



# Release Notes for Cisco AS5850 Universal Gateways for Cisco IOS Release 12.1 XV

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February 15, 2002

Cisco IOS Release 12.1(5) XV3

78-12421-01 Rev. I0

These release notes for the Cisco AS5850 universal gateways describe the enhancements provided in Cisco IOS Release 12.1(5) XV3. These release notes are updated as needed.

For a list of the software caveats that apply to Cisco IOS Release 12.1(5) XV3, see the [“Caveats Cisco IOS Release 12.1 XV” section on page 7](#) and *Caveats for Cisco IOS Release 12.1 T*. The caveats document is updated for every maintenance release and is located on Cisco.com and the Documentation CD-ROM.

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

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# Introduction

The Cisco AS5850 universal gateway provides the highest concentration of port and Integrated Services Digital Network (ISDN) terminations available in a single remote access server product. The Cisco AS5850 is specifically designed to meet the demands of large service providers such as Post, Telephone, and Telegraphs (PTTs), regional bell operating companies (RBOCs), inter-exchange carriers (IXCs), and large Internet service providers (ISPs).

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.1(5) XV3, see the [“New and Changed Information” section on page 5](#) and the [“Related Documentation” section on page 12](#).

## System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(5) XV3 and includes the following sections:

- [Memory Requirements, page 2](#)
- [Supported Hardware, page 2](#)
- [Determining the Software Version, page 3](#)
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## Memory Requirements

**Table 1** *Memory Requirements for the Cisco AS5850 Universal Gateways*

Image Name	Software Image	Compact Flash Memory	DRAM Memory	Runs From
IP Plus	c5850-p9-mz	32 MB	512 MB	RAM

## Supported Hardware

Cisco IOS Release 12.1(5) XV3 supports the Cisco AS5850. [Table 2](#) lists the supported feature boards. For detailed descriptions of the new hardware features, see the [“New and Changed Information” section on page 5](#).

**Table 2** Supported Feature Boards for the Cisco AS5850

Feature Boards	Product Description
Port Handling Cards	AS58-324UPC-CC
LAN Interfaces	Fast Ethernet 10/100BASE-T (RJ-45) <sup>1</sup> Dual Gigabit Ethernet
WAN Interface Options	Channelized T3 (AS58-1CT3/216U) Channelized E1 (AS58-24CE1)

1. The Fast Ethernet is for management purposes only.

## Determining the Software Version

To determine the version of Cisco IOS software running on your Cisco AS5850, log in to the Cisco AS5850 and enter the **show version EXEC** command:

