CISCO SYSTEMS

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Release Notes for Cisco IOS Release 11.2(10)P Software Feature Packs—Cisco AS5300 Access Servers

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These release notes discuss the Cisco IOS Release 11.2(10)P feature packs for Cisco AS5300 access servers. These are the product numbers for the supported feature packs:

- CD53-C-11.2= (Cisco AS5300 IP Feature Pack)

- CD53-CP-11.2= (Cisco AS5300 IP Plus Feature Pack)

- CD53-B-11.2= (Cisco AS5300 Desktop Feature Pack)

- CD53-BP-11.2= (Cisco AS5300 Desktop Plus Feature Pack)

- CD53-A-11.2= (Cisco AS5300 Enterprise Feature Pack)

- CD53-AP-11.2= (Cisco AS5300 Enterprise Plus Feature Pack)

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

Note Before running RSL, read the sections "Modem Code Alert" on page 4 and "Installation Tips" on page 6.

These release notes contain the following sections:

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- Installing the Software Image Using a TFTP or RCP Application on page 12
- Related Documentation on page 12
- Cisco Connection Online on page 15

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 8. Table 3 identifies which features are supported for a feature set on a specific platform.

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

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 AS5300 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 No.	CD-ROM Title	Image Included and Image Name (UNIX)	Image Name (DOS)	Flash Memory Req'd	Main Memory Req'd	Boot Flash Memory Req'd	Shared Memory Req'd	RSL Installer Description
CD53-C-11.2=	Cisco AS5300 IP Feature Pack Release 11.2(10)P	IP c5300-i-mz.112-10a.P1	80226910	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 IP feature set 11.2(10a)P1
CD53-CP-11.2=	Cisco AS5300 IP Plus Feature Pack Release 11.2(10)P	IP Plus c5300-is-mz.112-10a.P1	80227410	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 IP Plus feature set 11.2(10a)P1
CD53-B-11.2=	Cisco AS5300 Desktop Feature Pack Release 11.2(10)P	Desktop c5300-d-mz.112-10a.P1	80227210	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 Desktop feature set 11.2(10a)P1
CD53-BP-11.2=	Cisco AS5300 Desktop Plus Feature Pack Release 11.2(10)P	Desktop Plus c5300-ds-mz.112-10a.P1	80227310	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 Desktop Plus feature set 11.2(10a)P1
CD53-A-11.2=	Cisco AS5300 Enterprise Feature Pack Release 11.2(10)P	Enterprise c5300-j-mz.112-10a.P1	80227010	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 Enterprise feature set 11.2(10a)P1
CD53-AP-11.2=	Cisco AS5300 Enterprise Plus Feature Pack Release 11.2(10)P	Enterprise Plus c5300-js-mz.112-10a.P1	80227110	8 MB	32 MB	4 MB	16 MB	Cisco AS5300 Enterprise Plus feature set 11.2(10a)P1

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

Table 2   Cisco AS5300 Memory and Upgrade Options

Feature Set	Required Flash Memory	Boot Flash Upgrade Option	Required DRAM Memory	Main DRAM Upgrade Option
IP	8 MB Flash	MEM-8BF-AS53 (from 4 MB to 8 MB)	32 MB DRAM	MEM-64M-AS53 (from 32 MB to 64 MB)
IP/Plus	8 MB Flash		32 MB DRAM	
Desktop	8 MB Flash		32 MB DRAM	
Desktop Plus	8 MB Flash		32 MB DRAM	
Enterprise	8 MB Flash		32 MB DRAM	
Enterprise Plus	8 MB Flash		32 MB DRAM	

Modem Code Alert

Caution Your access server might contain modem code that needs to be saved before RSL erases the contents of Flash memory as part of the image load process.

Take the following steps to save the contents of Flash memory:

Step 1   Insert the Router Software Loader CD-ROM in your PC.

Step 2   Run the RSL application.

Step 3   At the first screen, cancel from the Connect Wizard.

Step 4   At the next screen, select the **Settings** menu and then the **Options** menu item. Make sure **Always backup images(s) before erasing** is selected, and specify a backup directory on your PC.

Step 5   Continue with the RSL application as described in the *Getting Started with the Router Software Loader* booklet.

