



# Release Notes for Cisco IOS Release 12.4(14)XK

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March 20, 2007

Cisco IOS Release 12.4(14)XK

Text Part Number OL-12926-01



**Note**

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See the “[Important Notes](#)” section on page 4 for important information for Cisco IOS Release 12.4(14)XK.

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These release notes support Cisco IOS Release 12.4(14)XK. They are updated to describe new memory requirements, hardware support, software platform deferrals, and related documents.

We recommend that you view the field notices for this release to see if your software or hardware platforms are affected. If you have an account on Cisco.com, you can find field notices at [http://www.cisco.com/kobayashi/support/tac/fn\\_index.html](http://www.cisco.com/kobayashi/support/tac/fn_index.html). If you do not have a Cisco.com login account, you can find field notices at [http://www.cisco.com/public/support/tac/fn\\_index.html](http://www.cisco.com/public/support/tac/fn_index.html).

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**Americas Headquarters:**

**Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA**

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# Introduction

Cisco IOS Release 12.4(14)XK is the first general availability release of this software. Many of the features and the hardware supported in this software have been previously released to customers on other software releases.

For information on new features and Cisco IOS commands that are supported by Cisco IOS Release 12.4(14)XK, see the [“New and Changed Information” section on page 3](#) and the [“Caveats” section on page 5](#).

## System Requirements

This section describes the system requirements for Cisco IOS Release 12.4(14)XK and includes the following sections:

- [Memory Recommendations, page 2](#)
- [Hardware Supported, page 2](#)
- [Determining Your Software Version, page 3](#)
- [Upgrading to a New Release, page 3](#)

## Memory Recommendations

**Table 1** *Memory Recommendations for the Cisco IOS Release 12.4(14)XK*

| Platforms               | Software Image | Flash Memory Recommended | DRAM Memory Recommended | Runs From |
|-------------------------|----------------|--------------------------|-------------------------|-----------|
| <b>Cisco 8850RPM-PR</b> | rpm-boot-mz    | 16 MB                    | 256 MB                  | RAM       |
|                         | rpm-jk9o3s-mz  | 32 MB                    | 256 MB                  | RAM       |
|                         | rpm-js-mz      | 32 MB                    | 256 MB                  | RAM       |
| <b>Cisco 8850RPM-XF</b> | rpmxf-boot-mz  | 16 MB                    | 512 MB                  | RAM       |
|                         | rpmxf-k9p12-mz | 64 MB                    | 512 MB                  | RAM       |
|                         | rpmxf-p12-mz   | 64 MB                    | 512 MB                  | RAM       |

## Hardware Supported

Cisco IOS Release 12.4(14)XK supports the following Cisco hardware platforms:

- Cisco 8850 RPM-PR
- CCisco 8850 RPM-XF

For detailed descriptions of the new hardware features, see the [“New and Changed Information” section on page 3](#).

## Determining Your Software Version

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

```
Router> show version
```

```
Cisco IOS Software, 8850 Software (C8850-IS-M), Version 12.4(14)XK, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
```

## Upgrading to a New Release

For information about selecting a new Cisco IOS software release, please refer to *How to Choose a Cisco IOS Software Release* at:

[http://www.cisco.com/warp/public/130/choosing\\_ios.shtml](http://www.cisco.com/warp/public/130/choosing_ios.shtml)

For *Cisco IOS Upgrade Ordering Instructions*, refer to the document at the following location:

[http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957\\_pp.htm](http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957_pp.htm)

To choose a new Cisco IOS software release by comparing feature support or memory requirements, use Cisco Feature Navigator. Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or by feature set (software image). Under the release section, you can compare Cisco IOS software releases side by side to display both the features unique to each software release and the features that the releases have in common.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

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

To choose a new Cisco IOS software release based on information about defects that affect that software, use Bug Toolkit at:

[http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

## New and Changed Information

This section lists the new hardware and software features that are supported in Cisco IOS Release 12.4T and contains the following sections:

- [New Hardware Features in Release 12.4\(14\)XK, page 4](#)
- [New Software Features in Release 12.4\(14\)XK, page 4](#)



### Note

A cumulative list of all new and existing features supported in this release, including platform and software image support, can be found in Cisco Feature Navigator at <http://www.cisco.com/go/cfn>.

