Release Notes for Cisco 7000 Family for Cisco IOS Release 12.2(14)SU1

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These release notes describe changes to the software for the Cisco 7000 family for Cisco IOS Release 12.2(14)SU1.

Contents

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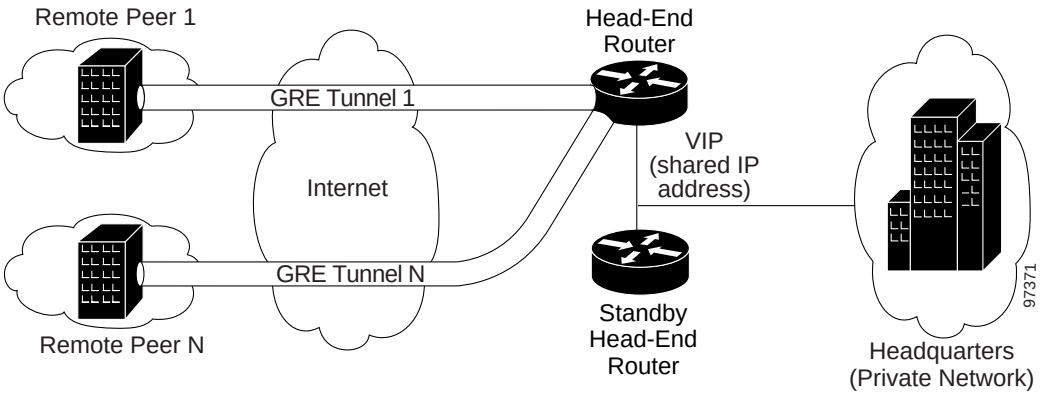
Introduction

Cisco IOS Software Release 12.2(14)SU1 features stateful failover of IPSec security associations (SAs) for site-to-site VPN (see Figure 1), storage of encrypted pre-shared keys in the configuration, Cisco 7200 NPE-G1 processor support, and VAM2 crypto card support (DES and 3DES only). Cisco IOS Software Release 12.2(14)SU1 is based on Cisco IOS Release 12.2(14)SU.

Figure 1 shows a sample topology for site-to-site configuration of IPSec Stateful Failover with Generic Routing Encapsulation (GRE), a tunnel interface not tied to specific "passenger" or "transport" protocols.

GRE supports multicast traffic, critical for V3PN applications.

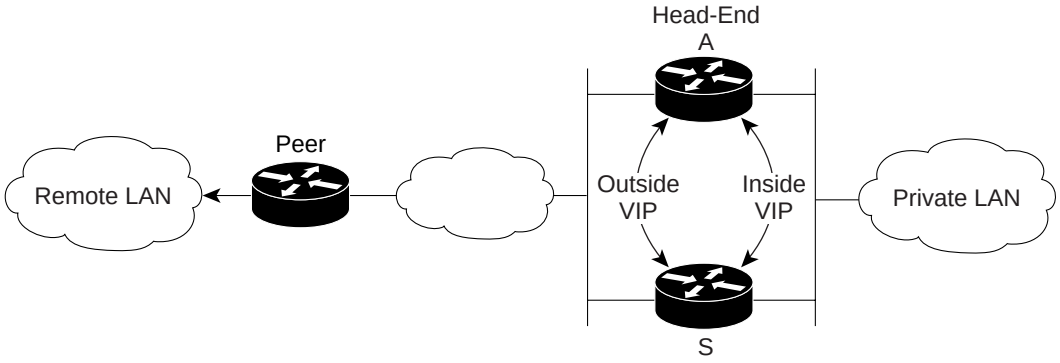
Figure 1 Site-to-Site VPN Configuration



There are four possible configurations for the Cisco 7200 series routers using Cisco IOS Release 12.2(14)SU1:

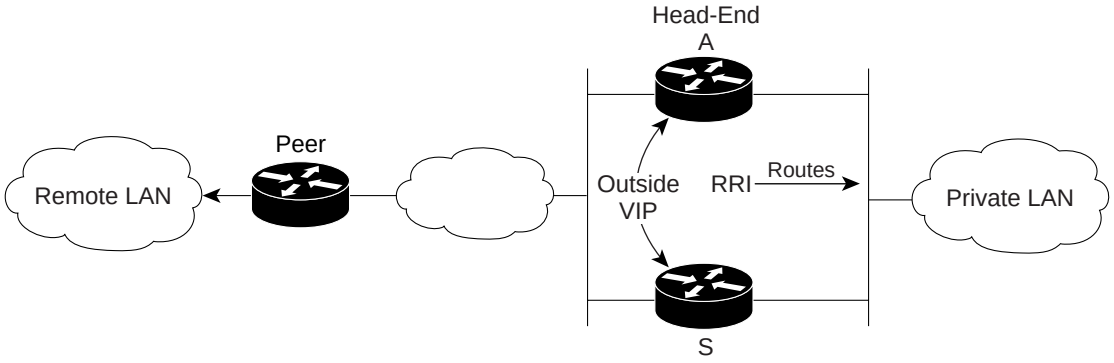
- non-GRE High Availability (HA) with a virtual IP (VIP), or redundancy groups, on the outside and a VIP on the inside (see Figure 2)
- non-GRE HA with only VIPs on the outside. The route to the outside is provided by Reverse Route Injection (RRI) (see Figure 3)
- GRE HA, with VIPs on the outside and inside interfaces (see Figure 4)
- GRE HA, with only a VIP on the outside, using RRI to inject routes (see Figure 5)

