



Release Notes for the Cisco 10000 Series ESR for Cisco IOS Release 12.0(17)SL7

April 29, 2002

These release notes provide information about Cisco IOS Release 12.0(17)SL7 running on the Cisco 10000 series edge services router (ESR). These release notes are identical to the release notes for Cisco IOS Release 12.0(17)SL6, but were updated to include fixes for caveats discovered and resolved since Cisco IOS Release 12.0(17)SL6 (see the [“Resolved Caveats in Cisco IOS Release 12.0\(17\)SL7” section on page 7](#)).

These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode and related documents.

Cisco IOS Release 12.0(17)SL7 is based on the following previous releases:

- Cisco IOS Release 12.0(17)SL6
- Cisco IOS Release 12.0(17)SL5
- Cisco IOS Release 12.0(17)SL4
- Cisco IOS Release 12.0(17)SL3
- Cisco IOS Release 12.0(17)SL2
- Cisco IOS Release 12.0(17)SL1
- Cisco 12.0ST features synchronized with Cisco IOS Release 12.0S

For a list of the software caveats that apply to Cisco IOS Release 12.0(17)SL, see the [“Caveats in Cisco IOS Release 12.0\(17\)SL” section on page 13](#).

Use these release notes in conjunction with the *Release Notes for Cisco IOS Release 12.0(S)* and the cross-platform *Release Notes for Cisco IOS Release 12.0*.

To review the release notes for Cisco IOS Release 12.0S, go to www.cisco.com and click **Technical Documents**. Select **Release 12.0** from the Cisco IOS Software drop-down menu. Then click **Release Notes > Cisco 12000 Series Routers > Cisco 7000 Family and 12000 Series—Release Notes for Release 12.0 S**.

To review the cross-platform *Release Notes for Cisco IOS Release 12.0*, go to www.cisco.com and click **Technical Documents**. Select **Release 12.0** from the Cisco IOS Software drop-down menu. Then click **Release Notes > Cross-Platform Release Notes**.



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

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

Contents

This document contains the following sections:

- [Upgrading to a New Software Release, page 2](#)
- [System Requirements, page 3](#)
- [New Features in Cisco IOS Release 12.0\(17\)SL, page 3](#)
- [Cisco 10000 Series ESR Software Features, page 4](#)
- [Limitations and Restrictions, page 5](#)
- [Important Notes, page 6](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL7, page 7](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL6, page 7](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL5, page 9](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL4, page 10](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL3, page 11](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL2, page 12](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL1, page 13](#)
- [Caveats in Cisco IOS Release 12.0\(17\)SL, page 13](#)
- [Resolved Caveats in Cisco IOS Release 12.0\(17\)SL, page 21](#)
- [Obtaining Documentation, page 24](#)
- [Obtaining Technical Assistance, page 25](#)

Upgrading to a New Software Release

For specific information about upgrading your Cisco 10000 series ESR to a new software release, see the *Cisco 10000 Series ESR Software Configuration Guide*.

For general information about upgrading to a new software release, see the product bulletin *Cisco IOS Upgrade Ordering Instructions* located at:

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957_pp.htm

For additional information about ordering Cisco IOS software, refer to the Cisco IOS Software Releases URL:

<http://www.cisco.com/warp/public/cc/pd/iosw/iore/index.shtml>

Upgrading Cisco IOS Software from Earlier Cisco IOS Releases

**Caution**

If you are upgrading your Cisco 10000 series ESR from Cisco IOS Release 12.0(14)SL or from earlier 12.0(x)SL-based releases, read this section.

Before you upgrade to Cisco IOS Release 12.0(17)SL7, save your current configuration file. If you decide to re-install Release 12.0(14)SL, or an earlier release, you must also re-install the configuration file associated with that release. This is because some BGP configuration-file entries in Release 12.0(17)SL7 are not compatible with Release 12.0(14)SL or earlier releases.

System Requirements

We recommend that you use 512 MB of memory on the Performance Routing Engine (PRE). New PREs are shipped with 512 MB of memory. In a redundant setup, both PREs should have the same amount of memory.

New Features in Cisco IOS Release 12.0(17)SL

The following new features and improvements are supported in Cisco IOS Release 12.0(17)SL:

- **Multiple Quality-of-Service (QoS) matches per phase**—QoS matching logic was optimized to handle multiple non-ACL matches, with up to four matches in a single pass when the matches are in separate class maps.
- **QoS classification for voice traffic**—Support was added for Real Time Protocol (RTP) to provide high priority classification for voice traffic.
- **QoS Priority Queueing (PQ)**—Ensures minimum latency for delay-sensitive traffic.
- **QoS Class-Based Weighted Fair Queueing (CBWFQ)**—Allows you to configure a portion of interface bandwidth for several different classes of traffic.
- **Frame Relay Traffic Shaping (FRTS)**—A method of limiting excess traffic on a Frame Relay interface at the PVC level.
- **Generic Traffic Shaping**—A method of limiting excess traffic at the interface level.
- **802.1q PXF switching for ARPA encapsulation**—Supports the ability to link individual VLANs to MPLS VPNs.
- **Per-Packet Load Balancing (PPLB)**—Ensures load balancing over multiple links by allowing the router to send successive data packets over paths, without regard to individual hosts or user sessions. PPLB uses a round-robin method to determine which path each packet takes to arrive at the destination.
- **ATM PVCs**—The Cisco 10000 series ESR now supports 4000 ATM PVCs.

Cisco 10000 Series ESR Software Features

Table 1 lists the features supported in the Cisco 10000 Series ESR.