## New Hardware Features in Release 12.4(14)XK

There are no new hardware features in Cisco IOS Release 12.4(14)XK.

## New Software Features in Release 12.4(14)XK

There are no new software features in Cisco IOS Release 12.4(14)XK.

## Important Notes

The following sections contain important notes about Cisco IOS Release 12.4(14)XK.

### Deferrals

Cisco IOS software images are subject to deferral. Cisco recommends that you view the deferral notices at the following location to determine if your software release is affected:

<http://www.cisco.com/kobayashi/sw-center/sw-ios-advisories.shtml>

### Field Notices and Bulletins

For general information about the types of documents listed in this section, see the following document:

[http://www.cisco.com/warp/customer/cc/general/bulletin/software/general/1654\\_pp.htm](http://www.cisco.com/warp/customer/cc/general/bulletin/software/general/1654_pp.htm)

- **Field Notices**—We recommend that you view the field notices for this release to see if your software or hardware platforms are affected. If you have an account with Cisco.com, you can find Field Notices at a [http://www.cisco.com/kobayashi/support/tac/fn\\_index.html](http://www.cisco.com/kobayashi/support/tac/fn_index.html). If you do not have a Cisco.com login account, you can find field notices at [http://www.cisco.com/public/support/tac/fn\\_index.html](http://www.cisco.com/public/support/tac/fn_index.html).
- **Product Bulletins**—If you have an account with Cisco.com, you can find product bulletins at <http://www.cisco.com/warp/customer/cc/general/bulletin/index.shtml>. If you do not have a Cisco.com login account, you can find product bulletins at <http://www.cisco.com/warp/public/cc/general/bulletin/iosw/index.shtml>.
- **What's Hot in Software Center**—*What's Hot in Software Center* provides information about caveats that are related to deferred software images. If you have an account on Cisco.com, you can access *What's Hot for IOS Releases* at <http://www.cisco.com/kobayashi/sw-center> or by logging in and choosing **Technical Support > Software Center > Cisco IOS Software > What's Hot in Software Center**.
- **What's New for IOS**—*What's New for IOS* lists recently posted Cisco IOS software releases and software releases that have been removed from Cisco.com. If you have an account on Cisco.com, you can access *What's New for IOS* at <http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml> or by logging into Cisco.com and choosing **Technical Support > Software Center > Products and Downloads > Cisco IOS Software**.

# Caveats

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.

For information on caveats in Cisco IOS Release 12.4T, refer to the [Caveats for Cisco IOS Release 12.4T](#) document, which lists severity 1 and 2 caveats and select severity 3 caveats for Cisco IOS Release 12.4T and is located on Cisco.com.

The *Dictionary of Internetworking Terms and Acronyms* contains definitions of acronyms that are not defined in this document:

<http://www.cisco.com/univercd/cc/td/doc/cisintwk/ita/index.htm>



## Note

If you have an account on [Cisco.com](http://www.cisco.com), you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to [Cisco.com](http://www.cisco.com) and click **Products and Services > Cisco IOS Software > Cisco IOS Software Releases 12.4T > Troubleshooting > Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl). (If the defect that you have requested cannot be displayed, this may be due to one or more of the following reasons: the defect number does not exist, the defect does not have a customer-visible description yet, or the defect has been marked Cisco Confidential.)

**Table 2 Release Caveats and Caveats Corrected Reference**

| DDTS Number | Software Release |          |
|-------------|------------------|----------|
|             | Corrected        | Caveat   |
| CSCsg52970  | 12.4(14)XK       | Resolved |
| CSCsf30622  | 12.4(14)XK       | Resolved |
| CSCsf98381  | 12.4(14)XK       | Resolved |
| CSCsh71247  | 12.4(14)XK       | Resolved |

## Open Caveats—Cisco IOS Release 12.4(14)XK

There are no open caveats in this release.

## Resolved Caveats—Cisco IOS Release 12.4(14)XK

This section describes possible unexpected behavior by Cisco IOS Release 12.4(14)XK. All the caveats listed in this section are resolved in Cisco IOS Release 12.4(14)XK. This section describes severity 1 and 2 caveats and select severity 3 caveats.