Note Modem code can exist in Flash memory for a variety of reasons. One reason is the factory might have copied a version of modem code later than the one bundled with Cisco IOS software. Another reason is that, in a previously installed system, modem code might have been copied to Flash memory during another procedure, for example, the addition of a new modem module carrier card.

Because RSL erases data in the first Flash memory partition, we recommend that you prepare your access server for future software upgrades by creating two partitions. When you download new firmware or portware in the future, remember to copy it to the second partition.

The following steps provide an example of creating two Flash memory partitions:

Step 1   Enter configuration mode on your access server:

```
as5300> enable
Password: <password>
as5300# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.

as5300(config)#
```

Step 2   Enter the **partition flash** command at the configuration mode prompt. You can partition the system Flash into eight segments and divide the system Flash RAM into equal or unequal segments. In the following example, the system Flash is partitioned into two equal segments.

```
as5300(config)#partition flash 2
```

Step 3   Return to enable mode.

```
as5300(config)#Ctrl-Z
```

Step 4   Enter the **show version** command for verification of your changes:

```
as5300#show version
Cisco Internetwork Operating System Software
IOS (tm) 5300 Software (C5300-I-M), Version 11.2(10a)P, RELEASE SOFTWARE (fc1)
```

```
Copyright (c) 1986-1997 by cisco Systems, Inc.
Compiled Wed 03-Dec-97 06:55 by ccai
Image text-base: 0x600088F0, data-base: 0x6043E000
ROM: System Bootstrap, Version 11.2(19970311:165032) [rmeadows-easy 116], INTERIM
SOFTWARE
BOOTFLASH: 5300 Software (C5300-BOOT-M), Version 11.2(0.10.0), CISCO DEVELOPMENT
TEST VERSION
as5300 uptime is 3 hours, 36 minutes
System restarted by reload
System image file is "flash:57199410.bin", booted via flash
Host configuration file is "rsl-as5300-startup.cfg", booted via tftp from
171.68.220.150
cisco AS5300 (R4K) processor (revision A.04) with 32768K/8192K bytes of memory.
Processor board ID 04614948
R4700 processor, Implementation 33, Revision 1.0 (512KB Level 2 Cache)
Channelized E1, Version 1.0.
Bridging software.
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
Primary Rate ISDN software, Version 1.0.
Backplane revision 1
Manufacture Cookie is not programmed.
1 Ethernet/IEEE 802.3 interface(s)
1 FastEthernet/IEEE 802.3 interface(s)
48 terminal line(s)
4 Channelized E1/PRI port(s)
128K bytes of non-volatile configuration memory.
8192K bytes of processor board System flash partition 1 (Read/Write)
8192K bytes of processor board System flash partition 2 (Read/Write)
4096K bytes of processor board Boot flash (Read/Write)
Configuration register is 0x2102
```

In the above example, the system Flash has two partitions of 8 MB and 8 MB.

Step 5   Write your changes to memory by entering the **write** command:

```
as5300# write
Building configuration...
[OK]
```

Step 6   Reboot the access server:

```
as5300# reload
```

Step 7   Enter **yes** when prompted to proceed with the reload:

```
Proceed with reload? [confirm] yes
```

Step 8   After the reload messages are complete, enter the **show flash** command to view your changes:

```
as5300# show flash
System flash directory, partition 1:
File  Length   Name/status
  1   2751436  57199410.bin
[2751500 bytes used, 5637108 available, 8388608 total]
8192K bytes of processor board System flash (Read/Write)
System flash directory, partition 2:
No files in System flash
[0 bytes used, 8388608 available, 4194304 total]
8192K bytes of processor board System flash (Read/Write)
as5300#
```

Modem Code Information

Cisco IOS software controls the version of modem code (firmware and portware) used by modems on the 12- and 6-port modules. You can accept this firmware/portware version, or you can download another version of modem code. Unless you are familiar with Cisco AS5300 modem code, we recommend that you accept the default and not attempt to download another version.

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

- One firmware version (used by Microcom 12-port modules) and one portware version (used by MICA 6-port modules) is always bundled with the Cisco IOS image.

Note This feature pack contains Cisco IOS Release 11.2(10)P, which is bundled with Microcom firmware version 3.1.30 and MICA portware version 2.0.1.7.

