



# Release Notes for Cisco 2691 and Cisco 2600XM Series Routers with Cisco IOS Release 12.4(11)XJ

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**March 26, 2008**

**Cisco IOS Release 12.4(11)XJ6**

**OL-12255-02 Third Release**

**Last Updated: September 24, 2008**

These release notes describe new features and significant software components for the Cisco 2691 and Cisco 2600XM series routers that support the Cisco IOS Release 12.4(11)XJ releases. These release notes are updated as needed to describe new memory requirements, new features, new hardware support, software platform deferrals, microcode or modem code changes, related document changes, and any other important changes. Use these release notes with the [Cross-Platform Release Notes for Cisco IOS Release 12.4T](#) located on [Cisco.com](#) and the Documentation CD.

For a list of the software caveats that apply to Release 12.4(11)XJ, see the “[Caveats](#)” section on [page 10](#) and [Caveats for Cisco IOS Release 12.4\(11\)T](#). The online caveats document is updated for every maintenance release and is located on [Cisco.com](#) and the Documentation CD.

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**Americas Headquarters:**

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

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# System Requirements

This section describes the system requirements for Release 12.4(11)XJ and includes the following sections:

- [Memory Requirements, page 2](#)
- [Hardware Supported, page 5](#)
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## Memory Requirements

[Table 1](#) describes the memory requirements for the Cisco IOS feature sets supported by Cisco IOS Cisco IOS Release 12.4(11)XJ on the Cisco 2691 and Cisco 2600XM series routers.

**Table 1**      **Recommended Memory for the Cisco 2691 and Cisco 2600XM Series Routers with Cisco IOS Release 12.4(11)XJ**

Platform	Image Name	Feature Set	Image	Flash Memory (MB)	DRAM (MB)
2610XM 2611XM 2620XM 2621XM 2650XM 2651XM	Cisco 2600 IPV-AESK9 Feat Set Factory Upgrade for Bundles  Cisco 2600 AISK9-AESK9 Feat Set Factory Upgrade for Bundles  Cisco 2600 SPSK9-AESK9 Feat Set Factory Upgrade for BundlesS	Feat Set Factory Upgrade For Bundles	c2600-adventerprisek9-mz	48	256
	Cisco 2600 INT Voice/Video, IPIPGW, TDMIP GW AES	INT Voice/Video, IPIPGW, TDMIP GW AES	c2600-adventerprisek9_ivs-mz	64	256
	Cisco 2600 Advanced Enterprise Services with SNA Switch	Advanced Enterprise Services with SNA Switch	c2600-adventerprisek9_sna-mz	48	256
	Cisco 2600 Advanced IP Services  Cisco 2600 IPV-AISK9 Feat Set Factory Upgrade for BundlesS  Cisco 2600 SPSK9-AISK9 Feat Set Factory Upgrade for Bundles	Advanced IP Services  Feat Set Factory Upgrade for BundlesS	c2600-advipservicesk9-mz	48	192
	Cisco 2600 Advanced Security	Advanced Security	c2600-advsecurityk9-mz	32	128
	Cisco 2600 Enterprise Base without Crypto	Enterprise Base without Crypto	c2600-entbase-mz	32	128
	Cisco 2600 Enterprise Base	Enterprise Base	c2600-entbasek9-mz	32	128
	Cisco 2600 Enterprise Services without Crypto	Enterprise Services without Crypto	c2600-entservices-mz	48	192

**Table 1**      **Recommended Memory for the Cisco 2691 and Cisco 2600XM Series Routers with Cisco IOS Release 12.4(11)XJ (continued)**

Platform	Image Name	Feature Set	Image	Flash Memory (MB)	DRAM (MB)
2610XM 2611XM 2620XM 2621XM 2650XM 2651XM	Cisco 2600 Enterprise Services Cisco 2600 IPV-ESK9 Feat Set Factory Upgrade for Bundles Cisco 2600 SPSK9-ESK9 Feat Set Factory Upgrade for Bundles	Enterprise Services Feat Set Factory Upgrade for Bundles	c2600-entservicesk9-mz	48	192
	Cisco 2600 IP Base without Crypto	IP Base without Crypto	c2600-ipbase-mz	32	128
	Cisco 2600 IP Base	IP Base	c2600-ipbasek9-mz	32	128
	Cisco 2600 IP Voice without Crypto	IP Voice without Crypto	c2600-ipvoice-mz	48	192
	Cisco 2600 INT Voice/Video, IPIP GW, TDMIP GW	INT Voice/Video, IPIP GW, TDMIP GW	c2600-ipvoice_ivs-mz	64	256
	Cisco 2600 IP Voice	IP Voice	c2600-ipvoicek9-mz	48	192
	Cisco 2600 SP Services Cisco 2600 IPV-SPSK9 Feat Set Factory Upgrade for Bundles	SP Servoces Feat Set Factory Upgrade for BundlesS	c2600-spservicesk9-mz	48	192
	Cisco 2600 TELCO Feature SEt	TELCO Feature SEt	c2600-telco-mz	32	128
2691	Cisco 2691 Advanced Enterprise Services	Advanced Enterprise Services	c2691-adventerprisek9-mz	64	256
	Cisco 2691 INT Voice/Video, IPIPGW, TDMIP GW AES	INT Voice/Video, IPIPGW, TDMIP GW AES	c2691-adventerprisek9_ivs-mz	64	256
	Cisco 2691 Advanced Enterprise Services with SNA Switching	Advanced Enterprise Services with SNA Switching	c2691-adventerprisek9_sna-mz	64	256
	Cisco 2691 Advanced IP Services	Advanced IP Services	c2691-advipservicesk9-mz	64	256
	Cisco 2691 Advanced Security	Advanced Security	c2691-advsecurityk9-mz	64	256
	Cisco 2691 Enterprise Base without Crypto	Enterprise Base without Crypto	c2691-entbase-mz	64	256
	Cisco 2691 Enterprise Base	Enterprise Base	c2691-entbasek9-mz	64	256

**Table 1**      **Recommended Memory for the Cisco 2691 and Cisco 2600XM Series Routers with Cisco IOS Release 12.4(11)XJ (continued)**

Platform	Image Name	Feature Set	Image	Flash Memory (MB)	DRAM (MB)
2691	Cisco 2691 Enterprise Services without Crypto	Enterprise Services without Crypto	c2691-entservices-mz	64	256
	Cisco 2691 Enterprise Services	Enterprise Services	c2691-entservicesk9-mz	64	256
	Cisco 2691 IP Base without Crypto	IP Base without Crypto	c2691-ipbase-mz	32	128
	Cisco 2691 IP Base	IP BAsE	c2691-ipbasek9-mz	32	128
	Cisco 2691 IP Voice without Crypto	IP Voice without Crypto	c2691-ipvoice-mz	64	256
	Cisco 2691 INT Voice/Video, IPIP GW, TDMIP GW	INT Voice/Video, IPIP GW, TDMIP GW	c2691-ipvoice_ivs-mz	64	256
	Cisco 2691 IP Voice	IP Voice	c2691-ipvoicek9-mz	64	256
	Cisco 2691 SP Services	SP Services	c2691-spservicesk9-mz	64	256
SLT	Cisco SLT Series IOS SS7 Signaling Link Termination	IOS SS7 Signaling Link Termination	c2600-ipss7-mz	16	64

## Hardware Supported

Cisco IOS Release 12.4(11)XJ supports the Cisco 2691 and Cisco 2600XM series routers.