Table 1 *Principal Software Features*

Administration	Cisco Discovery Protocol (CDP) Simple Network Management Protocol (SNMP)
Availability	SONET 1+1 Automatic Protection Switching (APS) Route Processing Redundancy Plus (RPR+)
Encapsulations	Ethernet High-Level Data Link Control (HDLC) Frame Relay Point-to-Point (PPP) Multilink Point-to-Point (MLP)
Multiprotocol Label Switching	Multiprotocol Label Switching Virtual Private Network (MPLS/VPN) edge services 802.1q PXF switching for ARPA encapsulation
Multicast Features	Multicast Static Routes Multicast Routing Monitor (MRM)
Multicast Services	Internet Group Management Protocol (IGMP) Protocol-Independent Multicast (PIM) Distance Vector Multicast Routing Protocol (DVMRP) Cisco Group Management Protocol (CGMP) Unidirectional Link Routing (UDLR) Session Directory Protocol (SDP) Multicast Source Discovery Protocol (MSDP) Border Gateway Protocol (BGP)
Quality of Service	Committed Access Rate (CAR) Class-Based Weighted Random Early Detection (CBWRED) QoS Policy Propagation on BGP (QPPB) Priority Queueing (PQ) Class-Based Weighted Fair Queueing (CBWFQ) Frame Relay Traffic Shaping (FRTS) Generic Traffic Shaping (GTS)

Table 1 *Principal Software Features (continued)*

Routing Protocols	Border Gateway Protocol (BGP) Intermediate System-to-Intermediate System (IS-IS) Open Shortest Path First (OSPF) Interior Gateway Routing Protocol (IGRP) Enhanced Interior Gateway Routing Protocol (EIGRP) Routing Information Protocol (RIP)
Security Features	Standard and extended access lists Authentication, Authorization, and Accounting (AAA) Kerberos authentication and client support on Telnet Radius authentication Terminal Access Controller Access Control System Plus (TACACS+)

Limitations and Restrictions

This section describes any limitations and restrictions that you should review before you use the Cisco 10000 series ESR.

Automatic Protection Switching Support

Automatic protection switching (APS) is supported on the OC-12 Packet Over SONET (POS) and Channelized OC-12 (ChOC-12) line cards with this release. However, certain limitations apply if the PRE installed in your system is the ESR-PRE. These limitations do not apply to the ESR-PRE1. You can verify which PRE is installed in the ESR by using the **show version** command.

For APS to work properly with the ESR-PRE, you must ensure that the OC-12 POS or ChOC-12 line card is installed in the lower-numbered (odd) slot.

The system receives clocking information from the line card in the odd slot. If you remove the odd-numbered card (or if the clocking mechanism on that card fails), the clocking is lost and the data path is shut down (Caveat CSCdr81416).

As a workaround, we recommend the following:

1. For the card pair, fully configure the lower-numbered card, and leave the higher-numbered card set to its default configuration.
2. Before you remove a card from the odd slot, run the **no associate** command and shut down the card. The following is an example of how to disable APS for cards in slots 3 and 4:

```
Router(config)# redundancy
Router(config-r)# no associate 3 4
Router(config-r-a-sl)# exit
Router(config)# interface pos 3/0/0
Router(config-if)# shutdown
```

You can now remove the card in slot 3.

3. Move the card located in the even slot to the odd slot and enter the **no shutdown** command. Traffic flow resumes. Insert a new card into the even slot and reconfigure the pair for redundancy.

Testing Performance of High-Speed Interfaces

Cisco IOS Release 12.0(17)SL is enhanced with multiple queues for all classes of traffic over high-speed interfaces. The software selects a queue based on the source and destination address for the packet. This ensures that a traffic flow always uses the same queue and the packets are transmitted in order.

When the Cisco 10000 series ESR is installed in a real network, the high-speed interfaces work efficiently to spread traffic flows equally over the queues. However, using single traffic streams in a laboratory environment may result in less-than-expected performance.

Therefore, to ensure accurate test results, you should test the throughput of the gigabit Ethernet, POS, or ATM uplink with multiple source or destination addresses.

**Tip**

To determine if traffic is being properly distributed, use the **show hardware pxf cpu queue** command.

Important Notes

This section contains issues that you should be aware of with Cisco IOS Release 12.0(17)SL.

Inserting a New Line Card

If you insert a new line card into the Cisco 10000 series ESR chassis, the line card initially reports that the line is up.

Frame Relay and PPP Sessions

You can run up to 4200 Frame Relay sessions or 1300 PPP sessions, and you can configure up to 800 BGP peers on the Cisco 10000 series ESR. The router also supports up to 512 Multilink Point-to-Point (MLP) protocol sessions.

**Note**

Each T1 interface in an MLP bundle represents a single PPP session. Thus, if you configure 130 MLP bundles of 10 T1 interfaces, each results in 1300 PPP sessions (which is the maximum number of PPP sessions that are supported on the Cisco 10000 series ESR).

Cisco Discovery Protocol

Beginning in Cisco IOS Release 12.0(15)SL, the Cisco Discovery Protocol (CDP) is disabled by default. To enable CDP on an interface, use the **cdp enable** command.

Resolved Caveats in Cisco IOS Release 12.0(17)SL7

This section lists problems that were found since the release of Cisco IOS Release 12.0(17)SL6, and are resolved in Cisco IOS Release 12.0(17)SL7.

CSCdp39987

Previously, an array boundary problem with TCP functionality caused the Cisco 10000 series ESR to reload unexpectedly. This problem has been fixed.

CSCds80984

Previously, packets were lost when a single link was contained in an MLP/MPLS virtual routing/forwarding (VRF) instance, and Cisco Express Forwarding (CEF) or a dialer interface was used. Also, interleaving did not function properly, and voice packets were lost. These problems have been fixed.

CSCdv66454

In the past, pings failed from a Cisco 10000 series ESR to a customer edge (CE) router over Multilink Point-to-Point Protocol (MLP) bundles. This problem has been fixed.

CSCdw46934

Previously, if you configured a secondary IP address on maintenance interface Fa 0/0/0 and copied the running configuration to the startup configuration, the Cisco 10000 series ESR did not save the information properly as part of the start-up configuration. This problem has been fixed.

CSCdw58089

In the past, IP connectivity was lost on a multilink bundle when the size of the bundle decreased to a single link member. This problem has been fixed.

CSCdx00697

Previously, Border Gateway Protocol (BGP) peering between 2 or more T1 links did not load balance correctly when the Cisco 10000 series ESR was configured for Per-Packet Load Balancing (PPLB) and the configuration included the **ebgp multihop** command with host static routes. This problem has been fixed.

CSCdx11162

In the past, a Parallel eXpress Forwarding (PXF) crash could occur if you applied an outbound Access Control List (ACL) with the **log** keyword. This problem has been fixed.

Resolved Caveats in Cisco IOS Release 12.0(17)SL6

This section lists problems that were found since the release of Cisco IOS Release 12.0(17)SL5, and are resolved in Cisco IOS Release 12.0(17)SL6.