Other firmware/portware versions can exist in the access server's Flash memory. The last **copy** command determines which version of firmware or portware is mapped to the modems.

- Versions of firmware and portware are posted to CCO as they become available. 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 modem code, be sure to read the firmware or portware release notes for a list of new features and outstanding bugs.

For detailed information about Microcom firmware download, refer to the "Modem Code" section in *Installing 56K 12-Port Modem Modules in Cisco AS5300 Universal Access Servers*. For general information about firmware and portware download, refer to the appendix "Managing Modems" in the *Cisco AS5300 Access Server Software Configuration Guide*.

Note All customer documentation is available on the Documentation CD shipped with your feature pack. In addition, the most current version of a document is available on the Web at http://www.cisco.com.

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:

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

- You are connecting to an access server that has a large configuration file.
- You are connecting to a Cisco AS5300 access server. A Cisco AS5300 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.

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

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.

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 AS5300 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 AS5300 Access Server Software Feature Sets

Features	Feature Set		
	IP Routing	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise
LAN Support			
Apollo Domain	—	—	Yes
AppleTalk 1 and 2[1]	—	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)[2]	Yes	Yes	Yes
IP	Yes	Yes	Yes
LAN extension host	Yes	Yes	Yes
Multiring	Yes	Yes	Yes
Novell IPX[3]	—	Yes	Yes
Open System Interconnect (OSI)	—	—	Yes
Source-route bridging (SRB)	—	—	Yes
Transparent and translational bridging	Yes	Yes	Yes
XNS	—	—	Yes
WAN Services			
Combinet Packet Protocol (CPP)	Yes	Yes	Yes
Dialer profiles	Yes	Yes	Yes
Half bridge/half router for CPP and PPP	Yes	Yes	Yes

Table 3   Cisco AS5300 Access Server Software Feature Sets (Continued)

	Feature Set		
Features	**IP Routing**	**Desktop (IP/IPX/AppleTalk/DEC)**	**Enterprise**
HDLC	Yes	Yes	Yes
IPXWAN 2.0	—	Yes	Yes
ISDN[4]	Yes	Yes	Yes
Multichassis Multilink PPP (MMP)[5]	Plus	Plus	Plus
PPP[6]	Yes	Yes	Yes
Virtual Private Dial-up Network (VPDN)	Plus	Plus	Plus
WAN Optimization			
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, link and payload compression	Yes	Yes	Yes
Snapshot routing	Yes	Yes	Yes
Weighted fair queuing	Yes	Yes	Yes
IP Routing			
BGP	Yes	Yes	Yes
BGP4[7]	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

Table 3   Cisco AS5300 Access Server Software Feature Sets (Continued)

Features	Feature Set		
	IP Routing	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise
Other Routing			
AURP	—	Yes	Yes
IPX RIP	—	Yes	Yes
NLSP	—	Yes	Yes
RTMP	—	Yes	Yes
SMRP	—	Yes	Yes
SRTP	—	—	Yes
Multimedia and Quality of Service			
Generic traffic shaping	Yes	Yes	Yes
Resource Reservation Protocol (RSVP)	Yes	Yes	Yes
Management			
HTTP Server	Yes	Yes	Yes
Modem Management	Plus	Plus	Plus
RMON events and alarms[8]	Yes	Yes	Yes
RMON full	Plus	Plus	Plus
SNMP	Yes	Yes	Yes
Telnet	Yes	Yes	Yes
Security			
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+[9]	Yes	Yes	Yes
IBM Support			
APPN	—	—	—
BAN for SNA Frame Relay support	Plus	Plus	Yes
Bisync	Plus	Plus	Yes
Caching and filtering	Plus	Plus	Yes
DLSw+ [10]	Plus	Plus	Yes
Downstream PU concentration (DSPU)	Plus	Plus	Yes

Table 3   Cisco AS5300 Access Server Software Feature Sets (Continued)

