



# Release Notes for Cisco IOS Release 12.0 SP

---

December 16, 2002

## **Cisco IOS Release 12.0(21)SP3 Part Number OL-1935-02**

These release notes for the Cisco 10720 Internet Router support Cisco IOS Release 12.0(21)SP3. These release notes are updated, as needed, to describe new features, memory requirements, supported hardware, software platform deferrals, and changes to the microcode and related documents.

Cisco IOS Release 12.0 SP is based on Cisco IOS Release 12.0 S and Cisco IOS Release 12.0, and is currently tailored to provide support for new features on the Cisco 10720 Internet Router. Cisco IOS Release 12.0 S is the follow-on release to Cisco IOS Release 11.1 CC, which was also targeted to the service provider environment.

Use these release notes in conjunction with the release notes for Cisco IOS Release 12.0 and Cisco IOS Release 12.0 S, which are located on Cisco.com and the Documentation CD-ROM.

For a list of software caveats that apply to Cisco IOS Release 12.0 SP, see the “[Caveats](#)” section on [page 13](#). In addition to the caveats listed in the “[Caveats](#)” section, the software caveats that apply to Cisco IOS Release 12.0 and Cisco IOS Release 12.0 S, also apply to Cisco IOS Release 12.0 SP, with the exception of platform-specific caveats that apply to platforms other than the Cisco 10720 Internet Router. For information on other caveats that might apply to Cisco IOS Release 12.0 SP, refer to the caveat documents for Cisco IOS Release 12.0 and Cisco IOS Release 12.0 S that are located on Cisco.com and on the Documentation CD-ROM.

Cisco recommends 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 [http://www.cisco.com/warp/customer/tech\\_tips/index/fn.html](http://www.cisco.com/warp/customer/tech_tips/index/fn.html). If you do not have a Cisco.com login account, you can find Field Notices at [http://www.cisco.com/warp/public/tech\\_tips/index/fn.html](http://www.cisco.com/warp/public/tech_tips/index/fn.html).

## Contents

These release notes contain the following sections:

- [Introduction, page 2](#)
- [System Requirements, page 2](#)
- [New and Changed Information, page 5](#)



---

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

Copyright © 2002. Cisco Systems, Inc. All rights reserved.

- [Caveats, page 13](#)
- [Related Documentation, page 32](#)
- [Obtaining Documentation, page 38](#)
- [Obtaining Technical Assistance, page 39](#)

## Introduction

Cisco IOS Release 12.0(21)SP3 supports the Cisco 10720 Internet Router.

Cisco IOS Release 12.0(19)SP was the first general-availability release of this software and was based on Cisco IOS Release 12.0(19)S, and therefore on the 12.0 mainline.

For information on new features and Cisco IOS commands supported by Cisco IOS Release 12.0 SP, see the “[New and Changed Information](#)” section on [page 5](#) and the “[Related Documentation](#)” section on [page 32](#).

## System Requirements

This section describes the following system requirements for Cisco IOS Release 12.0(21)SP3:

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

## Memory Requirements

[Table 1](#) lists the memory requirements for the Cisco 10720 Internet Router supported in Cisco IOS Release 12.0(21)SP3.

**Table 1** *Memory Requirements for the Cisco 10720 Internet Router*

Feature Set by Router	Image Name	Required Flash Memory	Required DRAM	Runs From
Service Provider	c10700-p-mz	64 MB	256 MB	RAM
Service Provider/Secured Shell	c10700-k4p-mz	64 MB	256 MB	RAM

## Supported Hardware

Cisco IOS Release 12.0 SP supports the Cisco 10720 Internet Router.

The Cisco 10720 Internet Router is a high-performance Cisco IOS router that enables service providers to offer next-generation business class IP services within metropolitan networks. Designed with support for 10/100 and later 1000-Mbps Ethernet access and high-speed OC48/STM16 Dynamic Packet Transport (DPT) technology over fiber uplink, the Cisco 10720 Internet Router allows service providers to offer IP services that are closer to the user, enabling the users to better control admission to network

resources. The small form factor allows easy deployment in central locations within business complexes. Based on Cisco Parallel eXpress Forwarding (PXF) (Toaster-based) architecture, the Cisco 10720 Internet Router is a cost-effective reliable platform that allows advanced Cisco IOS features to be introduced simply, efficiently, and without compromising performance.

The Cisco 10720 Internet Router provides two line card slots. The top slot can contain either of the following uplink cards:

- DPT uplink card equipped with two physical OC-48c/STM-16c ports with an aggregate bandwidth of 5 Gbps.
- Console/Auxiliary card when using the Cisco 10720 Internet Router as an Ethernet-only router.

The bottom slot contains one of the following access cards:

- 24-Port Fast Ethernet access card, available in TX, FX multimode, and FX single-mode
- 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card

For more information, see the [“Platform-Specific Documents” section on page 33](#).

## Determining the Software Version

To determine the version of Cisco IOS software currently running on your Cisco router, log in to the router and enter the **show version EXEC** command. The following is sample output from the **show version** command. The version number is indicated on the second line.

```
Router> show version
```

```
Cisco Internetwork Operating System Software
IOS (tm) 10700 Software (c10700-p-mz), Version 12.0(21)SP3, RELEASE SOFTWARE
```

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

## Feature Set Table

The Cisco IOS software is packaged in feature sets consisting of software images. Each feature set contains a specific set of Cisco IOS features.

[Table 2](#) lists the newest features and feature sets supported by the Cisco 10720 Internet Router in Cisco IOS Release 12.0 SP. The table uses the following conventions:

- In—The number in the “In” column indicates the Cisco IOS 12.0 SP release in which the feature was introduced.
- Yes—Indicates that the feature is supported in the software image.
- No—Indicates that the feature is not supported in the software image.

In addition to the new features listed in [Table 2](#), the Cisco 10720 Internet Router also supports the features listed in the *Cisco IOS Software Configuration for the Cisco 10720 Internet Router*.

**Table 2** Feature List by Feature Set for the Cisco 10720 Internet Router

Feature	In	Service Provider Feature Set	Service Provider/ Secured Shell Feature Set
802.1p support	(19)	Yes	Yes
802.1q support	(19)	Yes	Yes
802.3x flow control	(21)	Yes	Yes
AutoInstall	(21)	Yes	Yes
Cisco 10720 Console/Auxiliary Module	(21)	Yes	Yes
Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card	(21)	Yes	Yes
DPT <sup>1</sup> MIB <sup>2</sup>	(19)	Yes	Yes
FE <sup>3</sup> MTU <sup>4</sup> command	(19)	Yes	Yes
HSRP/MHSRP <sup>5</sup> support	(19)	Yes	Yes
IOS CNS <sup>6</sup> agent	(20)	Yes	Yes
Keepalive for UTI tunnel interfaces	(21)	Yes	Yes
MDI mode only permitted and supported for Japan	(21)	Yes	Yes
MDI, MDI-X, and Auto modes supported on Revision B 24-Port Fast Ethernet TX and 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access cards	(21)SP3	Yes	Yes
<b>media-type</b> command for Revision B Ethernet access cards	(21)SP3	Yes	Yes
Real-time clock	(19)	Yes	Yes
System performance at about 2.0 Mpps	(19)	Yes	Yes
Universal Transport Interface (UTI)	(19)	Yes	Yes
VLAN <sup>7</sup> ID rewrite at UTI tunnel egress	(20)	Yes	Yes
VLAN and non-VLAN translation at UTI tunnel egress	(21)	Yes	Yes

1. DPT = Dynamic Packet Transport
2. MIB = Management Information Base
3. FE = Fast Ethernet
4. MTU = maximum transmission unit
5. HSRP/MHSRP = Hot Standby Routing Protocol (HSRP)/ Multigroup HSRP
6. CNS = Cisco Networking Services
7. VLAN = Virtual LAN

**Note**

The Multiprotocol Label Switching (MPLS) and MPLS Virtual Private Networks (VPNs) features are not supported in Cisco IOS Release 12.0 SP.

# New and Changed Information

The following section lists the new features for Cisco IOS Release 12.0 SP.

## New Hardware Features in Cisco IOS Release 12.0(21)SP3

The following new hardware feature was introduced in Cisco IOS Release 12.0(21)SP3:

- [Revision B Ethernet Access Cards, page 5](#)

### Revision B Ethernet Access Cards

The Fast Ethernet TX access cards used in the Cisco 10720 Internet Router are now available in a new revision:

- 24-Port Fast Ethernet TX Access Card - Rev B
- 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX Access Card - Rev B

Revision B Ethernet access cards provide a configurable option for Fast Ethernet TX ports on the Cisco 10720 Internet Router. You can configure an Ethernet TX port on a Revision B access card for a media-dependent interface (MDI) or media-dependent interface crossed-over (MDI-X) cable connection. Also, you can configure a Fast Ethernet TX port to auto-sense the connection type (MDI or MDI-X) and auto-configure the port to the right mode.

Ethernet ports on servers normally use an MDI connector. Ethernet ports on a hub normally use an MDI-X connector. An Ethernet straight-through cable (commonly available) is used to connect an MDI to an MDI-X port. A cross-over cable (less commonly available) is used to connect an MDI to an MDI port, or an MDI-X to an MDI-X port.

The Revision B Ethernet access cards use Marvell 88E3082 PHY chips. Because the Marvell PHY chip provides better resistance against noise, it is possible to use the following types of cable connections for a Fast Ethernet TX port on a Revision B access card:

- Crossover cable to connect a media-dependent interface (MDI) port to a 10720 Fast Ethernet TX port in MDI mode.
- Crossover cable to connect a media-dependent interface crossed-over (MDI-X) port to a 10720 Fast Ethernet TX port in MDI-X mode.
- Straight-through cable to connect an MDI port to a 10720 Fast Ethernet TX port in MDI-X mode, or an MDI-X port to a 10720 Fast Ethernet TX port in MDI mode.

Revision B Ethernet access cards provide the flexibility to configure an Ethernet TX port on the Cisco 10720 Internet Router as MDI or MDI-X according to the network device connected to the port, therefore allowing for the use of a straight-through cable for all combinations.

