



# Release Notes for Cisco IOS Release 11.2(10)P Software Feature Packs—Cisco AS5200 Access Servers

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**January 26, 1998**

These release notes discuss the Cisco IOS Release 11.2(10)P feature packs for Cisco AS5200 access servers. These are the product numbers for the supported feature packs:

- CD52-C-11.2= (Cisco AS5200 IP Feature Pack)
- CD52-CP-11.2= (Cisco AS5200 IP Plus Feature Pack)
- CD52-B-11.2= (Cisco AS5200 Desktop Feature Pack)
- CD52-BP-11.2= (Cisco AS5200 Desktop Plus Feature Pack)
- CD52-A-11.2= (Cisco AS5200 Enterprise Feature Pack)
- CD52-AP-11.2= (Cisco AS5200 Enterprise Plus Feature Pack)

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**Note** The feature packs discussed here contain Cisco IOS Release 11.2(10)P software images and Router Software Loader (RSL) Version 6.0.

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**Note** Before running RSL, read the section “Installation Tips” on page 4.

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- Cisco Connection Online on page 12

## What is a Feature Pack?

The heart of a Cisco IOS software feature pack is a CD-ROM that contains a software image and Router Software Loader (RSL), a Windows 95 application that loads the image onto the access server/router. Each Cisco IOS Release 11.2 feature pack CD contains one feature set. For users without Windows 95, images can also be loaded with a Trivial File Transfer Protocol server application, as explained in these release notes.

Each Cisco IOS Release 11.2 software feature pack box contains the following:

- CD-ROM with the following software:
  - Feature set software image that includes bundled modem firmware
  - RSL program (Windows 95 application)
  - TFTP server application (Windows 95 application)
- Instruction booklet for using RSL
- Release notes (this document), which include instructions for using a TFTP server application on a system not running Windows 95
- Software license—for using Cisco software in object code form on a single access server or router
- Cisco Documentation CD-ROM, which contains all Cisco IOS software documentation

## Cisco Feature Pack Description

This section describes the Cisco feature packs, listing the software feature sets comprising each feature pack. You can use this information to identify your feature pack set in conjunction with the corresponding information provided in Table 3 in the section “Cisco IOS Release 11.2 Feature Sets” on page 6. Table 3 identifies which features are supported for a feature set on a specific platform.

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**Note** RSL Version 6.0, contained in every Cisco IOS Release 11.2 software feature pack, supports Ethernet, Fast Ethernet, and Token Ring interfaces.

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## Software Feature Packs

This section includes two tables: Table 1, describes each feature pack image, including a brief description of each feature set, the UNIX and DOS filenames of the images, and the memory required to run each feature set on the Cisco AS5200 access server. Table 2 lists the memory delivered by default and the memory upgrades available.

You can use Table 1 to identify the memory required for your configuration based on the image you run. You can then check this against Table 2 to determine how much memory is available on the access server as the factory default and the upgrades that you can obtain to satisfy your requirements.

**Table 1 Cisco Feature Pack Image Filenames and Memory Requirements**

| Model Number  | CD-ROM Title  | Image Included and UNIX Image Name       | DOS Image Name | Flash Memory Req'd | Main Memory Req'd | Boot Flash Memory Req'd | Shared Memory Req'd | RSL Installer Description                            |
|---------------|---|--|----------------|--------------------|-------------------|-------------------------|---------------------|--|
| CD52-C-11.2=  | Cisco AS5200 IP Feature Pack Release 11.2(10)P              | IP<br>c5200-i-1.112-10a.P1               | 80138010       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 IP feature set 11.2(10a)P1              |
| CD52-CP-11.2= | Cisco AS5200 IP Plus Feature Pack Release 11.2(10)P         | IP Plus<br>c5200-is-1.112-10a.P1         | 80138110       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 IP Plus feature set 11.2(10a)P1         |
| CD52-B-11.2=  | Cisco AS5200 Desktop Feature Pack Release 11.2(10)P         | Desktop<br>c5200-d-1.112-10a.P1          | 80137810       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 Desktop feature set 11.2(10a)P1         |
| CD52-BP-11.2= | Cisco AS5200 Desktop Plus Feature Pack Release 11.2(10)P    | Desktop Plus<br>c5200-ds-1.112-10a.P1    | 80137910       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 Desktop Plus feature set 11.2(10a)P1    |
| CD52-A-11.2=  | Cisco AS5200 Enterprise Feature Pack Release 11.2(10)P      | Enterprise<br>c5200-j-1.112-10a.P1       | 80138210       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 Enterprise feature set 11.2(10a)P1      |
| CD52-AP-11.2= | Cisco AS5200 Enterprise Plus Feature Pack Release 11.2(10)P | Enterprise Plus<br>c5200-js-1.112-10a.P1 | 80138310       | 8 MB               | 8 MB              | 4 MB                    | 4 MB                | Cisco AS5200 Enterprise Plus feature set 11.2(10a)P1 |