For descriptions of existing hardware features and supported modules, see the hardware installation guides, configuration and command reference guides, and additional documents specific to the Cisco 2691 and Cisco 2600XM series routers, which are available on [Cisco.com](http://www.cisco.com) and the Documentation CD at the following location:

[http://www.cisco.com/univercd/cc/td/doc/product/access/acs\\_mod/2600/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/2600/index.htm)

This URL is subject to change without notice. If it changes, point your web browser to [Cisco.com](http://www.cisco.com), and click the following path:

**Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Cisco 2600 Series Routers: <platform\_name>**

## Determining the Software Version

To determine which version of Cisco IOS software is currently running on your Cisco 2691 or Cisco 2600XM series router, log in to the router and enter the **show version** EXEC command. The following sample output from the **show version** command indicates the version number.

```
router> show version
Cisco Internetwork Operating System Software
IOS (tm) C2691 Software (C2691-Y7-MZ), Version 12.4(11)XJ, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
Synched to technology version 12.4(11)T
```

## Upgrading to a New Software Release

For general information about upgrading to a new software release, refer to the *Software Installation and Upgrade Procedures* located at [http://www.cisco.com/warp/public/130/upgrade\\_index.shtml](http://www.cisco.com/warp/public/130/upgrade_index.shtml).

## Feature Set Tables

The Cisco IOS software is packaged in feature sets consisting of software images, depending on the platform. Each feature set contains a specific set of Cisco IOS features. Release 12.4(11)XJ supports the same feature sets as Releases 12.4 and 12.4(11)T, but Release 12.4(11)XJ includes new features supported by the Cisco 2691 and Cisco 2600XM series routers.



### Caution

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

[Table 2](#) lists the feature and feature sets supported in Cisco IOS Release 12.4(11)XJ

The tables use the following conventions:

- In—The number in the ‘In’ column indicates the Cisco IOS release in which the feature was introduced. For example, “12.4(11)XJ” indicates that the feature was introduced in 12.4(11)XJ. If a cell in this column is empty, the feature was included in a previous release or in the initial base release.
- Yes—The feature is supported in the software image.
- No—The feature is not supported in the software image.



### Note

These feature set tables contain only a selected list of features, which are cumulative for Release 12.4(4)*nn* early deployment releases only (*nn* identifies each early deployment release). The tables do not list all features in each image—additional features are listed in [Cross-Platform Release Notes for Cisco IOS Release 12.4\(11\)T](#) and Release 12.4(11)T Cisco IOS documentation.

**Table 2** *Cisco IOS Release 12.4(11)XJ Feature List for Cisco 2691 and Cisco 2600XM Series Routers*

Feature	In	Image
<a href="#">CME SIP Features</a>	12.4(11)XJ	See <a href="#">Table 1</a> for image names.
<a href="#">HWIC and VLAN Feature Enhancements</a>		
<a href="#">Security and QoS Feature Enhancements for the IP VSAT Satellite WAN NM</a>		
<a href="#">Security and QoS Feature Enhancements for the IP VSAT Satellite WAN NM</a>		
<a href="#">VRF-Aware H.323 and SIP for Voice Gateways</a>		

## New and Changed Information

This section contains the following information:

- [New Hardware Features in Release 12.4\(11\)XJ4](#), page 7
- [New Software Features in Release 12.4\(11\)XJ4](#), page 7
- [New Hardware Features in Release 12.4\(11\)XJ3](#), page 7
- [New Software Features in Release 12.4\(11\)XJ3](#), page 7
- [New Hardware Features in Release 12.4\(11\)XJ2](#), page 8
- [New Software Features in Release 12.4\(11\)XJ2](#), page 8
- [New Hardware Features in Release 12.4\(11\)XJ](#), page 8
- [New Software Features in Release 12.4\(11\)XJ](#), page 8
- [New Features in Release 12.4\(11\)T](#), page 9

### New Hardware Features in Release 12.4(11)XJ4

There are no new hardware features for this release.

### New Software Features in Release 12.4(11)XJ4

There are no new software features for this release.

### New Hardware Features in Release 12.4(11)XJ3

There are no new hardware features for this release.

### New Software Features in Release 12.4(11)XJ3

There are no new software features for this release.

## New Hardware Features in Release 12.4(11)XJ2

There are no new hardware features for this release.

## New Software Features in Release 12.4(11)XJ2

There are no new software features for this release.

## New Hardware Features in Release 12.4(11)XJ

The following new hardware feature is supported in this release:

- [HWIC and VLAN Feature Enhancements, page 8](#)

### HWIC and VLAN Feature Enhancements

The Cisco Fast Ethernet HWICs are single-wide interface cards, available as a 1-port HWIC (HWIC-1FE) and as a 2-port HWIC (HWIC-2FE), that provide Cisco modular and integrated services routers with additional line-rate Layer 3 routed ports. The following enhancements have been made in Cisco IOS Release 12.4(11)XJ:

- Extended VLAN ID
- HWIC-1FE Routed Port
- HWIC one FE and two FE ports

For more information about these features, see the following documentation on Cisco.com:

- *Cisco Interface Cards Hardware Installation Guide*  
[http://www.cisco.com/en/US/products/hw/modules/ps2641/products\\_module\\_installation\\_guide\\_book09186a0080692b21.html](http://www.cisco.com/en/US/products/hw/modules/ps2641/products_module_installation_guide_book09186a0080692b21.html)
- *Cisco Network Modules and Interface Cards Regulatory Compliance and Safety Information*  
[http://www.cisco.com/en/US/products/hw/modules/ps2797/products\\_regulatory\\_approvals\\_and\\_compliance09186a0080183b96.html](http://www.cisco.com/en/US/products/hw/modules/ps2797/products_regulatory_approvals_and_compliance09186a0080183b96.html)

## New Software Features in Release 12.4(11)XJ

The following new software features are supported in this release:

- [CME SIP Features, page 9](#)
- [Security and QoS Feature Enhancements for the IP VSAT Satellite WAN NM, page 9](#)
- [Security and QoS Feature Enhancements for the IP VSAT Satellite WAN NM, page 9](#)
- [VRF-Aware H.323 and SIP for Voice Gateways, page 9](#)



## CME SIP Features

### MoH, Dialing, Line Updates, Presence with BLF, Provisioning New Phones

A presence service, as defined in RFC 2778 and RFC 2779, is a system for finding, retrieving, and distributing presence information from a source, called a presence entity (presentity), to an interested party called a watcher. When you configure presence in a Cisco Unified CME or Cisco Unified SRST system with a SIP WAN connection, a phone user, or watcher, can monitor the real-time status of another user at a directory number, the presentity.