The following information is provided for each caveat:

- Symptoms: A description of what is observed when the caveat occurs.
- Conditions: The conditions under which the caveat has been known to occur.
- Workaround: Solutions, if available, to counteract the caveat.

## Miscellaneous

- CSCsf30622  
Symptoms: A new class-map that is added does not appear under the policy-map on a Cisco RPM-XF router.  
Conditions: This symptom has been observed on a Cisco RPM-XF Router running a Cisco IOS Release 12.4T internal image. The policy-map is already attached to an interface(s).  
Workaround: Remove the policy-map from the attached interface(s). Make the changes to the policy-map. Reattach the affected policy-map to the required interface(s).
- CSCsf98381  
Symptoms: A card crash and memory corruption messages are observed.  
Conditions: This symptom has been observed when DPC feature is enabled and when any of the datapath devices failed in an RPM-XF card.  
Workaround: Disable the DPC device failure log and dump feature using the **hw-module rpm check datapath info-file off** command.
- CSCsg52970  
Symptoms: Service policy installation fails on Cisco routers like a Route Processor Module (RPM-XF).  
Conditions: This symptom has been observed when a service policy is applied to any type of interface. The direction in which the policy-map is applied does not matter. The RPM-XF was running Cisco IOS Release 12.4T or Release 12.4(11)T.  
Workaround: There is no workaround.
- CSCsh71247  
Symptoms: Cisco Express Forwarding (CEF) may not function correctly over PPP sessions, and the output of **show adjacency** command shows information similar to the following:  

|          |                 |                             |
|----------|-----------------|-----------------------------|
| Protocol | Interface       | Address                     |
| IP       | Virtual-Access3 | point2point(8) (incomplete) |

Conditions: This symptom is observed on a Cisco router when PPP is used on a full virtual-access interface or multilink bundle.  
Workaround: Disable CEF.

## Troubleshooting

The following documents provide assistance with troubleshooting your Cisco hardware and software:

- *Hardware Troubleshooting Index Page* at:  
<http://www.cisco.com/warp/public/108/index.shtml>
- *Troubleshooting Bus Error Crashes* at:  
[http://www.cisco.com/en/US/products/sw/iosswrel/ps1831/products\\_tech\\_note09186a00800cdd51.shtml](http://www.cisco.com/en/US/products/sw/iosswrel/ps1831/products_tech_note09186a00800cdd51.shtml)
- *Why Does My Router Lose Its Configuration During Reboot?* at:  
[http://www.cisco.com/warp/public/63/lose\\_config\\_6201.html](http://www.cisco.com/warp/public/63/lose_config_6201.html)

- *Troubleshooting Router Hangs* at:  
[http://www.cisco.com/warp/public/63/why\\_hang.html](http://www.cisco.com/warp/public/63/why_hang.html)
- *Troubleshooting Memory Problems* at:  
<http://www.cisco.com/warp/public/63/mallocfail.shtml>
- *Troubleshooting High CPU Utilization on Cisco Routers* at:  
<http://www.cisco.com/warp/public/63/highcpu.html>

## Related Documentation

The following sections describe the documentation available for Cisco IOS Release 12.4(14)XK. These documents consist of software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents.

Use these release notes with the documents and tools described in the following sections:

- [Release-Specific Documents, page 7](#)
- [Feature Modules, page 8](#)
- [Cisco Feature Navigator, page 8](#)
- [Cisco IOS Software Documentation Set, page 8](#)

## Release-Specific Documents

The following document is specific to Cisco IOS Release 12.4T and is located on Cisco.com:

- [Caveats for Cisco IOS Release 12.4T](#)

Refer to *Caveats for Cisco IOS Release 12.4T* for caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.4T.

On Cisco.com at:

**Technical Documents > Cisco IOS Software > Cisco IOS Release 12.4 > Release Notes > Cisco IOS Release 12.4T > Cross-Platform Release Notes for Cisco IOS 12.4T, Part 5 > Caveats > Caveats for Cisco IOS Release 12.4T**



### Note

If you have an account on Cisco.com, you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to [Cisco.com](http://www.cisco.com) and click **Products and Solutions > Cisco IOS Software > IOS Technologies > Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl). (If the defect that you have requested cannot be displayed, this may be due to one or more of the following reasons: the defect number does not exist, the defect does not have a customer-visible description yet, or the defect has been marked Cisco Confidential.)