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) 12.1 T Software (c5850-p6-mz), Version 12.1(5) XV3, RELEASE SOFTWARE
```

## Feature Set Tables

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

Cisco IOS Release 12.1(5) XV3 supports the same feature sets as Cisco IOS Release 12.1 T, but Cisco IOS Release 12.1(5) XV3 can include new features supported by the Cisco AS5850.



### Caution

Cisco IOS images with strong encryption (including, but not limited to, 168-bit Triple Data Encryption Standard [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 because of United States government regulations. When applicable, the purchaser and user 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).

**Table 3** lists the features supported by the Cisco AS5850 in Cisco IOS Release 12.1(5) XV3 and uses the following conventions:

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



### Note

This table might not be cumulative or list all the features in each image. You can find the most current Cisco IOS documentation on Cisco.com. These electronic documents may contain updates and modifications made after the hard-copy documents were printed. If you have a Cisco.com login account, you can find image and release information regarding features in Cisco IOS Release 12.1 T by using the Feature Navigator tool at <http://www.cisco.com/go/fn>.

**Table 3 Feature List for the Cisco AS5850**

<b>Features</b>	<b>IP Plus</b>
AAA Session MIB	Yes
AutoInstall Using DHCP for LAN Interfaces	Yes
Calling Line Identification Screening—Call Discriminator	Yes
Circuit Interface Identification MIB	Yes
Cisco AAA Server MIB and Additional Enhancements for the Cisco AS5x00	Yes
Deutsche Telekom Phase I	No
Dial Modifiers	No
Dialer DNIS-Group Range	Yes
Event MIB	Yes
Fax Relay Packet Loss Concealment	No
Individual SNMP Trap Support	Yes
Interface Index Persistence	Yes
Interworking Signaling Enhancements for H.323 VoIP	No
L2TP Tunnel Management Enhancements	Yes
NAT—Support for NetMeeting Directory (Internet Locator Service—ILS)	No
Network Side ISDN PRI Signaling, Trunking, and Switching	No
Parser Cache	Yes
Preauthentication with ISDN PRI and Channel-Associated Signaling	Yes
RADIUS Tunnel Attribute Extensions	Yes
Sticky IP	Yes
TCP Clear Performance Optimization	Yes
VoIP Call Admission Control using RSVP	No
<b>IP Routing</b>	
Asynchronous Serial Traffic over UDP	Yes
<b>LAN Support</b>	
CLI String Search	Yes
Dynamic Multiple Encaps for Dial-In over ISDN	Yes
L2TP Dialout	Yes
Parse Bookmarks	Yes
SS7	Yes
<b>Management</b>	
Process MIB	Yes
SNMP Version 3	Yes
<b>Miscellaneous</b>	
Cisco IOS DHCP Server	Yes

**Table 3** *Feature List for the Cisco AS5850 (continued)*

<b>Features</b>	<b>IP Plus</b>
<b>Security</b>	
AAA Server Group Deadtimer	Yes
AAA Server Group Enhancements	Yes
Resource Pool Management with Direct Remote Services	Yes
<b>WAN Services</b>	
Layer 2 Tunneling Protocol (L2TP)	Yes

## New and Changed Information

The following sections list the new hardware and software features supported by the Cisco AS5850 for Cisco IOS Release 12.1(5) XV3.

### New Hardware and Software Features in Cisco IOS Release 12.1(5) XV3

No new hardware and software features are supported by the Cisco AS5850 for Cisco IOS Release 12.1(5)XV3.

### New Hardware and Software Features in Cisco IOS Release 12.1(5) XV2

No new hardware and software features are supported by the Cisco AS5850 for Cisco IOS Release 12.1(5)XV2.

### New Hardware and Software Features in Cisco IOS Release 12.1(5) XV1

No new hardware and software features are supported by the Cisco AS5850 for Cisco IOS Release 12.1(5)XV1.

### New Hardware and Software Features in Cisco IOS Release 12.1(5) XV

No new hardware and software features are supported by the Cisco AS5850 for Cisco IOS Release 12.1(5)XV.

# MIBs

## Current MIBs

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

The Cisco AS5850 supports the following MIBs:

- CISCO-AAA-SERVER-MIB
- CISCO-ACCESS-ENVMON-MIB
- CISCO-CALL-HISTORY-MIB
- CISCO-CALL-RESOURCE-POOL-MIB
- CISCO-CALL-TRACKER-MIB
- CISCO-CALL-TRACKER-MODEM-MIB
- CISCO-CALL-TRACKER-TCP-MIB
- CISCO-CAS-IF-MIB
- CISCO-DIAL-CONTROL-MIB
- CISCO-ENTITY-FRU-CONTROL-MIB
- CISCO-ENTITY-VENDORTYPE-OID-MIB
- CISCO-ENVMON-MIB
- CISCO-ISDN-MIB
- CISCO-MEMORY-POOL-MIB
- CISCO-MODEM-MGMT-MIB
- CISCO-PING-MIB
- CISCO-POP-MGMT-MIB
- CISCO-PRODUCTS-MIB
- CISCO-QUEUE-MIB
- CISCO-VPDN-MGMT-MIB
- ENTITY-MIB
- IF-MIB
- OLD-CISCO-CHASSIS-MIB
- OLD-CISCO-CPU-MIB
- RFC 1406-MIB
- RFC 1407-MIB

## Limitations and Restrictions

Only modem and digital services are supported by using the 324 UPC or the 216 UPC features of the E1 and T3 trunk cards.

### Caveats Cisco IOS Release 12.1 XV

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious. Severity 3 caveats are moderate caveats, and only select severity 3 caveats are included in the caveats document.

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

All caveats in Cisco IOS Release 12.1 T and Cisco IOS Release 12.1 T are also in Cisco IOS Release 12.1(5) XV3.

For information on caveats in Cisco IOS Release 12.1 T, see *Caveats for Cisco IOS Release 12.1 T*.

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 select severity 3 caveats for Cisco IOS Release 12.1 and is located on Cisco.com and the Documentation CD-ROM.



#### Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, **log in** to Cisco.com and click **Service and Support: Technical Assistance Center: Select & Download Software: Jump to a software resource: Software Bug Toolkit/Bug Watcher**. Another option is to go to <http://www.cisco.com/support/bugtools/>.

### Open Caveats—Cisco IOS Release 12.1(5) XV3

There are no open caveats specific to Cisco IOS Release 12.1(5) XV3 that require documentation in the release notes.