<http://www.cisco.com/univercd/cc/td/doc/product/voice/its/cme41/cme410ft.htm>

## Security and QoS Feature Enhancements for the IP VSAT Satellite WAN NM

Feature enhancements for the IP VSAT Satellite WAN NM (NM-1VSAT-GILAT) including Security, QoS, Centralized IP Address Management, Local Firmware upgrade & configurable VSAT configuration password.

## SIP REFER

### Outside the Scope of a Dialog Created with an INVITE

Out-of-dialog REFER (OOD-R) allows remote applications to establish calls by sending a REFER message to a SIP gateway without an initial INVITE.

<http://www.cisco.com/univercd/cc/td/doc/product/voice/its/cme41/cme410ft.htm>

## VRF-Aware H.323 and SIP for Voice Gateways

VPN routing and forwarding (VRF) divides a physical router into multiple logical routers, each having its own set of interfaces and routing and forwarding tables. Adding VRF-awareness to voice gateways allows a voice gateway to exist in the same router as a customer edge (CE) or provider edge (PE) WAN router.

The VRF-Aware H.323 and SIP for Voice Gateways feature adds single voice VRF support to session-initiated protocol (SIP), H.323, and IP-to-IP gateways and to Cisco Survivable Remote Site Telephony routers. For more information, see the following link on Cisco.com:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios124/124newft/124limit/124x/124xj11/vrfawvgw.htm>

## New Features in Release 12.4(11)T

For information regarding the features supported in Cisco IOS Release 12.4T, see the Cross-Platform Release Notes and New Feature Documentation links at the following location on [Cisco.com](http://www.cisco.com):

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios124/124relnt/xprn124/index.htm>

This URL is subject to change without notice. If it changes, point your web browser to [Cisco.com](http://Cisco.com), and follow this path:

**Service & Support: Technical Documents: Cisco IOS Software: Release 12.4: Release Notes: Cross-Platform Release Notes (Cisco IOS Release 12.4 T)**

## Limitations and Restrictions

There are no known limitations or restrictions.

## Caveats

Caveats describe unexpected behavior or defects in the Cisco IOS software releases. Severity 1 caveats are the most serious caveats, severity 2 caveats are less serious, and severity 3 caveats are the least serious of these three severity levels.

Caveats in Cisco IOS Release 12.4(11)T are also in Cisco IOS Release 12.4(11)XJ. For information on caveats in Cisco IOS Release 12.4(11)T, refer to the [Caveats for Cisco IOS Release 12.4\(11\)T](#) document. This document lists severity 1 and 2 caveats; the documents are located on [Cisco.com](http://Cisco.com) and the Documentation CD.



### Note

If you have an account with [Cisco.com](http://Cisco.com), you can also use the Bug Toolkit to find select caveats of any severity. To reach the Bug Toolkit, log in to [Cisco.com](http://Cisco.com) and click **Service & Support: Technical Assistance Center: Tool Index: Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

This section contains the following caveat information:

- [Open Caveats - Cisco IOS Release 12.4\(11\)XJ6, page 10](#)
- [Resolved Caveats - Cisco IOS Release 12.4\(11\)XJ6, page 11](#)
- [Open Caveats - Cisco IOS Release 12.4\(11\)XJ4, page 11](#)
- [Resolved Caveats - Cisco IOS Release 12.4\(11\)XJ4, page 11](#)
- [Open Caveats - Cisco IOS Release 12.4\(11\)XJ3, page 13](#)
- [Resolved Caveats - Cisco IOS Release 12.4\(11\)XJ3, page 13](#)
- [Open Caveats - Cisco IOS Release 12.4\(11\)XJ2, page 13](#)
- [Resolved Caveats - Cisco IOS Release 12.4\(11\)XJ2, page 13](#)
- [Open Caveats - Cisco IOS Release 12.4\(11\)XJ, page 15](#)
- [Resolved Caveats - Cisco IOS Release 12.4\(11\)XJ, page 15](#)

## Open Caveats - Cisco IOS Release 12.4(11)XJ6

There are no open caveats in this release.

## Resolved Caveats - Cisco IOS Release 12.4(11)XJ6

CSCsh12480

Cisco IOS software configured for Cisco IOS firewall Application Inspection Control (AIC) with a HTTP configured application-specific policy are vulnerable to a Denial of Service when processing a specific malformed HTTP transit packet. Successful exploitation of the vulnerability may result in a reload of the affected device.

Cisco has released free software updates that address this vulnerability.

A mitigation for this vulnerability is available. See the “Workarounds” section of the advisory for details.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20080924-iosfw.shtml>.

CSCsg91306

Multiple vulnerabilities exist in the Session Initiation Protocol (SIP) implementation in Cisco IOS that can be exploited remotely to trigger a memory leak or to cause a reload of the Cisco IOS device.

Cisco has released free software updates that address these vulnerabilities. Fixed Cisco IOS software listed in the Software Versions and Fixes section contains fixes for all vulnerabilities addressed in this advisory.

There are no workarounds available to mitigate the effects of any of the vulnerabilities apart from disabling the protocol or feature itself, if administrators do not require the Cisco IOS device to provide voice over IP services.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20080924-sip.shtml>.

## Open Caveats - Cisco IOS Release 12.4(11)XJ4

There are no open caveats in this release.

## Resolved Caveats - Cisco IOS Release 12.4(11)XJ4

CSCse56501

A device running Cisco IOS software that has Internet Protocol version 6 (IPv6) enabled may be subject to a denial of service (DoS) attack. For the device to be affected by this vulnerability the device also has to have certain Internet Protocol version 4 (IPv4) User Datagram Protocol (UDP) services enabled. To exploit this vulnerability an offending IPv6 packet must be targeted to the device. Packets that are routed throughout the router can not trigger this vulnerability. Successful exploitation will prevent the interface from receiving any additional traffic. The only exception is Resource Reservation Protocol (RSVP) service, which if exploited, will cause the device to crash. Only the interface on which the vulnerability was exploited will be affected.