Table 2 lists factory default memory and the upgrade options that are available.

**Table 2 Cisco AS5200 Memory and Upgrade Options**

|                 | Default | Upgrade Options               |
|-----------------|---------|-------------------------------|
| Flash System    | 8 MB    | 16-MB upgrade: MEM-1X16-AS52= |
| Flash Bootflash | 4 MB    | 8-MB upgrade: MEM-BF-52=      |
| DRAM            | 8 MB    | 16-MB upgrade: MEM-16M-52=    |
| Shared          | 4 MB    | 8-MB upgrade: MEM-8S-52=      |

## Modem Firmware

Cisco IOS software controls the version of modem firmware used by modems on the 56K 12-port modules. You can accept this firmware version or you can download another version. Unless you are familiar with Cisco AS5200 modem firmware, we recommend that you accept the default and not attempt to download another version.

Because you have the option of overriding the firmware version selected by Cisco IOS software, the following information provides some factors to consider before you manually download firmware:

- One modem firmware version is always bundled with the Cisco IOS image, and other firmware versions can exist in the access server's boot Flash memory. This feature pack contains Cisco IOS Release 11.2(10)P, which is bundled with Microcom firmware version 3.1.30.
- Firmware versions 3.2.10 and later are available on CCO. If you own a SMARTnet contract, you can download firmware from CCO and obtain the benefit of new features. For example, firmware version 3.2.10 contains support for V.FC, FAX, Lucent K56flex, and Point of Sale (PoS). Before downloading new firmware, be sure to read the firmware release notes for a list of new features and outstanding bugs.
- For complete information about firmware download, refer to "Installing 56K 12-Port Modules in Cisco AS5200 Universal Access Servers," which is available at <http://www.cisco.com>. The section "Decisions about Downloading 56K Modem Code" contains background information, and the section "Downloading Modem Code for Releases Requiring a Single File" contains download procedures for Cisco IOS Release 11.2(10)P.

## Installation Tips

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

## Recovering from a Connection Error

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

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

```
"Failed to configure the router to enable the Cisco IOS software image and configuration file upload and download operations. You may want to check the router to make sure that the selected interface exists."
```

If you encounter this message, try increasing the Short Timeout value, which is set to 25 seconds, in the Options dialog box, especially if one of the following situations applies:

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

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

## Restoring the Startup Configuration

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

- Step 1** Ensure that all cables are properly attached to both the access server and the PC.
- Step 2** Restart RSL and connect using the **Preconfigured router** option.
- Step 3** When asked if you want to overwrite the existing startup configuration file, choose **NO**.
- Step 4** When asked if you want to continue, choose **YES**.
- Step 5** When connected, select **Download Router Configuration** in the Router Software Loader dialog box.
- Step 6** Select the appropriate file, and click **Copy configuration to the router's nonvolatile memory**.

The access server should now contain the startup configuration it had before the initial RSL connection. You can now exit RSL.

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**Note** In the previous situation, the access server's configuration register (**config-register 0xnnnn**) is not restored.

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**Note** If you enter **Ctrl-Alt-Delete** to terminate RSL, the access server's configuration and configuration register are not restored. However, in this case the configuration file is not deleted from the PC, so it can be restored using the previous steps.

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## Helpful Hints

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

- If you have added any static entries to the PC's Address Resolution Protocol (ARP) table, one of them might be deleted by RSL. This entry will need to be manually reentered into the PC's ARP table.
- If the access server's running configuration at connection time is not the same as the access server's startup configuration, the exact configuration will not be restored. Any changes that you have made since the last time a **copy running-config startup-config** or **write memory** command was entered will be lost.
- RSL will restore the access server's running configuration, but some configuration commands will not be restored. However, the startup configuration will be correct. You can restore the exact running configuration by rebooting the access server. Commands not restored to the running configuration include the following interface configuration commands: **no shutdown**, **no ringspeed**, and **media-type aui**.