Figure 2 HSRP VIP on Inside and Outside



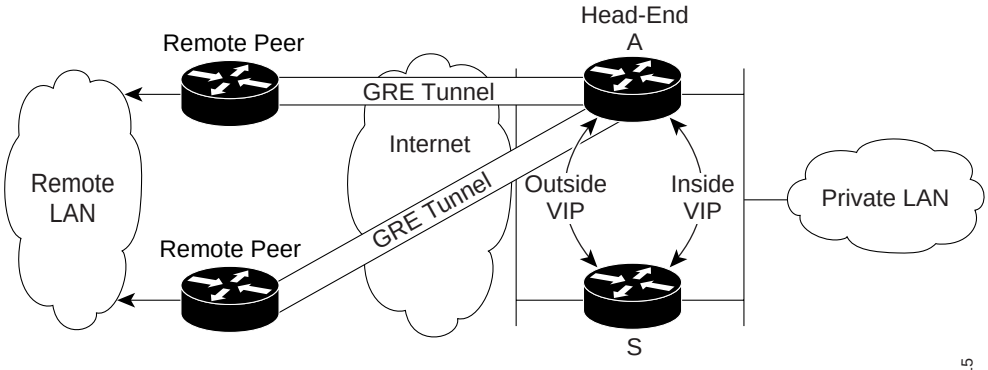
Inside VIP configured as default gateway
for route from private LAN to remote LAN

Figure 3 HSRP VIP on Outside, RRI Injected Routes on Inside



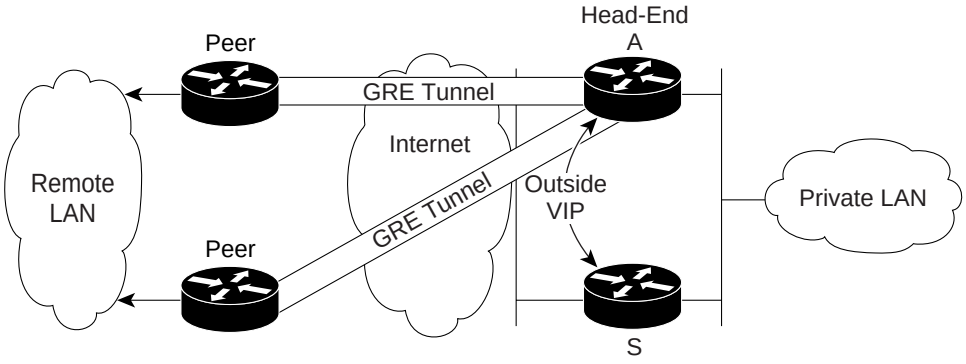
Reverse Route Injection (RRI) is configured
on the head-end router when the tunnel is forming.
RRI injects static routes to the remote network.

Figure 4 GRE HA with VIPs on the Outside and Inside Faces



Inside VIP configured as default gateway
for route from private LAN to remote LAN

Figure 5 GRE HA with Only a VIP on the Outside, Using RRI to Inject Routes



Reverse Route Injection (RRI) is configured
on the head-end router when the tunnel is forming.
RRI injects static routes to the remote network.

Features

There are no new features in Cisco IOS Release 12.2(14)SU1. However, several caveats have been resolved.

Table 1 provides a summary of the Cisco IOS Release 12.2(14)SU1 performance guidelines.

Note Performance may vary depending on the actual features enabled, however these guidelines offer general guidelines for stable deployment. Contact Cisco TAC for guidelines outside of these parameters.

Table 1 Performance Guidelines

Feature	Description
Number of tunnels	• 2000 tunnels [2000 IKE SA: 4000 IPSec SA] for Cisco 7200 with NPE-G1 or NPE400 with VAM/VAM2 • 500 tunnels for Cisco 7200 with NPE225 with VAM/VAM2
GRE	1000 GRE/IPSec tunnels

Limitations

The Cisco IOS Release 12.2(14)SU1 shares the same set of limitations as 12.2(14)SU, including the following:

- No EzVPN support for Stateful Failover
- Only single VAM/VAM2 support in the high availability (HA) configuration
- IPSec stateful solution is incompatible with old style IKE keepalives but is compatible with DPD (Note: DPD is not a requirement for IPSec stateful HA solution)
- No AES support in Cisco IOS Release 12.2(14)SU1
- No NAT-T features

System Requirements

This section includes the following topics:

Memory Requirements

Table 2 lists the software images and corresponding memory requirements for the Cisco 7200 series routers in Cisco IOS Release 12.2(14)SU1.

