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Release Notes for Cisco IOS Release 11.1 AA

July 25, 2003

This document describes the features and caveats for Cisco IOS Release 11.1 AA, up to and including Release 11.1(20) AA5. Release 11.1(20) AA5 is a platform-specific software release that supports features for the Cisco 1600 series routers, Cisco 3600 series routers, and Cisco AS5200 access servers. This document supplements the Cisco IOS Release 11.1 documentation set.

Use these release notes in conjunction with the *Release Notes for Cisco IOS Release 11.1*. For a list of software caveats that apply to this release, refer to the “Caveats” section on page 8 and to the *Caveats for Release 11.1*. All related documentation can be located on Cisco.com and the Documentation CD-ROM. See the “Obtaining Documentation” section on page 14 for more information.

Contents

These release notes discuss the following topics:

- System Requirements, page 2
- New and Changed Information, page 5
- Caveats, page 8
- Related Documentation, page 10
- Obtaining Documentation, page 14
- Obtaining Technical Assistance, page 15
- Open Source License Acknowledgements, page 16

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System Requirements

This section describes the system requirements for Release 11.1 AA and includes the following subsections:

- Memory Requirements, page 2
- Supported Hardware, page 3
- Determining Your Software Release, page 4
- Feature Set Tables, page 4

Memory Requirements

This section describes the memory requirements of the Cisco IOS features sets for Release 11.1(20) AA4AA4.

The memory requirements for feature sets available in Cisco IOS Release 11.1(20) AA4 are the same as those listed in the “Memory Requirements” in each of the platforms’ hardware documentation.

Note The Cisco 1600 and Cisco 3600 routers were introduced in Cisco IOS Release 11.1(7) AA.

Table 1 lists the minimum memory requirements for the Cisco 1600 series routers feature sets.

Table 2 lists the minimum memory requirements for the Cisco 3600 series routers feature sets.

Table 3 lists the minimum memory requirements for the Cisco AS5200 access server feature sets.

Table 1 Minimum Memory Requirements for the Cisco 1600 Series

Feature Set	Required Flash Memory	Required DRAM
IP	4 MB	2 MB
IP with AppleTalk	6 MB	4 MB
IP with AppleTalk Plus	6 MB	4 MB
IP Plus	6 MB	4 MB
IP/IPX	4 MB	2 MB
IP/IPX Plus	6 MB	4 MB
IP/IPX/AppleTalk	6 MB	4 MB
IP/IPX/AppleTalk Plus	6 MB	4 MB

Table 2 Minimum Memory Requirements for the Cisco 3600 Series

Feature Set	Required Flash Memory	Required DRAM
IP	4 MB	16 MB
IP with IBM base	4 MB	16 MB
IP/IPX	4 MB	16 MB
IP/IPX with IBM base	4 MB	16 MB
IP/IPX with IBM base and APPN	4 MB	32 MB
Desktop	4 MB	16 MB
Desktop with IBM base	4 MB	24 MB
Enterprise	4 MB	24 MB
Enterprise with APPN ¹	8 MB	32 MB

1. Dual-bank Flash memory is not supported with the Enterprise and APPN feature set.

Table 3 Minimum Memory Requirements for the Cisco AS5200

Cisco AS5200	Required Flash Memory	Required Main Memory	Runs from
IP/Managed Modems Set	8 MB Flash	8 MB DRAM	Flash
Desktop/Managed Modems Set	8 MB Flash	8 MB DRAM	Flash
Enterprise/RMON/Managed Modems Set	8 MB Flash	8 MB DRAM	Flash
Packet Memory	9 MB Flash	9 MB DRAM	Flash

Supported Hardware

Cisco IOS Release 11.1 AA supports the following platforms:

- Cisco 1600 series routers
- Cisco 3600 series routers
- Cisco AS5200 access servers

Refer to the *Release Notes for Cisco IOS Release 11.1* publication for a summary of the LAN interfaces supported on each platform and the WAN data rates and interfaces supported on each platform.

Table 4 lists the interfaces supported in Cisco IOS Release 11.1(20) AA4.