## Cisco IOS Release 11.2 Feature Sets

Table 3 shows specific features supported in Cisco IOS Release 11.2 for Cisco AS5200 access servers. The table uses these conventions to identify features:

- Yes: the feature is offered in the feature set
- – : the feature is not offered in the feature set
- Plus: the feature is offered only in the Plus feature set

**Table 3 Cisco IOS Release 11.2 Feature Sets for Cisco AS5200 Access Servers**

| Features   | IP Routing | Desktop<br>(IP/IPX/AppleTalk/DEC) | Enterprise |
|--|------------|-----------------------------------|------------|
| <b>LAN Support</b>                                 |            |                                   |            |
| Apollo Domain                                      | —          | —                                 | Yes        |
| AppleTalk 1 and 2 <sup>1</sup>                     | —          | Yes                               | Yes        |
| Banyan VINES                                       | —          | —                                 | Yes        |
| Concurrent routing and bridging (CRB)              | Yes        | Yes                               | Yes        |
| DECnet IV  | —          | Yes                               | Yes        |
| DECnet V   | —          | —                                 | Yes        |
| GRE  | Yes        | Yes                               | Yes        |
| Integrated routing and bridging (IRB) <sup>2</sup> | Yes        | Yes                               | Yes        |
| IP   | Yes        | Yes                               | Yes        |
| LAN extension host                                 | Yes        | Yes                               | Yes        |
| Multiring  | Yes        | Yes                               | Yes        |
| Novell IPX <sup>3</sup>                            | —          | Yes                               | Yes        |
| OSI  | —          | —                                 | Yes        |
| Source-route bridging (SRB)                        | —          | —                                 | Yes        |
| Transparent and translational bridging             | Yes        | Yes                               | Yes        |
| XNS  | —          | —                                 | Yes        |
| <b>WAN Services</b>                                |            |                                   |            |
| Combinet Packet Protocol (CPP)                     | Yes        | Yes                               | Yes        |
| Dialer profiles                                    | Yes        | Yes                               | Yes        |
| Frame Relay  | Yes        | Yes                               | Yes        |
| Frame Relay SVC Support (DTE)                      | —          | —                                 | Yes        |
| Frame Relay traffic shaping                        | Yes        | Yes                               | Yes        |
| Half bridge/half router for CPP and PPP            | Yes        | Yes                               | Yes        |
| HDLC   | Yes        | Yes                               | Yes        |
| IPXWAN 2.0   | —          | Yes                               | Yes        |
| ISDN <sup>4</sup>                                  | Yes        | Yes                               | Yes        |
| Multichassis Multilink PPP (MMP)                   | —          | —                                 | Yes        |
| PPP <sup>5</sup>                                   | Yes        | Yes                               | Yes        |

Table 3 Cisco IOS Release 11.2 Feature Sets for Cisco AS5200 Access Servers (Continued)

