <i>Cisco IOS Configuration Fundamentals Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Cisco IOS User Interfaces</li> <li>File Management</li> <li>System Management</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Bridging and IBM Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume 1 of 2</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume 2 of 2</i></li> </ul>	<ul style="list-style-type: none"> <li>Transparent Bridging</li> <li>SRB</li> <li>Token Ring Inter-Switch Link</li> <li>Token Ring Route Switch Module</li> <li>RSRB</li> <li>DLSw+</li> <li>Serial Tunnel and Block Serial Tunnel</li> <li>LLC2 and SDLC</li> <li>IBM Network Media Translation</li> <li>SNA Frame Relay Access</li> <li>NCIA Client/Server</li> <li>Airline Product Set</li> <li>DSPU and SNA Service Point</li> <li>SNA Switching Services</li> <li>Cisco Transaction Connection</li> <li>Cisco Mainframe Channel Connection</li> <li>CLAW and TCP/IP Offload</li> <li>CSNA, CMPC, and CMPC+</li> <li>TN3270 Server</li> </ul>

**Table 9 Cisco IOS Release 12.2 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Dial Technologies Configuration Guide</i></li> <li>• <i>Cisco IOS Dial Technologies Command Reference</i></li> </ul>	Preparing for Dial Access Modem and Dial Shelf Configuration and Management ISDN Configuration Signaling Configuration Dial-on-Demand Routing Configuration Dial Backup Configuration Dial Related Addressing Service Virtual Templates, Profiles, and Networks PPP Configuration Callback and Bandwidth Allocation Configuration Dial Access Specialized Features Dial Access Scenarios
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	LAN Interfaces Serial Interfaces Logical Interfaces
<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP Configuration Guide</i></li> <li>• <i>Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services</i></li> <li>• <i>Cisco IOS IP Command Reference, Volume 2 of 3: Routing Protocols</i></li> <li>• <i>Cisco IOS IP Command Reference, Volume 3 of 3: Multicast</i></li> </ul>	IP Addressing and Services IP Routing Protocols IP Multicast
<ul style="list-style-type: none"> <li>• <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i></li> <li>• <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i></li> </ul>	AppleTalk Novell IPX
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i></li> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i></li> </ul>	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Voice, Video, and Fax Configuration Guide</i></li> <li>• <i>Cisco IOS Voice, Video, and Fax Command Reference</i></li> </ul>	Voice over IP Call Control Signaling Voice over Frame Relay Voice over ATM Telephony Applications Trunk Management Fax, Video, and Modem Support
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Quality of Service Solutions Configuration Guide</i></li> <li>• <i>Cisco IOS Quality of Service Solutions Command Reference</i></li> </ul>	Packet Classification Congestion Management Congestion Avoidance Policing and Shaping Signaling Link Efficiency Mechanisms

**Table 9 Cisco IOS Release 12.2 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options Supported AV Pairs
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	Cisco IOS Switching Paths NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	ATM Broadband Access Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Mobile Wireless Configuration Guide</i></li> <li>• <i>Cisco IOS Mobile Wireless Command Reference</i></li> </ul>	General Packet Radio Service
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Terminal Services Configuration Guide</i></li> <li>• <i>Cisco IOS Terminal Services Command Reference</i></li> </ul>	ARA LAT NASI Telnet TN3270 XRemote X.28 PAD Protocol Translation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Guide Master Index</i></li> <li>• <i>Cisco IOS Command Reference Master Index</i></li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Software System Error Messages</i></li> <li>• New Features in 12.2-Based Limited Lifetime Releases</li> <li>• New Features in Release 12.2 T</li> <li>• Release Notes (Release note and caveat documentation for 12.2-based releases and various platforms)</li> </ul>	

# Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

## World Wide Web

The most current Cisco documentation is available on the World Wide Web at <http://www.cisco.com>. Translated documentation can be accessed at [http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml).

## Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

## Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](http://www.cisco.com/cgi-bin/order/order_root.pl)
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:  
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS(6387).

## Documentation Feedback

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

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

For your convenience, many documents contain a response card behind the front cover for submitting your comments by mail. Otherwise, you can mail your comments to the following address:

Cisco Systems, Inc.  
Document Resource Connection  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

# Obtaining Technical Assistance

The following sections provide sources for obtaining technical assistance from Cisco Systems.

## Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

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To access Cisco.com, go to the following website:

<http://www.cisco.com>

## Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

## Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

<http://www.cisco.com/tac>

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

<http://www.cisco.com/register/>

Cisco.com registered users who cannot resolve a technical issue by using the TAC online resource can open a case online by using the TAC Case Open tool at the following website:

<http://www.cisco.com/tac/caseopen>

## Contacting TAC by Telephone

If you have a priority level 1(P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

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