Note For a complete list of the minimum memory recommendations for the Cisco 7200 series of routers in Cisco IOS Release 12.2, go to the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122/122feats.htm#55814

Note It is recommended that you upgrade your boot image with the c7200-kboot-mz boot helper image when using Cisco IOS Release 12.2(14)SU1.

Table 2 Software Images and Memory Recommendations for Cisco IOS Release 12.2(14)SU1

Platform	Feature Set	Image Name	Flash Memory Required	Minimum DRAM
Cisco 7200	Cisco IOS IP/FW/IDS/IPSec 3DES	c7200-ik9o3s-mz	64 MB	256 MB
	Cisco IOS IP Plus/IPSec 3DES	c7200-ik9s-mz	64 MB	256 MB
	Cisco IOS Enterprise/FW/IDS/IPSec 3DES	c7200-jk9o3s-mz	64 MB	256 MB
	Cisco IOS Enterprise/IPSec 3DES	c7200-jk9s-mz	64 MB	256 MB
	Cisco IOS Enterprise IPSec 3DES	c7200-kboot-mz	64 MB	256 MB

Hardware Supported

Cisco IOS Software Release 12.2(14)SU1 supports the Cisco 7200 series routers with NPE- 225, NPE-400, and NPE-G1 processors, as well as the VPN Acceleration Module (VAM) and VAM2 crypto cards (DES and 3DES only).

Note Cisco IOS Software Release 12.2(14)SU1 supports only a single VAM/VAM2 in the HA configuration.

For additional information about supported hardware for these platforms, refer to the Hardware/Software Compatibility Matrix in the Cisco Software Advisor at the following URL:

http://www.cisco.com/cgi-bin/front.x/Support/HWSWmatrix/hwswmatrix.cgi

Determining the Software Version

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

Note The following example shows output from the Cisco 7200 series router.

```
router> show version

Cisco Internetwork Operating System Software
IOS (tm) 7200 series Software c7200-jk9o3s-mz, Version 12.2(14)SU1, RELEASE SOFTWARE
```

Upgrading to a New Software Release

For general information about upgrading to a new software release, refer to S*oftware Installation and Upgrade Procedures* located at the following URL:

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.

For a complete list of feature sets supported by the Cisco 7200 series routers in Release 12.2, go to the following URL:
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122/122reqs.htm#xtocid3

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

New and Changed Information

This section includes the following topics:

New Hardware Features in Cisco IOS Release 12.2(14)SU1

There are no new hardware features supported on Cisco IOS Release 12.2(14)SU1.

New Software Features in Cisco IOS Release 12.2(14)SU1

There are no new software features introduced in Cisco IOS Release 12.2(14)SU1.

Caveats

This section lists caveats for the Cisco IOS Release 12.2(14)SU1, by tracking number (DDTS #) and release number, and indicates whether the caveat has been corrected. An “O” indicates that the caveat is open in the release; a “C” indicates that the caveat is closed in the release, and an “R” indicates that the caveat is resolved in the release.

Note If you are a registered cisco.com user, view Bug Toolkit on cisco.com at the following website:

http://www.cisco.com/kobayashi/support/tac/tools_trouble.shtml

To become a registered cisco.com user, go to the following website:

http://tools.cisco.com/RPF/register/register.do

Table 3 lists the caveats for the Cisco IOS Release 12.2(14)SU1.

Table 3 Caveats for Cisco IOS Releases 12.2(14)SU1

	Cisco IOS Software Release 12.2(14)SU1
DDTS Number	
•CSCea57826	R
•CSCeb56909	R
•CSCec22929	R
•CSCec25430	R
•CSCec27821	R
•CSCed11793	R
•CSCed13018	R
•CSCed20668	C
•CSCed29514	R
•CSCed40933	R
•CSCed55288	R
•CSCed59558	O
•CSCed67358	R
•CSCed89735	R
•CSCed95499	R
•CSCee04949	R
•CSCee43714	R
•CSCee47151	R
•CSCee62180	R
•CSCee64286	R
•CSCee66319	R

Table 3 Caveats for Cisco IOS Releases 12.2(14)SU1

	Cisco IOS Software Release 12.2(14)SU1
DDTS Number	
•CSCee67450	R
•CSCee69057	R
•CSCee71113	R
•CSCee72833	R
•CSCee84496	R
•CSCee91488	R
•CSCee92886	R
•CSCef19264	R
•CSCef28957	R
•CSCef29752	R
•CSCin76829	R
•CSCin78324	R
•CSCin78325	R

In this section, the following information is provided for each caveat:

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

Note If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II, log in to Cisco.com and click **Software Center**: **Cisco IOS Software**: **Bug Toolkit**: **Bug Navigator II**. Another option is to go to http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl.

The caveats section includes the following subsections:

- Open Caveats—Cisco IOS Release 12.2(14)SU1, page 10
- Sample Configuration, page 17

Open Caveats—Cisco IOS Release 12.2(14)SU1

This section describes possibly unexpected behavior by Cisco IOS Release 12.2(14)SU1. All the caveats listed in this section are open in Cisco IOS Release 12.2(14)SU1. This section describes severity 1 and 2 caveats and select severity 3 caveats.