| Features  | IP Routing | Desktop<br>(IP/IPX/AppleTalk/DEC) | Enterprise |
|---|------------|-----------------------------------|------------|
| SMDS  | Yes        | Yes                               | Yes        |
| Switched 56   | Yes        | Yes                               | Yes        |
| Virtual Private Dial-up Network (VPDN)                          | —          | Yes                               | Yes        |
| X.25 <sup>6</sup>   | Yes        | Yes                               | Yes        |
| <b>WAN Optimization</b>   |            |                                   |            |
| Bandwidth-on-demand   | Yes        | Yes                               | Yes        |
| Custom and priority queuing                                     | Yes        | Yes                               | Yes        |
| Dial backup   | Yes        | Yes                               | Yes        |
| Dial-on-demand  | Yes        | Yes                               | Yes        |
| Header <sup>7</sup> , link and payload compression <sup>8</sup> | Yes        | Yes                               | Yes        |
| Snapshot routing  | Yes        | Yes                               | Yes        |
| Weighted fair queuing   | Yes        | Yes                               | Yes        |
| <b>IP Routing</b>   |            |                                   |            |
| BGP   | Yes        | Yes                               | Yes        |
| BGP4 <sup>9</sup>   | Yes        | Yes                               | Yes        |
| EGP   | Yes        | Yes                               | Yes        |
| Enhanced IGRP   | Yes        | Yes                               | Yes        |
| Enhanced IGRP Optimizations                                     | Yes        | Yes                               | Yes        |
| ES-IS   | —          | —                                 | Yes        |
| IGRP  | Yes        | Yes                               | Yes        |
| IS-IS   | —          | —                                 | Yes        |
| Named IP Access Control List                                    | Yes        | Yes                               | Yes        |
| Network Address Translation (NAT)                               | Plus       | Plus                              | Plus       |
| NHRP  | Yes        | Yes                               | Yes        |
| On Demand Routing (ODR)   | Yes        | Yes                               | Yes        |
| OSPF  | Yes        | Yes                               | Yes        |
| OSPF Not-So-Stubby-Areas (NSSA)                                 | Yes        | Yes                               | Yes        |
| OSPF On Demand Circuit (RFC 1793)                               | Yes        | Yes                               | Yes        |
| PIM   | Yes        | Yes                               | Yes        |
| Policy-based routing  | Yes        | Yes                               | Yes        |
| RIP   | Yes        | Yes                               | Yes        |
| RIP Version 2   | Yes        | Yes                               | Yes        |
| <b>Other Routing</b>  |            |                                   |            |
| AURP  | —          | Yes                               | Yes        |
| IPX RIP   | —          | Yes                               | Yes        |
| NLSP  | —          | Yes                               | Yes        |
| RTMP  | —          | Yes                               | Yes        |

Table 3 Cisco IOS Release 11.2 Feature Sets for Cisco AS5200 Access Servers (Continued)

| Features   | IP Routing | Desktop<br>(IP/IPX/AppleTalk/DEC) | Enterprise |
|--|------------|-----------------------------------|------------|
| SMRP   | —          | Yes                               | Yes        |
| SRTP   | —          | —                                 | Yes        |
| <b>Multimedia and Quality of Service</b>           |            |                                   |            |
| Generic traffic shaping                            | Yes        | Yes                               | Yes        |
| Random Early Detection (RED)                       | Yes        | Yes                               | Yes        |
| Resource Reservation Protocol (RSVP)               | Yes        | Yes                               | Yes        |
| <b>Management</b>                                  |            |                                   |            |
| AutoInstall  | Yes        | Yes                               | Yes        |
| Automatic modem configuration                      | Yes        | Yes                               | Yes        |
| HTTP Server  | Yes        | Yes                               | Yes        |
| Modem Management                                   | Plus       | Plus                              | Plus       |
| RMON events and alarms <sup>10</sup>               | Yes        | Yes                               | Yes        |
| RMON full  | Plus       | Plus                              | Plus       |
| SNMP   | Yes        | Yes                               | Yes        |
| Telnet   | Yes        | Yes                               | Yes        |
| <b>Security</b>                                    |            |                                   |            |
| Access lists                                       | Yes        | Yes                               | Yes        |
| Access security                                    | Yes        | Yes                               | Yes        |
| Extended access lists                              | Yes        | Yes                               | Yes        |
| Kerberized login                                   | —          | —                                 | Yes        |
| Kerberos V client support                          | —          | —                                 | Yes        |
| Lock and key                                       | Yes        | Yes                               | Yes        |
| MAC security for hubs                              | Yes        | Yes                               | Yes        |
| MD5 routing authentication                         | Yes        | Yes                               | Yes        |
| RADIUS   | Yes        | Yes                               | Yes        |
| TACACS+ <sup>11</sup>                              | Yes        | Yes                               | Yes        |
| <b>IBM Support</b>                                 |            |                                   |            |
| APPN   | —          | —                                 | —          |
| BAN for SNA Frame Relay support                    | Plus       | Plus                              | Yes        |
| Bisync   | Plus       | Plus                              | Yes        |
| Caching and filtering                              | Plus       | Plus                              | Yes        |
| DLSw+ <sup>12</sup>                                | Plus       | Plus                              | Yes        |
| Downstream PU concentration (DSPU)                 | Plus       | Plus                              | Yes        |
| Frame Relay SNA support (RFC 1490)                 | Plus       | Plus                              | Yes        |
| Native Client Interface Architecture (NCIA) Server | Plus       | Plus                              | Yes        |
| NetView Native Service Point                       | Plus       | Plus                              | Yes        |