Cisco is providing fixed software to address this issue. There are workarounds available to mitigate the effects of the vulnerability.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20080326-IPv4IPv6.shtml>.

## CSCsg70474

Multiple voice-related vulnerabilities are identified in Cisco IOS software, one of which is also shared with Cisco Unified Communications Manager. These vulnerabilities pertain to the following protocols or features:

- Session Initiation Protocol (SIP)
- Media Gateway Control Protocol (MGCP)
- Signaling protocols H.323, H.254
- Real-time Transport Protocol (RTP)
- Facsimile reception

Cisco has made free software available to address these vulnerabilities for affected customers. Fixed Cisco IOS software listed in the Software Versions and Fixes section contains fixes for all vulnerabilities mentioned in this advisory.

There are no workarounds available to mitigate the effects of any of the vulnerabilities apart from disabling the protocol or feature itself.

This advisory is posted at

<http://www.cisco.com/warp/public/707/cisco-sa-20070808-IOS-voice.shtml>

## CSCsi01470

A vulnerability in the Cisco implementation of Multicast Virtual Private Network (MVPN) is subject to exploitation that can allow a malicious user to create extra multicast states on the core routers or receive multicast traffic from other Multiprotocol Label Switching (MPLS) based Virtual Private Networks (VPN) by sending specially crafted messages.

Cisco has released free software updates that address this vulnerability. Workarounds that mitigate this vulnerability are available.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20080326-mvpn.shtml>.

## CSCsi60004

Multiple voice-related vulnerabilities are identified in Cisco IOS software, one of which is also shared with Cisco Unified Communications Manager. These vulnerabilities pertain to the following protocols or features:

- Session Initiation Protocol (SIP)
- Media Gateway Control Protocol (MGCP)
- Signaling protocols H.323, H.254
- Real-time Transport Protocol (RTP)
- Facsimile reception

Cisco has made free software available to address these vulnerabilities for affected customers. Fixed Cisco IOS software listed in the Software Versions and Fixes section contains fixes for all vulnerabilities mentioned in this advisory.

There are no workarounds available to mitigate the effects of any of the vulnerabilities apart from disabling the protocol or feature itself.

This advisory is posted at

<http://www.cisco.com/warp/public/707/cisco-sa-20070808-IOS-voice.shtml>

CSCsi80749

Multiple voice-related vulnerabilities are identified in Cisco IOS software, one of which is also shared with Cisco Unified Communications Manager. These vulnerabilities pertain to the following protocols or features:

- Session Initiation Protocol (SIP)
- Media Gateway Control Protocol (MGCP)
- Signaling protocols H.323, H.254
- Real-time Transport Protocol (RTP)
- Facsimile reception

Cisco has made free software available to address these vulnerabilities for affected customers. Fixed Cisco IOS software listed in the Software Versions and Fixes section contains fixes for all vulnerabilities mentioned in this advisory.

There are no workarounds available to mitigate the effects of any of the vulnerabilities apart from disabling the protocol or feature itself.

This advisory is posted at

<http://www.cisco.com/warp/public/707/cisco-sa-20070808-IOS-voice.shtml>

## Open Caveats - Cisco IOS Release 12.4(11)XJ3

There are no open caveats in this release.

## Resolved Caveats - Cisco IOS Release 12.4(11)XJ3

There are no resolved caveats in this release.

## Open Caveats - Cisco IOS Release 12.4(11)XJ2

There are no open caveats in this release.

## Resolved Caveats - Cisco IOS Release 12.4(11)XJ2

CSCec12299

Devices running Cisco IOS versions 12.0S, 12.2, 12.3 or 12.4 and configured for Multiprotocol Label Switching (MPLS) Virtual Private Networks (VPNs) or VPN Routing and Forwarding Lite (VRF Lite) and using Border Gateway Protocol (BGP) between Customer Edge (CE) and Provider Edge (PE) devices may permit information to propagate between VPNs.

Workarounds are available to help mitigate this vulnerability.

This issue is triggered by a logic error when processing extended communities on the PE device.

This issue cannot be deterministically exploited by an attacker.

Cisco has released free software updates that address these vulnerabilities. Workarounds that mitigate these vulnerabilities are available.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20080924-vpn.shtml>.

#### CSCsf08998

Multiple voice-related vulnerabilities are identified in Cisco IOS software, one of which is also shared with Cisco Unified Communications Manager. These vulnerabilities pertain to the following protocols or features:

- Session Initiation Protocol (SIP)
- Media Gateway Control Protocol (MGCP)
- Signaling protocols H.323, H.254
- Real-time Transport Protocol (RTP)
- Facsimile reception

Cisco has made free software available to address these vulnerabilities for affected customers. Fixed Cisco IOS software listed in the Software Versions and Fixes section contains fixes for all vulnerabilities mentioned in this advisory.

There are no workarounds available to mitigate the effects of any of the vulnerabilities apart from disabling the protocol or feature itself.

This advisory is posted at

<http://www.cisco.com/warp/public/707/cisco-sa-20070808-IOS-voice.shtml>

#### CSCsd85587

A vulnerability has been discovered in a third party cryptographic library which is used by a number of Cisco products. This vulnerability may be triggered when a malformed Abstract Syntax Notation One (ASN.1) object is parsed. Due to the nature of the vulnerability it may be possible, in some cases, to trigger this vulnerability without a valid certificate or valid application-layer credentials (such as a valid username or password).

Successful repeated exploitation of any of these vulnerabilities may lead to a sustained Denial-of-Service (DoS); however, vulnerabilities are not known to compromise either the confidentiality or integrity of the data or the device. These vulnerabilities are not believed to allow an attacker will not be able to decrypt any previously encrypted information.

The vulnerable cryptographic library is used in the following Cisco products:

- Cisco IOS, documented as Cisco bug ID CSCsd85587
- Cisco IOS XR, documented as Cisco bug ID CSCsg41084
- Cisco PIX and ASA Security Appliances, documented as Cisco bug ID CSCse91999
- Cisco Unified CallManager, documented as Cisco bug ID CSCsg44348
- Cisco Firewall Service Module (FWSM)

This vulnerability is also being tracked by CERT/CC as VU#754281.

Cisco has made free software available to address this vulnerability for affected customers. There are no workarounds available to mitigate the effects of the vulnerability.