Table 4 Interfaces Supported

Interface	Cisco 1600 Series	Cisco 3600 Series	Cisco AS5200
Ethernet (AUI)	Yes	Yes	Yes
Ethernet (10BaseT)	Yes	Yes	No
Synchronous serial	Yes	Yes	Yes
Asynchronous serial	Yes	Yes	Yes
Token Ring	No	Yes	No
ISDN BRI S/T	Yes	Yes	No
ISDN BRI U	Yes	Yes	No
ISDN PRI	No	Yes	Yes
Channelized T1 and E1	No	Yes	Yes
Switched 56 kbps	Yes	No	No
Switched Digital Data Service (DDS)	Yes	No	No

Determining Your Software Release

To determine the version of Cisco IOS software currently running on your device, log in to the router or access server and use the **show version EXEC** command. The following is sample output from the **show version** command. The version number is indicated on the second line as shown below:

```
Cisco Internetwork Operating System Software
IOS (tm) 1600 Software (C1600-JS-L), Version 11.1(20) AA4, RELEASE SOFTWARE
```

Additional command output lines include more information, such as processor revision numbers, memory amounts, hardware IDs, and partition information.

For information on upgrading to a new software release, refer to the *Cisco IOS Software Release Upgrade Paths and Packaging Simplification product bulletin #703* located on Cisco.com. For more information, refer to the “Obtaining Documentation” section on page 14.

On Cisco.com, follow this path:

Products and Ordering: Product Bulletins: Upgrade Paths and Packaging Simplification

Feature Set Tables

The Cisco IOS software is packaged in feature sets (also called software images) depending on the platform. Each feature set contains a specific set of Cisco IOS features. The following sections list the features set matrix and the features supported by each feature set.

The following feature sets are available in Cisco IOS Release 11.1(20) AA4. Refer to *Release Notes for Cisco IOS Release 11.1* for a complete list of the features provided in these sets.

The Cisco 1600 series routers feature sets are as follows:

- IP Routing
- IP/IPX Routing
- IP/AppleTalk

- IP/IPX/AppleTalk

The Cisco 3600 series routers feature sets are as follows:

- IP Routing
- IP/IPX Routing
- IP/IPX/IBM/APPN
- Desktop
- Enterprise

The Cisco AS5200 access server feature sets are as follows:

- IP/Managed Modems
- Desktop/Managed Modems
- Enterprise/RMON/ Managed Modems

New and Changed Information

The following sections list the new features that are available in each maintenance release of Cisco IOS Release 11.1 AA. Features are detailed in the documentation listed in the “Related Documentation” section on page 10.

New Features in Cisco IOS Releases 11.1(20) AA4 Through 11.1(15) AA

There were no new features introduced in these releases.

New Features in Cisco IOS Release 11.1(14) AA

This software release supports the Cisco AS5200 access server microcom modem module, which can connect up to 33.6 Kbps.

New Features in Cisco IOS Releases 11.1(13) AA Through 11.1(9) AA

There were no new features introduced in these releases.

New Features in Cisco IOS Release 11.1(8) AA

This software release supports the NM-1E1R2W network module for Cisco 3600 routers.

New Features in Cisco IOS Release 11.1(7) AA

The following new features were added in Cisco IOS Release 11.1(7) AA:

- Cisco 1600 series—Includes the Cisco 1601, Cisco 1602, Cisco 1603, and Cisco 1604 routers. The Cisco 1600 series is a family of modular access routers for small offices connecting Ethernet LANs to the Internet and corporate intranets over one or two WAN connections. Interfaces supported include 10BaseT, asynchronous and synchronous serial, synchronous serial with integrated 56-kbps CSU/DSU, ISDN BRI S/T, and ISDN BRI U.

- Cisco 3600—Includes the Cisco 3640 and Cisco 3620 routers. As modular solutions, these routers enable corporations to increase dialup density and take advantage of various current and emerging WAN technologies and networking capabilities such as dialup connectivity, LAN-to-LAN routing, data and access security, WAN optimization, and multimedia features.

The Cisco 3640 is equipped with four network module slots. The Cisco 3620 has two slots. Each network module slot accepts a variety of network module interface cards, including LAN and WAN mixed media cards supporting Ethernet, Token Ring, and a variety of WAN technologies. These cards provide the foundation of LAN and WAN connectivity on a single network module. Additional applications are supported with a series of network module cards offering asynchronous and synchronous serial, ISDN PRI, and ISDN BRI interfaces.

- Cisco AS5200 access server channelized T1 software enhancements include ground-start and loop-start support to the **cas-group** controller configuration command.

This software release supports the dual E1 PRI interface card for Cisco AS5200 access servers.

New or Changed Commands in Cisco IOS Release 11.1(7) AA for Cisco 1600 Series Routers

The following is a list of ROM monitor and Cisco IOS commands that are new or modified, or have special syntax or usage for Cisco 1600 series routers. All other commands used with these routers are documented in the Cisco IOS Release 11.2 command references.