Note Many caveats that apply to Cisco IOS Release 12.2 also apply to Cisco IOS Release 12.2(11)S. For information on severity 1 and 2 caveats in Cisco IOS Release 12.2, see the *Caveats for Cisco IOS Release 12.2* document located on Cisco.com at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/xprn122/index.htm

- CSCed59558

  Symptom: On the Initiator with 1518 bytes packet size, during tunnel creation, some tunnels may not come up.

  Conditions: This symptom is only seen if all packets for the affected tunnels are near MTU size and it only happens occasionally. Note that these conditions are less likely seen in a normal environment than in a lab setting.

  Workaround: The workaround is to disable cef (the **no ip cef** command) and then Enable cef again (the **ip cef** command).

Resolved and Closed Caveats—Cisco IOS Release 12.2(14)SU1

This section describes caveats that have been resolved by Cisco IOS Release 12.2(14)SU1.

- CSCea57826

  Symptom: Incoming packets may be become stuck indefinitely on the native Gigabit Ethernet interfaces of a Network Processing Engine G1 (NPE-G1) that is installed in a Cisco 7200 series router.

  Conditions: This symptom is observed under a full traffic load and only on a Cisco 7200 series router that is configured with an NPE-G1.

  Workaround: Issue a **shutdown** command follow by a **no shutdow**n command on the affected NPE-G1 Gigabit Ethernet interface.

- CSCeb56909

  Cisco Routers running Internetwork Operating System (IOS) that supports Multi Protocol Label Switching (MPLS) are vulnerable to a Denial of Service (DoS) attack on MPLS disabled interfaces.

  The vulnerability is only present in Cisco IOS release trains based on 12.1T, 12.2, 12.2T, 12.3 and 12.3T. Releases based on 12.1 mainline, 12.1E and all releases prior to 12.1 are not vulnerable.

  More details can be found in the security advisory which is posted at http://www.cisco.com/warp/public/707/cisco-sa-20050126-les.shtml.

- CSCec14039

  Symptom: A Network Processing Engine G1 (NPE-G1) may restart unexpectedly and report the following message:

  'Last reset from watchdog reset'

  Conditions: This symptom is observed on a Cisco 7200 series router that is configured with an NPE-G1 Network Processing Engine and a Cisco 7301 router.

  Workaround: There is no workaround.

- CSCec22929

  Symptom: A software-forced reload may occur on a Cisco 7200 series router after an OIR of a PA-2T3+ port adaptor.

  Conditions: This symptom is observed when traffic enters through the interface of the port adapter.

  Workaround: Shut down the interface of the port adapter before you perform an OIR.

- CSCec25430

  Symptoms: A Cisco device reloads on receipt of a corrupt CDP packet. This may occur when reloading a faulty Cisco IP conference station 7935 or 7936, causing a connected Cisco switch or router to reload. A CDP message, such as the following, may display on the terminal:

  > %CDP-4-DUPLEX_MISMATCH duplex mismatch discovered on FastEthernet5/1 (not half duplex), with SEP00e0752447b2 port 1 (half duplex)

  Conditions: This symptom is observed when an empty **version** field exists in the output of the show **cdp entry *** command for at least one entry.

  Workaround: Disable CDP by entering the **no cdp run** global configuration command.

  First Alternate Workaround: Disable CDP on the specific (sub-)interface(s) whose corresponding neighbor(s) has or have an empty "version" field in the output of the **show cdp entry *** command.

  Second Alternate Workaround: Disconnect the 7935 or 7936 phone, in the case of the specific symptom that is described above.

- CSCec27821

  Symptom: A Network Processing Engine G-1 or G-100 (NPE-G1 or NPE-G100) may forward unicast IP packets that have a Layer 2 multicast MAC address.

  Conditions: This symptom is observed on an NPE-G1 that is installed in a Cisco 7200 series router, or an NPE-G100 installed in a Cisco 7304 router

  Workaround: Create an access control list (ACL) to filter the packets.

  Alternate Workaround: Configure a static multicast MAC address mapping to the ports of the connected Layer 2 switch.

- CSCed11793

  Symptom: The output queue of a Gigabit Ethernet port may become stuck, preventing traffic from leaving the interface.

  Conditions: This symptom is observed on the Gigabit Ethernet port 0/1 (gig0/1) of a Network Processing Engine NPE-G1 (NPE-G1) that is installed in a Cisco 7200 series routers.

  Workaround: Enter the **shutdown** interface configuration command followed by the **no shutdown** interface configuration command on the affected interface.

  Alternate Workaround: Reload the router.

- CSCed13018

  Symptom: Native Gigabit Ethernet interface throttling is always bypassed.

  Conditions: With the newer version of BCM chips, the throttling is also bypassed; it is only needed for the older revision.

  Workaround: There is no workaround.

- CSCed20668

  Symptom: On the standby device, you may see the following IPSec security association (SA) insertion failure message:

  %CRYPTO_HA-3-IPSECADDENTRYFAIL:(VIP=80.0.0.200)IPSEC SA entry insertion on standby device failed

  Condition: This failure symptom may be observed in a stress situation in a 2000ike/8000ipsec hub and spoke environment.