**Note**

In IOS Release 12.0(21)SP2 and earlier versions, only MDI-X mode was supported on Ethernet TX access cards on the Cisco 10720 Internet Router. MDI mode and automatic cable-type detection were not supported due to regulatory requirements.

## New Software Features in Cisco IOS Release 12.0(21)SP3

The following new hardware feature was introduced in Cisco IOS Release 12.0(21)SP3:

- [media-type Command, page 6](#)

### media-type Command

To configure the type of cable connector used on a Fast Ethernet TX interface on a Revision B 24-Port Fast Ethernet TX access card or 4-Port Gigabit Ethernet 8-Port 10/100BASE-TX access card, use the **media-type {auto | mdi | mdix}** command in interface configuration mode, where:

**auto** automatically detects the cable type as MDI or MDI-X.

**mdi** configures an MDI cable connection on a Fast Ethernet TX interface.

**mdix** configures an MDI-X cable connection on a Fast Ethernet TX interface



#### Note

For Revision A Ethernet access cards, the default cable connector setting is **mdix**, except in Japan where it is possible to use the **media-type** command to change the cable connection type. On Revision B Ethernet access cards, the default setting for a Fast Ethernet TX interface is **auto**.

To verify the revision of an installed Revision B Ethernet access card, use the **show diags** command in privileged EXEC mode as shown in the following example.

```
Router# show diags 2
SLOT 2: 1 24 Port 100 Mbps Fast Ethernet TX controller.
  MAIN: type: 0x000B, 800-23030-01 rev A0 dev none
        SW key: 00-00-00 S/N CAT0533000E
        Test hist: 0x00(no failure) RMA#: 000000
        RMA hist: 0 upgrades 0 field failures
  PCA: PCA: 73-8616-02 Rev A0 fab ver 5
  DIAG: Test count: 0x00000000 Test results: 0x00000000
  Access FPGA ver: 0x0024
```

For a Revision B 24-Port Fast Ethernet TX access card or a Revision B 4-Port Gigabit Ethernet 8-Port 10/100BASE-TX access card, **23030** is displayed in the 800 number in the line describing the type of access card.

For a Revision A 24-Port Fast Ethernet TX access card or a Revision A 4-Port Gigabit Ethernet 8-Port 10/100BASE-TX access card, **09019** is displayed.

## New Hardware Features in Cisco IOS Release 12.0(21)SP2

No new hardware features are introduced in Cisco IOS Release 12.0(21)SP2.

## New Software Features in Cisco IOS Release 12.0(21)SP2

No new software features are introduced in Cisco IOS Release 12.0(21)SP2.

## New Hardware Features in Cisco IOS Release 12.0(21)SP1

No new hardware features are introduced in Cisco IOS Release 12.0(21)SP1.

## New Software Features in Cisco IOS Release 12.0(21)SP1

No new software features are introduced in Cisco IOS Release 12.0(21)SP1.

## New Hardware Features in Cisco IOS Release 12.0(21)SP

The following new hardware features were introduced in Cisco IOS Release 12.0(21)SP:

- [Cisco 10720 Console/Auxiliary Module, page 7](#)
- [Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX Access Card, page 7](#)

### Cisco 10720 Console/Auxiliary Module

The Cisco 10720 Console/Auxiliary Module provides console and auxiliary access to the Cisco 10720 Internet Router from the front panel. It is installed in the upper card slot of the router chassis.

You can use the Cisco 10720 Console/Auxiliary Module with either a 24-Port 10/100 Ethernet TX or a Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card to customize the 10720 as an Ethernet-only router.

For information about how to install, use, and verify the operation of the Cisco 10720 Console/Auxiliary Module, refer to the *Cisco 10720 Internet Router Uplink Card Installation and Configuration Guide* at:

### Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX Access Card

The Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card with four Gigabit Ethernet and eight Fast Ethernet ports is available on the Cisco 10720 Internet Router to provide network access using either Fast Ethernet and/or Gigabit Ethernet connectivity.

This card supports copper cabling on Fast Ethernet ports, and fiber-optic cabling on its Gigabit Ethernet ports. The Gigabit Ethernet ports use Small Form-Factor Pluggable (SFP) optical modules to provide the following optical interfaces:

- 1000BASE-SX (short reach)
- 1000BASE-LH (intermediate reach)
- 1000BASE-ZX (long reach)

For more information about how to install and configure the Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card, refer to the *Cisco 10720 Internet Router Access Card Installation and Configuration Guide* at:

<http://www.cisco.com/univercd/cc/td/doc/product/aggr/10720/10720fru/13082acc.htm>

## New Software Features in Cisco IOS Release 12.0(21)SP

In addition to the features listed in the *Cisco Software Configuration for the Cisco 10720 Internet Router*, Cisco IOS Release 12.0(21)SP supports the following new software features:

- [802.3x Flow Control, page 8](#)
- [AutoInstall, page 8](#)

- [Keepalive for a UTI Tunnel Interface, page 8](#)
- [VLAN and non-VLAN Translation at UTI Tunnel Egress, page 9](#)

## 802.3x Flow Control

The **flowcontrol** command is available on Gigabit Ethernet (GE) ports on the 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card to enable 802.3x flow control on Ethernet connections.

Flow control inhibits the transmission of packets to the port for a period of time. Typically, if the receive buffer becomes full, the port transmits a "pause" packet that tells remote ports to delay sending more packets for a specified period of time. In addition, the Gigabit Ethernet ports can receive and act upon "pause" packets from other devices.

The following example shows how to use the **flowcontrol** command to enable 802.3x flow control on a Gigabit Ethernet interface. Enter the configuration commands, one per line. End with **Ctrl-Z**.

```
router# configure terminal
router(config)# interface gigabitethernet 2/1
router(config-if)# flowcontrol on
```

For more information about how to use the **flowcontrol** command in a Cisco 10720 Internet Router, refer to the *Cisco IOS Software Configuration for the Cisco 10720 Internet Router* at:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120st/120st18/10720.htm>

## AutoInstall

The AutoInstall feature allows you to configure a new Cisco 10720 Internet Router automatically and dynamically. The AutoInstall procedure involves connecting a new router to a network where an existing router is preconfigured, turning on the new router, and enabling it with a configuration file that is automatically downloaded from a Trivial File Transfer Protocol (TFTP) server, reachable through the DPT/SRP uplink interface on the Cisco 10720 Internet Router. If no startup configuration has already been saved in the router, the AutoInstall procedure is invoked when the router starts.

For more detailed information about the AutoInstall feature, refer to:

[http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgcr/fun\\_c/fcprt1/fccfgtoo.htm#41164](http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgcr/fun_c/fcprt1/fccfgtoo.htm#41164)

## Keepalive for a UTI Tunnel Interface

The **keepalive** command is available on tunnel interfaces on a Cisco 10720 Internet Router to configure the time interval and number of retries used by Cisco IOS software to send a keepalive signal to a UTI tunnel peer. The keepalive signal provides the status of both ends of a UTI tunnel, and ensures that the UTI tunnel is alive.

The keepalive feature is implemented as a request/response mechanism between the tunnel interfaces at each end of a UTI tunnel. The keepalive function periodically monitors the status of the UTI tunnel, and informs the user of the tunnel status and the reason for any failure. It is recommended that you enable the keepalive feature to better monitor and maintain UTI tunnel configurations.

The following example shows how to use the **keepalive** command in interface configuration mode to send a keepalive request every 20 seconds to a tunnel interface, and to retry the message three times if there is no response. Enter the configuration commands, one per line. End with **Ctrl-Z**.

```
router# configure terminal
router(config)# interface tunnel 1
router(config-if)# keepalive 20 3
```

For more information about how to use the **keepalive** command in a Cisco 10720 Internet Router, refer to:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120st/120st18/10720.htm>

To ensure interoperability between routers when a UTI tunnel is configured between a Cisco 10720 Internet router and a Cisco 7000 series or Cisco 12000 series Internet router, you must also use the **tunnel uti keepalive old** command on the interface at each end of the tunnel. For more information about how to use this command, refer to the Universal Transport Interface (UTI) feature module at:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120s/120s18/uti.htm>

## Prioritizing Fast Ethernet and Gigabit Ethernet Traffic

The **ethernet priority-map receive** command is available on Fast Ethernet and Gigabit Ethernet interfaces and VLAN subinterfaces on the 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card to prioritize incoming Ethernet 802.1p- and 802.1q-tagged packets. Traffic prioritization minimizes the number of packets that can be dropped when throughput exceeds what the access card can process.

The following example shows how to use the **ethernet priority-map receive** command on an 802.1q VLAN subinterface to map all incoming traffic to high priority. You can use the same command on other ports to map incoming VLAN traffic to low priority. Enter the configuration commands, one per line. End with **Ctrl-Z**.

```
router# configure terminal
router(config)# interface gigabitethernet 2/1.1
router(config-subif)# ethernet priority-map receive high
```

As shown in the next example, you can also use the **ethernet priority-map receive** command on a Fast Ethernet or Gigabit Ethernet interface to prioritize 802.1p-tagged packets. All incoming tagged packets whose 802.1p priority is equal to or greater than the threshold value you specify are mapped to the high-priority queue. Enter the configuration commands, one per line. End with **Ctrl-Z**.

```
router# configure terminal
router(config)# interface gigabitethernet 2/1
router(config-if)# ethernet priority-map receive 4
```

For more information about how to use the **ethernet priority-map receive** command in a Cisco 10720 Internet Router, refer to the *Cisco IOS Software Configuration for the Cisco 10720 Internet Router* at:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120st/120st18/10720.htm>

## VLAN and non-VLAN Translation at UTI Tunnel Egress

The VLAN and non-VLAN translation feature allow you to provision a UTI tunnel configured for an Ethernet port or an 802.1Q VLAN subinterface on the following Ethernet access cards in a Cisco 10720 Internet Router:

- 24-Port 10/100 Ethernet TX card
- 24-Port 100 Mbps Ethernet FX card

- Combined 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX card

As a result, traffic coming out of the UTI tunnel toward a customer edge (CE) router conforms to the following frame formats:

- Non-802.1Q encapsulation for a tunnel attached to an Ethernet port
- 802.1Q encapsulation for a tunnel attached to a VLAN subinterface

When VLAN and non-VLAN translation is disabled for a UTI tunnel, all tunneled packets that are 802.1Q encapsulated on an Ethernet interface, or non-802.1Q encapsulated on a VLAN subinterface, are sent out at the tunnel egress as they are, with their original Layer 2 encapsulation.