Features	Feature Set		
	IP Routing	Desktop (IP/IPX/AppleTalk/DEC)	Enterprise
Native Client Interface Architecture (NCIA) Server	Plus	Plus	Yes
NetView Native Service Point	Plus	Plus	Yes
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 via local acknowledgment	Plus	Plus	Yes
SRB/RSRB[11]	Plus	Plus	Yes
SRT	Plus	Plus	Yes
TG/COS	—	—	Yes
TN3270	—	—	Yes
Protocol Translation			
LAT	—	—	Yes
Rlogin	—	—	Yes
Remote Node[12]			
ARAP 1.0/2.0	—	Yes	Yes
Asynchronous master interfaces	Yes	Yes	Yes
ATCP	—	Yes	Yes
CPPP	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 AS5300 Access Server Software Feature Sets (Continued)

Features	Feature Set		
	IP Routing	**Desktop (IP/IPX/AppleTalk/DEC)**	**Enterprise**
Terminal Services[12]			
LAT[13]	—	—	Yes
Rlogin	Yes	Yes	Yes
Telnet	Yes	Yes	Yes
TN3270	—	—	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. In Plus images only
6. PPP includes support for LAN protocols supported by the feature set, address negotiation, PAP and CHAP authentication, and PPP compression, and Multilink PPP.
7. BGP4 includes soft configuration, multipath support, and prefix filtering with inbound route maps.
8. The RMON events and alarms groups are supported on all interfaces. Full RMON support is available with the Plus feature sets.
9. TACACS+ Single Connection and TACACS+ SENDAUTH enhancements are supported.
10. Cisco IOS Release 11.2 introduces several DLSw+ enhancements available in the Plus, Plus 40, and Plus 56 feature sets.
11. SRB/RSRB is fast switched. This enhancement is on by default, but can be disabled.
12. Supported on access servers (with limited support on router auxiliary ports).
13. Use of LAT requires a 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 AS5300, refer to the *Release Notes for the Cisco AS5300 for Cisco IOS Release 11.2P*.

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
• *Configuration Fundamentals Configuration Guide*	Access Server and Router Product Overview
• *Configuration Fundamentals Command Reference*	User Interface
	System Images and Configuration Files
	Using ClickStart, AutoInstall, and Setup
	Interfaces
	System Management

Books	Chapter Topics
• *Security Configuration Guide*	Network Access Security
• *Security Command Reference*	Terminal Access Security
	Accounting and Billing
	Traffic Filters
	Controlling Router Access
	Network Data Encryption with Router Authentication
• *Access Services Configuration Guide*	Terminal Lines and Modem Support
• *Access Services Command Reference*	Network Connections
	AppleTalk Remote Access
	SLIP and PPP
	XRemote
	LAT
	Telnet
	TN3270
	Protocol Translation
	Configuring Modem Support and Chat Scripts
	X.3 PAD
	Regular Expressions
• *Wide-Area Networking Configuration Guide*	ATM
• *Wide-Area Networking Command Reference*	Dial-on-Demand Routing (DDR)
	Frame Relay
	ISDN
	LANE
	PPP for Wide-Area Networking
	SMDS
	X.25 and LAPB
• *Network Protocols Configuration Guide, Part 1*	IP
• *Network Protocols Command Reference, Part 1*	IP Routing
• *Network Protocols Configuration Guide, Part 2*	AppleTalk
• *Network Protocols Command Reference, Part 2*	Novell IPX
• *Network Protocols Configuration Guide, Part 3*	Apollo Domain
• *Network Protocols Command Reference, Part 3*	Banyan VINES
	DECnet
	ISO CLNS
	XNS

Books	Chapter Topics
• *Bridging and IBM Networking Configuration Guide*	Transparent Bridging
• *Bridging and IBM Networking Command Reference*	Source-Route Bridging
	Remote Source-Route Bridging
	DLSw+
	STUN and BSTUN
	LLC2 and SDLC
	IBM Network Media Translation
	DSPU and SNA Service Point Support
	SNA Frame Relay Access Support
	APPN
	NCIA Client/Server Topologies
	IBM Channel Attach

Supporting documents:

• *Cisco IOS Software Command Summary*

• *Access Services Quick Configuration Guide*

• *System Error Messages*

• *Debug Command Reference*

• *Cisco Management Information Base (MIB) User
   Quick Reference*

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

• WWW: http://www.cisco.com

• WWW: http://www-europe.cisco.com

• WWW: http://www-china.cisco.com

• Telnet: cco.cisco.com

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

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

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

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