  Workaround: The workaround is not to stress the box beyond the 2000 IKE/4000IPSec in hub and spoke environment since the system is not designed to operate at that stress level.

- CSCed29514

  Symptom: The C7200 NPE-G1 bulletin GE (SBeth) MAC Filter accepts NULL DAs 00-00-00-00-00-00. This unintentional behavior may pose a denial of service security risk in customer environments if their networks are flooded with NULL DAs. This appears to be a Broadcomm silicon or documentation error. The Broadcomm docs state that NULL DAs may be used for unused MAC Filter entries, implying that they are not accepted.

  Conditions: When NULL DAs are presented to the NPE-G1 SBeth I/F.

  Workaround: There is no workaround.

- CSCed31869

  Symptom: During rekey we may see the following Invalid Packet message:

  ```
  %VPN_HW-1-PACKET_ERROR: slot: 6 Packet Encryption/Decryption error, Invalid Packet
  ```

  Condition: At rekey time, we may run into this problem; no failover attempt is needed to trigger this.

  Workaround: There is no workaround.

- CSCed40933

  Cisco Internetwork Operating System (IOS) Software is vulnerable to a Denial of Service (DoS) attack from crafted IPv6 packets when the device has been configured to process IPv6 traffic. This vulnerability requires multiple crafted packets to be sent to the device which may result in a reload upon successful exploitation.

  More details can be found in the security advisory, which is posted at http://www.cisco.com/warp/public/707/cisco-sa-20050126-ipv6.shtml.

- CSCed55288

  Symptom: A Cisco 7200 router running a VPN Accelerator Module may give spurious memory access at the hifn_fastsend function.

  Conditions: This is seen under rare circumstances when a Cisco 7200 router has a VAM or VAM2 card.

  Workaround: There is no workaround.

- CSCed67358

  Symptoms: An IPv6 PIM neighbor may be down after changing the PIM configuration.

  Conditions: This symptom is observed when the **no ipv6 pim** command is entered on some subinterfaces of a physical Ethernet interface and PIM is enabled on several subinterfaces of the same physical Ethernet interface. It affects both IPv4 and IPv6, for multicast and OSPF Hello message.

  Workaround: There is no workaround.

- CSCed89735

  Symptom: An uncorrectable ECC parity error may occur on a Cisco 7200 series router that is configured with an NPE-G1.

  Conditions: This symptom is observed rarely when you enter the **show sysctlr** or the **show tech** command on the NPE-G1.

  Workaround: Do not enter the **show sysctlr** or the **show tech** command.

- CSCed95499

  Symptom: A Cisco router may crash if a PA driver attempts to convert an uncached I/O Mem address to an cached I/O mem address.

  Conditions: This symptom is observed on a Cisco 7200 series router that is configured with an NPE-G1.

  Workaround: There is no workaround.

- CSCee04949

  Symptom: Resetting a VAM/AIM-EPII module may block all the interrupts.

  Conditions: This is triggered when the router is extremely low on I/O memory and the crypto accelerator is reset.

  Workaround: Reload the router and monitor memory usage.

- CSCee43714

  Symptoms: A router displays the following error message:

  ```
  %VPN_HW-1-PACKET_ERROR:slot:1 Packet Encryption/Decryption error, Output
  Authentication error(0x20000000)
  ```

  There is insufficient information in this message to properly troubleshoot the situation. The error message should state the source and destination IP addresses and possibly a packet dump.

  Conditions: This symptom is observed on a router that functions in an VPN environment, with hardware crypto accelerator.

  Workaround: There is no workaround.

- CSCee47151

  Symptoms: When you enter the **shutdown** command followed by the **no shutdown** command on an ATM interface, the source address on the ACL between the routers may change unexpectedly, causing IPSec to fail. The following is an example of an unexpected change in the source address on the ACL:

```
ip access-list extended acl1
    permit ip any host a.b.c.d
permit ip any w.x.y.z 0.0.0.63  <--- this statement is changed to

ip access-list extended acl1
    permit ip any host  a.b.c.d
    permit ip host 0.0.0.0 w.x.y.z 0.0.0.63    <--- this statement
```

  Conditions: This symptom is observed on a Cisco 7206VXR that runs the c7200-ik2s-mz image of Cisco IOS Release 12.1(19)E3, but may also occur in other releases such as Cisco IOS Release 12.3 and Release 12.3T.

  Workaround: Manually change the ACL statement back to original configuration.

- CSCee62180

  Symptom: Traffic not intended to be protected by IPSec may get encrypted and later dropped on the receiving router because it expects the same flow to be in clear.

  Condition: On a Cisco IOS router running IPSec (IP Security) encryption, if the crypto access-list is defined in such a way that it has explicit deny statements for networks that do not need to be encrypted, and a **permit ip any any** at the end to encrypt all other traffic, then the deny statements may be ignored.

  Workaround: Use explicit “permit” statements in the crypto ACL to only define networks that need to be encrypted.