However, when VLAN-to-non-VLAN translation is enabled on an Ethernet port (interface), the VLAN tag is removed from any packet that has 802.1Q VLAN frame format at tunnel egress. Packets are transmitted to the CE router in non-802.1Q frame format.

Similarly, when non-VLAN-to-VLAN translation is enabled on a VLAN subinterface, a VLAN tag is added to any packet that does not already have 802.1Q VLAN frame format at the tunnel egress. Packets are transmitted through the UTI tunnel in 802.1Q format. When a packet already has 802.1Q VLAN frame format, UTI VLAN rewrite is performed by default.

The following example shows how to enable VLAN-to-non-VLAN translation on the endpoint of a UTI tunnel. You can use the same command on the other end of the UTI tunnel to enable the feature end-to-end. Enter the configuration commands, one per line. End with **Ctrl-Z**.

```
router# configure terminal
router(config)# interface fastethernet 2/1
router(config-if)# uti-tunnel Tunnel0 translate enable
```

For more information about the Universal Transport Interface (UTI) feature, refer to:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120s/120s18/uti.htm>

## New Hardware Features in Cisco IOS Release 12.0(20)SP1

The following new hardware feature was introduced in Cisco IOS Release 12.0(20)SP1:

- [RX PKT LED Behavior on 1-Port OC-48 DPT Line Cards, page 10](#)

### RX PKT LED Behavior on 1-Port OC-48 DPT Line Cards

After you shut down the port interface on a 1-port OC-48 DPT line card in the Cisco 10720 Internet Router, the RX PKT LED remains ON if SRP packets (including transit SRP packets) are still being received in pass-through mode. The RX PKT LED turns OFF if no SRP packets are received.

## New Software Features in Cisco IOS Release 12.0(20)SP1

In addition to the features listed in the *Cisco Software Configuration for the Cisco 10720 Internet Router*, Cisco IOS Release 12.0(20)SP1 supports the following new software features:

- [IOS CNS Agent, page 11](#)
- [VLAN ID Rewrite at UTI Tunnel Egress, page 11](#)

## IOS CNS Agent

The Cisco IOS CNS Agent provides the capability for an IOS device to be managed through the Cisco Networking Services (CNS) technology.

Cisco Networking Services is a foundation technology for linking users to network services. CNS Software Developers Kit (SDK) accomplishes this linking by making applications network-aware and increasing the intelligence of the network elements. CNS SDK provides building blocks to a range of customers in market segments such as enterprise, service provider, independent software vendors, and system integrators.

The Cisco IOS CNS Agent includes the CNS Event Agent and the CNS Configuration Agent.

The CNS Event Agent allows Cisco IOS applications to publish and subscribe to events on a CNS Event Bus. The CNS Configuration Agent works in conjunction with the CNS Event Agent to provide the following:

- Initial configurations
- Incremental (partial) configurations
- Synchronized configuration updates

## VLAN ID Rewrite at UTI Tunnel Egress

The VLAN ID Rewrite feature applies to UTI tunnels that are attached to 802.1q VLAN interfaces on a Cisco 10720 Internet Router. The egress side of a UTI tunnel that is mapped to a VLAN rewrites the VLAN ID in outgoing 802.1q packets to the ID of the local VLAN.

This feature allows you to use VLAN interfaces with different VLAN IDs at either end of a UTI tunnel.

When you use the VLAN ID Rewrite feature, Cisco recommends that you use the Spatial Reuse Protocol (SRP) as the backbone interface on the Cisco 10720 Internet Router.

## New Hardware Features in Cisco IOS Release 12.0(19)SP

Cisco IOS Release 12.0(19)SP supports the Cisco 10720 Internet Router. For more information, see the [“Supported Hardware” section on page 2](#).

## New Software Features in Cisco IOS Release 12.0(19)SP

In addition to the features listed in the *Cisco Software Configuration for the Cisco 10720 Internet Router*, Cisco IOS Release 12.0(19)SP supports the following software features:

- [802.1p Support, page 12](#)
- [802.1q Support, page 12](#)
- [DPT MIB, page 12](#)
- [FE MTU Command, page 12](#)
- [HSRP/MHSRP Support, page 12](#)
- [Real-Time Clock, page 13](#)
- [System Performance, page 13](#)
- [Universal Transport Interface, page 13](#)

## 802.1p Support

The IEEE 802.1p standard enables individual end stations to request a particular quality of service (QoS) of the network and for the network to respond accordingly. Three bits in the 802.1q header with values ranging from 0 to 7 can be used to set different priority levels of user traffic at Layer 2. In the context of the Cisco 10720 Internet Router, the Modular QoS feature is used to set the 802.1p bits, similar to setting the IP type of service (ToS) bits. The switches that are deployed behind the Cisco 10720 Internet Router that supports this feature can take advantage of the priority bits for providing a higher quality of service for certain types of traffic.

## 802.1q Support

The term “VLAN” refers to the ability to virtually create a LAN using a switched architecture. Rather than being defined on a physical or geographical basis, VLANs can be defined on a logical or organizational basis in which the network can be configured using software. The IEEE standard 802.1q defines the operation of VLAN bridges that permit the definition, operation, and administration of VLAN topologies within a bridged LAN infrastructure. This standard is based on a frame-tagging mechanism to identify the specific VLAN.

## DPT MIB

The Cisco 10720 Internet Router supports the DPT MIB. Refer to the following URL for MIB information: <ftp://ftp.cisco.com/pub/mibs/v2/CISCO-SRP-MIB.my>.

## FE MTU Command

You can change the size of the maximum transmission unit (MTU) on a Fast Ethernet interfaces by using the **mtu** command in interface configuration mode. To allow UTI encapsulation on 1500-byte packets, the maximum size supported for the MTU on a Fast Ethernet interface is 2000 bytes.



### Note

---

The maximum MTU supported on a DPT/SRP interface is 9196 bytes.

---

Use the following configuration commands to change the MTU. The valid MTU values are from 1500 to 2000. Enter the configuration commands, one per line. End with CNTL/Z.

```
router# configure terminal
router(config)# interface fastethernet 2/1
router(config)# mtu <1500-2000>
```

## HSRP/MHSRP Support

Hot Standby Routing Protocol (HSRP)/ Multigroup HSRP (MHSRP) provides automatic router backup. HSRP allows a single router to belong to one Hot Standby group, whereas MHSRP allows a single router to belong to multiple Hot Standby groups.



### Note

---

In Cisco IOS Release 12.0(19)SP, the specification of an arbitrary MAC address with the **standby mac-address** CLI command is not supported.

---

For more information about the HSRP/MHSRFP feature, see the Cisco Internetworking Case Study *Using HSRP for Fault-Tolerant IP Routing* and the Cisco Tech Note *Hot Standby Router Protocol (HSRP) Features and Functionality*.

## Real-Time Clock

The onboard Real-Time Clock (RTC) with backup battery power provides accurate timekeeping for up to ten years in the absence of power.

## System Performance

In Cisco IOS Release 12.0(19)SP, the performance of the system can now reach about 2.0 Mpps.

## Universal Transport Interface

The Universal Transport Interface (UTI) feature allows a pair of routers connected using an IP network to provide high-speed transparent Layer 2 connectivity between a pair of interfaces (subinterfaces are not supported in this release). This functionality can be used to build Layer 2 VPNs or to support legacy network migration. The UTI feature includes support for both FE-port and VLAN mapping to UTI tunnels and supports a maximum of 1022 tunnels on the Cisco 10720 Internet Router.

UTI allows service providers to provide a simple method to integrate a Layer 2 VPN model for both internal and external use. Some instances where this is advantageous include the following:

- Where a simple sales and service model is required
- Where internetwork packet leakage must be avoided
- Where the passenger network needs to apply a different routing policy than that provided by the carrier network

For more information about the UTI feature, refer to the *Universal Transport Interface* feature module. Cisco IOS Release 12.0(19)SP adds support for the UTI feature to the Cisco 10720 Internet Router.

## Caveats

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious; 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 open and resolved caveats for Cisco IOS Release 12.0 SP.

Because Cisco IOS Release 12.0 SP and Cisco IOS Release 12.0 S are based on Cisco IOS Release 12.0, many caveats that apply to these releases apply to Cisco IOS Release 12.0.

For information on severity 1 and 2 caveats in Cisco IOS Release 12.0, see *Caveats for Cisco IOS Release 12.0*. This document 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. To reach Bug Navigator II, **Log in** to Cisco.com and click **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools>.

## Open Caveats—Cisco IOS Release 12.0(21)SP3

No new caveats have been opened in Cisco IOS Release 12.0(21)SP3.

## Resolved Caveats—Cisco IOS Release 12.0(21)SP3

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(21)SP3. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdx87577

Memory allocation failures occur on a Cisco 10720 Internet Router that has authentication, authorization, and accounting (AAA) configured and has "%SYS-2-MALLOCFAIL" error messages displayed. When you enter the **show memory summary** command, the command output shows that many small blocks of memory are used by the AAA processes.

Workaround: There is no known workaround.

- CSCdy89663

A Cisco 10720 Internet Router may reload when it is transmitting multicast traffic and an interface flaps.

Workaround: There is no known workaround.

- CSCdz13077

A Cisco 10720 Internet Router running IOS Release 12.0(21)SP1 does not respond correctly during an snmpwalk request from the MIB object, IpAdEntAddr.

Workaround: There is no known workaround.