**Table 3 Cisco IOS Release 11.2 Feature Sets for Cisco AS5200 Access Servers (Continued)**

| <b>Features</b>  | <b>IP Routing</b> | <b>Desktop<br/>(IP/IPX/AppleTalk/DEC)</b> | <b>Enterprise</b> |
|--|-------------------|---|-------------------|
| QLLC   | Plus              | Plus                                      | Yes               |
| Response Time Reporter (RTR)                                 | Plus              | Plus                                      | Yes               |
| SDLC integration   | Plus              | Plus                                      | Yes               |
| DLSw (RFC 1795)  | Plus              | Plus                                      | Yes               |
| SDLC transport (STUN)  | Plus              | Plus                                      | Yes               |
| SDLC-to-LAN conversion (SDLLC)                               | Plus              | Plus                                      | Yes               |
| SNA and NetBIOS WAN optimization<br>via local acknowledgment | Plus              | Plus                                      | Yes               |
| SRB/RSRB <sup>13</sup>                                       | Plus              | Plus                                      | Yes               |
| SRT  | Plus              | Plus                                      | Yes               |
| TG/COS   | —                 | —   | Yes               |
| TN3270   | —                 | —   | Yes               |
| <b>Protocol Translation</b>                                  |                   |   |                   |
| LAT  | —                 | —   | Yes               |
| Rlogin   | —                 | —   | Yes               |
| <b>Remote Node<sup>14</sup></b>                              |                   |   |                   |
| ARAP 1.0/2.0   | —                 | Yes                                       | Yes               |
| Asynchronous master interfaces                               | Yes               | Yes                                       | Yes               |
| ATCP   | —                 | Yes                                       | Yes               |
| CHAP   | Yes               | Yes                                       | Yes               |
| CSLIP  | Yes               | Yes                                       | Yes               |
| DHCP   | Yes               | Yes                                       | Yes               |
| IP pooling   | Yes               | Yes                                       | Yes               |
| IPX and ARAP on virtual async interfaces                     | —                 | —   | Yes               |
| IPXCP  | —                 | Yes                                       | Yes               |
| MacIP  | —                 | Yes                                       | Yes               |
| NASI   | —                 | —   | Yes               |
| NetBEUI over PPP   | Yes               | Yes                                       | Yes               |
| SLIP   | Yes               | Yes                                       | Yes               |

**Table 3 Cisco IOS Release 11.2 Feature Sets for Cisco AS5200 Access Servers (Continued)**

| Features                              | IP Routing | Desktop<br>(IP/IPX/AppleTalk/DEC) | Enterprise |
|---------------------------------------|------------|-----------------------------------|------------|
| <b>Terminal Services<sup>15</sup></b> |            |                                   |            |
| LAT <sup>15</sup>                     | —          | —                                 | Yes        |
| Rlogin                                | Yes        | Yes                               | Yes        |
| Telnet                                | Yes        | Yes                               | Yes        |
| TN3270                                | —          | —                                 | Yes        |
| X.25 PAD                              | Yes        | Yes                               | Yes        |
| Xremote                               | —          | —                                 | Yes        |

1. Includes AppleTalk load balancing.
2. IRB supports IP, IPX, and AppleTalk; it is supported for transparent bridging, but not for SRB; it is supported on all media-type interfaces except X.25 and ISDN bridged interfaces; and IRB and concurrent routing and bridging (CRB) cannot operate at the same time.
3. The Novell IPX feature includes display SAP by name, IPX Access Control List violation logging, and plain-English IPX access lists.
4. ISDN support includes calling line identification (ANI), X.25 over the B channel, ISDN subaddressing, and applicable WAN optimization features.
5. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression, and Multilink PPP.
6. X.25 includes X.25 switching.
7. IPX header compression (RFC 1553) is available in the feature sets that support IPX.
8. X.25 and Frame Relay payload compression are supported.
9. BGP4 includes soft configuration, multipath support, and prefix filtering with inbound route maps.
10. The RMON events and alarms groups are supported on all interfaces. Full RMON support is available with the Plus feature sets.
11. TACACS+ Single Connection and TACACS+ SENDAUTH enhancements are supported.
12. Cisco IOS Release 11.2 introduces several DLSw+ enhancements available in the Plus feature sets.
13. SRB/RSRB is fast switched. This enhancement is on by default, but can be disabled.
14. Supported on access servers (with limited support on router auxiliary ports).
15. Use of LAT requires terminal license (FR-L8-10.X= for an 8-user license or FR-L16-10.X= for a 16-user license).

