



# Release Notes for Catalyst 4000 Access Gateway Module for Cisco IOS Release 12.1 XI

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February 12, 2002



**Note**

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You can find the most current Cisco IOS documentation on Cisco Connection Online (CCO). These electronic documents may contain updates and modifications made after the hardcopy documents were printed.

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These release notes for the Catalyst 4000 Access Gateway module describe the enhancements provided in Cisco IOS Release 12.1(3)XI8. These release notes are updated as needed.

For a list of the software caveats that apply to Cisco IOS Release 12.1(3)XI8, see the “Caveats” section on page 6 and *Caveats for Cisco IOS Release 12.1 T*. The caveats document is updated for every maintenance release and is also located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.1* located on CCO and the Documentation CD-ROM.

## Contents

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# Introduction

The Cisco Catalyst 4000 Access Gateway module adds voice interfaces, WAN interfaces and DSP farm services to the Cisco Catalyst 4000 family switch and enables it to become an integrated voice and data solution for branch and remote offices and small to medium businesses that support from 50 to 240 users. The module provides the following interfaces:

- A console port
- A management Ethernet port
- Two VIC/WIC slots
- One VIC slot
- One high-density analog slot
- Connection to the switching ASIC within the Catalyst 4000

The Cisco Catalyst 4000 Access Gateway Module supports H.323 for the telephony gateway functions and the Skinny Client Control Protocol (SCCP) for the DSP farm services. The module operates as a peer device in Voice over IP (VoIP) applications or as a slave device under the control of Cisco Call Manager in the Cisco AVVID IP Telephony environment.

## System Requirements

This section describes the system requirements for Release 12.1(3)XI8:

- Memory Recommendations, page 2
- Hardware Supported, page 3
- Determining the Software Version, page 3
- Feature Set Tables, page 3

## Memory Recommendations

Table 1 describes the minimum memory recommendations for the Access Gateway module.

**Table 1** Minimum Memory Recommendations for the Access Gateway Module

Platforms	Image Name	Software Image	Flash Memory Recommended	DRAM Memory Recommended	Runs From
c4gwy	IOS IP/Firewall	c4gwy-io3s-mz	32 MB, fixed	64 MB	RAM
c4gwy	IOS IP/Firewall/Voice	c4gwy-io3sx3-mz	32 MB	64 MB	RAM

## Hardware Supported

Cisco IOS Release 12.1(3a)XI8 supports the Catalyst 4000 Access Gateway module.