CSCdu57458

In the past, if you created new channels within a channelized T3, and a BER test was running on any T1 within the T3, serial interface information corresponding to the T1 interface was incorrectly reported under a different T1 interface. This occurred with the channelized OC-12, channelized STM-1, and channelized T3 line cards. This problem has been fixed.

CSCdu67172

Previously, if you started a BER test on a T1 interface, and you issued the **no t1 t1-line-number bert** command, the test continued running until the test interval time expired. This problem has been fixed.

CSCdu67208

In the past, the host name that appears on the console was truncated after you exited controller configuration mode. This no longer occurs.

CSCdu78843

Previously, SONET APS failed when the fiber optic cable between the Cisco 10000 series ESR and a Cisco ONS 15454 was removed. This problem has been fixed.

CSCdv49567

In the past, if you removed the MLP interfaces from the configuration of the Cisco 10000 series ESR, some of the bundle interface CEF entries remained in the configuration while some of the CEF entries that were attached to the MLP interfaces were removed. This problem has been fixed.

CSCdv58239

In the past, if redundant PREs were installed in the Cisco 10000 series ESR chassis and the configuration included the **boot config disk0:** command, some commands in the startup configuration were absent after the primary PRE synchronized with the secondary PRE. This no longer occurs.

CSCdv66525

Previously, in rare circumstances, when the PXF engine restarted, a pxf_crashinfo file was not created. This problem no longer occurs.

CSCdv73848

In the past, the Cisco 10000 series ESR sometimes ran out of memory space while continually processing SNMP requests. This no longer occurs.

CSCdw08393

Previously, if redundant PREs were configured on the Cisco 10000 series ESR and you configured the primary PRE using the **crypto key generate rsa** command, the secondary PRE was not configured with the **crypto key generate rsa** command during synchronization with the primary PRE. This problem has been fixed.

CSCdw54852

In the past, if redundant PREs were installed in the Cisco 10000 series ESR, only one tty session could be active in configuration mode. This problem has been fixed.

CSCdw65903

An error can occur with management protocol processing. For more information, go to the following URL:

<http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903>

Resolved Caveats in Cisco IOS Release 12.0(17)SL5

This section lists problems that were found since the release of Cisco IOS Release 12.0(17)SL4, and are resolved in Cisco IOS Release 12.0(17)SL5.

CSCdm73271

Previously, placing a multilink interface into an administratively down state sometimes caused the remote interface to flap. This has been fixed.

CSCdu75923

In the past, the Cisco 10000 series ESR reported an alignment correction traceback message if the BGP neighbor, connected through POS and GigE links, went down and came back up. This no longer occurs.

CSCdu78308

Packets were not equally balanced between links in a given PPLB group. This occurred when a PPLB group contained 3, 5, or 6 links. It also occurred in lab testing, where 2 or more equal-sized groups were configured and tested with deterministic traffic streams. This has been fixed.

CSCdu78843

Previously, in a Cisco laboratory test, SONET APS failed when the fiber optic cable between the Cisco 10000 series ESR and a Cisco ONS 15454 was removed. This problem has been fixed.

CSCdv49141

In a Cisco 10000 series ESR with a channelized OC-12 line card installed, sometimes all of the interfaces (channel groups) associated with a given channelized T3 were up, but the line protocol was down. This problem has been fixed.

CSCdv51662

In the past, if the Cisco 10000 series ESR was configured with a channelized OC-12 line card and had T3 and T1 interfaces configured, and if you reloaded the router, sometimes the T1 interfaces did not come up. This no longer occurs.

CSCdv52429

The bgp cluster-id was not used or stored in the configuration when it was configured in IP address format. This has been fixed.

CSCdv53709

Previously, when a pxf fault condition occurred on a PRE1, sometimes a pxf_crashinfo file was not created. This no longer occurs.

CSCdv58828

A traceback sometimes occurred after the router was reloaded, after an online insertion and removal (OIR) event, after a pxf reload, or after the router received a large amount of prefixes from a BGP peer. This problem also occurred on a Cisco 10000 series ESR on which OSPF was configured as the Interior Gateway Protocol (IGP). It has been fixed.

CSCdv85708

In the past, if you issued the **no shutdown** command followed by the **clock source internal** command on the channelized OC-12 line card SONET controller, the router sometimes failed to set the clock source to internal. This no longer occurs.

CSCdv85757

Previously, under extreme cold or hot temperature conditions, if the clock on the SONET controller was configured as line, the SONET controller remained in the down state. This problem has been fixed.

CSCdv85794

If the clock source on the SONET controller of the channelized OC-12 line card was configured to line, and Loss of Signal (LOS) was detected, the SONET framer on the line card did not switch to internal clock. This has been fixed.

CSCdv87088

The output of the **show interface** command displayed the last output as never instead of the elapsed time. This has been fixed.

CSCdv90780

Previously, if the Cisco 10000 series ESR was running Cisco IOS software earlier than Release 12.0(20)ST, PXF output queue drops could occur when high rate multicast traffic was transmitted from high speed interfaces (such as GigE and OC-12 POS interfaces). This no longer occurs.

CSCdw35607

When WRED was configured on a multilink PPP bundle, WRED was not actually enabled. Instead, the queue behaved as if tail-drop was enabled. This has been fixed.

Resolved Caveats in Cisco IOS Release 12.0(17)SL4

This section lists problems that were found and resolved in Cisco IOS Release 12.0(17)SL4.

CSCdv58867

If you used the **no t1 t1-number channel-group channel-group-number** command to remove multiple T1 channels, and then reconfigured the same T1 channels, the output of the **show ppp multi interface multilink number** command would sometimes show the same member as active and inactive at the same time. This has been fixed.

CSCdv66857

Previously, the output counter on an interface did not work properly when the output queue size was changed. This has been fixed.

CSCdv66868

Previously, if you added or deleted serial links from the MLPPP bundle, the MLPPP interface showed erroneous input statistics. This no longer occurs.

CSCdv75271

A small percentage (less than 10%) of OC-12 ATM and OC-3 ATM line cards failed to boot while under the control of Cisco IOS software due to an unexpected Systems Error (SERR) interrupt. This has been fixed.

CSCdv79571

A problem between the release of Cisco IOS Release 12.0(15)SL and 12.0(17)SL occurred in which upgrading Cisco IOS software on some ATM networks failed because all packets, after a few seconds, were marked as ignored input errors. This no longer occurs.