### Resolved Caveats—Cisco IOS Release 12.1(5) XV3

All the caveats listed in this section are resolved in Cisco IOS Release 12.1(5) XV3. 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 Caveats—Release 12.1(5) XV2

This section documents possible unexpected behavior by Cisco IOS Release 12.1(5) XV2 and describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds64859

On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5) XV2, for V.110 calls, **show isdn status** command in the EXEC mode displays the “calltype” field incorrectly as **VOICE** instead of **V.110**.

Workaround: Use the **show spe** command in EXEC mode to determine the call type for each port.

- CSCdt64308

The configuration of the serial interfaces that correspond to the controllers on a CT3-216UP card installed in a Cisco AS5850 is lost if the card is subjected to an online insertion and removal (OIR) removal followed by an OIR insertion. The loss of the configuration causes calls to the CT3-216UP card to fail.

Workaround: Reconfigure the serial interfaces.

- CSCdt65014

A CT3-216UP card installed in a Cisco AS5850 might reload unexpectedly during boot and then reports a bad device ID on the Fast Ethernet controller on the backplane. The CT3-216UP card subsequently boots up and functions correctly. There is no workaround.

- CSCdu00558

If the download of nondefault universal port firmware is attempted on a CT3-216UP card in slot 0 of a Cisco AS5850 universal gateway system, one half of the ports on that card get stuck in downloading state and so become unusable.

Workaround: To recover those ports, configure the download of the IOS-bundled default firmware on them.

Under some as yet undetermined conditions, the download of the nondefault firmware can also sometimes cause the CT3-216UP card in slot 0 to crash.

Workaround: Change the configuration to cause the default IOS-bundled firmware to be downloaded to the CT3-216UP card in slot 0.

- CSCdu00952

A Cisco AS5850 universal gateway system may suffer a system reset under stress if it has authentication, authorization, and accounting (AAA) periodic accounting configured.

Workaround: Disable AAA periodic accounting on the system.

- CSCdu03877

On a Cisco AS5850 universal gateway, the 24 Port E1 Feature card sometimes resets under undetermined conditions.

There is no known workaround.

- CSCdu04861

While switching IP multicast traffic, some as yet undetermined condition can sometimes cause the Cisco AS5850 universal gateway system to reset unexpectedly.

There is no known workaround.

## Resolved Caveats—Release 12.1(5) XV2

All the caveats listed in this section are closed or resolved in Cisco IOS Release 12.1(5) XV2. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds81678 (portware caveat)

On a Cisco AS5400 universal gateway, Cisco AS5800 universal access server, or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV, data is corrupted for V.110 calls at the speeds of 12 kbps and 24 kbps. On the Cisco AS5850 and Cisco AS5400, all V.110 calls at these speeds are affected by this problem. On the Cisco AS5800, all V.110 calls at this speed to the “324 Universal Port Card” are affected by this problem. There is no workaround.

This portware caveat has been resolved.

- CSCds90049

On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV, the following MIB problems exist for V.110 calls:

- In the “ciscoCallTrackerMIB,” the “cpmDS0CallType” variable registers the calls as analog calls instead of V.110 calls.
- In the “ciscoPopMgmtMIB,” the “cpmV110Calls” variable does not count the number of active V.110 calls.
- In the “ciscoModemMgmtMIB,” the “cmModulationSchemeUsed” variable is set to unknown instead of to V.110.

There is no workaround.

This caveat is resolved in Cisco IOS Release 12.1(5) XV2.

- 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 caveat 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 12.1(5) XV2.

## Open Caveats—Release 12.1(5) XV1

This section documents possible unexpected behavior by Cisco IOS Release 12.1(5) XV1 and describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds64859

On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5) XV1, for V.110 calls, the **show isdn status** command in EXEC mode displays the “calltype” field incorrectly as **VOICE** instead of **V.110**.

Workaround: Use the **show spe** command in EXEC mode to determine the call type for each port.

- CSCdt53433

Under a rare and undetermined condition with all modems in a “busyout” state, the Cisco AS5850 reloads unexpectedly. There is no workaround.

- CSCdt64308

The configuration of the serial interfaces that correspond to the controllers on a CT3-216UP card installed in a Cisco AS5850 is lost if the card is subjected to an OIR removal followed by an OIR insertion. The loss of the configuration causes calls to the CT3-216UP card to fail.

Workaround: Reconfigure the serial interfaces.

- CSCdt65014

A CT3-216UP card installed in a Cisco AS5850 might reload unexpectedly during boot and then report a bad device ID on the Fast Ethernet controller on the backplane. The CT3-216UP card subsequently boots and functions correctly. There is no workaround.

## Resolved Caveats—Release 12.1(5) XV1

All the caveats listed in this section are closed or resolved in Cisco IOS Release 12.1(5) XV1. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds81678 (portware caveat)

On a Cisco AS5400 universal gateway, Cisco AS5800 universal access server, or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV1, data is corrupted for V.110 calls at the speeds of 12 kbps and 24 kbps. On the Cisco AS5850 and Cisco AS5400, all V.110 calls at these speeds are affected by this problem. On the Cisco AS5800, all V.110 calls at these speed to the “324 Universal Port Card” are affected by this problem. There is no workaround.

This portware caveat has been resolved.

- CSCds90049