## Feature Modules

Feature modules describe new features that are supported in Cisco IOS Release 12.4T 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 into the next printing of the Cisco IOS documentation set.

On Cisco.com at:

**Technical Documents > Cisco IOS Software > Cisco IOS Release 12.4 > New Feature Documentation > 12.4T New Features and System Messages**

## Cisco Feature Navigator

Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

Cisco Feature Navigator is available 24 hours a day, 7 days a week, and is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

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

## Cisco IOS Software Documentation Set

The Cisco IOS Release 12.4 documentation set consists of the configuration guide and command reference pairs listed in [Table 3](#) and the supporting documents listed in [Table 4](#). The configuration guides and command references are organized by technology. For the configuration guides:

- Some technology documentation, such as that for DHCP, contains features introduced in Releases 12.2T and 12.3T and, in some cases, Release 12.2S.
- Other technology documentation, such as that for OSPF, consists of a chapter and accompanying Release 12.2T and 12.3T feature documents.

**Note**

In some cases, information contained in Release 12.2T and 12.3T feature documents augments or supersedes content in the accompanying documentation. Therefore it is important to review all feature documents for a particular technology.

[Table 3](#) lists the Cisco IOS Release 12.4 configuration guides and command references.

**Table 3 Cisco IOS Release 12.4 Configuration Guides and Command References**

| Configuration Guide and Command Reference Titles                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IP</b>                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <a href="#">Cisco IOS IP Addressing Services Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP Addressing Services Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to configuring IP addressing and services, including Network Address Translation (NAT), Domain Name System (DNS), and Dynamic Host Configuration Protocol (DHCP). The command reference provides detailed information about the commands used in the configuration guide.                                                                                                   |
| <a href="#">Cisco IOS IP Application Services Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Application Services Command Reference</a> , Release 12.4  | The configuration guide is a task-oriented guide to configuring IP application services, including IP access lists, Web Cache Communication Protocol (WCCP), Gateway Load Balancing Protocol (GLBP), Server Load Balancing (SLB), Hot Standby Router Protocol (HSRP), and Virtual Router Redundancy Protocol (VRRP). The command reference provides detailed information about the commands used in the configuration guide. |
| <a href="#">Cisco IOS IP Mobility Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP Mobility Command Reference</a> , Release 12.4                       | The configuration guide is a task-oriented guide to configuring Mobile IP and Cisco Mobile networks. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                                 |
| <a href="#">Cisco IOS IP Multicast Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP Multicast Command Reference</a> , Release 12.4                     | The configuration guide is a task-oriented guide to configuring IP multicast, including Protocol Independent Multicast (PIM), Internet Group Management Protocol (IGMP), Distance Vector Multicast Routing Protocol (DVMRP), and Multicast Source Discovery Protocol (MSDP). The command reference provides detailed information about the commands used in the configuration guide.                                         |
| <a href="#">Cisco IOS IP Routing Protocols Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP Routing Protocols Command Reference</a> , Release 12.4     | The configuration guide is a task-oriented guide to configuring IP routing protocols, including Border Gateway Protocol (BGP), Intermediate System-to-Intermediate System (IS-IS), and Open Shortest Path First (OSPF). The command reference provides detailed information about the commands used in the configuration guide.                                                                                              |
| <a href="#">Cisco IOS IP Switching Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP Switching Command Reference</a> , Release 12.4                     | The configuration guide is a task-oriented guide to configuring IP switching features, including Cisco Express Forwarding (CEF), fast switching, and Multicast Distributed Switching (MDS). The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                          |
| <a href="#">Cisco IOS IPv6 Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IPv6 Command Reference</a> , Release 12.4                                     | The configuration guide is a task-oriented guide to configuring IP version 6 (IPv6), including IPv6 broadband access, IPv6 data-link layer, IPv6 multicast routing, IPv6 quality of service (QoS), IPv6 routing, IPv6 services and management, and IPv6 tunnel services. The command reference provides detailed information about the commands used in the configuration guide.                                             |
| <a href="#">Cisco IOS Optimized Edge Routing Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Optimized Edge Routing Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to configuring Optimized Edge Routing (OER) features, including OER prefix learning, OER prefix monitoring, OER operational modes, and OER policy configuration. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                    |