## Open Caveats—Cisco IOS Release 12.0(21)SP2

No new caveats have been opened in Cisco IOS Release 12.0(21)SP2.

## Resolved Caveats—Cisco IOS Release 12.0(21)SP2

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(21)SP2. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdy05276

When you configure a POS interface on the 2-Port OC-48c/STM-16c POS/DPT uplink card in a 10720 customer edge (CE) router that is connected to an OC-48c/STM-16c POS/SDH line card in a Cisco 12000 Series Internet Router, the POS interface may not come up and a section loss of signal (SLOS) alarm is reported.

Workaround: Reload the 10720 CE routers or unplug and replug the fiber cables connected to each 10720 router.

- CSCdy25265

Following a Cisco 10720 Internet Router crash, error messages with the MISTRAL error code may be logged in the crashinfo file to indicate an error condition in the Mistral application-specific integrated circuit (ASIC). For example, the following error message in the crashinfo file indicates a parity error in the Mistral ASIC:

```
MISTRAL_TM_DATA_PAR_ERR_REG_MASK_HI: 42
Error condition detected: TM_NPP_PARITY_ERROR
Error condition detected: IBL_CRC_ERR
```

Work around: This enhancement in the Mistral error handler has been implemented in IOS software releases 12.0(21)SP2, 12.0(23)S, and 12.0(24)S.

- CSCdy44251

After you remove a large number of routes on a Cisco 10720 Internet Router, the forwarding information base (FIB) table on the gigabit route processor (GRP) may be missing entries for directly connected subnets.

Workaround: Enter the **clear ip route *destination gateway*** command for each affected network prefix, where:

*destination* is the IP address of the host or network. (An IP alias or a host name that can be resolved through DNS can also be used.)

*gateway* is the IP address or alias of the gateway router.

The following example shows how to restore the IP address for a connected subnet that is missing from the FIB table:

```
router# show ip cef 10.2.0.4 255.255.255.252
%Prefix not found

router# clear ip route 10.2.0.4 255.255.255.252

router# show ip cef 10.2.0.4 255.255.255.252
10.2.0.4/30, version 285154, epoch 0, attached, connected, cached adjacency to
POS1/0
0 packets, 0 bytes
  via POS1/0, 0 dependencies
    valid cached adjacency
```

## Open Caveats—Cisco IOS Release 12.0(21)SP1

This section describes possibly unexpected behavior by Cisco IOS Release 12.0(21)SP1. This section describes only severity 1, severity 2, and select severity 3 caveats.

- CSCdy05276

When you configure a POS interface on the 2-Port OC-48c/STM-16c POS/DPT uplink card in a 10720 customer edge (CE) router that is connected to an OC-48c/STM-16c POS/SDH line card in a Cisco 12000 Series Internet Router, the POS interface may not come up and a section loss of signal (SLOS) alarm is reported.

Workaround: Reload the 10720 CE routers or unplug and replug the fiber cables connected to each 10720 router.

- CSCdy25265

Following a Cisco 10720 Internet Router crash, error messages with the MISTRAL error code may be logged in the crashinfo file to indicate an error condition in the Mistral application-specific integrated circuit (ASIC). For example, the following error message in the crashinfo file indicates a parity error in the Mistral ASIC:

```
MISTRAL_TM_DATA_PAR_ERR_REG_MASK_HI: 42
Error condition detected: TM_NPP_PARITY_ERROR
Error condition detected: IBL_CRC_ERR
```

Work around: This enhancement in the Mistral error handler has been implemented in IOS software releases 12.0(21)SP2, 12.0(23)S, and 12.0(24)S.

## Resolved Caveats—Cisco IOS Release 12.0(21)SP1

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(21)SP1. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdw25374
 

When 64-byte traffic at 100 percent line rate is sent over a Gigabit Ethernet interface, frame loss can result. A small percentage of packets (approximately 0.6 percent in the worst-case scenario) are dropped in the Galileo MAC chip. The percentage of lost packets, however, does not increase as the line rate increases.

There is no known workaround.
- CSCdx52934
 

Half-duplex mode is not supported on Gigabit Ethernet (GE) ports on a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card even though a GE port will become active and can negotiate half-duplex mode if connected to another device that is configured to support only half-duplex.

Workaround: Ensure that the remote device is configured to advertise full-duplex operation.
- CSCdx65955
 

When the last VLAN is removed on a Fast Ethernet or Gigabit Ethernet subinterface, the interface's maximum transmission unit (MTU) may be set to a lower value than the MTU default value of 1524.

Workaround: There is no known workaround.
- CSCdx68326
 

When random packet sizes are sent in bi-directional line rate on a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card, a lock-up sequence may occur on one of the five circuits on the card. The lock-up sequence automatically triggers a recovery sequence on the port software. The recovery sequence resets the port so that the data path is re-established in approximately one second.

Workaround: No workaround is required. Port recovery is automatically performed.
- CSCdx68350
 

On a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card, when the software automatically triggers a port recovery (see [CSCdx68326](#)) and the **debug access errors** command is enabled, the Route Processor may receive an extremely high throughput and cause the router to hang.

Workaround: When you use a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card in a Cisco 10720 Internet Router, do not enable the **debug access errors** command.
- CSCdx80319
 

The existing **flowcontrol {on | off | auto}** command does not allow you to enable autonegotiation and specify which flow control setting to advertise.

Workaround: Use the new **flowcontrol {on | off | auto {onoff | off}}** command, where:

  - on** enables 802.3x flow control.
  - off** disables 802.3x flow control.
  - auto onoff** enables 802.3x flow control autonegotiation on the port and advertises the capability to

support either 802.3x flow control ON or OFF.

**auto off** enables 802.3x flow control autonegotiation on the port and advertises the capability to support 802.3x flow control OFF.

- CSCdy03533

If the SRP frame size, including the cyclic redundancy check (CRC) counter, is between 52 and 102 bytes, a Cisco 10720 Internet Router running IOS (19)SP and later cannot forward SRP transit traffic at the full OC-48 line-rate on either the inner SRP ring, outer SRP ring, or both rings.

The transit performance may be as low as 1.6Gbps in one direction. Any frame size greater than 102 bytes can be forwarded at the full OC-48 line rate.

Workaround: There is no known workaround.

- CSCdy03690

If a Cisco 10720 Internet Router has two equal cost paths to a source device, after a reload, the CEF adjacency for the source address is created properly, but the corresponding PXF Load adjacency is not always populated from the CEF adjacency.

The PXF Load adjacency is used whenever two or more equal cost paths are present for a specific source address.

Workaround: In order for the PXF Load adjacency to be correctly created, one of the following must occur:

- You must enter the **clear ip route \*** command.
- You must enter the **clear ip ospf proc** command.
- A change (for example, a failure) in the route to the source must occur.

## Open Caveats—Cisco IOS Release 12.0(21)SP

This section describes possibly unexpected behavior by Cisco IOS Release 12.0(21)SP. This section describes only severity 1, severity 2, and select severity 3 caveats.

- CSCdw25374

When 64-byte traffic at 100 percent line rate is sent over a Gigabit Ethernet interface, frame loss can result. A small percentage of packets (approximately 0.6 percent in the worst-case scenario) are dropped in the Galileo MAC chip. The percentage of lost packets, however, does not increase as the line rate increases.

There is no known workaround.

- CSCdx52934

Half-duplex mode is not supported on Gigabit Ethernet (GE) ports on a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card even though a GE port will become active and can negotiate half-duplex mode if connected to another device that is configured to support only half-duplex.

Workaround: Ensure that the remote device is configured to advertise full-duplex operation.

- CSCdx65955

When the last VLAN is removed on a Fast Ethernet or Gigabit Ethernet subinterface, the interface's maximum transmission unit (MTU) may be set to a lower value than the MTU default value of 1524.

Workaround: There is no known workaround.

- CSCdx68326
 

When random packet sizes are sent in bi-directional line rate on a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card, a lock-up sequence may occur on one of the five circuits on the card. The lock-up sequence automatically triggers a recovery sequence on the port software. The recovery sequence resets the port so that the data path is re-established in approximately one second.

Workaround: No workaround is required. Port recovery is automatically performed.
- CSCdx68350
 

On a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card, when the software automatically triggers a port recovery (see [CSCdx68326](#)) and the **debug access errors** command is enabled, the Route Processor may receive an extremely high throughput and cause the router to hang.

Workaround: When you use a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card in a Cisco 10720 Internet Router, do not enable the **debug access errors** command.
- CSCdx74925
 

Cyclic redundancy check (CRC) errors are caused by certain data payloads on the Gigabit Ethernet ports of a 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX access card under heavy traffic conditions.

Workaround: There is no known workaround.
- CSCdx80319
 

The existing **flowcontrol {on | off | auto}** command does not allow you to specify which flow control setting to advertise.

Workaround: Use the new **flowcontrol {on | off | auto {onoff | off}}** command, where:

  - on** enables 802.3x flow control.
  - off** disables 802.3x flow control.
  - auto onoff** enables 802.3x flow control autonegotiation on the port and advertises the capability to support either 802.3x flow control ON or OFF.
  - auto off** enables 802.3x flow control autonegotiation on the port and advertises the capability to support 802.3x flow control ON.
- CSCdy03690
 

If a Cisco 10720 Internet Router has two equal cost paths to a source device, after a reload, the CEF adjacency for the source address is created properly, but the corresponding PXF Load adjacency is not always populated from the CEF adjacency.

The PXF Load adjacency is used whenever two or more equal cost paths are present for a specific source address.

Workaround: In order for the PXF Load adjacency to be correctly created, one of the following must occur:

  - You must enter the **clear ip route \*** command.
  - You must enter the **clear ip ospf proc** command.
  - A change (for example, a failure) in the route to the source must occur.
- CSCdy44251
 

After you remove a large number of routes on a Cisco 10720 Internet Router, the forwarding information base (FIB) table on the gigabit route processor (GRP) may be missing entries for directly connected subnets.

Workaround: Enter the **clear ip route *destination gateway*** command for each affected network prefix, where:

*destination* is the IP address of the host or network. (An IP alias or a host name that can be resolved through DNS can also be used.)