- CSCee64286

  Symptoms: An SA-VAM may become stuck after the following error message is generated:

```
rx_intr:*error* PA still owns free pool buffer {0xA,0xy,0xz,0xw}.
```

  Conditions: This symptom is observed on a Cisco 7200 series router when the SA-VAM becomes out of sync with the Cisco IOS software image.

  Workaround: Reload the crypto engine by entering the **no crypto engine accel** command followed by the **crypto engine accel** command. If the Cisco 7200 series router runs Cisco IOS Release 12.1 E, reset the SA-VAM by entering the **crypto card shut** command followed by the **crypto card enable** command.

- CSCee66319

  Symptom: A router running IPSec may reload due to a bus error.

  Condition: This condition occurs when using hardware encryption.

  Workaround: There is no workaround.

- CSCee67450

  A Cisco device running Cisco IOS and enabled for the Border Gateway Protocol (BGP) is vulnerable to a Denial of Service (DoS) attack from a malformed BGP packet. Only devices with the command ‘bgp log-neighbor-changes’ configured are vulnerable. The BGP protocol is not enabled by default, and must be configured in order to accept traffic from an explicitly defined peer. Unless the malicious traffic appears to be sourced from a configured, trusted peer, it would be difficult to inject a malformed packet.

  If a misformed packet is received and queued up on the interface, this bug may also be triggered by other means which are not considered remotely exploitable such as the use of the command ‘show ip bgp neighbors’ or running the command ‘debug ip bgp <neighbor> updates’ for a configured bgp neighbor.

  Cisco has made free software available to address this problem.

  For more details, please refer to this advisory, available at http://www.cisco.com/warp/public/707/cisco-sa-20050126-bgp.shtml

- CSCee69057

  Symptoms: A Cisco 7200VXR series router may hang.

  Conditions: This symptom is observed on a Cisco 7200VXR series router configured for IPSec encryption, either via tunnel protection or via a crypto map with a PA-MC-8TE1.

  Workaround: The workaround is to disable IPSec encryption.

- CSCee71113

  Symptom: A router running IPSec prefragmentation may reload due to a bus error.

  Condition: This symptom is observed only with prefragmentation and occurs under special circumstances.

  Workaround: Disable prefrag feature by entering the **crypto ipsec fragmentation after-encryption** global configuration command.

- CSCee72833

  Symptoms: A Cisco 7200VXR series router running HW IPSec encryption may hang during reload when exposed to runt packets on the PA-MC-8TE1 interfaces.

  Condition: This symptom may be observed if the AUX port is connected to the Console port of a Catalyst 3550.

  Workaround: The workaround is to disconnect the cable from AUX port.

- CSCee84496

  Symptoms: A Cisco 7200 series router with an NPE-G1 processor may display an erroneous parity error message.

  Conditions: This symptom is observed on a Cisco 7200 series when a NPE-G1 processor receives an ECC/bus error.

  Workaround: There is no workaround.

- CSCee91488

  Symptoms: The VAM2 driver may announce incorrect capacity to IKE and IPSec, hence some IKE and IPSec commands may fail.

  Condition: An error condition occurs when VAM2 firmware stops processing commands due to an internal firmware error.

  Workaround: The workaround is to reset the VAM module.

- CSCee92886

  Symptom: A Cisco router running Cisco IOS Release 12.2(14)SU with the ipsec stateful failover feature configured may have IPSec traffic blackholed for a long time. HSRP indicates that the interfaces involved in crypto traffic (both the inside interface and the outside interface) are in a mismatched state (one is Active, the other is on Standby).

  Condition: This symptom is seen when IPSec stateful failover is configured. HSRP is configured on both the inside and outside interfaces, and either the inside or the outside LAN is flapping.

  Workaround: Perform a shut, then a no shut, on one of the Active HSRP interfaces.

- CSCef19264

  Symptoms: Using IPSec with hardware crypto engine accelerators may cause an excessive traffic load in a network with routing loops.

  Conditions: This symptom is observed when the TTL in the ip header is not correctly decremented prior to IPSec encapsulation.

  Workaround: The workaround is to eliminate the routing loop in the network.

- CSCef28957

  Symptom: A Cisco 7200 series router with a VAM2 fails to create 2048 bit RSA keys. The message "IPSECcard a time out has occurred" is seen.

  Conditions: This is seen when the following conditions are present:

  – a VAM and a VAM2

  – Cisco IOS Release 12.2(14)SU or 12.2(14)SU1

  – 2048 bit RSA keys are used for IKE RSA-sig or RSA-encr based negotiation

  Workaround: Use other RSA key sizes 512-1024, 1536. Note that the key size must be a multiple of 64.

- CSCef29752

  Symptom: A Cisco 7200 series router with a VAM2 may see Heartbeat Failure and reset.

  Conditions: This symptom may be observed when an unsupported RSA key size not a multiple of 64 is generated.

  Workaround: The workaround is to use other RSA key sizes in the 512-1024 range, such as 1536 which is a multiple of 64.