**Table 3 Cisco IOS Release 12.4 Configuration Guides and Command References (continued)**

| Configuration Guide and Command Reference Titles                                                                                                                                       | Description                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security and VPN                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS Security Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Security Command Reference</a> , Release 12.4                                           | The configuration guide is a task-oriented guide to configuring various aspects of security, including terminal access security, network access security, accounting, traffic filters, router access, and network data encryption with router authentication. The command reference provides detailed information about the commands used in the configuration guide.      |
| QoS                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS Quality of Service Solutions Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Quality of Service Solutions Command Reference</a> , Release 12.4   | The configuration guide is a task-oriented guide to configuring quality of service (QoS) features, including traffic classification and marking, traffic policing and shaping, congestion management, congestion avoidance, and signaling. The command reference provides detailed information about the commands used in the configuration guide.                         |
| LAN Switching                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS LAN Switching Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS LAN Switching Command Reference</a> , Release 12.4                                 | The configuration guide is a task-oriented guide to local-area network (LAN) switching features, including configuring routing between virtual LANs (VLANs) using Inter-Switch Link (ISL) encapsulation, IEEE 802.10 encapsulation, and IEEE 802.1Q encapsulation. The command reference provides detailed information about the commands used in the configuration guide. |
| Multiprotocol Label Switching (MPLS)                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS Multiprotocol Label Switching Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Multiprotocol Label Switching Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to configuring Multiprotocol Label Switching (MPLS), including MPLS Label Distribution Protocol, MPLS traffic engineering, and MPLS Virtual Private Networks (VPNs). The command reference provides detailed information about the commands used in the configuration guide.                                              |
| Network Management                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS IP SLAs Monitoring Technology Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS IP SLAs Monitoring Technology Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to configuring the Cisco IOS IP Service Level Assurances (IP SLAs) feature. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                       |
| <a href="#">Cisco IOS NetFlow Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS NetFlow Command Reference</a> , Release 12.4                                             |                                                                                                                                                                                                                                                                                                                                                                            |

**Table 3 Cisco IOS Release 12.4 Configuration Guides and Command References (continued)**

| Configuration Guide and Command Reference Titles                                                                                                                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Cisco IOS Network Management Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Network Management Command Reference</a> , Release 12.4                                               | The configuration guide is a task-oriented guide to network management features, including performing basic system management, performing troubleshooting and fault management, configuring Cisco Discovery Protocol (CDP), configuring Cisco Networking Services (CNS), configuring DistributedDirector, and configuring Simple Network Management Protocol (SNMP). The command reference provides detailed information about the commands used in the configuration guide.                                                                  |
| <b>Voice</b>                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <a href="#">Cisco IOS Voice Configuration Library</a> , Release 12.4<br><a href="#">Cisco IOS Voice Command Reference</a> , Release 12.4                                                                       | The configuration library is a task-oriented collection of configuration guides, application guides, a troubleshooting guide, feature documents, a library preface, a voice glossary, and more. It also covers Cisco IOS support for voice call control protocols, interoperability, physical and virtual interface management, and troubleshooting. In addition, the library includes documentation for IP telephony applications. The command reference provides detailed information about the commands used in the configuration library. |
| <b>Wireless / Mobility</b>                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <a href="#">Cisco IOS Mobile Wireless Gateway GPRS Support Node Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Mobile Wireless Gateway GPRS Support Node Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to understanding and configuring a Cisco IOS Gateway GPRS Support Node (GGSN) in a 2.5G General Packet Radio Service (GPRS) and 3G Universal Mobile Telecommunication System (UMTS) network. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                         |
| <a href="#">Cisco IOS Mobile Wireless Home Agent Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Mobile Wireless Home Agent Command Reference</a> , Release 12.4                               | The configuration guide is a task-oriented guide to understanding and configuring the Cisco Mobile Wireless Home Agent, which is an anchor point for mobile terminals for which Mobile IP or Proxy Mobile IP services are provided. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                   |
| <a href="#">Cisco IOS Mobile Wireless Packet Data Serving Node Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Mobile Wireless Packet Data Serving Node Command Reference</a> , Release 12.4   | The configuration guide is a task-oriented guide to understanding and configuring the Cisco Packet Data Serving Node (PDSN), a wireless gateway between the mobile infrastructure and standard IP networks that enables packet data services in a Code Division Multiple Access (CDMA) environment. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                   |
| <a href="#">Cisco IOS Mobile Wireless Radio Access Networking Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Mobile Wireless Radio Access Networking Command Reference</a> , Release 12.4     | The configuration guide is a task-oriented guide to understanding and configuring Cisco IOS Radio Access Network products. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                                                                                                                            |