*gateway* is the IP address or alias of the gateway router.

The following example shows how to restore the IP address for a connected subnet that is missing from the FIB table:

```
router# show ip cef 10.2.0.4 255.255.255.252
%Prefix not found

router# clear ip route 10.2.0.4 255.255.255.252

router# show ip cef 10.2.0.4 255.255.255.252
10.2.0.4/30, version 285154, epoch 0, attached, connected, cached adjacency to
POS1/0
0 packets, 0 bytes
  via POS1/0, 0 dependencies
  valid cached adjacency
```

- CSCdy89663

A Cisco 10720 Internet Router may reload when it is transmitting multicast traffic and an interface flaps.

Workaround: There is no known workaround.

- CSCdz13077

Cisco 10720 Internet Router running IOS Release 12.0(21)SP1 does not respond correctly during an snmpwalk request from the MIB object, IpAdEntAddr.

Workaround: There is no known workaround.

## Resolved Caveats—Cisco IOS Release 12.0(21)SP

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(21)SP. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdu53160

When unidirectional multicast traffic is sent at full line rate to a Cisco 10720 Internet Router across an SRP ring, and each of the 24 Fast Ethernet ports is joined to a unique multicast group, the router may forward traffic unevenly between different Fast Ethernet interfaces.

Workaround: Reduce the traffic rate or reduce the number of ports joined to the multicast group.

- CSCdv20444

On a Cisco 10720 Internet Router, the accuracy of output-queue shaping on high speed interfaces, such as DPT or Gigabit Ethernet, is not within 10 percent of the configured value. If you configure the shaping value to 50 percent, the effective throughput on the port will be approximately 60 percent.

Workaround: Use traffic policing (CAR) in order to obtain the configured value.

- CSCdv63326

On a Cisco 10720 Internet Router, when you use the Modular QoS command line interface to configure high bandwidths (greater than 65 percent) for weighted fair queueing (WFQ) and the priority queue, the results are not accurate. For example, if you configure WFQ to 65 percent, the amount of effective bandwidth that is used is 61 percent.

There is no known workaround.

- CSCdv79090

If you use the **set srp priority** command and another set command (**set ip precedence**, **set ip dscp**, **set qos-group**, and so on) to configure a policy map, the new configuration does not take effect on reload. The following error message is displayed:

```
The set srp-priority command requires bandwidth, priority or shape.
```

Workaround: When you configure a policy map, configure the bandwidth first, and then the SRP priority before you enter any other **set** commands, such as **set ip precedence** or **set ip dscp**. For example, you would enter:

```
policy-map pany
  class any
    bandwidth percent 40
    set ip dscp 10
    set srp-priority 7
```

Not:

```
policy-map pany
  class any
    set ip dscp 10
    set srp-priority 7
    bandwidth percent 40
```

- CSCdv73281

On a 24-Port Fast Ethernet 10/100BASE-TX or 100BASE-FX access card, a Fast Ethernet port stays up and does not go down as it should when there is a speed mismatch between the port configuration setting (for example, 10 Mbps) and the rate at which a connected device is transmitting data (for example, 100 Mbps).

Workaround: Correct the speed mismatch between the Fast Ethernet port configuration and the network device connected to the port.

- CSCdv75731

When a second multicast sender station starts sending traffic through a Cisco 10720 Internet Router, only traffic from the first source station is forwarded.

Workaround: Configure an Internet Group Management Protocol (IGMP) static group on the same interface. Also, if traffic streams from both source station addresses are sent together in the initial traffic stream, no problem occurs. The problem occurs only if there is a delay between the first and second traffic streams.

- CSCdv86829

When a Cisco 10720 Internet Router experiences Layer 2 Spatial Reuse Protocol (SRP) congestion due to SRP fairness or traffic exceeding the rate configured for the high and low priority queues using the **srp tx-transit-rate** command, the Parallel eXpress Forwarding (PXF) scheduler may treat the different queues unfairly.

This happens because the Cisco Versatile Traffic Management System (VTMS) schedules queues based on a static configuration of 2.4 Gbps in all cases. Unfair queue treatment occurs because the Layer 2 flow controls some queues more than others. As a result, queues that send larger packets tend to receive more bandwidth.

Workaround: Use the **srp tx-transit-rate** command to set the rate to 2488 Mbps (full bandwidth) and re-engineer the network to reduce the effect of SRP fairness.

- CSCdw19743

The ring access controller (RAC) ASIC treats corrupted packets as valid keepalives and transmits them on the link. No Section Loss of Signal (SLOS) or Section Loss of Frame (SLOF) alarm is issued at the SONET layer and the link remains up.

There is no known workaround.

- CSCdw23744

When access control lists (ACLs) are configured on a DPT interface to check and log multicast IP addresses, the PXF network processor in the router continuously restarts when a high rate of multicast traffic is received at the interface and checked against the ACL entries.

Workaround: Do not implement ACL logging on an interface that receives a high rate of multicast traffic.

- CSCdw24100

On a Cisco 10720 Internet Router, you cannot the configure the committed information rate (CIR) value to be 99% or more of the available bandwidth on an interface as in the following service policy configuration:

```
class-map match-all be
  match ip precedence 0 1 4
class-map match-all priority
  match ip precedence 2 3
class-map match-all real-time
  match ip precedence 5
!
policy-map pe-p3q
class be
  bandwidth percent 4
class priority
  bandwidth percent 30
class real-time
  bandwidth percent 65
```

Workaround: Reconfigure the CIR to be 98% or less of the bandwidth and, if necessary, reconfigure a lower bandwidth percentage (for example, to 64% in the preceding service policy) for the real time class.

- CSCdw26411

When you use the **show diags** command to display hardware information about the uplink and access cards installed on the Cisco 10720 Internet Router, the deviation number is not displayed in the output.

Workaround: There is no known workaround.

- CSCdw34528

When you apply a UTI tunnel to a VLAN subinterface of a Fast Ethernet (FE) port on a Cisco 10720 Internet Router, traffic with the correct VLAN\_ID of the VLAN subinterface is not sent through the UTI tunnel if the FE interface goes up and down for any reason; for example, if the link flaps or if there is a manual shutdown followed by no shutdown.

If the traffic is IP and the 10720 is configured with the destination IP address, packets are rerouted. If the destination address is not known or if the traffic is not IP, the traffic is dropped.

This problem does not occur if the UTI tunnel is applied to a Fast Ethernet main interface.

Workaround: Reload the Cisco 10720 Internet Router.

- CSCdw63071

When a Cisco 10720 Internet Router loads a large routing table, the following error message may appear:

```
%GENERAL-3-EREVENT: HWCEF: Failed to alloc Mtrie HW node
```

This means that the Mtrie IP lookup algorithm used in Cisco Express Forwarding (CEF) failed to allocate sufficient memory. This error happens when a full Internet table that consists of approximately 100K or more of sparsely distributed routes is added to the hardware forwarding table.

Workaround: There is no known workaround.

- CSCdw63227

Ucode version 1.3.1 has been released for IOS Release 12.0(20)SP1 on the Cisco 10720 Internet Router.

- CSCdx03139

When you use the **show controllers srp slot/port** command to monitor optical power, the values displayed in the command output are not accurate.

Workaround: You can use the **show controllers srp slot/port** command to measure signal degradation over time, without taking the displayed values to be totally accurate.

- CSCdx50295

On a Cisco 10720 Internet Router, the police actions and the statistics output for the **show policymap interface** command are incorrectly calculated when the Layer 2 decapsulation size of a packet is different than the encapsulation size. Policing is based on the size of the incoming datagram instead of the size of the outgoing datagram.

For example, if packets enter on a Fast Ethernet (FE) interface and are transmitted on another FE interface, no policing error occurs because the decapsulation and encapsulation sizes are the same. However, if a packet is received on an SRP interface (decapsulation size: 16 bytes from SRP) and is transmitted on an FE interface (encapsulation size: 14 bytes to FE), the output policing uses two additional bytes in its calculations. In this case, an error of up to 3% more packets are policed than the maximum configured value.

Workaround: There is no known workaround.

- CSCdx80319

The existing **flowcontrol {on | off | auto}** command does not allow you to specify which flow control setting to advertise.

Workaround: Use the new **flowcontrol {on | off | auto {onoff | off}}** command, where:

**on** enables 802.3x flow control.

**off** disables 802.3x flow control.

**auto onoff** enables 802.3x flow control autonegotiation on the port and advertises the capability to support either 802.3x flow control ON or OFF.

**auto off** enables 802.3x flow control autonegotiation on the port and advertises the capability to support 802.3x flow control ON.

## Open Caveats—Cisco IOS Release 12.0(20)SP2

There are no new open caveats in Cisco IOS Release 12.0(20)SP2.

## Resolved Caveats—Cisco IOS Release 12.0(20)SP2

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(20)SP2. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdv20444

On a Cisco 10720 Internet Router, the accuracy of output-queue shaping on high speed interfaces, such as DPT or Gigabit Ethernet, is not within 10 percent of the configured value. If you configure the shaping value to 50 percent, the effective throughput on the port will be approximately 60 percent.

Workaround: Use traffic policing (CAR) in order to obtain the configured value.

- CSCdx77061

On Cisco 10720 Internet Routers running IOS (19)SP and later, small IP packets of 35 and 39 bytes in IP length that require padding may get corrupted in the last byte of the packet payload. This problem does not occur on other packet sizes.

Workaround: There is no known workaround.

## Open Caveats—Cisco IOS Release 12.0(20)SP1

This section describes possibly unexpected behavior by Cisco IOS Release 12.0(20)SP1. This section describes only severity 1, severity 2, and select severity 3 caveats.

- CSCdv63326

On a Cisco 10720 Internet Router, when you use the Modular QoS command line interface to configure high bandwidths (greater than 65 percent) for weighted fair queuing (WFQ) and the priority queue, the results are not accurate. For example, if you configure WFQ to 65 percent amount of effective bandwidth that is used is 61 percent.

There is no known workaround.