This advisory is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20070522-crypto.shtml>.

**Note**

Another related advisory is posted together with this Advisory. It also describes vulnerabilities related to cryptography that affect Cisco IOS. A combined software table for Cisco IOS only is available at <http://www.cisco.com/warp/public/707/cisco-sa-20070522-cry-bundle.shtml> and can be used to choose a software release which fixes all security vulnerabilities published as of May 22, 2007. The related advisory is published at <http://www.cisco.com/warp/public/707/cisco-sa-20070522-SSL.shtml>.

## Open Caveats - Cisco IOS Release 12.4(11)XJ

There are no open caveats in this release.

## Resolved Caveats - Cisco IOS Release 12.4(11)XJ

CSCse89321: DTMF path not getting confirmed in sip media forking call

**Symptom** There is no end-to-end DTMF path confirmation.

**Workaround** There is no workaround.

CSCsf26561: User portion of Diversion header is incorrect when calling through AA

**Symptom** Tests on customer setup have revealed that PSTN to AA --> tx to SCCP phone--> CFWD to CUE/PSTN has an issue. The 302 Moved Temporarily from CME to BroadSoft has a Diversion header whose user portion is the private extension #, not the expanded DID # due to which the subsequent call fails.

**Workaround** Remove the dialplan-pattern.

CSCsf32028: Host portion of Refer-To: header must be an Address of Record

**Symptom** SIP trunking environments (for example, Cbeyond) need the URIs to carry Address of Record [AOR] in many SIP headers.

**Workaround** There is no workaround.

CSCsg17289: DNS-SRV issues for SIP registrations

**Symptom** Registrar, both the dial-peers would try to send a REGISTER request sequentially. When first Dial-peer (D1) is sending REGISTER Request, the registrar cache is empty. It first sends a DNS query (SRV). After getting the DNS Response, it updates the Registrar cache and sends the REGISTER request to Registrar R1. dns\_count variable here is set to SIP\_DNS\_MODE.

When second dial-peer is sending REGISTER request, it finds the resolved IP address in registrar cache (R1) so it sends the REGISTER request to R1. dns\_count variable here is set to SIP\_NON\_DNS\_MODE. But both the REGISTER request fails as R1 is down.

As D1 is set to SIP\_DNS\_MODE, D1 would send a DNS query again with incremented dns\_count to get any alternate Registrar and it gets R2. It sends REGISTER request to R2 and gets successfully registered. As D2 is set to SIP\_NON\_DNS\_MODE, it does not retry the DNS query and simply backs off for period REG\_EXPIRES/20.

**Workaround** There is no workaround.

CSCsg18902: Blind transfer is not working on SIP trunk

**Symptom** Blind transfer failed on SCCP endpoint over SIP trunk

**Conditions** When session-target is configured but outbound-proxy is not configured.

**Workaround** There is no workaround.

CSCsg30101:CME: dtmf-relay force rtp-nte CLI does not work

**Symptom** The **voice-class sip dtmf-relay force rtp-nte** command does not work.

**Conditions** Call comes from PSTN gw to CUE-AA, w/offer SDP of g711u, 100(NSE) CME invite's the CUE by offering g711u and NOTIFY for DTMF. CUE replies with g711u & NOTIFY for DTMF CME replies to the PSTN gw with only g711u codec with the software image.

As a result, rfc2833 is not negotiated and hence DTMF is sent raw inband. When PSTN caller presses DTMF digits after being prompted by AA, nothing works, since the CME cannot convert raw-inband DTMF to NOTIFY. With 12.4-4T3 the CME replied to the PSTN gw with g711u and rfc2833(PT=101).

**Workaround** There is no workaround.

CSCsg39750: Spurious mem access/traceback while resetting sip phone with presence

**Symptom** Spurious memory access and traceback is encountered while resetting the SIP phone (7961). After configuring presence with CME.BLF speed dial entries, the status is not updated for the watched phones.

**Workaround** There is no workaround.



CSCsg46362: contact header incorrect in 302 message using sip-srst redirect mode

**Symptom** The contact header ip address is incorrect in the 302 message sent by SIP SRST in redirect mode. As the result basic call fails in this mode. B2b mode is working okay.

**Workaround** Use b2b mode.

CSCsg46411: CME does not send a REFER over SIP trunk for calls involving AA

**Symptom** CME fails to send a REFER over the SIP trunk for calls coming into the CUE-AA and being transferred to a local extension.

**Conditions** The CUE does a BYE-Also transfer and the CME is supposed to look at the Also: header and put that into the URI for REFER message.

**Workaround** There is no workaround.

CSCsg51244: CME does not send 3xx messages for transfer --> forward scenarios

**Symptom** CME does not send a 3xx message during call fwd if there was a call-transfer invoked before the call-forward happens.

**Conditions** With only **no suppl service sip refer** configured on CME at global level, we do not see the CME sending a 3xx over the SIP trunk to BSFT, Instead, a wrong reINVITE (only g711u, no dynamic payload 101) is seen when the call is forwarded to B's mailbox. This could potentially cause DTMF issues for PSTN caller. For PSTN to extension-A(DID #) CFNA to A's voicemail, the CME does send a 3xx as expected. Therefore, when a transfer is done before a forward to voicemail happens, the CME does not send a 3xx.

**Workaround** There is no workaround.

CSCsg51259: DTMF stops working after consult transfer to called party mailbox

**Symptom** PSTN connects to extension A, A transfers to B, B's CUE voicemail answers due to CFNA, A does a full consult transfer to B's CUE voicemail.

**Conditions** The call goes through fine, and the caller can leave a message for B, but DTMF fails even if signaling shows that 101 payload was negotiated for the SIP trunk. So if the caller wants to re-record or mark the message urgent, it does not work, although the message gets recorded.

**Workaround** There is no workaround.

CSCek61666: Ephone DNS get stuck in SEIZE state under certain conditions

**Symptom** Ephone DNS gets stuck in seize state under certain conditions, particularly under the following sequence:

1. phone-A has multiple trunk-DNS configured.
2. Call comes in on one of trunk-DN, say DN1. Call is answered and the transfer button is pressed and another extension (DN3) is dialed. The dialed extension answers the call.
3. At this time, the user on phone-A goes offhook on another trunk DN (say DN2), and dials one digit.
4. The PSTN user who is connected to DN1 hangs up and so does DN3

The above sequence gets both channels of DN1 into SEIZE state.

**Conditions** The rootcause of the issue was narrowed down to trunkdial flag that is part of the skinnyCB structure which is maintained per-phone. So, when DN2 goes offhook this trunkdial flag is set. When trunkdial flag is ON, all state transitions in the DN is ignored in SkinnyUpdateCallState. So, all state transitions are ignored for DN1 when the call is being cleared because the trunkdial flag is set for the entire phone rather than the specific DN.