**Table 3 Cisco IOS Release 12.4 Configuration Guides and Command References (continued)**

| Configuration Guide and Command Reference Titles                                                                                                                                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Long Reach Ethernet (LRE) and Digital Subscriber Line (xDSL)</b>                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Broadband and DSL Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Broadband Access Aggregation and DSL Command Reference</a> , Release 12.4 | The configuration guide is a task-oriented guide to configuring broadband access aggregation and digital subscriber line features. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                                                                                                            |
| <a href="#">Cisco IOS Service Selection Gateway Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Service Selection Gateway Command Reference</a> , Release 12.4    | The configuration guide is a task-oriented guide to configuring Service Selection Gateway (SSG) features, including subscriber authentication, service access, and accounting. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                                                                |
| <b>Dial—Access</b>                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Dial Technologies Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Dial Technologies Command Reference</a> , Release 12.4                    | The configuration guide is a task-oriented guide to configuring lines, modems, and ISDN services. This guide also contains information about configuring dialup solutions, including solutions for remote sites dialing in to a central office, Internet service providers (ISPs), ISP customers at home offices, enterprise WAN system administrators implementing dial-on-demand routing, and other corporate environments. The command reference provides detailed information about the commands used in the configuration guide. |
| <b>Asynchronous Transfer Mode (ATM)</b>                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Asynchronous Transfer Mode Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Asynchronous Transfer Mode Command Reference</a> , Release 12.4  | The configuration guide is a task-oriented guide to configuring Asynchronous Transfer Mode (ATM), including WAN ATM, LAN ATM, and multiprotocol over ATM (MPOA). The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                                                                              |
| <b>WAN</b>                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Wide-Area Networking Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Wide-Area Networking Command Reference</a> , Release 12.4              | The configuration guide is a task-oriented guide to configuring wide-area network (WAN) features, including: Layer 2 Tunneling Protocol Version 3 (L2TPv3); Frame Relay; Link Access Procedure, Balanced (LAPB); and X.25. The command reference provides detailed information about the commands used in the configuration guide.                                                                                                                                                                                                    |
| <b>System Management</b>                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Configuration Fundamentals Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Configuration Fundamentals Command Reference</a> , Release 12.4  | The configuration guide is a task-oriented guide to using Cisco IOS software to configure and maintain Cisco routers and access servers, including information about using the Cisco IOS command-line interface (CLI), loading and maintaining system images, using the Cisco IOS file system, using the Cisco IOS Web browser user interface (UI), and configuring basic file transfer services. The command reference provides detailed information about the commands used in the configuration guide.                             |