- boot
- boot system
- copy
- copy mop
- copy rcp
- copy running-config
- copy startup-config
- copy tftp
- erase
- partition
- show flash
- show controllers bri
- show service-module serial
- snmp-server enable
- tftp-server
- verify
- xmodem

For documentation describing the new software features specific to the Cisco 1600 series routers, refer to the online feature module *New Features for Cisco 1600 Series Routers*.

New or Changed Commands in Cisco IOS Release 11.1(7) AA for Cisco 3600 Series Routers

The following is a list of ROM monitor and Cisco IOS commands that are new or modified, or have special syntax or usage for Cisco 3600 series routers. All other commands used with these routers are documented in the Cisco IOS Release 11.2 command references.

- boot
- boot system
- copy
- copy mop
- copy rcp
- copy running-config
- copy startup-config
- copy tftp
- copy xmodem
- copy ymodem
- erase
- memory-size iomem
- partition
- show flash
- tftp-server
- verify
- xmodem

For documentation describing the new software features specific to the Cisco 3600 series routers, refer to the online feature module *New Features for Cisco 3600 Series Routers*.

New or Changed Commands in Cisco IOS Release 11.1(7)AA for Cisco AS5200 Access Server

The Cisco IOS command listed below is new or modified, or has a special syntax or usage for Cisco AS5200 access server. All other commands used with this server are documented in the Cisco IOS Release 11.2 command references.

- cas-group

For documentation describing this new software feature specific to the Cisco AS5200 access server, refer to the online feature module *Channelized E1 Signaling for the Cisco AS5200*.

New Features in Cisco IOS Release 11.1(6) AA

The following new features were added to Cisco IOS Release 11.1(6) AA:

- Two channelized E1 controllers, each providing one physical interface to the network when running as a channelized interface card used to run ISDN PRI.

With this feature, you must configure E1 clocking using the **clock source line primary** command and the **clock source line secondary** command.

- The **show modem** command now provides more detailed information about modem performance, status, connections, and version information about modem firmware, bootcode, and hardware.
- The **show controller t1** command now provides version information about T1 links.

Caveats

There are no caveats specific to Cisco IOS Release 11.1(20) AA.

For complete descriptions of open and resolved caveats for previous maintenance releases, see the *Caveats for Release 11.1* document on Cisco.com and on the Documentation CD-ROM.

- On Cisco.com, follow this path:
Products and Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.1: Cisco IOS Release 11.1 Software Caveats.
- On the Documentation CD-ROM, follow this path:
Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.1: Cisco IOS Release 11.1 Software Caveats.

See the “Obtaining Documentation” section on page 14 for more information.

Open Caveats—Cisco IOS Release 11.1(20)AA5

There are no open caveats specific to Cisco IOS Release 11.1(20)AA5 that require documentation in the release notes.

Resolved Caveats—Cisco IOS Release 11.1(20)AA5

All the caveats listed in this section are resolved in Cisco IOS Release 11.1(20)AA5. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCea02355
Cisco routers and switches running Cisco IOS software and configured to process Internet Protocol version 4 (IPv4) packets are vulnerable to a Denial of Service (DoS) attack. A rare sequence of crafted IPv4 packets sent directly to the device may cause the input interface to stop processing traffic once the input queue is full. No authentication is required to process the inbound packet. Processing of IPv4 packets is enabled by default. Devices running only IP version 6 (IPv6) are not affected. A workaround is available.
Cisco has made software available, free of charge, to correct the problem.
This advisory is available at
<http://www.cisco.com/warp/public/707/cisco-sa-20030717-blocked.shtml>

Open Caveats—Cisco IOS Release 11.1(20)AA4

There are no open caveats specific to Cisco IOS Release 11.1(20)AA4 that require documentation in the release notes.

Resolved Caveats—Cisco IOS Release 11.1(20)AA4

All the caveats listed in this section are resolved in Cisco IOS Release 11.1(20)AA4. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- 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>

Closed and Resolved Caveats—Release 11.1(20)AA3

This section describes caveats that have been closed and resolved in Cisco IOS Release 11.1(20)AA3.

- Caveat CSCdr54230

A Border Gateway Protocol (BGP) UPDATE contains Network Layer Reachability Information (NLRI) and attributes that describe the path to the destination. Each path attribute is a type, length, value (TLV) object.

The type is a two-octet field that includes the attribute flags and the type code. The fourth high-order bit (bit 3) of the attribute flags is the Extended Length bit. It defines whether the attribute length is one octet (if set to 0) or two octets (if set to 1). The extended length bit is used only if the length of the attribute value is greater than 255 octets.