## Determining the Software Version

To determine the version of Cisco IOS software running on an Access Gateway module, log in to the device and enter the **show version** EXEC command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) c4gwy Software (c4gwy-io3s-mz), Version 12.1(3)XI8, RELEASE SOFTWARE
```

## Feature Set Tables

Cisco IOS software is packaged in feature sets consisting of software images—depending on the platform. Each feature set contains a specific set of Cisco IOS features.

Cisco IOS Release 12.1(3)XI8 supports the same feature sets as Cisco IOS Release 12.1, but Cisco IOS Release 12.1(3)XI8 can include new features supported by the Access Gateway module.

Table 2 describes the supported feature sets.

**Table 2** Feature Sets Supported by the Cisco Catalyst 4000

Feature Sets		Feature Set Matrix Term	Software Image	Platforms
IP Standard Feature Sets	IP/FW	<ul style="list-style-type: none"> <li>Basic</li> <li>Firewall</li> </ul>	c4gwy-io3s-mz	Catalyst 4000 Access Gateway module
	IP/FW/Voice	<ul style="list-style-type: none"> <li>Basic</li> <li>Firewall</li> <li>Voice</li> </ul>	c4gwy-io3sx3-mz	Catalyst 4000 Access Gateway module



### Caution

Cisco IOS images with strong encryption (including, but not limited to 168-bit (3DES) data encryption feature sets) are subject to United States government export controls and have limited distribution. Strong encryption images to be installed outside the United States are likely to require an export license. Customer orders may be denied or subject to delay due to United States government regulations. When applicable, you must obtain local import and use authorizations for all encryption strengths. Please contact your sales representative or distributor for more information, or send an e-mail to [export@cisco.com](mailto:export@cisco.com).

## New and Changed Information

The following sections list the new hardware and software features Cisco IOS Release 12.1(3a)XI8.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI8

Cisco IOS Release 12.1(3a)XI8 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI7

Cisco IOS Release 12.1(3a)XI7 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI6

Cisco IOS Release 12.1(3a)XI6 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI5

Cisco IOS Release 12.1(3a)XI5 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI4

Cisco IOS Release 12.1(3a)XI4 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI3

Cisco IOS Release 12.1(3a)XI3 does not support the Cisco Catalyst 4000.

### New Hardware and Software Features in Cisco IOS Release 12.1(3a)XI2

Cisco IOS Release 12.1(3a)XI2 does not support the Cisco Catalyst 4000.

### New Hardware Features in Cisco IOS Release 12.1(3a)XI

Cisco IOS Release 12.1(3a)XI supports the Cisco Catalyst 4000 Access Gateway module.

### New Software Features in Cisco IOS Release 12.1(3a)XI

There are two new software features supported by the Catalyst 4000 Access Gateway module for Cisco IOS Release 12.1(3a)XI. Under the control of Cisco CallManager, the Access Gateway module can support conferencing and transcoding services.

The conferencing service allows an external Cisco CallManager to use the DSP farm to mix participants into multiple conferences. The conferencing service adds G.711 voice streams to form unicast conferences.

The Cisco CallManager controls the conference with Skinny Client Control Protocol (SCCP).

The conferencing service supports:

- Ad hoc or meet-me conferences
- Up to 24 channels or voice streams

Partitioning the 24 channels into a set of conferences is done at the Cisco CallManager.

- A maximum of six participants per conference
- A maximum of eight simultaneous conferences
- G.711 a-Law or u-Law encoding only

The transcoding service allows an external Cisco CallManager to use the DSP farm to compress or decompress WAN packets of voice streams between G.723.1 or G.729a to or from G.711. G.711 is the uncompressed format for LANs.

The transcoding service supports:

- Up to 16 full-duplex channels on 8 DSPs
- G.711 a-Law or u-Law to or from either G.729a or G.723.1
- Capability to revert to one of several backup Cisco CallManagers in case the main one fails

## New Hardware Features in Cisco IOS Release 12.1(3a)XI

Cisco IOS Release 12.1(3a)XI supports the Cisco Catalyst 4000 Access Gateway module.

## New Software Features in Cisco IOS Release 12.1(3a)XI

There are no new software features supported by the Catalyst 4000 Access Gateway module for Cisco IOS Release 12.1(3a)XI.

## Important Notes

The following sections contain important notes about Cisco IOS Release 12.1(3)XI8 that can apply to the Catalyst 4000 Access Gateway module.

### Tighten Screws on VICs and WICs

You must tighten the screws on the VICs and WICs mounted on the Access Gateway module. If the screws are not properly tightened, the VIC or WIC may malfunction.

## TDM Clocking

The TDM clock reference on the Access Gateway module can be derived from one of seven sources. These are the free running on-board clock and two recovered clock sources from each VIC slot that contains an E1/T1 card.

The default reference is the on-board clock. The **frame-clock-select** command can be used to select one of the E1/T1 ports as the primary reference. This command can also be used to select up to 3 prioritized backups that can be used if the primary clock fails. Switch over to a backup source is non-revertive, the system does not switch back to a higher priority clock if it recovers after a failure.

The command has the following syntax:

```
[no] frame-clock-select priority E1/T1 slot/port
```

The clock source with priority 1 is the primary reference and the clock with priority 4 is the lowest priority backup.

The clock reference selection using the **frame-clock-select** command is independent of the clock selection between line or internal on an E1/T1 controller. Framing and CRC errors due to clock slips may be observed on E1/T1 interfaces if the on-board clock is used as the reference.

## Need to Support 56 Kbps Operation for Slot 3 WIC

The 8260 Rev1A device, which is being used in the Access Gateway module hardware, has a defect that can cause data corruption when configuring the MCC SI Ram for 2 entries (7 bits forming the 56kbps channel and 1 bit being discarded).

As a workaround, 3 SI RAM entries would have to be used, but the Access Gateway module does not have enough room available. Therefore, only 64kbps channels will be supported on the Access Gateway module.

If absolutely required, we could implement this feature in Access Gateway module slots 1 and 2 using the SCCs and limit it to 2 channels or super-channels per Access Gateway module slot. This requires more design work and will not be addressed unless really needed.

Customers that need 56kbps should use the WIC-56K4 WIC.

## Caveats

Caveats describe unexpected behavior or defects in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious.

This section contains only open and resolved caveats for this current Cisco IOS maintenance release.

All caveats in Cisco IOS Release 12.1(3) and Cisco IOS Release 12.1(3)T are in Cisco IOS Release 12.1(a)XI8.

For information on caveats in Cisco IOS Release 12.1, see *Caveats for Cisco IOS Release 12.1*, which lists severity 1 and 2 caveats and is located on CCO and the Documentation CD-ROM.

## Open Caveats—Release 12.1(3a)XI8

There are no open caveats specific to Cisco IOS Release 12.1(3a)XI8 that require documentation in the release notes.

## Resolved Caveats—Release 12.1(3a)XI8

All the caveats listed in this section are resolved in Cisco IOS Release 12.1(3a)XI8. 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>

## Open and Resolved Caveats—Release 12.1(3a)XI7

Cisco IOS Release 12.1(3a)XI7 does not support the Cisco Catalyst 4000.

## Open and Resolved Caveats—Release 12.1(3a)XI6

Cisco IOS Release 12.1(3a)XI6 does not support the Cisco Catalyst 4000.

## Open and Resolved Caveats—Release 12.1(3a)XI5

Cisco IOS Release 12.1(3a)XI5 does not support the Cisco Catalyst 4000.

## Open and Resolved Caveats—Release 12.1(3a)XI4

Cisco IOS Release 12.1(3a)XI5 does not support the Cisco Catalyst 4000.

## Open and Resolved Caveats—Release 12.1(3a)XI3

Cisco IOS Release 12.1(3a)XI3 does not support the Cisco Catalyst 4000.

## Open Caveats—Cisco IOS Release 12.1(3a)XI2

- CSCds27872

Basic FAX is not working in IP Telephony mode when using the FXS/G.711 interface.

- CSCdr79627

Before erasing a file from the flash file system, all telnet sessions to the Access Gateway (except the one from where the erase command will be executed) must be closed. Otherwise a system crash might occur.

- CSCds02511

Fast switching is disabled on serial interfaces when IP RTP header compression is configured.

- CSCdr94851

The **show voicecard conference** and **show voicecard transcode** commands can be inaccurate on extremely busy networks.

During periods of heavy usage, when calls are repeatedly connected and torn down, problems are encountered if you perform the show commands for transcoding or conferencing. The conference bridge or transcoder resource might have been released and then reused. The results are an incomplete display of the actual resource.

There are also times when the console gets stuck in a loop when trying to track an invalid resource.

- CSCds02576

Caller ID is not supported on analog and digital ports (T1CAS and Analog FCS) in this release.

- CSCds06790

When the conference bridge resource limit of 24 conferees is reached, the twenty-fifth conferee causes the conference originator to be dropped. The conference originator is also dropped when the maximum users on a conference bridge is extended beyond six.

- CSCdr76149

In IP Telephony mode, the Access Gateway module only supports two codecs: G711u and G711a. The default codec appears as G729r8. The codec needs to be set to G.711 using the command line interface.

- CSCds08253

Hook-flash does not work properly.

- CSCds18197

The Access Gateway module does not support fxs-ground-start signalling in ds0-group command. See the following example:

```
Gateway(config-controller)#ds0-group 0 time 1 type ?
e&m-delay-dial      E & M Delay Dial
e&m-immediate-start E & M Immediate Start
e&m-wink-start      E & M Wink Start
ext-sig             External Signaling
fxo-ground-start    FXO Ground Start
fxo-loop-start      FXO Loop Start
fxs-loop-start      FXS Loop Start
```

## Open Caveats—Cisco IOS Release 12.1(3)XI1

- CSCds02511

Fast switching is disabled on serial interfaces when IP RTP header compression is configured.

- CSCdr94851

The **show voicecard conference** and **show voicecard transcode** commands can be inaccurate on extremely busy networks.

During periods of heavy usage, when calls are repeatedly connected and torn down, problems are encountered if you perform the show commands for transcoding or conferencing. The conference bridge or transcoder resource might have been released and then reused. The results are an incomplete display of the actual resource.

There are also times when the console gets stuck in a loop when trying to track an invalid resource.

- CSCds02576  
Caller ID is not supported on analog and digital ports (T1CAS and Analog FCS) in this release.
- CSCds06790  
When the conference bridge resource limit of 24 conferees is reached, the twenty-fifth conferee causes the conference originator to be dropped. The conference originator is also dropped when the maximum users on a conference bridge is extended beyond six.
- CSCdr76149  
In IP Telephony mode, the Access Gateway module only supports two codecs: G711u and G711a. The default codec appears as G729r8. The codec needs to be set to G.711 using the command line interface.
- CSCds08253  
Hook-flash does not work properly.
- CSCds17582  
During normal IP gateway operation, T1 CAS and analog FXS work fine. But if a VoIP call is placed over the network and requires hardware transcoding, the voice interface stops working. Symptoms are no dialtone from Chopin, signaling still goes through, but no talk path. This happens as long as one hardware transcoded call is up. This condition disappears once the transcoded call is released.
- CSCds18197  
The Access Gateway module does not support fxs-ground-start signalling in ds0-group command. See the following example:  