CSCdv83722

Previously, when a VC was being OAM managed and the VCs were oversubscribed, the status of the VCs could continually change between up and down. This has been fixed.

CSCdv84423

Due to a race condition in the SAR firmware, in rare circumstances it was possible for a VC to become stuck in a close pending state and become unusable. This no longer occurs.

CSCdv85009

Previously, the Cisco 10000 series ESR did not respond to a traceroute if the destination IP address was in the range of x.x.x.224 to x.x.x.239. This has been fixed.

CSCdv85737

Previously, if you configured mcast, with multiple uplinks over ATM, the mcast connection could timeout every three minutes, requiring that the mcast groups be recreated.

Resolved Caveats in Cisco IOS Release 12.0(17)SL3

This section lists problems that were found and resolved in Cisco IOS Release 12.0(17)SL3.

CSCdu61078

Previously, you could not ping the Cisco 10000 series ESR over the PPLB group. This no longer occurs.

CSCdv34249

When a recursive route was added and all of its output interfaces were configured as per-packet load sharing, packets switched to this new route were per-destination load-shared. This has been fixed.

CSCdv48185

If multiple prefixes were configured through PPLB-enabled interfaces, and all the output interfaces of the router were configured for per-packet load sharing, and you added a recursive route, the packets switched through this new route were per-destination load-shared. This no longer occurs.

CSCdv58945

When large FDL packets of invalid lengths were received by the channelized ChOC-12 line card, the contents of the packet were printed on the line card console. In the case of a large FDL packet, excessive printing on the line card console caused the line card to reset. This has been fixed.

Resolved Caveats in Cisco IOS Release 12.0(17)SL2

This section lists problems that were found and resolved in Cisco IOS Release 12.0(17)SL2.

CSCdr19206

If you preconfigure a line card using the **card** command, PRE performance is no longer affected.

CSCdt93862

The access level issue that occurred when using the Web interface has been corrected.

CSCdt96234

If you enter the **wr mem** command, the router no longer fails.

CSCdu31306

A PFX stall error with 126 multilink PPPs in a QoS configuration no longer occurs.

CSCdu58727

Priority queues no longer experience tail drops when the line card is under heavy load.

CSCdu65451

Duplicate caveat, which was resolved (see CSCdu73749).

CSCdu87866

When you unconfigure and configure the router using the **copy tftp run** command, the router no longer stops responding.

CSCdv04992

A large increase in latency for multilink PPP bundles combined with an increase in the number of packet tail drops no longer causes a dramatic decrease in performance.

CSCdv05972

Duplicate caveat, which was resolved (see CSCdv12192).

CSCdv07513

The PFX stall error no longer occurs in column 6 during low traffic.

CSCdv08702

There is no longer a slow buffer leak when you run multicast input on MLP.

CSCdv12192

There is no longer a buffer leak in multilink PPP column 7.

Resolved Caveats in Cisco IOS Release 12.0(17)SL1

This section lists problems that are resolved in Cisco IOS Release 12.0(17)SL1.

CSCdt11794

If you enter the **dir disk0/1** command at the rommon prompt, a TLB (Store) Exception error message no longer appears.

CSCdu71387

If the router receives an IP packet with Ethernet padding over the MLP bundle, it now properly passes the packet to the line card.

CSCdu73749

When the router was configured with large numbers of routes, clearing the entire routing table caused high CPU use. In rare cases, the line cards or Cisco IOS software rebooted. This problem no longer occurs.

Caveats in Cisco IOS Release 12.0(17)SL

[Table 2](#) describes the caveats for the Cisco 10000 series ESR running Cisco IOS Release 12.0(17)SL.