The AS_PATH (type code 2) is represented by a series of TLVs (or path segments). The path segment type indicates whether the content is an AS_SET or AS_SEQUENCE. The path segment length indicates the number of autonomous systems (ASes) in the segment. The path segment value contains the list of ASes (each AS is represented by two octets).

The total length of the attribute depends on the number of path segments and the number of ASes in them. For example, if the AS_PATH contains only an AS_SEQUENCE, then the maximum number of ASes (without having to use the extended length bit) is 126 [= (255-2)/2]. If the UPDATE is propagated across an AS boundary, then the local Abstract Syntax Notation (ASN) must be appended and the extended length bit used.

The caveat was caused by the mishandling of the operation during which the length of the attribute was truncated to only one octet. Because of the internal operation of the code, the receiving border router would not be affected, but its iBGP peers would detect the mismatch and issue a NOTIFICATION message (update malformed) to reset their session.

The average maximum AS_PATH length in the Internet is between 15 and 20 ASes, so there is no need to use the extended length. The failure was discovered because of a malfunction in the BGP implementation of another vendor. There is no workaround.

This caveat is resolved in Cisco IOS Release 11.1(20)AA3.

- CSCds04747

Cisco IOS software contains a flaw that permits the successful prediction of TCP Initial Sequence Numbers.

This vulnerability is present in all released versions of Cisco IOS software running on Cisco routers and switches. It only affects the security of TCP connections that originate or terminate on the affected Cisco device itself; it does not apply to TCP traffic forwarded through the affected device in transit between two other hosts.

To remove the vulnerability, Cisco is offering free software upgrades for all affected platforms. The defect is described in DDTS record CSCds04747.

Workarounds are available that limit or deny successful exploitation of the vulnerability by filtering traffic containing forged IP source addresses at the perimeter of a network or directly on individual devices.

This notice will be posted at

<http://www.cisco.com/warp/public/707/ios-tcp-isn-random-pub.shtml>.

This caveat is resolved in Cisco IOS Release 11.1(20)AA3.

Related Documentation

The following sections describe the documentation available for the Cisco 1600 series, the Cisco 3600 series, and the Cisco AS5200 access server. Typically, these documents consist of hardware installation guides, software installation guide guides, Cisco IOS configuration and command references, system error messages, and feature modules, which are updates to the Cisco IOS documentation. Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online only.

The most up-to-date documentation can be found on the web via Cisco.com and on the latest Documentation CD-ROM. These electronic documents might contain updates and modifications made after the paper documents were printed. See the “Obtaining Documentation” section on page 14 for more information.

This section contains the following subsections:

- Cisco 1600 Series-Specific Documentation, page 10
- Cisco 3600 Series-Specific Documentation, page 11
- Cisco AS5200-Specific Documentation, page 11
- Feature Module Documentation, page 11
- Feature Navigator, page 12
- Cisco IOS Software Documentation, page 12

Cisco 1600 Series-Specific Documentation

The following Cisco 1600 documents are available:

- Quick Start Guides
- *Cisco 1600 Series Hardware Installation Guide*
- *Cisco 1600 Series Software Configuration Guide*
- *Cisco WAN Interface Cards Hardware Installation Guide*

- New Features for Cisco 1600 Series Routers
- Cisco 1600 Series Router Configuration Notes
- *Regulatory Compliance and Safety Information for the Cisco 1600*

Cisco 3600 Series-Specific Documentation

The following Cisco 3600 documents are available:

- *Cisco 3620 Router Installation and Configuration Guide*
- *Cisco 3640 Router Installation and Configuration Guide*
- *Update to Network Modules Hardware Install and Config Guide*
- *WAN Interface Cards Hardware Installation Guide*
- *Cisco 3600 Series Configuration Notes*
- Redundant Power Systems
- Regulatory Compliance and Safety Info for the Cisco 3600 Series

Cisco AS5200-Specific Documentation

The following Cisco AS5200 documents are available:

- *Cisco AS5200 Universal Access Server Software Configuration Guide*
- *Cisco AS5200 Universal Access Server Installation Guide*
- *Cisco AS5200 Manager Guide*
- Modem/Terminal Adapter Information
- Regulatory compliance and safety information
- Documentation for spare parts

Feature Module Documentation

Feature modules describe new features supported by Release 11.1 AA and are an update to the Cisco IOS documentation set. As updates, the features modules are available online only. The feature module information is included in the next printing of the Cisco IOS documentation set. Feature modules consist of a brief overview of the feature, benefits, configuration tasks, and a command reference.