**Workaround** CSCek61570 resolves this issue in the Cisco IOS 12.4(XC) throttle using a mechanism where the state transitions are not ignored it is not the active DN with trunkdial flag still in the skinnyCB structure. Make the trunkdial flag per-DN specific rather than per-phone.

CSCek37305: Cisco 7200 router crashes at get\_hwidb\_if\_same

**Symptom** Router crashes on unconfiguring T1 controller with interface configured for RTP priority.

**Conditions** This is seen on 7200 NPE-G1 router loaded with 12.2(31.4.17)SB image

**Workaround** A workaround is to ensure that the **ip rtp priority** or **ip rtp reserve** command is removed before deleting the interface.

CSCek39470: Router memory leak due to pak subblock chunk leaking with crypto+BVI

**Symptom** Cisco IOS router running 12.4 may experience per packet memory leak due to pak subblock leak in Process memPool (not in IO mem pool). The symptom is: **show proc mem 1** output seeing the first allocator's memory count is keep growing, and never decrease.

**Conditions** The leak is observed with BVI (Bridge-group Virtual Interface) interface configured with crypto ipsec tunnels. Specifically when the router is doing decryption, then send the decrypted packet to BVI interface.

**Workaround** Shutdown any BVI (Bridge-group Virtual Interface) if being used in a router with crypto ipsec configured.

CSCek45272: NAT overload failing with static mappings

**Symptom** NAT overloading from inside source address to an outside interface may fail.

**Conditions** The symptom was seen when translation ports were specified in an access-list associated to a route map and a second static NAT translation condition. Traffic which should have been NATed via the primary NAT overload statement failed because of the specified translation ports being used in second NAT translation condition. This occurred even though the traffic to be NATed did not meet the conditions of the second static NAT translation condition.

**Workaround** Remove the ip nat inside source interface X overload statement and then re-add it. The AT translations will then worked correctly until the next router reload.

CSCek61570: Trunk dn stuck in seize/seize state and does not recover

**Symptom** The ephone DN may get stuck in SEIZED state and one-way audio would occur afterwards.

Conditions: If another call is dropped during trunk dialing, the DN for this terminated call would move to seized state.

**Workaround** Press ENDCALL softkey twice to move the seized DN to idle state after finishing the and trunk call. To work around the one-way audio issue, the call needs to be transferred out and then transferred back.

CSCek62099: MLP: PPPoE encap not applied to CEF switched non-MLP packets

**Symptom** When PPP Multilink is enabled over a PPP over Ethernet (PPPoE) session, outbound packets are incorrectly sent without PPPoE headers. This causes them to be dropped.

**Conditions** Symptom is observed in IOS version 12.4 on all software-forwarding router platforms. It only affects packets which are not multilink encapsulated (due to the bundle only having a single link).

**Workaround** Either disable multilink PPP, or use the ppp multilink fragment delay interface command to force multilink headers to be applied to all outbound packets.

CSCir00074: Router crashes when casnDisconnect is set to true for pppoe session

**Symptom** A router crashes when the casnDisconnect object is set to “true” for a PPPoE session.

**Conditions** This symptom is observed on a Cisco 10000 series when you attempt to terminate the PPPoE session through SNMP by using the casnDisconnect object of the ISCO-AAA-SESSION-MIB.

**Workaround** There is no workaround.

CSCir00530: CJ-Ph2:Entry missing in cefcModuleTable for a CJ PA in Escort slot

**Symptom** Entry for Crackerjack PA missing from cefcModuleTable.

**Conditions** SNMPGet on the table is issued.

**Workaround** There is no workaround.

CSCsc48536: A router may reload unexpected due to bus error at ipnat\_lock\_nat

**Symptom** A Cisco router may reload unexpectedly with a bus error exception.

**Conditions** This symptom has been observed on a router with Network Address Translation (NAT) enabled.

**Workaround** There is no workaround.

CSCsd50476: When channel-group configured serial interface goes down CSCse35510  
OER misidentifying overlapping prefixes

**Symptom** A serial link goes down.

**Conditions:** This symptom occurs when a T1/E1 controller that is configured with channel-group causes the serial link to go down. The CEM interface will not come up.

**Workaround** There is no workaround.

CSCse46648: IP Address Getting Removed From Interface On Deleting Crypto Config

**Symptom** IP address removal from a physical interface

**Conditions** When IPSEC connection fails and the **ip unnumbered config** is applied on the virtual template

**Workaround** Use cryptomaps, wit vtis, to configure the ip address on the physical interface and re attempt connection.

CSCse88584: Router proposes the default ISKMP policy if configured one does not  
matc

**Symptom** Router is proposing the default ISAKMP policy if the configured one does not match

**Workaround** There is no workaround.

CSCsf16536: IOSIPS - router crashes at tw\_timer\_start with sig action denyFlowInline

**Symptom** A Cisco IOS router may experience a unexpected reload.

**Conditions** This problem occurs when the router has IPS (Intrusion Prevention Systems) configured, and one or more attack signatures has the denyFlowInline action enabled.

**Workaround** Do not enable the denyFlowInline action for any IPS signatures.

CSCsf27796: 1841 router reloads at retparticle with %SYS-2-BADSHARE error

**Symptom** A 1841 router may reload at retparticle with %SYS-2-BADSHARE errors.

**Conditions:** The router must be running crypto traffic using a dialer interface over a GSHDSL interface.

**Workaround** There is no workaround.

CSCsg02881: MLP: Bandwidth of down MLP group should be sum of member bandwidths

**Symptom** The bandwidth of a multilink group interface that is down does not reflect the actual bandwidths of the links that are configured as members of the multilink group. In Cisco IOS Release 12.4(8) and later, the multilink interface bandwidth reflects the bandwidth of the last link in the bundle prior to going down. In earlier versions, the bandwidth is restored to 100000 Kbps.

**Conditions** This symptom is observed when the multilink interface is down. The bandwidth is correct when the multilink bundle is up.

**Workaround** There is no workaround.

CSCsg10159: Successive Default route ctrl fails on different link but on same router

**Symptom** Default route withdrawn message is send from BR immediately after successful control of default roue. And prefix goes to DEFAULT state.

**Conditions** This only happens if OER system has only one BR and static routing protocol is used. The bug is limited to default route prefix only.