```
Gateway(config-controller)#ds0-group 0 time 1 type ?
  e&m-delay-dial      E & M Delay Dial
  e&m-immediate-start E & M Immediate Start
  e&m-wink-start      E & M Wink Start
  ext-sig            External Signaling
  fxo-ground-start   FXO Ground Start
  fxo-loop-start     FXO Loop Start
  fxs-loop-start     FXS Loop Start
```

## Closed Caveats—Cisco IOS Release 12.1(3)XI1

- CSCdp79409  
Need to support 56kb/s operation for slot 3 wic.  
Reason for this action:  
The 8260 Rev1A device (which is being used in the FCS Access Gateway module hardware) has a defect that can cause data corruption when configuring the MCC SI Ram for 2 entries (7 bits forming the 56kbps channel and 1 bit being discarded). As a workaround, 3 SI RAM entries would have to be used, but the Access Gateway module does not have enough room available. Therefore, only 64kbps channels will be supported on the Access Gateway module.  
If absolutely required, we could implement this feature in Access Gateway module slots 1 and 2 using the SCCs and limit it to 2 channels or super-channels per Access Gateway module slot. This requires more design work and will not be addressed unless really needed.  
Customers needing 56kbps should use the WIC-56K4 WIC.

## Open Caveats—Cisco IOS Release 12.1(3a)XI

- CSCdr87640

There are 3 VIC/WIC cards installed on the Access Gateway module, but SNMP query for cardTable returns with no value. CiscoView needs the information to manage the VIC/WIC cards on the Access Gateway module.

- CSCdr89094

When running LFI on a WAN and a line is oversubscribed, when there is a high level of voice traffic, the line protocol may go down. If RTP header compression is enabled, the line protocol will stay up.

## Resolved Caveats—Release 12.1(3a)XI

There are no resolved caveats specific to Cisco IOS Release 12.1(3a)XI that require documentation in the release notes.



### Note

If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, **Login** to CCO and click **Software Center: Cisco IOS Software: Cisco Bug Navigator II**. You can also find Bug Navigator II at: <http://www.cisco.com/support/bugtools>

## Related Documentation

The following sections describe the documentation available for the Cisco Catalyst 4000 family switches. These documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

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

Use these release notes with these documents:

- Release-Specific Documents, page 10
- Platform-Specific Documents, page 11
- Feature Modules, page 11
- Cisco IOS Software Documentation Set, page 11

## Release-Specific Documents

The following documents are specific to or support Cisco IOS Release 12.1(3a)XI8 and are located on CCO and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.1*

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes**

- Product bulletins, field notices, and other release-specific documents on CCO at:  
**Technical Documents**

## Platform-Specific Documents

These documents are available for the Cisco Catalyst 4000 family switches on CCO and the Documentation CD-ROM:

- *Catalyst 4003 and 4006 Switch Installation Guide*
- *Switch Software Documentation, Release 5.5*
- *Catalyst 4000 Family Release Notes*
- *Catalyst 4000 Family Installation & Configuration Notes*
- *Site Preparation and Safety Guide*
- *Troubleshooting Tips*

On CCO at:

**Technical Documents: Documentation Home Page: Multilayer LAN Switches: Cisco 4000 Family Switches**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Multilayer LAN Switches: Cisco 4000 Family Switches**

## Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 T, and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: New Features in Release 12.1T**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: New Features in Release 12.1T**

## Cisco IOS Software Documentation Set

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

## Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

On CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

On the Documentation CD-ROM at:

**Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

## Release 12.1 Documentation Set

Table 3 describes the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form upon request.

**Note**

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

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On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

**Table 3 Cisco IOS Release 12.1 Documentation Set**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Fundamentals Configuration Guide</i></li> <li>• <i>Cisco IOS Configuration Fundamentals Command Reference</i></li> </ul>	Configuration Fundamentals Overview Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS System Management Cisco IOS User Interfaces Commands Cisco IOS File Management Commands Cisco IOS System Management Commands
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i></li> <li>• <i>Cisco IOS Dial Services Configuration Guide: Network Services</i></li> <li>• <i>Cisco IOS Dial Services Command Reference</i></li> </ul>	Preparing for Dial Access Modem Configuration and Management ISDN and Signalling Configuration PPP Configuration Dial-on-Demand Routing Configuration Dial-Backup Configuration Terminal Service Configuration Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Networks X.25 on ISDN Solutions Telco Solutions Dial-Related Addressing Services Interworking Dial Access Scenarios
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	Interface Configuration Overview Configuring LAN Interfaces Configuring Serial Interfaces Configuring Logical Interfaces
<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP and IP Routing Configuration Guide</i></li> <li>• <i>Cisco IOS IP and IP Routing Command Reference</i></li> </ul>	IP Addressing and Services IP Routing Protocols IP Multicast
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Multiservice Applications Configuration Guide</i></li> <li>• <i>Cisco IOS Multiservice Applications Command Reference</i></li> </ul>	Multiservice Applications Overview Voice Video Broadband