To access the feature modules on Cisco.com, follow this path:

Products and Ordering: Cisco Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.1: Feature Pack Information.

To access the feature modules on the documentation CD-ROM, follow this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 11.1: Feature Pack Information.

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. If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to establish 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 Java Script 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

Table 5 lists the Cisco IOS software documentation set. Software documentation consists of the Cisco IOS configuration guides and command references and also includes several supporting documents. These documents are shipped with the routers and access servers in electronic form on the Documentation CD-ROM, unless you specifically ordered the printed version of the documents.

The Cisco IOS configuration guides, command references, and major topics are as follows:

Table 5 Cisco IOS Release 11.1 Documentation Set

Books	Major Topics
<ul style="list-style-type: none"> • <i>Configuration Fundamentals Configuration Guide</i> • <i>Configuration Fundamentals Command Reference</i> 	<ul style="list-style-type: none"> Configuration Fundamentals Overview Cisco IOS User Interfaces File Management Interface Configuration System Management
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 1</i> • <i>Network Protocols Command Reference, Part 1</i> 	<ul style="list-style-type: none"> IP Addressing IP Services IP Routing Protocols
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 2</i> • <i>Network Protocols Command Reference, Part 2</i> 	<ul style="list-style-type: none"> AppleTalk Novell IPX
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 3</i> • <i>Network Protocols Command Reference, Part 3</i> 	<ul style="list-style-type: none"> Apollo Domain Banyan VINES DECnet ISO CLNS XNS

Table 5 Cisco IOS Release 11.1 Documentation Set (Continued)

Books	Major Topics
<ul style="list-style-type: none"> • <i>Wide-Area Networking Configuration Guide</i> • <i>Wide-Area Networking Command Reference</i> 	ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> • <i>Security Configuration Guide</i> • <i>Security Command Reference</i> 	AAA Security Services Security Server Protocols Traffic Filtering Network Data Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<ul style="list-style-type: none"> • <i>Dial Solutions Configuration Guide</i> • <i>Dial Solutions Command Reference</i> 	Dial Business Solutions and Examples Dial-In Port Setup DDR and Dial Backup Remote Node and Terminal Service Cost-Control and Large-Scale Dial Solutions VPDN
<ul style="list-style-type: none"> • <i>Cisco IOS Switching Services Configuration Guide</i> • <i>Cisco IOS Switching Services Command Reference</i> 	Switching Paths for IP Networks Fast Switching Autonomous Switching NetFlow Switching Optimum Switching Virtual LAN (VLAN) Switching and Routing Inter-Switch Link Protocol Encapsulation IEEE 802.10 Encapsulation LAN Emulation
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</i> 	Transparent Bridging Source-Route Bridging Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN NCIA Client/Server Topologies IBM Channel Attach

Table 5 Cisco IOS Release 11.1 Documentation Set (Continued)

Books	Major Topics
<ul style="list-style-type: none">• <i>Cisco IOS Software Command Summary</i>• <i>Dial Solutions Quick Configuration Guide</i>• <i>System Error Messages</i>• <i>Debug Command Reference</i>	

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.

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
- 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 product 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.

To submit your comments by mail, for your convenience many documents contain a response card behind the front cover. 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

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

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.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

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/>

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users 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.

Open Source License Acknowledgements

The following notices pertain to this software license.

OpenSSL/Open SSL Project

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>).

This product includes cryptographic software written by Eric Young (ey@cryptsoft.com).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

License Issues

The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact openssl-core@openssl.org.

OpenSSL License:

Copyright © 1998-2007 The OpenSSL Project. All rights reserved.

This document is to be used in conjunction with the documents listed in the “Related Documentation” section on page 10.

CCIP, the Cisco *Powered* Network mark, the Cisco Systems Verified logo, Cisco Unity, Fast Step, Follow Me Browsing, FormShare, Internet Quotient, iQ Breakthrough, iQ Expertise, iQ FastTrack, the iQ Logo, iQ Net Readiness Scorecard, Networking Academy, ScriptShare, SMARTnet, TransPath, and Voice LAN are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, Discover All That’s Possible, The Fastest Way to Increase Your Internet Quotient, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, GigaStack, IOS, IP/TV, LightStream, MGX, MICA, the Networkers logo, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, RateMUX, Registrar, SlideCast, StrataView Plus, Stratum, SwitchProbe, TeleRouter, and VCO are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and certain other countries.

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This package is an SSL implementation written by Eric Young (ey@cryptsoft.com).

The implementation was written so as to conform with Netscapes SSL.

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