**Workaround** Use non-default route prefix.

CSCsg12813: Speech loss after receiving MDCX from PGW

**Symptom** A Cisco AS5400 gateway may change its RTP sequence numbers after receiving a MDCX command. The RTP Stream SSRC is always the same but the Sequence Number seems to be randomly initiated again.

**Conditions** MGCP receives a modification request from PGW for echo cancellation 3 seconds after the call is established.

**Workaround** There is no workaround.

CSCsg16186: SCMAbort Event crash seen on NPE-G2

**Symptom** System may crash during bootup.

**Conditions** When PA-MCX-8TE1+ is in the system and 256MB IO Memory is configured.

**Workaround** Reduce IO memory in the configuration.

Further Problem Description: You should see SCM Abort message in the crash info file.

CSCsg16748: ABR deletes OSPF type 3 LSA after it received max-aged type 2 LSA

**Symptom** In the situation ABR has both type 2 LSA and type 1 LSA for a prefix, ABR deletes type 3 LSA if it received max-aged type 2 LSA.

**Workaround** The workaround of this issue is configuring **timers lsa arrival** and **timers throttle lsa all** or **timers lsa-interval**.

CSCsg33172: IPS 5.0: Provide more informational error message XML and names

**Symptom** A few inconsistent error message.

**Conditions** Some SDEE messages aren't consistent with SDEE schema.

**Workaround** There is no workaround.

CSCsg38907: rip - redistribute static: redistributed prefixes have metric 16

**Symptom** Under some conditions redistributed static routes are sent out with metric 16

**Conditions** \* the static route for a subnet of a classfull network has a next-hop in another classfull network that is not enabled under rip. The rip update is sent out to a subnet within the same major network that the prefix of the static is about

**Workaround** Enable the next-hop network under rip. Configure distribute-list to filter the update.

CSCsg39216: ezvpn tunnel traffic with **acl** keyword is not excluded from NAT

**Symptom** When EZVPN client is configured with “**acl**” keyword, the tunneled (vpn) traffic also gets NATed.

**Conditions** This only happens if there is a NAT configuration that includes the interesting VPN traffic. The tunneled traffic should be bypassed from NAT when the VPN is up.

Example:

```
crypto ipsec client ezvpn hwclient
connect auto
group cisco key cisco123
mode network-extension
peer 10.1.1.1
acl 103
```

```
access-list 103 permit ip 192.168.100.0 0.0.0.255 192.168.1.0 0.0.0.255
```

This occurs when the following is true:

- 1) ezvpn client is configured
- 2) interesting tunnel traffic is defined using the “**acl**” keyword under global ezvpn configuration
- 3) NAT is configured

**Workaround** Use **crypto ipsec ezvpn client <ezvpn-name> inside** on the interface instead of **acl** keyword under ezvpn global configuration.

CSCsg39961: crash sending pki request to CA CSCsg43460 Improve NPE-G2 ENVN handling

**Symptom** A router may unexpectedly reload when trying to send a PKI request to a CA.

**Conditions** The router must be configured with crypto PKI trustpoints.

**Workaround** Because this is a 1 byte redzone overrun, the following will prevent the crashes, and will display error messages instead. First, to prevent the usage of chunks, configure **no memory lite**. Second, configure **exception memory ignore overflow processor** to correct the redzone overrun.

CSCsg46546: Erroneous alerting during pickup with CSCek58324 scenario

**Symptom** Pickup will result in alerting from the pickup target instead of connected.

**Conditions** Two calls come into a trunk monitor dn. The first one to come in is answered. The second one is then answered on the same phone using the line button. Another phone uses the pickup softkey to dial the first incoming call, which is now on hold.

**Workaround** This issue only appears to occur on the second scenario of the above after a router reload.

CSCsg47834: NACK is observed for Open voice channel command

**Symptom** NACK message may be received from 5510 DSP in response to Open Voice Channel command sent by the Cisco IOS software.

```
2568288: Oct 24 13:11:33.240: //-1/xxxxxxxxxxxx/HPI/[]/hpi_tx_global_debug_info:
      DSP 3/0x3 port INVALID_CHANNEL_STATE(85), info 0x01(1)
      DSP 3/0x00000003 port mode CLOSED(1), state UNDEFINED(133), NACKed message
74/0x4A @0
      DSP message header 0008 0003 004A 0001 Payload: 0x0000 0x0000 0xFFFF 0x0000
```

**Conditions** This problem may be observed when a same 5510 DSP is used as a Transcoding and Voice Termination resource.

#### Workaround

1) Disable Transcoding

(or)

2) Make sure that the Transcoding and Voice Termination are on different DSP(s).

This can be performed by configuring the maximum number of transcoding sessions to a value such that it would require a multiple of 240 DSP credits.

Example 1:

In the following configuration each transcoding session (complexity=high) will require 40 DSP credits. In order to use a multiple of 240 credits, we need to set the maximum transcoding sessions to 6 ( $6 * 40 = 240$ ) or any multiple of 6.

```
dspfarm profile 1 transcode
  codec g711ulaw
  codec g729r8
  associate application SCCP
```

```
Router(conf-t)#dspfarm profile 1 transcode
Router(config-dspfarm-profile)#maximum sessions 6
```

Example 2:

In the following configuration each transcoding session (complexity=medium) will require 30 DSP credits. In order to use a multiple of 240 credits, we need to set the maximum transcoding sessions to 8 ( $8 * 30 = 240$ ) or any multiple of 8.

```
dspfarm profile 2 transcode
  codec g711ulaw
```



```

codec g711alaw
codec g729ar8
codec g729abr8
associate application SCCP

```

```

Router(config-t)#dspfarm profile 2 transcode
Router(config-dspfarm-profile)#maximum sessions 8

```

Use **show voice dsp group all** command to verify DSP resource allocation.



**Note** Each 5510 DSP has 240 Credits. This work-around cannot be implemented if the router has only one PVDM2-16 which has only one DSP.

CSCsg48183: Unforeseen ARP request send from all interfaces

**Symptom** A router may unexpectedly send an ARP request from all its active interfaces to the nexthop of the network of an SNMP server.

**Conditions** This symptom is observed on a Cisco router that has the **snmp-server host** command enabled after any of the following actions occur:

- Reload the router.
- A switchover of the active RP occurs.
- Enter the **redundancy force-switchover main-cpu** command.

**Workaround** There is no workaround.

CSCsg57228: IPS5.0: c871 reloads using IOS-S222 package file

**Symptom** Router crashes loading the IOS signature package file

**Conditions** Appeared to happen the most on the Cisco 871 and Cisco 2600 platforms.

**Workaround** There is no workaround.

CSCsg68199: Trunk DN offhook is not propagated to a phone already in dial out mode

**Symptom** Two IP Phones A and B are registered with Cisco CallManager Express; these phones share two trunk DN's 1 & 2. If Phone-A goes offhook on DN-1 and Phone-B immediately goes offhook on DN-2. This condition should show the DN-2 button on Phone-A as busy which is not happening.