- CSCin76829

  Symptom: A Cisco 7200VXR series router with a VAM Encryption/Compression engine port adapter may stop forwarding traffic and show the following error:

  ```
  %SYS-2-BADSHARE: Bad refcount in retparticle, ptr=0, count=0
  -Traceback= 605BEBE0 616335E0 60F827D8 60154C08 604892B4 6048B39C 6048D3D0
  ```

  Conditions: This symptom is observed on a Cisco 7200VXR series router running IOS Software Release 12.1(20)E.

  Workaround: There is no workaround.

- CSCin78324

  Symptoms: A Cisco 7200VXR series router may hang.

  Conditions: This symptom is observed on a Cisco 7200VXR series router configured for IPSec encryption, either via tunnel protection or via a crypto map with a PA-MC-8TE1.

  Workaround: The workaround is to disable IPSec encryption.

- CSCin78325

  Symptoms: A serial interface of a PA-MC-8TE1+ continues to process packets even after the interface is placed in the "ADMINDOWN" state. The counters in the output of the **show interfaces serial** command may continue to increment even if the serial interface is shut down.

  Conditions: This symptom is observed on a serial interface of a PA-MC-8TE1+ when there is a channel-group configuration for the interface.

  Workaround: Remove the channel-group configuration for the interface.

Sample Configuration

The configuration for IPSec Stateful Failover builds on the standard Stateful Failover configuration, but with the addition of a tunnel interface for each GRE endpoint, as shown in Figure 1.

1. The crypto parameters on the Stateful Failover Pair must be the same for:
   - isakmp policy (encryption, authentication, hash, lifetime, group)
   - isakmp key (shared secret with remote peer)
   - IPSec security-association lifetimes
   - IPSec transform set
2. Crypto map has to be applied to the physical interface (not the tunnel). To get traffic to go to the Tunnel interface there should be a route to the Tunnel IP address from the crypto peer.
3. SSP group can be configured with up to 32 redundancy groups, (with 32 Virtual IP Addresses).
4. There must be an access-list for the GRE traffic with the VIP as one of the endpoints.

Following is a sample configuration which uses multiple redundancy groups, and multiple GRE tunnels. Note that this isn't necessarily a realistic deployment, but was used in the lab to illustrate the failover of multiple redundancy groups with multiple GRE tunnels. Ethernet sub-interfaces were used to simulate multiple VIPs.

Note that the other redundant router would have the same configuration except that the physical IP addresses will be different, and the SSP remote address will be pointing to the physical IP address of the private interface of the SSP peer.

Head-end router:

```
ip cef
!
ssp group 100
 remote 40.0.0.5
 redundancy GRE_1
 redundancy GRE_2
redundancy PRIVATE

!
crypto isakmp policy 1
 encr 3des
 authentication pre-share
crypto isakmp key gre1 address 20.1.1.1
crypto isakmp key gre2 address 20.1.2.1
```

Note The 20.1.+.1 addresses are the remote peers.

```
crypto isakmp ssp 100
!
!
crypto ipsec security-association lifetime kilobytes 536870912
crypto ipsec security-association lifetime seconds 86400
!
crypto ipsec transform-set HA_TRANSFORM esp-3des
!
crypto map gre_1 1 ipsec-isakmp
 set peer 20.1.1.1
 set transform-set HA_TRANSFORM
 match address gre_1
!
crypto map gre_2 1 ipsec-isakmp
 set peer 20.1.2.1
 set transform-set HA_TRANSFORM
 match address gre_2
!
!
call rsvp-sync
!
!
interface Tunnel1
  ip unnumbered FastEthernet0/0.1
 tunnel source 172.1.1.100
 tunnel destination 20.1.1.1
!
interface Tunnel2
  ip unnumbered FastEthernet0/0.2
 tunnel source 172.1.2.100
 tunnel destination 20.1.2.1
!
!
```

Note: Sub-interfaces are used to simulate failover of multiple HSRP groups.

```
interface FastEthernet0/0
 no ip address
 no shutdown
 duplex full
 speed 100
!
interface FastEthernet0/0.1
 encapsulation dot1Q 500
 ip address 172.1.1.6 255.255.255.0
 standby delay minimum 35 reload 60
 standby 1 ip 172.1.1.100
 standby timer 1 3
 standby 1 preempt
 standby 1 name GRE_1
 standby 1 track FastEthernet0/1
  crypto map gre_1 ssp 100
!
interface FastEthernet0/0.2
 encapsulation dot1Q 501
 ip address 172.1.2.6 255.255.255.0
 standby delay minimum 35 reload 60
 standby 2 ip 172.1.2.100
 standby 2 timers 1 3
 standby 2 preempt
 standby 2 name GRE_2
 standby 2 track FastEthernet0/1
   crypto map gre_2 ssp 100
!
!
```

```
interface FastEthernet0/1
 ip address 40.0.0.6 255.255.255.0

 duplex full
 speed 100
 standby delay minimum 35 reload 60
 standby 255 ip 40.0.0.100
 standby 255 timers 1 3
 standby 255 preempt
 standby 255 name PRIVATE
 standby 255 track FastEthernet0/0
!
!
ip classless
ip route 10.0.1.1 255.255.255.255 Tunnel1
ip route 10.0.1.2 255.255.255.255 Tunnel2
ip route 20.1.1.0 255.255.255.0 172.1.1.4
ip route 20.1.2.0 255.255.255.0 172.1.2.4
ip route 40.0.1.0 255.255.255.0 40.0.0.13
ip route 40.0.2.0 255.255.255.0 40.0.0.13
ip route 40.0.3.0 255.255.255.0 40.0.0.13
ip route 40.0.4.0 255.255.255.0 40.0.0.13
ip route 40.0.5.0 255.255.255.0 40.0.0.13
ip route 223.255.254.254 255.255.255.255 40.0.0.1
no ip http server
!
```