- CSCdv73281

On a 24-Port Fast Ethernet 10/100BASE-TX or 100BASE-FX access card, a Fast Ethernet port stays up and does not go down as it should when there is a speed mismatch between the port configuration setting (for example, 10 Mbps) and the rate at which a connected device is transmitting data (for example, 100 Mbps).

Workaround: Correct the speed mismatch between the Fast Ethernet port configuration and the network device connected to the port.

- CSCdv75731

When a second multicast sender station starts sending traffic through a Cisco 10720 Internet Router, only traffic from the first source station is forwarded.

Workaround: Configure an Internet Group Management Protocol (IGMP) static group on the same interface. Also, if traffic streams from both source station addresses are sent together in the initial traffic stream, no problem occurs. The problem occurs only if there is a delay between the first and second traffic streams.

- CSCdv79090

If you use the **set srp priority** command and another set command (**set ip precedence**, **set ip dscp**, **set qos-group**, and so on) to configure a policy map, the new configuration does not take effect on reload. The following error message is displayed:

The set srp-priority command requires bandwidth, priority or shape.

Workaround: When you configure a policy map, configure the bandwidth first, and then the SRP priority before you enter any other **set** commands, such as **set ip precedence** or **set ip dscp**. For example, you would enter:

```
policy-map pany
  class any
    bandwidth percent 40
    set ip dscp 10
    set srp-priority 7
```

Not:

```
policy-map pany
  class any
    set ip dscp 10
    set srp-priority 7
    bandwidth percent 40
```

- CSCdw19743

The ring access controller (RAC) ASIC treats corrupted packets as valid keepalives and transmits them on the link. No Section Loss of Signal (SLOS) or Section Loss of Frame (SLOF) alarm is issued at the SONET layer and the link remains up.

There is no known workaround.

- CSCdw24100

On a Cisco 10720 Internet Router, you cannot the configure the committed information rate (CIR) value to be 99% or more of the available bandwidth on an interface as in the following service policy configuration:

```
class-map match-all be
  match ip precedence 0 1 4
class-map match-all priority
  match ip precedence 2 3
class-map match-all real-time
  match ip precedence 5
!
policy-map pe-p3q
  class be
    bandwidth percent 4
  class priority
    bandwidth percent 30
  class real-time
    bandwidth percent 65
```

Workaround: Reconfigure the CIR to be 98% or less of the bandwidth and, if necessary, reconfigure a lower b and width percentage (for example, to 64% in the preceding service policy) for the real time class.

- CSCdw26576

On a Cisco 10720 Internet Router, when you send traffic streams in small bursts on the Versatile Traffic Management System (VTMS), the traffic may be dropped.

Workaround: Reconfigure the number of packets sent per burst to a higher value, such as 100 to 300 packets.

- CSCdw34528
 

When you apply a UTI tunnel to a VLAN subinterface of a Fast Ethernet (FE) port on a Cisco 10720 Internet Router, traffic with the correct VLAN\_ID of the VLAN subinterface is not sent through the UTI tunnel if the FE interface goes up and down for any reason; for example, if the link flaps or if there is a manual shutdown followed by no shutdown.

If the traffic is IP and the 10720 is configured with the destination IP address, packets are rerouted. If the destination address is not known or if the traffic is not IP, the traffic is dropped.

This problem does not occur if the UTI tunnel is applied to a Fast Ethernet main interface.

Workaround: Reload the Cisco 10720 Internet Router.
- CSCdw45616
 

Unused bandwidth configured for committed information rate (CIR) is not redistributed to other queues.

Workaround: There is no known workaround.
- CSCdw63071
 

When a Cisco 10720 Internet Router loads a large routing table, the following error message may appear:

```
%GENERAL-3-EREVENT: HWCEF: Failed to alloc Mtrie HW node
```

This means that the Mtrie IP lookup algorithm used in Cisco Express Forwarding (CEF) failed to allocate sufficient memory. This error happens when a full Internet table that consists of approximately 100K or more of sparsely distributed routes is added to the hardware forwarding table.

Workaround: There is no known workaround.
- CSCdw63227
 

Ucode version 1.3.1 has been released for IOS Release 12.0(20)SP1 on the Cisco 10720 Internet Router.
- CSCdx03139
 

When you use the **show controllers srp slot/port** command to monitor optical power, the values displayed in the command output are not accurate.

Workaround: You can use the **show controllers srp slot/port** command to measure signal degradation over time, without taking the displayed values to be totally accurate.

## Resolved Caveats—Cisco IOS Release 12.0(20)SP1

All the caveats listed in this section are resolved in Cisco IOS Release 12.0(20)SP1. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdu57564
 

No classification based on precedence exists for punted IP traffic.

There is no known workaround.
- CSCdv20445
 

On a Cisco 10720 Internet Router, changing the bandwidth (CIR) or priority queue percentage value with traffic running will have no effect until the output queue gets emptied.

- CSCdv36581

A problem with flow control occurs when you configure the low priority SRP rate-limiter on a Cisco 10720 Internet Router because the high priority traffic also gets rate-limited to the same value. For example:

```
Router# config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# int srp 1/1
Router(config-if)# srp tx-traffic-rate low 20
Router(config-if)# srp tx-traffic-rate high 400
```

In this example, high priority traffic is also rate-limited to 20 Mbps.

Workaround: Do not configure the low priority SRP rate-limiter value. The SRP fairness algorithm will rate-limit the traffic in case of ring congestion.

- CSCdv40843

A Cisco 10720 Internet Router can stop forwarding packets when line rate multicast traffic is sent to more than 750 different multicast groups. If the mainboard error debugging is enabled, the message “VA\_SDRAM\_CRC\_CHK\_ERR” is displayed on the console.

Workaround: Reduce the traffic rate or reduce the number of different multicast groups joined by the router to 500 or below.

- CSCdv43436

In a UTI tunnel applied to the main Fast Ethernet interface, all 802.1q packets are dropped when traffic is sent or received through the tunnel.

There is no known workaround.

- CSCdv45767

On a Cisco 10720 Internet Router, when full line rate traffic with packets larger than 300 bytes is sent from a Fast Ethernet access card to the SRP uplink card on only one side (Side A or Side B) of the uplink, the uni-directional traffic does not reach OC-48 line-rate. This problem does not occur when traffic is sent on both sides of the SRP uplink.

Workaround: Reduce the traffic rate or re-engineer the SRP ring so that the outgoing traffic is evenly distributed between both SRP ports.

- CSCdv65227

Power monitoring for LR1 and LR2 SRP uplinks is not supported.

There is no known workaround.

- CSCdv65253

When you enter the **show srp transit** command on a Cisco 10720 Internet Router, the transit delay statistics displayed are not accurate. The values are displayed in 20ns units instead of nanoseconds.

Workaround: Multiply the values displayed by 20.

- CSCdv73167

If you remove a UTI tunnel from the main Fast Ethernet interface and then apply the UTI tunnel to a subinterface of the main interface, all traffic into the subinterface is punted to the route processor (RP). No problem occurs with traffic sent out from the subinterface.

There is no known workaround.

- CSCdv74796

The **media-type** command is not necessary because only MDI-X mode is supported on a Fast Ethernet interface except for Japan.

Workaround: Starting in IOS Release 12.0(21)SP3, the Cisco 10720 Internet Router supports the following Revision B access cards:

- 24-Port Fast Ethernet TX Access Card - Rev B
- 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX Access Card - Rev B

The Revision B access cards use Marvell 88E3082 PHY chips. Because the Marvell PHY chip provides better resistance against noise, it is now possible to use the following types of cable connections on an Ethernet TX port on a Revision B access card:

- Crossover cable to connect a media-dependent interface (MDI) port to a 10720 Fast Ethernet TX port in MDI mode.
- Crossover cable to connect a media-dependent interface crossed-over (MDI-X) port to a 10720 Fast Ethernet TX port in MDI-X mode.
- Straight-through cable to connect an MDI port to a 10720 Fast Ethernet TX port in MDI-X mode, or an MDI-X port to a 10720 Fast Ethernet TX port in MDI mode.

To configure the cable connector type on a 10720 Fast Ethernet TX interface, use the **media-type** {**auto** | **mdi** | **mdix**} command in interface configuration mode, where:

**auto** automatically detects the cable type.

**mdi** configures an MDI cable connection on a Fast Ethernet TX interface.

**mdix** configures an MDI-X cable connection on a Fast Ethernet TX interface.

For more information about how to use the **media-type** command, see [New Software Features in Cisco IOS Release 12.0\(21\)SP3, page 6](#).

- CSCdv78036

When you use the **set ip dscp** and **set srp-priority** commands to configure a policy map on an outbound SRP interface, the resulting SRP priority is sometimes incorrect.

DSCP values sometimes cause an incorrect SRP priority. For example, if you set the IP DSCP value to 46 and the SRP priority to 6 or 7, the resulting SRP priority displayed with the **show hardware pxf cpu queue srp** command can be 8 (an invalid value).

There is no known workaround.

- CSCdv85747

Trace routes fail at Cisco 10000 Series routers for addresses x.x.x.225 to x.x.x.239.

There is no known workaround.

- CSCdw00021

When running IOS Release 12.0(19)SP, the Cisco 10720 Internet Router may crash due to the following error:

```
00:37:55: %Camr-3-MISTRAL_IO_ERROR: MISTRAL_IO_BUS_INT_MASK_LO: 28,
Error address = 0x16000884, IO status = 0x440
```

Workaround: Enter the **test write 2 0xB6000050 0x801** command.

- CSCdw12659

Traffic may be lost on the ring, such as during startup, because wrap states for the ring access controller (RAC) are inconsistent. For example, this happens when only one RAC is wrapped.

Workaround: Enter the **shutdown** and then the **no shutdown** commands on the Spatial Reuse Protocol (SRP) interface.

- CSCdw13905

When a Cisco 10720 Internet Router's configuration allows a large number of packets in feedback in the PXF network processor (Toaster) for further processing, the control queue in the Spatial Reuse Protocol (SRP) interface enters an inactive state.