**Conditions** This happens only when trunk DN's are used and they go offhook in quick succession on different phones and are in dialing mode.

**Workaround** There is no workaround.

CSCsg68711: Incoming call in background does not audibly ring after transfer commit

**Symptom** Phone does not ring for the second incoming call after committing transfer at alert for the first call.

**Conditions** While transferring a trunk DN call, a call comes in. After committing the transfer at alert, the incoming call still doesn't ring on the phone.

**Workaround** There is no workaround.

CSCsg70221: DTMF through the hairpin of a trunk DN does not work

**Symptom** DTMF tones are being suppressed to prevent duplicate DTMF tones from being extended to an SCCP controlled VG224 port. This problem is direct result of a fix implemented for correct CSCsf98754. The lack of DTMF prevents IVR devices from working correctly

**Conditions** PSTN -- FXO --- CME GATEWAY --- VG224/FXS --- IVR

A call comes into a FXO port that is part of a trunk group and gets transferred to an extension that is hanging off of a vg224. DTMF is not relayed to the end point

**Workaround** Set the transfer system to full blind to prevent the blocking of the DTMF.

CSCsg70355: Adopt new default summer-time rules from Energy Policy Act of 2005

**Symptom** Starting in calendar year 2007, daylight savings summer-time rules may cause Cisco IOS to generate timestamps (such as in syslog messages) that are off by one hour.

**Conditions** The Cisco IOS configuration command, **clock summer-time zone recurring**, uses United States standards for daylight savings time rules by default. The Energy Policy Act of 2005 (H.R.6.ENR), Section 110 changes the start date from the first Sunday of April to the second Sunday of March, and it changes the end date from the last Sunday of October to the first Sunday of November.

**Workaround** A workaround is possible by using the clock summer-time configuration command to manually configure the proper start date and end date for daylight savings time. After the summer-time period for calendar year 2006 is over, one can for example configure:

```
clock summer-time PDT recurring 2 Sun Mar 2:00 1 Sun Nov 2:00
```

(this example is for the US/Pacific time zone)

CSCsg73806: Runaway debugs: AFW\_Module\_ObjectCount pCallIndSs

**Symptom** A router may display the following message to the console repeatedly:

```
AFW_Module_ObjectCount pCallIndSs 1
```

This is a cosmetic error. With the fix, this message will only be seen with debugs enabled.

**Conditions** This is seen on voice routers.

**Workaround** There is no workaround.

CSCsg78801: 4.x MinHits or 5.0 event-count not summarizing correctly

**Symptom** Min hit or event count not resetting correctly

**Conditions** Will fire signature on 1st occurrence of event, but never resets correctly so may or may not continue to fire signature.

**Workaround** There is no workaround.

CSCsg90212: VSA: Add code to handle CRNG failure interrupt

**Symptom** When VSA encounters a Continual RNG failure, the IOS will print the message

VSA encountered CRNG failure

**Workaround** There is no workaround.

## Related Documentation

The following sections describe the documentation available for the Cisco 2691 and Cisco 2600XM series routers. Typically, these documents consist of hardware and software installation guides, Cisco IOS configuration and command references, system error messages, feature modules, and other documents. Documentation is available as printed manuals or electronic documents, except for feature modules, which are available online on [Cisco.com](http://Cisco.com) and the Documentation CD.

Use these release notes with the documents listed in the following sections:

- [Release-Specific Documents](#)
- [Platform-Specific Documents](#)

## Release-Specific Documents

The following documents are specific to Release 12.4 and apply to Cisco IOS Release 12.4(11)XJ. They are located on [Cisco.com](http://Cisco.com) and the Documentation CD (under the heading Service & Support):

- To reach the *Cross-Platform Release Notes for Cisco IOS Release 12.4(11)T*, click this path:  
**Technical Documents: Cisco IOS Software: Release 12.4: Release Notes: Cisco IOS Release 12.4(11)T**
- To see other features that are supported on various Cisco platforms in Cisco IOS Release 12.4(11)XJ, go to the following document on Cisco.com:

*Cisco IOS Release 12.4 Special and Early Deployments*

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios124/124reInt/rnspls/rnxc.htm>

- To reach product bulletins, field notices, and other release-specific documents, click this path:

**Technical Documents: Product Bulletins**

- To reach the *Caveats for Cisco IOS Release 12.4* and *Caveats for Cisco IOS Release 12.4(11)T* documents, which contain caveats applicable to all platforms for all maintenance releases of Release 12.4, click this path:

**Technical Documents: Cisco IOS Software: Release 12.4: Caveats**



#### Note

If you have an account with [Cisco.com](http://www.cisco.com), you can also use the Bug Toolkit to find selected caveats of any severity. To reach the Bug Toolkit, log in to [Cisco.com](http://www.cisco.com), and click **Service & Support: Technical Assistance Center: Tool Index: Bug Toolkit**. Another option is to go to [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

## Platform-Specific Documents

Hardware installation guides, configuration and command reference guides, and additional documents specific to the Cisco 2691 and Cisco 2600XM series routers are available on [Cisco.com](http://www.cisco.com) and the Documentation CD at the following location:

[http://www.cisco.com/univercd/cc/td/doc/product/access/acs\\_mod/2600/index.htm](http://www.cisco.com/univercd/cc/td/doc/product/access/acs_mod/2600/index.htm)

This URL is subject to change without notice. If it changes, point your web browser to [Cisco.com](http://www.cisco.com), and click the following path:

**Cisco Product Documentation: Access Servers and Access Routers: Modular Access Routers: Series Integrated Services Routers: <platform\_name>**

## CiscoFeature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image. Feature Navigator is available 24 hours a day, 7 days a week.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at [cdadmin@cisco.com](mailto:cdadmin@cisco.com). If you do not have an account on Cisco.com, go to <http://www.cisco.com/register> and follow the directions to set up an account.

To use Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript support and enabling instructions for other browsers, check with the browser vendor.

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

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

## Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents.

### Documentation Modules

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

Select your release and click the command references, configuration guides, or any other Cisco IOS documentation you need.

## Open Source License Acknowledgements

The following notices pertain to this software license.

### OpenSSL/Open SSL Project

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>).

This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).

This product includes software written by Tim Hudson (tjh@cryptsoft.com).

### License Issues

The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact [openssl-core@openssl.org](mailto:openssl-core@openssl.org).

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