On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5) XV1, the following MIB problems exist for V.110 calls:

- In the “ciscoCallTrackerMIB,” the “cpmDS0CallType” variable registers the calls as analog calls instead of V.110 calls.
- In the “ciscoPopMgmtMIB,” the “cpmV110Calls” variable does not count the number of active V.110 calls.
- In the “ciscoModemMgmtMIB,” the “cmModulationSchemeUsed” variable is set to unknown instead of to V.110.

There is no workaround.

This caveat is resolved in Cisco IOS Release 12.1(5) XV1.

- 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 caveat 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 12.1(5) XV1

## Open Caveats—Release 12.1(5)XV

This section documents possible unexpected behavior by Cisco IOS Release 12.1(5) XV3 and describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCds64859

On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV, for V.110 calls, the **show isdn status** command in EXEC command mode displays the “calltype” field incorrectly as **VOICE** instead of **V.110**.

Workaround: Use the **show spe** command in EXEC mode to determine the call type for each port.

- CSCds81678

On a Cisco AS5400 universal gateway, Cisco AS5800 universal access server, or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV, data is corrupted for V.110 calls at the speeds of 12 kbps and 24 kbps. On the Cisco AS5850 and Cisco AS5400, all V.110 calls at these speeds are affected by this problem. On the Cisco AS5800, all V.110 calls at this speed to the “324 Universal Port Card” are affected by this problem. There is no workaround.

- CSCds90049  
On a Cisco AS5800 universal access server or Cisco AS5850 universal gateway running Cisco IOS Release 12.1(5)XV, the following MIB problems exist for V.110 calls:
  - In the “ciscoCallTrackerMIB,” the “cpmDS0CallType” variable registers the calls as analog calls instead of V.110 calls.
  - In the “ciscoPopMgmtMIB,” the “cpmV110Calls” variable does not count the number of active V.110 calls.
  - In the “ciscoModemMgmtMIB,” the “cmModulationSchemeUsed” variable is set to unknown instead of to V.110.

There is no workaround.

- CSCdt11333  
Under some undetermined conditions, an 8E1-216UP feature board on the Cisco AS5850 universal gateway reports spurious accesses, which might result in some degradation in system performance on the affected feature board. There is no workaround.

## Resolved Caveats—Release 12.1(5)XV

Because Cisco IOS Release 12.1(5)XV is the initial release for the Cisco AS5850 universal gateway, there are no closed or resolved caveats that require documentation in the release notes.

## Related Documentation

The following sections describe the documentation available for the Cisco AS5850. These documents consist of hardware and software installation guides, Cisco IOS configuration guides and command references, system error messages, feature modules, and other documents.

Documentation is available as printed manuals or electronic documents, except for feature modules and the *Cisco AS5850 Universal Gateway Operations, Administration, Maintenance, and Provisioning Guide*, which are available online on Cisco.com and the Documentation CD-ROM.

Use these release notes with these documents:

- [Release-Specific Documents, page 13](#)
- [Platform-Specific Documents, page 13](#)
- [Feature Modules, page 14](#)
- [Feature Navigator, page 14](#)
- [Cisco IOS Software Documentation Set, page 14](#)

## Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.1 and are located on Cisco.com and the Documentation CD-ROM:

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

On Cisco.com at:

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1: Release Notes: Cross-Platform Release Notes**

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 Cisco.com at:

**Technical Documents**

- The “[Caveats Cisco IOS Release 12.1 XV](#)” section on page 7 of these release notes

As a supplement to the caveats listed in “[Caveats Cisco IOS Release 12.1 XV](#)” in these release notes, see *Caveats for Cisco IOS Release 12.1* and *Caveats for Cisco IOS Release 12.1 T*, which contains caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.1 and Cisco IOS Release 12.1 T.

On Cisco.com at:

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1: Release Notes: Caveats**

On the Documentation CD-ROM at:

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




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**Note** If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, go to Cisco.com and press **Login**. Then go to **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools/>.

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## Platform-Specific Documents

These documents are available for the Cisco AS5850 on Cisco.com and the Documentation CD-ROM:

- *Cisco AS5850 Universal Gateway Hardware Installation Guide*
- *Cisco AS5850 Universal Gateway Card Installation Guide*
- *Cisco AS5850 Universal Gateway Regulatory Compliance and Safety Information*
- *Cisco AS5850 Universal Gateway Commissioning Guide*
- *Cisco AS5850 Universal Gateway Operations, Administration, Maintenance, and Provisioning Guide*

On Cisco.com at:

**Technical Documents: Cisco IOS Software Configuration: Access Servers and Access Routers: Access Servers: Cisco AS5850**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Access Servers and Access Routers: Access Servers: Cisco AS5850**

## Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 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 Cisco.com at:

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1: New Feature Documentation**

On the Documentation CD-ROM at:

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