Table 2 Cisco IOS Release 12.0(17)SL Caveats

Caveat	Description
CSCdp96265	<p>If you configure a DS3 BERT pattern 2^20-O153 on any unchannelized DS3 (by using the bert pattern 2^20-O153 interval 1-14400 command), and you then connect the line card to T-Bird 310 test set, the pattern does not synchronize with T-Bird 310.</p> <p>Workaround: Use a different BERT pattern.</p>
CSCdr25441	<p>The router sends out DHCP INFORM and DISCOVER messages containing an incorrect Ethernet address.</p> <p>Workaround: No workaround is necessary. This caveat is harmless because these DHCP messages are not used to acquire IP addresses. They are used to gather environmental data such as the domain name server address.</p>
CSCdr36564	<p>When you use the Frame Relay autosense feature, the Cisco 10000 series ESR sends all three LMI status message types immediately after the interface starts responding. However, sometimes the switch at the other end is not ready to receive messages and as a result, misses one or two messages that were sent. LMI autosense waits until the next scheduled interval (default is 1 minute) to send the messages again.</p> <p>This problem primarily affects clear channel CT3 interfaces.</p> <p>Workaround: There is currently no workaround.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCdr37991	<p>If you configure an STS-1 on a ChOC-12 line card as unchannelized and then configure the remote side to send idle-character marks (namely, 0xFF), the T3 line stops responding and transmits a Remote Alarm Indication (RAI).</p> <p>Workaround: When you use unchannelized T3 mode, configure the remote side to send idle-character flags (0x7E). To set this value, use the interface configuration mode idle-character command.</p>
CSCdr43835	<p>When you send large numbers of packets from the Gigabit Ethernet line card to the PRE in the Cisco 10000 series ESR, you may lose a small number of packets. This only occurs for some packet sizes at very high bandwidths, with loss rates of a few parts per million.</p> <p>Workaround: There is currently no workaround.</p>
CSCdr62013	<p>If large MLP configurations are in use, and you attempt to copy the configuration from a TFTP server directly into the running config, the copy may fail. Failures may include interfaces not appearing, or IPCP or LCP states not opening correctly.</p> <p>Workaround: These failures are far less likely to occur if the configuration is copied to bootflash, and then from bootflash to the running config. Copy the configuration file to the startup config and then reload the router.</p>
CSCdr81416	<p>Limited support exists for APS. For detailed information, refer to the “Automatic Protection Switching Support” section on page 5.</p>
CSCdr81671	<p>On rare occasions, the system cannot retrieve remote performance data if you are using a ChOC-12 line card that has its T1s configured with ANSI FDL enabled.</p> <p>Workaround: There is currently no workaround.</p>
CSCdr84775	<p>WRED does not drop outbound packets correctly on the Channelized T3 line card (CT3) in the default WRED configuration.</p> <p>Workaround: Change the WRED policy to a non-default value.</p>
CSCdr98341	<p>The Flash disk can fall into the chassis when you insert the disk into the empty space to the right of the slot B in the PRE flash assembly.</p> <p>Workaround: Pay extra attention when inserting a flash disk into the PRE flash assembly. Do not insert the disk in the empty space to the right of the slot B—<i>if you insert a card in that space, it will fall into the chassis.</i></p>
CSCds06423	<p>Some MPLS packets are CEF switched when they should be label switched. This condition occurs if the Cisco 10000 series ESR has two interfaces configured for label switching.</p> <p>Workaround: Configure only one interface for label switching.</p>
CSCds25069	<p>The default logging parameter (logging rate-limit console all 10 except critical) sets console logging to disabled.</p> <p>Workaround: Enter the logging console critical command to view the most important events such as card up/down and toaster failure events.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCds36324	<p>Mass configuration (which occurs during boot/reload and can occur during link state changes) takes a long period of time (for example, more than 40 minutes for 2000 VCs associated with a main interface) with large numbers of PVCs (100s to 1000s). This problem occurs when you attempt to configure large numbers of PVCs on the main interface (or multipoint subinterfaces) with static maps on each PVC.</p> <p>Workaround: Do not configure more than 500 PVCs on a single OC-12 ATM line card or more than 900 PVCs on a Cisco 10000 series ESR.</p>
CSCds40839	<p>After you enter the show controller command, occasionally an alarm LED appears as active even though no alarms are indicated</p> <p>Workaround: Perform a shut/no shut configuration on the SONET controller. For example:</p> <pre data-bbox="573 720 857 846">conf t controller sonet 7/0/0 shut no shut end</pre>
CSCds41791	<p>If you reload a Cisco 10000 series ESR, some initialization messages are logged to the console before the startup-config is loaded. These initialization messages are transitional and may report an incorrect state, especially for the FastEthernet interface.</p> <pre data-bbox="573 1003 1498 1266">00:00:15: Downloading Microcode: file=system:pxf/ucode_file, version=2.0(21.4), description=Nightly Build Software created Wed 13-Sep-00 00:38 00:00:21: %LINK-3-UPDOWN: Interface Ethernet0/0/0, changed state to up 00:00:21: %LINK-5-CHANGED: Interface FastEthernet0/0/0, changed state to reset 00:00:23: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0/0, changed state to up 00:00:23: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0/0, changed state to down</pre> <p>These messages do not appear in the buffered log.</p> <p>Workaround: Ignore these messages.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description																																																																																								
CSCds43837	<p>The show atm pvc command displays "Unexpected QoS type" for its traffic parameters. This occurs when a PVC was previously configured with only an ATM vc-class, and then the vc-class was subsequently deleted.</p> <p>For example:</p> <pre>sw-apollo-3(config)#vc-class atm test sw-apollo-3(config-vc-class)#vbr-nrt 1000 1000 10 sw-apollo-3(config-vc-class)#exit sw-apollo-3(config)#int atm 3/0/0 sw-apollo-3(config-if)#pvc 200 sw-apollo-3(config-if-atm-vc)#class-vc test sw-apollo-3(config-if-atm-vc)#end sw-apollo-3#sh atm vc</pre> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7"></th> <th style="text-align: right;">VCD /</th> <th colspan="3" style="text-align: right;">Peak Avg/Min</th> </tr> <tr> <th colspan="11">Burst</th> </tr> <tr> <th>Interface</th> <th>Name</th> <th>VPI</th> <th>VCI</th> <th>Type</th> <th>Encaps</th> <th>Kbps</th> <th>Kbps</th> <th>Cells</th> <th>Sts</th> <th></th> </tr> </thead> <tbody> <tr> <td>3/0/0</td> <td>1</td> <td>0</td> <td>200</td> <td>PVC</td> <td>SNAP</td> <td>1000</td> <td>1000</td> <td>10</td> <td>UP</td> <td></td> </tr> </tbody> </table> <pre>sw-apollo-3#</pre> <p>Now delete the vc-class:</p> <pre>sw-apollo-3#conf t sw-apollo-3(config)#no vc-class atm test sw-apollo-3(config)#end sw-apollo-3#sh atm vc</pre> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="7"></th> <th style="text-align: right;">VCD /</th> <th colspan="3" style="text-align: right;">Peak Avg/Min</th> </tr> <tr> <th colspan="11">Burst</th> </tr> <tr> <th>Interface</th> <th>Name</th> <th>VPI</th> <th>VCI</th> <th>Type</th> <th>Encaps</th> <th>Kbps</th> <th>Kbps</th> <th>Cells</th> <th>Sts</th> <th></th> </tr> </thead> <tbody> <tr> <td>3/0/0</td> <td>1</td> <td>0</td> <td>200</td> <td>PVC</td> <td>SNAP</td> <td>%Unexpected qos type</td> <td></td> <td></td> <td>UP</td> <td></td> </tr> </tbody> </table> <p>Workaround: Configure the vc directly using conventional means (non ATM vc-classes), or remove the vc and re-create it with a new ATM vc-class.</p>								VCD /	Peak Avg/Min			Burst											Interface	Name	VPI	VCI	Type	Encaps	Kbps	Kbps	Cells	Sts		3/0/0	1	0	200	PVC	SNAP	1000	1000	10	UP									VCD /	Peak Avg/Min			Burst											Interface	Name	VPI	VCI	Type	Encaps	Kbps	Kbps	Cells	Sts		3/0/0	1	0	200	PVC	SNAP	%Unexpected qos type			UP	
							VCD /	Peak Avg/Min																																																																																	
Burst																																																																																									
Interface	Name	VPI	VCI	Type	Encaps	Kbps	Kbps	Cells	Sts																																																																																
3/0/0	1	0	200	PVC	SNAP	1000	1000	10	UP																																																																																
							VCD /	Peak Avg/Min																																																																																	
Burst																																																																																									
Interface	Name	VPI	VCI	Type	Encaps	Kbps	Kbps	Cells	Sts																																																																																
3/0/0	1	0	200	PVC	SNAP	%Unexpected qos type			UP																																																																																
CSCds48362	<p>The show interface output occasionally displays an extremely large number of configured VCs which do not really exist.</p> <p>Workaround: There is currently no workaround.</p>																																																																																								
CSCds49222	<p>When a segment on a MPLS traffic engineered path is disabled, the PXF engine reloads, temporarily causing all forwarding to stop.</p> <p>Workaround: There is currently no workaround.</p>																																																																																								
CSCds49948	<p>With multiple PVP tunnels, if the aggregate traffic received by one or more of the PVPs is heavily oversubscribed (starting at about 110% of the tunnel's PCR rate), the traffic on companion PVP tunnels on that interface may experience throughput that is lower than expected.</p> <p>Workaround: There is currently no workaround.</p>																																																																																								
CSCds49957	<p>When you boot the Cisco 10000 series ESR, the system may display the following messages:</p> <pre>*Oct 17 12:32:48.287: %SNMP-3-TRAPBLOCK: Attempt to generate SNMP trap from a process with blocking disabled -Traceback= 60565064 606A6B34 60678238 60678438 6067AD88 6067AF30 602FCBDC 6024817C 60248168</pre> <p>Workaround: Ignore the messages.</p>																																																																																								