Workaround: Re-configure the router so that the number of packets that are feedback in Toaster is limited. Use the **show hardware pxf cpu queue srp 1/1** command to display queue statistics for the SRP interface. Use the **show hardware pxf cpu context** command to display PXF statistics for the amount of feedback passing through Toaster.

- 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—Cisco IOS Release 12.0(19)SP

This section describes possibly unexpected behavior by Cisco IOS Release 12.0(19)SP. This section describes only severity 1, severity 2, and select severity 3 caveats.

- CSCdu53160

When unidirectional multicast traffic is sent at full line rate to a Cisco 10720 Internet Router across an SRP ring, and each of the 24 Fast Ethernet ports is joined to a unique multicast group, the router may forward traffic unevenly between different Fast Ethernet interfaces.

Workaround: Reduce the traffic rate or reduce the number of ports joined to the multicast group.

- CSCdu57564

No classification based on precedence exists for punted IP traffic.

There is no known workaround.

- CSCdv20444

On a Cisco 10720 Internet Router, the output-queue shaping accuracy is not within 10 percent of the configured value. If the user configures shaping to a value of 50 percent, the effective throughput on the port will be approximately 60 percent.

Workaround: Use traffic policing (CAR) in order to obtain the configured value.

- CSCdv20445

On a Cisco 10720 Internet Router, changing the bandwidth (CIR) or priority queue percentage value with traffic running will have no effect until the output queue gets emptied.

Workaround: Stop and restart traffic.

- CSCdv36581

A problem with flow control occurs when you configure the low priority SRP rate-limiter on a Cisco 10720 Internet Router because the high priority traffic also gets rate-limited to the same value. For example:

```
Router# config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# int srp 1/1
```

```
Router(config-if)# srp tx-traffic-rate low 20
Router(config-if)# srp tx-traffic-rate high 400
```

In this example, high priority traffic is also rate-limited to 20 Mbps.

Workaround: Do not configure the low priority SRP rate-limiter value. The SRP fairness algorithm will rate-limit the traffic in case of ring congestion.

- CSCdv40843

A Cisco 10720 Internet Router can stop forwarding packets when line rate multicast traffic is sent to more than 750 different multicast groups. If the mainboard error debugging is enabled, the message “VA\_SDRAM\_CRC\_CHK\_ERR” is displayed on the console.

Workaround: Reduce the traffic rate or reduce the number of different multicast groups joined by the router to 500 or below.

- CSCdv43436

In a UTI tunnel applied to the main Fast Ethernet interface, all 802.1q packets are dropped when traffic is sent or received through the tunnel.

There is no known workaround.

- CSCdv45767

When sending full line-rate traffic with packets larger than 300 bytes from the Fast Ethernet access to the SRP uplink on a Cisco 10720 Internet Router, the system does not achieve full OC-48 line rate. This problem only occurs when uni-directional traffic is using only one side of the SRP uplink (Side A or Side B). Traffic using both sides of the SRP uplink will achieve OC-48 line-rate.

Workaround: Reduce the traffic rate or re-engineer the SRP ring, so that the outgoing traffic is evenly distributed between both SRP ports.

- CSCdv65227

Power monitoring for LR1 and LR2 SRP uplinks is not supported.

There is no known workaround.

- CSCdv65253

When you enter the **show srp transit** command on a Cisco 10720 Internet Router, the transit delay statistics displayed are not accurate. The values are displayed in 20ns units instead of nanoseconds.

Workaround: Multiply the values displayed by 20.

- CSCdv68090

When you configure the maximum information rate (MIR) of shaped queues on user queues and on the default queue, only a subset of the available and configured bandwidth is used.

Workaround: Configure a committed information rate (CIR) value by using the **bandwidth percent** command on the default queue along with the shaped parameters.

- CSCdv73167

If you remove a UTI tunnel from the main Fast Ethernet interface and then apply the UTI tunnel to a subinterface of the main interface, all traffic into the subinterface is punted to the route processor (RP). No problem occurs with traffic sent out from the subinterface.

There is no known workaround.

- CSCdv74796

The **media-type** command is not necessary because only MDI-X mode is supported on a Fast Ethernet interface.

Workaround: Starting in IOS Release 12.0(21)SP3, the Cisco 10720 Internet Router supports the following Revision B access cards:

- 24-Port Fast Ethernet TX Access Card - Rev B
- 4-Port Gigabit Ethernet 8-Port 10/100 Ethernet TX Access Card - Rev B

The Revision B access cards use Marvell 88E3082 PHY chips. Because the Marvell PHY chip provides better resistance against noise, it is now possible to use the following types of cable connections on an Ethernet TX port on a Revision B access card:

- Crossover cable to connect a media-dependent interface (MDI) port to a 10720 Fast Ethernet TX port in MDI mode.
- Crossover cable to connect a media-dependent interface crossed-over (MDI-X) port to a 10720 Fast Ethernet TX port in MDI-X mode.
- Straight-through cable to connect an MDI port to a 10720 Fast Ethernet TX port in MDI-X mode, or an MDI-X port to a 10720 Fast Ethernet TX port in MDI mode.

To configure the cable connector type on a 10720 Fast Ethernet TX interface, use the **media-type** {**auto** | **mdi** | **mdix**} command in interface configuration mode, where:

- auto** automatically detects the cable type.
- mdi** configures an MDI cable connection on a Fast Ethernet TX interface.
- mdix** configures an MDI-X cable connection on a Fast Ethernet TX interface.

For more information about how to use the **media-type** command, see [New Software Features in Cisco IOS Release 12.0\(21\)SP3, page 6](#).

- CSCdv78036

When you use the **set ip dscp** and **set srp-priority** commands to configure a policy map on an outbound SRP interface, the resulting SRP priority is sometimes incorrect.

DSCP values sometimes cause an incorrect SRP priority. For example, if you set the IP DSCP value to 46 and the SRP priority to 6 or 7, the resulting SRP priority displayed with the **show hardware pxf cpu queue srp** command can be 8 (an invalid value).

There is no known workaround.

- CSCdv85747

Trace routes fail at Cisco 10000 Series routers for addresses x.x.x.225 to x.x.x.239.

There is no known workaround.

- CSCdv86829

When a Cisco 10720 Internet Router experiences Layer 2 Spatial Reuse Protocol (SRP) congestion due to SRP fairness or traffic exceeding the rate configured for the high and low priority queues using the **srp tx-transit-rate** command, the Parallel eXpress Forwarding (PXF) scheduler may treat the different queues unfairly.

This happens because the Cisco Versatile Traffic Management System (VTMS) schedules queues based on a static configuration of 2.4 Gbps in all cases. Unfair queue treatment occurs because the Layer 2 flow controls some queues more than others. As a result, queues that send larger packets tend to receive more bandwidth.

Workaround: Use the **srp tx-transit-rate** command to set the rate to 2488 Mbps (full bandwidth) and re-engineer the network to reduce the effect of SRP fairness.

- CSCdw00021

When running IOS 12.0(19)SP, the Cisco 10720 Internet Router may crash due to the following error:

00:37:55: %Camr-3-MISTRAL\_IO\_ERROR: MISTRAL\_IO\_BUS\_INT\_MASK\_LO: 28,  
Error address = 0x16000884, IO status = 0x440

Workaround: Enter the **test write 2 0xB6000050 0x801** command.

- CSCdw12659

Traffic may be lost on the ring, such as during startup, because wrap states for the ring access controller (RAC) are inconsistent. For example, this happens when only one RAC is wrapped.

Workaround: Enter the **shutdown** and then the **no shutdown** commands on the Spatial Reuse Protocol (SRP) interface.

- CSCdw13905

When a Cisco 10720 Internet Router's configuration allows a large number of packets in feedback in the PXF network processor (Toaster) for further processing, the control queue in the Spatial Reuse Protocol (SRP) interface enters an inactive state.

Workaround: Re-configure the router so that the number of packets that are feedback in Toaster is limited. Use the **show hardware pxf cpu queue srp 1/1** command to display queue statistics for the SRP interface. Use the **show hardware pxf cpu context** command to display PXF statistics for the amount of feedback passing through Toaster.

- CSCdw23744

When access control lists (ACLs) are configured on a DPT interface to check and log multicast IP addresses, the PXF network processor in the router continuously restarts when a high rate of multicast traffic is received at the interface and checked against the ACL entries.

Workaround: Do not implement ACL logging on an interface that receives a high rate of multicast traffic.

- CSCdw26411

When you use the **show diags** command to display hardware information about the uplink and access cards installed on the Cisco 10720 Internet Router, the deviation number is not displayed in the output.

Workaround: There is no known workaround.

- CSCdw90589

A hardware problem in the MISTRAL Application-Specific Integrated Circuit (ASIC) can cause the Cisco 10720 Internet Router to crash. The following message is displayed on the console and is logged in the crashinfo file:

```
00:04:21: %Camr-3-MISTRAL_ERROR:MISTRAL_TM_NPP_PAR_ERR_REG_MASK_HI: 41
-Traceback= 5022DA50 501DE2A8
00:04:21: %Camr-3-INTPROC: Process Traceback= 5022CC18 501DDF8C
-Traceback= 5022D6C8 5022DB74 501DE2A8
```

Workaround: There is no known workaround. If you think that the hardware is defective, obtain a Return Material Authorization (RMA) number to return the system. A screening process has been established in order to detect this failure during manufacturing.

- CSCdx50295

On a Cisco 10720 Internet Router, the police actions and the statistics output for the **show policymap interface** command are incorrectly calculated when the Layer 2 decapsulation size of a packet is different than the encapsulation size. Policing is based on the size of the incoming datagram instead of the size of the outgoing datagram.

For example, if packets enter on a Fast Ethernet (FE) interface and are transmitted on another FE interface, no policing error occurs because the decapsulation and encapsulation sizes are the same. However, if a packet is received on an SRP interface (decapsulation size: 16 bytes from SRP) and is transmitted on an FE interface (encapsulation size: 14 bytes to FE), the output policing uses two additional bytes in its calculations. In this case, an error of up to 3% more packets are policed than the maximum configured value.