## Installing the Software Image Using a TFTP or RCP Application

The Router Software Loader application contained on the feature pack CD-ROM is designed to work with a PC running Microsoft Windows 95. The booklet included with the CD-ROM explains how to perform this simple and recommended install process. However, an alternative is available using a TFTP or RCP server application to install router software.

For information about how to use TFTP or RCP, see the following location:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/relnote/fprn/loadswfp.htm>.

## Related Documentation

For a list of documentation related to the Cisco AS5200, refer to the *Release Notes for the Cisco AS5200 and AS5100 for Cisco IOS Release 11.2*.

Release notes and other Cisco documentation are on the Documentation CD-ROM that is included with your feature pack, and at Cisco Connection Online (CCO) on the World Wide Web.

On the Documentation CD-ROM, the path for Cisco IOS documentation is as follows:

— *Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.2.*

On CCO, <http://www.cisco.com/>, the path is as follows:

— *Software & Support*, scroll down and select *Documentation*. Click *Cisco Documentation: Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.2*.

Online documentation for Release 11.2 includes:

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

The Cisco IOS software documentation for Cisco IOS Release 11.2 is divided into eight modules. There are also supporting documents. Each documentation module consists of two books: a configuration guide and a corresponding command reference. The Cisco IOS documentation set consists of the following books and chapter topics:

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

| Books  | Chapter Topics  |
|--|---|
| <ul style="list-style-type: none"> <li>• <i>Wide-Area Networking Configuration Guide</i></li> <li>• <i>Wide-Area Networking Command Reference</i></li> </ul>   | ATM<br>Dial-on-Demand Routing (DDR)<br>Frame Relay<br>ISDN<br>LANE<br>PPP for Wide-Area Networking<br>SMDS<br>X.25 and LAPB   |
| <ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 1</i></li> <li>• <i>Network Protocols Command Reference, Part 1</i></li> </ul>   | IP<br>IP Routing  |
| <ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 2</i></li> <li>• <i>Network Protocols Command Reference, Part 2</i></li> </ul>   | AppleTalk<br>Novell IPX   |
| <ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 3</i></li> <li>• <i>Network Protocols Command Reference, Part 3</i></li> </ul>   | Apollo Domain<br>Banyan VINES<br>DECnet<br>ISO CLNS<br>XNS  |
| <ul style="list-style-type: none"> <li>• <i>Bridging and IBM Networking Configuration Guide</i></li> <li>• <i>Bridging and IBM Networking Command Reference</i></li> </ul>   | Transparent Bridging<br>Source-Route Bridging<br>Remote Source-Route Bridging<br>DLSw+<br>STUN and BSTUN<br>LLC2 and SDLC<br>IBM Network Media Translation<br>DSPU and SNA Service Point Support<br>SNA Frame Relay Access Support<br>APPN<br>NCIA Client/Server Topologies<br>IBM Channel Attach |
| Supporting documents:  |   |
| <ul style="list-style-type: none"> <li>• <i>Cisco IOS Software Command Summary</i></li> <li>• <i>Access Services Quick Configuration Guide</i></li> <li>• <i>System Error Messages</i></li> <li>• <i>Debug Command Reference</i></li> <li>• <i>Cisco Management Information Base (MIB) User Quick Reference</i></li> </ul> |   |

## Cisco Connection Online

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- WWW: <http://www.cisco.com>
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- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact [cco-help@cisco.com](mailto:cco-help@cisco.com). For additional information, contact [cco-team@cisco.com](mailto:cco-team@cisco.com).

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**Note** If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or [tac@cisco.com](mailto:tac@cisco.com). To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or [cs-rep@cisco.com](mailto:cs-rep@cisco.com).

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Cisco documentation and additional literature are available on a CD-ROM, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM is available as a single item 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>.

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