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCds50249	<p>If incoming multicast packets match an input access list that has the log option enabled, the output of the show log command and show access-list commands display double the number of matches.</p> <p>Workaround: There is currently no workaround.</p>
CSCds63025	<p>Line Protocol on one or two T1s may not come up when you perform a reload with a large configuration (for example, 1008 T1s with PPP encap or 504 MLPPPs).</p> <p>Workaround: Reload the line card using the command hw slot slot_number reset.</p>
CSCds63387	<p>When a redundant power supply is removed or a line card is OIRed, SNMP traps are generated by the syslog mib. There is a request to generate these traps using the env, mon, and entity MIBs respectively.</p> <p>Workaround: Filter the SNMP traps using the syslog MIB.</p>
CSCds67459	<p>When a serial interface is configured to be part of a MPLS/VPN, if you enter the no channelized command on the T3 controller, this clears the interface. However, the sh ip vrf vrf_name continues to show the interface as part of the vrf.</p> <p>Workaround: The only way to eliminate unwanted interfaces in the vrf table is to reload the box.</p>
CSCds68294	<p>In the unlikely event of a total failure of the cooling fan tray, or any other scenario resulting in high-temperature operation, the Cisco 10000 series ESR continues running, and does not power off.</p> <p>Workaround: If you observe fan failure or over-temperature alarms or log messages, immediately power off the chassis until the problem is corrected.</p>
CSCds69465	<p>Ping traffic does not resume after you switch from an explicit path to a dynamic path.</p> <p>Workaround: There is currently no workaround.</p>
CSCds74846	<p>When MPLS TE is configured and the logging console is turned on, the following error message appears repeatedly in the window:</p> <pre>"00:58:10: %TFIB-7-SCANSABORTED: TFIB scan not completing. MAC string updated."</pre> <p>Workaround: Leave the logging console turned off.</p>
CSCds86646	<p>ISIS adjacencies become recalculated with 65 to 85 MB of TCP traffic to the router.</p> <p>Workaround: Because this problem is caused by hackers, we recommend that you use access lists to block out hackers. Access lists prevent packets from punting to the RP and taking down the router.</p>
CSCds86767	<p>A Cisco 10000 series ESR router running Cisco IOS Release 12.0(10)SL may experience a buffer leak when interfaces are down (but not administratively down).</p> <p>Workaround: Administratively shut down the interfaces.</p>
CSCdt00312	<p>If you request deletion of a file from flash storage, the flash file delete function may choose an incorrect default device. The incorrect default used is slot0:.</p> <p>Workaround: When you specify the filename, prefix the filename with disk0:.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCdt04686	<p>During the reloading process, the match input-interface Serial3/0/0/1:0 configuration statement is not recognized and disappears from the configuration files after the Cisco 10000 series ESR is reloaded.</p> <p>Workaround: Reenter the match input-interface Serial3/0/0/1:0 command.</p>
CSCdt08501	<p>PVCs in the down state can still pass traffic. When a PVP is created with associated F4 OAM VCs, and those F4 OAM VCs do not appear (for instance, because there is no VP at the far end or the VP at the far end did not create F4 OAM VCs), traffic can still be passed on the PVCs associated with the PVP in question. When the F4 OAM loopback cells are not returned, Cisco IOS software declares all PVP associated PVCs to be down. IOS does not, however, notify the forwarding engine or the line card. This allows traffic routed over the PVCs in question to pass.</p> <p>Workaround: There is currently no workaround.</p>
CSCdt21254	<p>When the ACL is downloaded from the tftp server, the CPU advances to 100% utilization and several line cards lost IPC with the PRE and are reset.</p> <p>Workaround: Do not configure all 8000 lines of ACL. Split the ACL into several smaller ACLs and download them separately.</p>
CSCdt28444	<p>In a chassis using TACACS security and running redundant PREs, you can access the console while the secondary PRE is cutting over to primary PRE. If no action is taken on the console for the length of the session timeout period, TACACS engages on the console. If the user does access the console during the cutover, the user enters exec mode (not enable mode).</p> <p>Workaround: To help control security, set a short session timeout on the console port, and keep tight control of the enable password.</p>
CSCdt38819	<p>MALLOCFAIL with multicast traffic if a high rate of multicast traffic is sent out before multicast routing entries are updated.</p> <p>Workaround: There is currently no workaround. After the routing entries are updated, this problem disappears.</p>
CSCdt47342	<p>TFIB table failure.</p> <p>Workaround: There is currently no workaround. However, the table eventually updates.</p>
CSCdt50540	<p>Sometimes a traceback message is generated during an RPR+ switch over to the new primary PRE. A message similar to the following appears:</p> <pre>00:03:07: %IPC-5-INVALID: Sequence Structure port index=0x3 -Traceback= 60321EC0 60322868 60806A54 603348C8 60359924 60025B94 602828CC 602828B8</pre> <p>Workaround: This message is harmless. Ignore the message.</p>
CSCdt54684	<p>On rare occasions, if a large number of ds0 interfaces are configured on a CT3 line card, spurious memory error messages may appear.</p> <p>Workaround: There is currently no workaround.</p>
CSCdt55873	<p>On rare occasions in which relatively high rates of traffic bursts are received on the OC-12 ATM line card, some packets may be dropped but not counted by the software.</p> <p>Workaround: There is currently no workaround.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCdt57432	<p>If you use snmpwalk or other similar tool to display the value of the different objects associated with a Cisco 10000 series ESR, you can see that when an unchannelized DS3 controller has been created in a ChOC-12 line card, the configuration values of the DS3 MIB are not correct. If subsequent configuration commands are issued, the values displayed are correct. This problem probably exists in a channelized STM-1 line card as well, when in unchannelized DS3 mode.</p> <p>Workaround: Rely on the outcome of the show controller t3 and show interface serial commands.</p>
CSCdt57555	<p>Verilink-hibit mode does not work on the Cisco 10000 series ESR with ChOC-12 line cards whose paths are configured in unchannelized DS3 mode. When the Verilink-hibit mode is chosen by the network administrator, Verilink-lowbit mode is programmed in the hardware instead.</p> <p>Workaround: There is currently no workaround. You must use Verilink-lowbit mode.</p>
CSCdt63838	<p>The message Bad file magic number – cannot load bootflash appears.</p> <p>Workaround: Perform the following:</p> <ol style="list-style-type: none"> a. copy bootflash:<file> to disk0:<file> b. delete bootflash:<file> and squeeze bootflash: c. copy disk0:<file> bootflash:<file>
CSCdt64787	<p>At the end of the line in the show run command output, 0.0.0.0 is appended randomly.</p> <p>Workaround: Make sure that 0.0.0.0 is not in the running-config when saving it and then reusing it.</p>
CSCdt65387	<p>ChOC-12 DS3 substrate does not work in Kentrox mode at full bandwidth.</p> <p>Workaround: Set the ChOC-12 interface to Digital Link mode and full bandwidth (no dsu bandwidth). This works the same as the Kentrox CSU/DSU when set to full bandwidth, and will work with scrambling enabled or disabled (set the same value at both ends).</p>
CSCdt70049	<p>With 500 Frame Relay interfaces on CT3 running IP Multicast, multicast packets get punted to the RP causing IPC OIR on the CT3. This causes the line protocol on the router connected to the Cisco 10000 series ESR to go down (and remain down) on some interfaces. The interface stats show no traffic over the affected interface. On the Cisco 10000 series ESR the Frame Relay PVC corresponding to it shows as Deleted.</p> <p>Workaround: Perform a shut/no shut on the affected interface, or a hw-module slot reset on the line card to bring the line protocol back up.</p>
CSCdt76746	<p>In some cases, ATM counters display incorrect packet input values after receiving packets from several locations (for example, the line card, IOS, and the PXF forwarding engine).</p> <p>Workaround: There is currently no workaround.</p>