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Quality of Service Solutions Configuration Guide</i></li> <li>• <i>Cisco IOS Quality of Service Solutions Command Reference</i></li> </ul>	Quality of Service Overview Classification Congestion Management Congestion Avoidance Policing and Shaping Signalling Link Efficiency Mechanisms Quality of Service Solutions
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Other Security Features

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	Cisco IOS Switching Services Overview Cisco IOS Switching Paths Multilayer Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	Wide-Area Networking Overview Configuring Frame Relay Configuring X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Guide Master Index</i></li> <li>• <i>Cisco IOS Command Reference Master Index</i></li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Dial Services Quick Configuration Guide</i></li> <li>• <i>Cisco IOS Software System Error Messages</i></li> <li>• <i>New Features in 12.1-Based Limited Lifetime Releases</i></li> <li>• <i>New Features in Release 12.1 T</i></li> <li>• Release Notes (Release note and caveat documentation for 12.1-based releases and various platforms)</li> </ul>	

## Obtaining Documentation

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

### 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. Therefore, it is probably more current than printed documentation. The CD-ROM package is available as a single unit or as an annual subscription.

### Ordering Documentation

Registered CCO users can order the Documentation CD-ROM and other Cisco Product documentation through our online Subscription Services at <http://www.cisco.com/cgi-bin/subcat/kaojump.cgi>.

Nonregistered CCO users can order documentation through a local account representative by calling Cisco's corporate headquarters (California, USA) at 408 526-4000 or, in North America, call 800 553-NETS (6387).

# Obtaining Technical Assistance

Cisco provides Cisco Connection Online (CCO) as a starting point for all technical assistance. Warranty or maintenance contract customers can use the Technical Assistance Center. All customers can submit technical feedback on Cisco documentation using the web, e-mail, a self-addressed stamped response card included in many printed docs, or by sending mail to Cisco.

## Cisco Connection Online

Cisco continues to revolutionize how business is done on the Internet. Cisco Connection Online 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.

CCO's broad range of features and services helps customers and partners to streamline business processes and improve productivity. Through CCO, you will find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online support services, 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 CCO to obtain additional personalized information and services. Registered users may order products, check on the status of an order and view benefits specific to their relationships with Cisco.

You can access CCO in the following ways:

- WWW: [www.cisco.com](http://www.cisco.com)
- Telnet: [cco.cisco.com](telnet://cco.cisco.com)
- Modem using standard connection rates and the following terminal settings: VT100 emulation; 8 data bits; no parity; and 1 stop bit.
  - From North America, call 408 526-8070
  - From Europe, call 33 1 64 46 40 82

You can e-mail questions about using CCO to [cco-team@cisco.com](mailto:cco-team@cisco.com).

## Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to warranty or maintenance contract customers who need technical assistance with a Cisco product that is under warranty or covered by a maintenance contract.

To display the TAC web site that includes links to technical support information and software upgrades and for requesting TAC support, use [www.cisco.com/techsupport](http://www.cisco.com/techsupport).

To contact by e-mail, use one of the following:

Language	E-mail Address
English	<a href="mailto:tac@cisco.com">tac@cisco.com</a>
Hanzi (Chinese)	<a href="mailto:chinese-tac@cisco.com">chinese-tac@cisco.com</a>

Language	E-mail Address
Kanji (Japanese)	japan-tac@cisco.com
Hangul (Korean)	korea-tac@cisco.com
Spanish	tac@cisco.com
Thai	thai-tac@cisco.com

In North America, TAC can be reached at 800 553-2447 or 408 526-7209. For other telephone numbers and TAC e-mail addresses worldwide, consult the following web site:  
<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

## Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a CCO login account, you can access the following URL, which contains links and tips on configuring your Cisco products:

[http://www.cisco.com/kobayashi/technotes/serv\\_tips.shtml](http://www.cisco.com/kobayashi/technotes/serv_tips.shtml)

This URL is subject to change without notice. If it changes, point your Web browser to CCO and click on this path: **Technical Assistance Center: Technical Tips**. (You must have a CCO account to access this link.)

The following sections are provided from the Technical Tips page:

- Access Dial Cookbook—Contains common configurations or recipes for configuring various access routes and dial technologies.
- Field Notices—Notifies you of any critical issues regarding Cisco products and includes problem descriptions, safety or security issues, and hardware defects.
- Frequently Asked Questions—Describes the most frequently asked technical questions about Cisco hardware and software.
- Hardware—Provides technical tips related to specific hardware platforms.
- Hot Tips—Describes popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC Fax-on-demand service. To reach Fax-on-demand and receive documents at your fax machine from the United States, call 888 50-CISCO (888 502-4726). From other areas, call 650 596-4408.
- Internetworking Features—Lists tips on using and deploying Cisco IOS software features and services.
- Sample Configurations—Provides actual configuration examples that are complete with topology and annotations.
- Software Products—Contains Cisco IOS Software Bulletins, Cisco TCP/IP Suite 100, General Cisco IOS, Internet/Intranet Applications and Software, Network Management, Network Protection Software Tips, and WAN Switching Products and Software.
- Special Collections—Lists other helpful documents, including *Case Studies*, *References & Request for Comments (RFCs)*, and *Security Advisories*.

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