Workaround: There is no known workaround.

- CSCdx77061

On Cisco 10720 Internet Routers running IOS (19)SP and later, small IP packets of 35 and 39 bytes in IP length that require padding may get corrupted in the last byte of the packet payload. This problem does not occur on other packet sizes.

Workaround: There is no known workaround.

- CSCdx87577

Memory allocation failures occur on a Cisco 10720 Internet Router that has authentication, authorization, and accounting (AAA) configured and has "%SYS-2-MALLOCFAIL" error messages displayed. When you enter the **show memory summary** command, the command output shows that many small blocks of memory are used by the AAA processes.

Workaround: There is no known workaround

- CSCdy03533

If the SRP frame size, including the cyclic redundancy check (CRC) counter, is between 52 and 102 bytes, a Cisco 10720 Internet Router running IOS (19)SP and later cannot forward SRP transit traffic at the full OC-48 line-rate on either the inner SRP ring, outer SRP ring, or both rings.

The transit performance may be as low as 1.6Gbps in one direction. Any frame size greater than 102 bytes can be forwarded at the full OC-48 line rate.

Workaround: There is no known workaround.

## Resolved Caveats—Cisco IOS Release 12.0(19)SP

Because Cisco IOS Release 12.0(19)SP is the initial 12.0 SP release, there are no resolved caveats that require documentation in the release notes.

## Related Documentation

The following sections describe the documentation available for the Cisco 10720 Internet Router. These documents consist of hardware and software installation guides, Cisco IOS configuration and command reference publications, system error messages, feature modules, and other documents.

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

Use these release notes with these documents:

- [Release-Specific Documents, page 33](#)
- [Platform-Specific Documents, page 33](#)
- [Feature Modules, page 34](#)
- [Cisco IOS Software Documentation Set, page 34](#)

## Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.0 and are located on Cisco.com and the Documentation CD-ROM:

- *Cross-Platform Release Notes for Cisco IOS Release 12.0*

On Cisco.com at

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes**

On the Documentation CD-ROM at

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes**

- Product bulletins, field notices, and other release-specific documents on Cisco.com at

**Technical Documents**

- Caveats for Cisco IOS Release 12.0

As a supplement to the caveats listed in the “**Caveats**” section in these release notes, see *Caveats for Cisco IOS Release 12.0*, which contains caveats applicable to all platforms for all maintenance releases of Cisco IOS Release 12.0.

On Cisco.com at

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.0: Caveats**

On the Documentation CD-ROM at

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Caveats**




---

**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 **Software Center: Cisco IOS Software: Cisco IOS Bug Navigator II**. Another option is to go to <http://www.cisco.com/support/bugtools>.

---

## Platform-Specific Documents

These documents are available for the Cisco 10720 Internet Router on Cisco.com and the Documentation CD-ROM:

- *Cisco 10720 Internet Router Installation and Configuration Guide*
- *Cisco Software Configuration for the 10720 Internet Router*
- *Cisco 10720 Internet Router Field Replaceable Units*

On Cisco.com at:

**Technical Documents: Aggregation**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Aggregation**

## Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.0 S, 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 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases: New Features in Cisco IOS Release 12.0 S**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases: New Features in Cisco IOS Release 12.0 S**

Table 3 describes the contents of select Cisco IOS Release 12.0 S feature modules.

**Table 3 Cisco IOS Software Release 12.0 S Feature Modules**

Release Version	Feature Module
12.0 S	Dynamic Packet Transport (DPT) Feature Guide
12.0(7)S	Modular Quality of Service Command Line Interface Overview ATM Cell Loss Priority Setting
12.0(6)S	Turbo Access Control List
12.0(5)S	Multicast Routing Monitor Service Shell Version 1 Support

## Cisco IOS Software Documentation Set

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

### Documentation Modules

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

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

You can access these documents on Cisco.com at

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References**

You can access these documents on the Documentation CD-ROM at

## Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

### Cisco IOS Release 12.0 Documentation Set

Table 4 describes the contents of the Cisco IOS Release 12.0 software documentation set, which is available in electronic form, and in printed form upon request.



#### Note

You can find the most current Cisco IOS documentation on Cisco.com and the Documentation CD-ROM.

On Cisco.com at:

**Technical Documents: Cisco IOS Software: Cisco IOS Release 12.0**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0**

**Table 4 Cisco IOS Software Release 12.0 Documentation Set**

Book	Chapter Topic
<ul style="list-style-type: none"> <li>• <i>Configuration Fundamentals Configuration Guide</i></li> <li>• <i>Configuration Fundamentals Command Reference</i></li> </ul>	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
<ul style="list-style-type: none"> <li>• <i>Bridging and IBM Networking Configuration Guide</i></li> <li>• <i>Bridging and IBM Networking Command Reference</i></li> </ul>	Bridging and IBM Overview Bridging IBM Networking

**Table 4 Cisco IOS Software Release 12.0 Documentation Set (continued)**

Book	Chapter Topic
<ul style="list-style-type: none"> <li><i>Dial Solutions Configuration Guide</i></li> </ul>	Overview of Interfaces, Controllers, and Lines Used for Dial Access Configuring Modem Support and Other Asynchronous Devices Managing Modems Configuring Terminal Operating Characteristics for Dial-In Sessions Setting Up ISDN Basic Rate Service Configuring Synchronous Serial Ports Configuring Channelized E1 and T1 Configuring ISDN Special Signaling Configuring X.25 on ISDN Using A0/D1 Configuring AppleTalk Remote Access Preparing for Asynchronous DDR Configuring Asynchronous PP and SLIP Configuring the Bandwidth Allocation Control Protocol Configuring PPP Callback for DDR Configuring ISDN Caller ID Callback Configuring Dial Backup for Dialer Profiles Configuring Dial Backup Using Dialer Watch Configuring Dial Backup for Serial Lines Configuring Peer-to-Peer DDR with Dialer Profiles Configuring Dial-Out Enterprise Dial Scenarios and Configurations Configuring Easy IP Deciding and Preparing to Configure DDR Configuring Legacy DDR Hubs Configuring Multichassis Multilink PPP Configuring Support for NASI Clients to Access Network Resources Dial Networking Business Applications Configuring the Cisco PAD Per-User Configuration Configuring Media-Independent PPP and Multilink PPP Configuring Protocol Translation and Virtual Asynchronous Devices Establishing a Reverse Telnet Session to a Modem Configuring Snapshot Routing Telco and ISP Dial Scenarios and Configurations Configuring Legacy DDR Spokes Configuring Dial-In Terminal Services Configuring V.120 Access Configuring Virtual Private Dialup Networks Configuring Virtual Profiles Configuring Virtual Template Interfaces Configuring X.25 on ISDN

**Table 4 Cisco IOS Software Release 12.0 Documentation Set (continued)**

Book	Chapter Topic
<ul style="list-style-type: none"> <li>• <i>Dial Solutions Command Reference</i></li> </ul>	Dial-In Port Setup Dial-In Terminal Services Dial-On Demand Routing Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Dialup Networks Other Network Traffic on ISDN Channels Dial-Related Addressing Services
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	Interface Configuration Overview LAN Interfaces Logical Interfaces Serial Interfaces
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 1</i></li> <li>• <i>Network Protocols Command Reference, Part 1</i></li> </ul>	IP Overview IP Addressing and Services IP Routing Protocols
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 2</i></li> <li>• <i>Network Protocols Command Reference, Part 2</i></li> </ul>	AppleTalk and Novell IPX Overview AppleTalk Novell IPX
<ul style="list-style-type: none"> <li>• <i>Network Protocols Configuration Guide, Part 3</i></li> <li>• <i>Network Protocols Command Reference, Part 3</i></li> </ul>	Network Protocols Overview Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none"> <li>• <i>Security Configuration Guide</i></li> <li>• <i>Security Command Reference</i></li> </ul>	Security Overview Authentication, Authorization, and Accounting (AAA) Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<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 NewFlow Switching Tag Switching Multilayer Switching Multicast Distributed Switching Virtual LANs MPOA Commands

**Table 4 Cisco IOS Software Release 12.0 Documentation Set (continued)**

Book	Chapter Topic
<ul style="list-style-type: none"> <li>• <i>Wide-Area Networking Configuration Guide</i></li> <li>• <i>Wide-Area Networking Command Reference</i></li> </ul>	Wide-Area Network Overview ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Voice, Video, and Home Applications Configuration Guide</i></li> <li>• <i>Voice, Video, and Home Applications Command Reference</i></li> </ul>	Using Voice, Video, and Home Applications Voice Video Broadband
<ul style="list-style-type: none"> <li>• <i>Quality of Service Solutions Configuration Guide</i></li> <li>• <i>Quality of Service Solutions Command Reference</i></li> </ul>	Quality of Service Overview Classification Congestion Management Congestion Avoidance Policy and Shaping Overview Signaling Link Efficiency Mechanisms
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Software Command Summary</i></li> <li>• <i>Cisco IOS Software System Error Messages</i></li> <li>• <i>Debug Command Reference</i></li> <li>• <i>Dial Solutions Quick Configuration Guide</i></li> <li>• New Features in 12-Based Limited Lifetime Releases</li> <li>• Release Notes (Release Notes for 12.0-based releases and various platforms)</li> </ul>	



**Note**

*The Cisco Management Information Base (MIB) User Quick Reference* is no longer published. If you have an account with Cisco.com, you can find the current list of MIBs supported by Cisco. To reach the *Cisco Network Management Toolkit*, **Log in** to Cisco.com and click **Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIBs**.

## Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

[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 Cisco Documentation CD-ROM package, which is shipped 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 through 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, elsewhere in North America, by calling 800 553-NETS (6387).

## Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Leave Feedback** at the bottom of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

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

We appreciate your comments.

## Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

## Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

## Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

## Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

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

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

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

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

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

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number

---

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

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

All other trademarks mentioned in this document or Web site are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0208R)

Copyright © 1999–2002, Cisco Systems, Inc.  
All rights reserved.