Table 2 Cisco IOS Release 12.0(17)SL Caveats (continued)

Caveat	Description
CSCdu10065	<p>If you reload microcode, and you have changed IP addresses on interfaces just before you reload, traffic may be forwarded to an incorrect interface.</p> <p>Workaround: Use the shutdown command to shutdown the interface experiencing the problem, and then reactivate it by using the no shutdown command.</p>
CSCdu22374	<p>When the Cisco 10000 series ESR is configured for 802.1q VLANs, the output of the show vlans command reports values that are higher than they should be, for the following parameters:</p> <ul style="list-style-type: none"> • gigabit Ethernet received packets • gigabit Ethernet received bytes • VLAN received packets <p>Workaround: There is currently no workaround.</p>
CSCdu22652	<p>If you perform a reload, the values for the transmitted and received output of the show vlans command indicates, incorrectly, that those values incremented.</p> <p>Workaround: There is currently no workaround.</p>
CSCdu25589	<p>When the destination IP address of an incoming 802.1q packet matches one of the IP addresses of the router, the output of the show vlans command for 802.1q packets increments two times. Ping request packets, however, are always counted correctly regardless of destination.</p> <p>Workaround: There is currently no workaround.</p>
CSCdu25747	<p>If you configure fair queueing on a frame relay interface with a large number of PVCs, and the traffic exceeds the link rate, several PVCs may experience a greater number of drops than other PVCs on that interface.</p> <p>Workaround: There is currently no workaround.</p>
CSCdu28935	<p>When the interface on the remote end is set to be administratively down, and you are attempting to bring up the PPP protocol, the status of the interface alternate between down and up until the PPP protocol is up.</p> <p>Workaround: There is currently no workaround.</p>
CSCdu32435	<p>If you configure 998 VPNs over VLAN, and you configure over 146 BGP routes per VPN, the BGP neighbor may start flapping.</p> <p>Workaround: There is no workaround, but the problem is less likely to occur if you configure fewer than 146 BGP routes per VPN.</p>
CSCdu34349	<p>If you configure more than 100 BGP routes per VPN, and there are more than 200 VPNs configured on the system, CEF may not function properly after redistributing.</p> <p>Workaround: Reduce the number of BGP routes per VPN to 100 or less.</p>
CSCdu40483	<p>If you enable multicast replication with an MLP bundle as the source, and the MLP broadcaster may exhibit behavior that is not compliant with MLP standards, then replication may not occur for all interfaces.</p> <p>Workaround: If replication does not occur on all interfaces, reload the microcode.</p>

Resolved Caveats in Cisco IOS Release 12.0(17)SL

This section lists problems that are resolved in Cisco IOS Release 12.0(17)SL. For a list of problems that were resolved in previous Cisco IOS Releases, refer to the release notes for those particular versions.

CSCdr32279

When you enter the **hw-module slot_number reset** command, and the logging console is configured to informational, the event sequence no longer appears in a different order than that shown by the **reload** command.

CSCdr52081 and CSCdj94209

Previously, the PRE could crash if you repeatedly changed a port back and forth from channelized to unchannelized. This no longer occurs.

CSCdr92058

Previously, large multicast groups could cause CPU hog issues with PIM. This has been fixed.

CSCds04367

When older CT3 line cards were powered on, with live DS3 signals present at the receive BNC connector, the receive line interface device on the board could possibly lock up, preventing the controller from running. This no longer occurs.

CSCds18665

If the interface between a PE (PE1) and CE router went down, MPLS labels would disappear at the far end provider edge peer (PE2) MPLS interface. This has been fixed.

CSCds36117

If you entered the **clear ip mroute** command on a system with large multicast groups, CPU hog issues could arise that caused problems of moderate severity (such as losing keepalives). This no longer occurs.