**Table 3 Cisco IOS Release 12.4 Configuration Guides and Command References (continued)**

| Configuration Guide and Command Reference Titles                                                                                                                                                                                             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Cisco IOS Interface and Hardware Component Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Interface and Hardware Component Command Reference</a> , Release 12.4                                                 | <p>The configuration guide is a task-oriented guide to configuring and managing interfaces and hardware components, including dial shelves, LAN interfaces, logical interfaces, serial interfaces, and virtual interfaces. The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>IBM Technologies</b>                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <a href="#">Cisco IOS Bridging and IBM Networking Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Bridging Command Reference</a> , Release 12.4<br><a href="#">Cisco IOS IBM Networking Command Reference</a> , Release 12.4 | <p>The configuration guide is a task-oriented guide to configuring:</p> <ul style="list-style-type: none"> <li>• Bridging features, including: transparent and source-route transparent (SRT) bridging, source-route bridging (SRB), Token Ring Inter-Switch Link (TRISL), and Token Ring Route Switch Module (TRRSM).</li> <li>• IBM network features, including: data-link switching plus (DLSw+), serial tunnel (STUN), and block serial tunnel (BSTUN); Logical Link Control, type 2 (LLC2), and Synchronous Data Link Control (SDLC); IBM Network Media Translation, including SDLC Logical Link Control (SDLLC) and Qualified Logical Link Control (QLLC); downstream physical unit (DSPU), Systems Network Architecture (SNA) service point, SNA Frame Relay Access, Advanced Peer-to-Peer Networking (APPN), native client interface architecture (NCIA) client/server topologies, and IBM Channel Attach.</li> </ul> <p>The two command references provide detailed information about the commands used in the configuration guide.</p> |
| <b>Additional and Legacy Protocols</b>                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <a href="#">Cisco IOS AppleTalk Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS AppleTalk Command Reference</a> , Release 12.4                                                                                               | <p>The configuration guide is a task-oriented guide to configuring the AppleTalk protocol. The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <a href="#">Cisco IOS DECnet Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS DECnet Command Reference</a> , Release 12.4                                                                                                     | <p>The configuration guide is a task-oriented guide to configuring the DECnet protocol. The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <a href="#">Cisco IOS ISO CLNS Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS ISO CLNS Command Reference</a> , Release 12.4                                                                                                 | <p>The configuration guide is a task-oriented guide to configuring International Organization for Standardization (ISO) Connectionless Network Service (CLNS). The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <a href="#">Cisco IOS Novell IPX Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Novell IPX Command Reference</a> , Release 12.4                                                                                             | <p>The configuration guide is a task-oriented guide to configuring the Novell Internetwork Packet Exchange (IPX) protocol. The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <a href="#">Cisco IOS Terminal Services Configuration Guide</a> , Release 12.4<br><a href="#">Cisco IOS Terminal Services Command Reference</a> , Release 12.4                                                                               | <p>The configuration guide is a task-oriented guide to configuring terminal services, including DEC, local-area transport (LAT), and X.25 packet assembler/disassembler (PAD). The command reference provides detailed information about the commands used in the configuration guide.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Table 4 lists the documents and resources that support the Cisco IOS Release 12.4 software configuration guides and command references.

**Table 4 Cisco IOS Release 12.4 Supporting Documents and Resources**

| Document Title                                                                                     | Description                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Cisco IOS Master Commands List</i> , Release 12.4                                               | An alphabetical listing of all the commands documented in the Cisco IOS Release 12.4 command references.                                                                                                                                                                                                         |
| <i>Cisco IOS New, Modified, Replaced, and Removed Commands</i> , Release 12.4                      | A listing of all the new, modified, replaced and removed commands since Cisco IOS Release 12.3, grouped by Release 12.3T maintenance release and ordered alphabetically within each group.                                                                                                                       |
| <i>Cisco IOS New and Modified Commands</i> , Release 12.3                                          | A listing of all the new, modified, and replaced commands since Cisco IOS Release 12.2, grouped by Release 12.2T maintenance release and ordered alphabetically within each group.                                                                                                                               |
| <i>Cisco IOS System Messages, Volume 1 of 2</i><br><i>Cisco IOS System Messages, Volume 2 of 2</i> | Listings and descriptions of Cisco IOS system messages. Not all system messages indicate problems with your system. Some are purely informational, and others may help diagnose problems with communications lines, internal hardware, or the system software.                                                   |
| <i>Cisco IOS Debug Command Reference</i> , Release 12.4                                            | An alphabetical listing of the <b>debug</b> commands and their descriptions. Documentation for each command includes a brief description of its use, command syntax, and usage guidelines.                                                                                                                       |
| <i>Release Notes</i> , Release 12.4                                                                | A description of general release information, including information about supported platforms, feature sets, platform-specific notes, and Cisco IOS software defects.                                                                                                                                            |
| <i>Dictionary of Internetworking Terms and Acronyms</i>                                            | Compilation and definitions of the terms and acronyms used in the internetworking industry.                                                                                                                                                                                                                      |
| RFCs                                                                                               | RFCs are standards documents maintained by the Internet Engineering Task Force (IETF). Cisco IOS software documentation references supported RFCs when applicable. The full text of referenced RFCs may be obtained at the following URL:<br><a href="http://www.rfc-editor.org/">http://www.rfc-editor.org/</a> |
| MIBs                                                                                               | MIBs are used for network monitoring. To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>                                                     |

## Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>



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This document is to be used in conjunction with the documents listed in the [“Related Documentation” section on page 7](#).

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