Note Access-lists are needed to permit GRE traffic to flow.

```
ip access-list extended gre_1
 permit gre host 172.1.1.100 host 20.1.1.1
ip access-list extended gre_2
 permit gre host 172.1.10.100 host 20.1.2.1
```

Related Documentation

Hardware Documents

Cisco 7200 series router hardware documentation is available on cisco.com at this URL:

http://www.cisco.com/en/US/products/hw/routers/ps341/products_product_index09186a0080123f5a.html

Cisco IOS Software Documents

Cisco IOS Release 12.2 software documentation is available on cisco.com at this URL:

http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/products_tech_note09186a00800941da.shtml

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/univercd/home/home.htm

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation DVD

Cisco documentation and additional literature are available in a Documentation DVD package, which may have shipped with your product. The Documentation DVD is updated regularly and may be more current than printed documentation. The Documentation DVD package is available as a single unit.

Registered Cisco.com users (Cisco direct customers) can order a Cisco Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

http://www.cisco.com/en/US/partner/ordering/

Cisco Marketplace:

http://www.cisco.com/go/marketplace/

Ordering Documentation

You can find instructions for ordering documentation at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpck/pdi.htm

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Ordering tool:

  http://www.cisco.com/en/US/partner/ordering/

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can send comments about technical documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

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

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com
- Nonemergencies—psirt@cisco.com

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.*x* through 8.*x*.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one that has the most recent creation date in this public key server list:

http://pgp.mit.edu:11371/pks/lookup?search=psirt%40cisco.com&op=index&exact=on

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

Cisco Technical Support Website

The Cisco Technical Support Website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, 365 days a year, at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support Website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support Website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco TAC engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco TAC engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is "down," or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

  http://www.cisco.com/packet

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

  http://www.cisco.com/go/iqmagazine

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

  http://www.cisco.com/ipj

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Glossary

Active—Active IPSec High Availability router

DPD—Dead Peer Detection. DPD allows two IPSec peers to determine if the other is still “alive” during the lifetime of a VPN connection.

EzVPN—Cisco Easy Virtual Private Networks (EzVPN) Client on Cisco IOS Software. The Cisco Ez VPN client feature can be configured to create IPSec VPN tunnels between a supported router and another Cisco router that supports this form of IPSec encryption/decryption.

GRE—Generic Routing Encapsulation. Tunneling protocol developed by Cisco that can encapsulate a wide variety of protocol packet types inside IP tunnels, creating a virtual point-to-point link to Cisco routers at remote points over an IP internetwork.

HSRP—Hot Standby Routing Protocol. HSRP provides network redundancy for IP networks, ensuring that user traffic immediately and transparently recovers from first hop failures in network edge devices or access circuits.

IKE—Internet Key Exchange. IKE establishes a shared security policy and authenticates keys for services (such as IPSec) that require keys. Before any IPSec traffic can be passed, each router/firewall/host must verify the identity of its peer. This can be done by manually entering pre-shared keys into both hosts or by a CA service.

IPSec—IP Security. A framework of open standards that provides data confidentiality, data integrity, and data authentication between participating peers. IPSec provides these security services at the IP layer. IPSec uses IKE to handle the negotiation of protocols and algorithms based on local policy and to generate the encryption and authentication keys to be used by IPSec. IPSec can protect one or more data flows between a pair of hosts, between a pair of security gateways, or between a security gateway and a host.

SA—security association. An instance of security policy and keying material applied to a data flow. Both IKE and IPSec use SAs, although SAs are independent of one another. IPSec SAs are unidirectional and they are unique in each security protocol.

SSP—State Synchronization Protocol (SSP) is a protocol developed to transfer state information between the active and standby routers.

Standby—Standby IPSec High Availability router.

Stateful Failover—Feature that enables a backup (standby) router to automatically take over the primary (active) router’s tasks in the event of a active router failure with minimal or no loss of traffic. The remote peer sees no difference between the two routers since it is connected to a virtual end point (VEP), owned by either headend router that shares the same IPSec information.

V3PN—Voice and Video Enabled VPN (V3PN), integrates three core technologies: IP Telephony, Quality of Service (QoS), and IP Security (IPSec) VPN to guarantee the timely delivery of latency-sensitive applications such as voice and video.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 19 .