CSCds51102

Previously, if you performed an SNMP walk or viewed entries in the if table, cef-layer internal interfaces appeared in the interface table.

CSCds55667

Previously, the Kentrox DS3 subrate mode did not work when you set it to full bandwidth (45.2 Mbps on Kentrox CSU, 44210 kbps on a Cisco 10000 series ESR).

CSCds86293

If you issued the **dir** or **show slot0:** or **show slot1:** command, the router reported Open device slot0 failed (Device not ready). This has been fixed.

CSCds89640

If large OIDs (1024.1 fields) were sent to the router, the Cisco 10000 series ESR stopped responding. This no longer occurs.

CSCds91966

Previously, if you deleted a T1/E1, IP routes associated with subinterfaces were not removed.

CSCdt11390

On a Cisco 10000 series ESR system with channelized OC-12 line cards, the output of the **show controllers** command is now complete and correct.

CSCdt31691

When a large number of VBR-nrt VCs are configured (200 and above) and the link transitions DOWN, the host software running on the OC-12 ATM line card no longer takes a SW Watchdog timeout, forcing the line card firmware to reload.

CSCdt34428

If you perform OIR on a line card configured for 768 PPP sessions with traffic running on all interfaces, interfaces no longer fail to come up. The **show interface** command now displays the correct IPCP state.

CSCdt42890

On rare occasions, line cards would not be recognized when you performed an OIR of multiple cards on a new system, or in a system in which the configuration was erased (for example, using **write erase**). This has been fixed.

CSCdt63446

If an access-list with logging option enabled is attached to an interface, and you send traffic through the interface, the interfaces no longer go down.

CSCdt67315

Under circumstances where ATM VCs are created and deleted on a regular basis, the OC-12 ATM segmenter firmware will no longer transition to a state in which it drops some packets without counting them in a data stream where packet sizes alternate from small to large.

CSCdt74932

Previously, when a TU-AIS was received at a particular TU in TUG3#3, the next TU at the T1 or E1 level contained data corruption. This no longer occurs.

CSCdt76739

If you remove an APS configuration for a channelized OC-12 line card, and then issue the **show controllers sonet high_slot_number** command, or the **show controllers sonet** command, the Cisco 10000 series ESR no longer crashes.

Other Resolved Caveats

This section includes caveats listed in previous release notes that are listed as resolved because they are unreproducible or do not affect the behavior of the Cisco 10000 series ESR. In the event a caveat listed in this section causes problems, please contact Cisco customer service.

For a list of unreproducible caveats in previous Cisco IOS Releases, refer to the release notes for those particular releases.

CSCdr47500

During periods of heavy traffic (approaching interface line rate), some interfaces experienced inconsistent performance between interfaces of the same type.

CSCdr72007

The number of VPNs that could be created on gigabit Ethernet subinterfaces was limited to under 100.

CSCdr82363

When the encapsulation mode was changed from PPP to HDLC or vice-versa, the system dropped about 3 of the next 10 packets transmitted. After that, the packets were transmitted normally.

CSCdr82579

When a ChOC-12 line card was reconfigured from a channelized T3 configuration to an unchannelized T3 configuration or vice-versa, the initial packets were not forwarded.

CSCds01233

If you sent a large number of small packets in large multicast groups, this could cause certain debug messages to appear on the console.

CSCds64134

Occasionally, after you reloaded routers (with background traffic load equal to no_drop rate), the throughput was 3 to 400 pps below the expected rate.

CSCds65431

On rare occasions, after a single reload while under load, the Gigabit Ethernet line card was up, but dropped nearly all packets on the output queue.

CSCdt12602

If some interfaces flapped continuously in a Frame-Relay environment, the interface statistics reported input errors (overruns) on the flapping interfaces.

CSCdt19582

Following a reload of the Cisco IOS software, the Gigabit Ethernet interface did not always come back up. The interface remained in the "GigabitEthernet1/0/0 is down, line protocol is down" state.

CSCdt25901

During a reload, if the router continuously received IP packets, CPUHOG messages may appeared in the log, and the router may took longer to come up.

CSCdt28191

After you reloaded line cards under background traffic load, one or more interfaces would not come up.

CSCdt33623

If you issued a **write erase** command on the primary PRE followed by an **erase sec-nvram:** command, and then reloaded both PREs simultaneously, some line cards would not be recognized correctly on reboot.

CSCdt40511

The router stopped responding after several hours of receiving multicast traffic over 500 CT3 ds0 Frame Relay interfaces, at a rate of 10 pps of 260-byte packets.

CSCdt41680

The **ip address negotiate** command sent dynamic host configuration protocol (DHCP) requests out to all serial line interfaces.

CSCdt50591

In some test instances, Frame Relay interfaces did not correctly join a multicast group when it should have. The result is that multicast packets destined for those interfaces will be punted to the route processor. If enough packets were received, the CPU usages on the route processor to run at a high usage.

CSCdt53363

On rare occasions, when a large number of ds0 interfaces was configured on a CT3 line card, buffer with corrupt pool pointer error messages would appear.

CSCdt63854

Under rare conditions in which scripts of VC creates and VC deletes were executed in turn, some VBR-nrt VCs were not created.

Obtaining Documentation

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

World Wide Web

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

- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>

Documentation CD-ROM

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

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on the World Wide Web, you can submit technical comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco.

You can e-mail your comments to bug-doc@cisco.com.

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

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

We appreciate your comments.

Obtaining Technical Assistance

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

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

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

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

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

<http://www.cisco.com>

Technical Assistance Center

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

Contacting TAC by Using the Cisco TAC Website

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

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

P3 and P4 level problems are defined as follows:

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

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

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

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

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

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

Contacting TAC by Telephone

If you have a priority level 1 (P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

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

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

CCIP, the Cisco *Powered* Network mark, the Cisco Systems Verified logo, Cisco Unity, Follow Me Browsing, FormShare, Internet Quotient, iQ Breakthrough, iQ Expertise, iQ FastTrack, the iQ Logo, iQ Net Readiness Scorecard, Networking Academy, ScriptShare, SMARTnet, TransPath, and Voice LAN are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, Discover All That's Possible, The Fastest Way to Increase Your Internet Quotient, and iQuick Study are service marks of Cisco Systems, Inc.; and Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, the Cisco IOS logo, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherSwitch, Fast Step, GigaStack, 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. (0203R)

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