## Feature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image.

Feature Navigator is available 24 hours a day, 7 days a week. To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at [cdbadmin@cisco.com](mailto:cdbadmin@cisco.com). If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to 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 JavaScript support and enabling instructions for other browsers, check with the browser vendor.

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

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

## Cisco IOS Software Documentation Set

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

## Documentation Modules

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

On Cisco.com at:

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

On the Documentation CD-ROM at:

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

## Cisco IOS Release 12.1 Documentation Set Contents

[Table 4](#) lists the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form if ordered.



**Note**

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

On Cisco.com at:

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

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

**Table 4** *Cisco IOS Release 12.1 Documentation Set*

<b>Books</b>	<b>Major Topics</b>
<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>	Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS System Management
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Bridging and IBM Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume I</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume II</i></li> </ul>	Using Cisco IOS Software Overview of SNA Internetworking Bridging IBM Networking

**Table 4 Cisco IOS Release 12.1 Documentation Set (continued)**

Books	Major Topics
<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>	<ul style="list-style-type: none"> <li>Preparing for Dial Access</li> <li>Modem Configuration and Management</li> <li>ISDN and Signaling Configuration</li> <li>PPP Configuration</li> <li>Dial-on-Demand Routing Configuration</li> <li>Dial-Backup Configuration</li> <li>Terminal Service Configuration</li> <li>Large-Scale Dial Solutions</li> <li>Cost-Control Solutions</li> <li>Virtual Private Networks</li> <li>X.25 on ISDN Solutions</li> <li>Telco Solutions</li> <li>Dial-Related Addressing Services</li> <li>Interworking Dial Access Scenarios</li> </ul>
<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>	<ul style="list-style-type: none"> <li>Interface Configuration Overview</li> <li>Configuring LAN Interfaces</li> <li>Configuring Serial Interfaces</li> <li>Configuring Logical Interfaces</li> </ul>
<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>	<ul style="list-style-type: none"> <li>IP Addressing and Services</li> <li>IP Routing Protocols</li> <li>IP Multicast</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i></li> <li>• <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>AppleTalk and Novell IPX Overview</li> <li>Configuring AppleTalk</li> <li>Configuring Novell IPX</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i></li> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Overview</li> <li>Configuring Apollo Domain</li> <li>Configuring Banyan VINES</li> <li>Configuring DECnet</li> <li>Configuring ISO CLNS</li> <li>Configuring XNS</li> </ul>
<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>	<ul style="list-style-type: none"> <li>Multiservice Applications Overview</li> <li>Voice</li> <li>Video</li> <li>Broadband</li> </ul>
<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>	<ul style="list-style-type: none"> <li>Quality of Service Overview</li> <li>Classification</li> <li>Congestion Management</li> <li>Congestion Avoidance</li> <li>Policing and Shaping</li> <li>Signaling</li> <li>Link Efficiency Mechanisms</li> <li>Quality of Service Solutions</li> </ul>

**Table 4** Cisco IOS Release 12.1 Documentation Set (continued)

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Other Security Features
<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 Cisco Express Forwarding NetFlow Switching MPLS Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	Wide-Area Networking Overview Configuring ATM Configuring Frame Relay Configuring Frame Relay-ATM Interworking Configuring SMDS 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>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 notes and caveat documentation for 12.1-based releases and various platforms)</li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Dial Services Quick Configuration Guide</i></li> </ul>	

# Obtaining Documentation

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

## World Wide Web

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

## Documentation CD-ROM

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

## Ordering Documentation

Cisco documentation is available in the following ways:

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

## Documentation Feedback

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

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## Cisco.com

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

<http://www.cisco.com>

## Technical Assistance Center

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

## Contacting TAC by Using the Cisco TAC Website

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

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

P3 and P4 level problems are defined as follows:

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

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

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

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

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.

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This document is to be used in conjunction with the documents listed in the “[Related Documentation](#)” section on page 12.

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