Release Notes for Cisco IOS Release 15.6(1)M

The following release notes support Cisco IOS Releases 15.6(1)M and higher releases. These releases support the Cisco 5900 Embedded Services Routers (ESR) platforms. These release notes are updated to describe new features, limitations, troubleshooting, recommended configurations, caveats, and how to obtain support and documentation.

Contents

This publication consists of the following sections:

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Image Information and Supported Platforms

Note You must have a Cisco.com account to download the software.

Cisco IOS Release 15.6(1)M includes the following Cisco IOS images:

- c5915-adventerprisek9-mz.SPA
- c5915-entbase-mz.SPA
- c5921i86-universalk9-ms.SPA
- c5921i86-entbasek9-ms.SPA
- c5921i86-entbasek9-tar.SPA
- c5921i86-universalk9-tar.SPA
- c5930-adventerprisek9-mz.SPA
- c5940-adventerprisek9-mz.SPA

Related Documentation

The following documentation is available:

- Software Configuration Guide for the Cisco 5900 Embedded Services Routers

  http://www.cisco.com/c/en/us/td/docs/solutions/GGSG-Engineering/15-4-3M/config-guide/Configuration-Guide.html

- Cisco 5921 Embedded Services Router Integration Guide

  http://www.cisco.com/c/dam/en/us/td/docs/solutions/GGSG-Engineering/Cisco_5921/Cisco_5921_ESR_Integration.pdf

- IOS Bulletins—You can find bulletins at:

  http://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-software-releases-listing.html

New Features Supported

The following new features are supported with release 15.6(1)M.

Add 5Mbps and 100Mbps to the 5921

There are two new licenses that support additional throughput speeds on the 5921. The c5921 universalk9 and entbasek9 images now support the 5Mbps and the 100Mbps PIDs shown in the following table.

License PID	Name used within IOS	Enforced Rate in Mbps
L-FL-5921-XL0-K9	c5921-x86-level0	5
L-FL-5921-XL1-K9	c5921-x86-level1	10
L-FL-5921-XL2-K9	c5921-x86-level2	25
L-FL-5921-XL3-K9	c5921-x86-level3	50
L-FL-5921-XL4-K9	c5921-x86-level4	100

Performance Improvements on the 5921

The 50% CPU usage restriction on fast path thread has been removed. The IOS scheduler thread avoids going to sleep when it has a job, and improves the performance of c5921. This was previously tracked as bug #CSCuv60913 in the Closed Caveats section.

The Cisco 5921 ESR has the following limitation:

With the 5921 ESR, several situations have been encountered in which the e1000e Ethernet driver strips VLAN tags before a frame reaches the 5921. This will result in dot1q trunking not performing properly (the 5921 will receive frames with no VLAN tag, even though it is configured to expect VLAN tags). In IOS, you will notice this by seeing ARP or ping failures.

If you see such behavior, please issue the following debug command from IOS:

```
#debug arp
```

Now, try the ping again. If the VLAN tag stripping issue is present, you will see a "wrong cable" message similar to the following:

```
*Jan 14 21:49:50.874: IP ARP rep filtered src 192.168.110.2 e05f.b986.5500, dst
192.168.110.1 0022.4d7b.e424 wrong cable, interface Ethernet0/0.130
```

Now switch to the Linux command line and see if the e1000e driver is being used by issuing the following command (using eth0 as an example):

```
[root@router ~]# ethtool -i eth0
driver: e1000e    <== LOOK FOR THIS
version: 2.3.2-k
firmware-version: 2.1-2
bus-info: 0000:02:00.0
supports-statistics: yes
supports-test: yes
supports-eeprom-access: yes
supports-register-dump: yes
supports-priv-flags: no
```

From the Linux command line, verify the VLAN mode of the device:

```
[root@router ~]# ethtool -d eth0
MAC Registers
-------------
0x00000: CTRL (Device control register)  0x58100248
      Endian mode (buffers):           little
      Link reset:                      reset
      Set link up:                     1
      Invert Loss-Of-Signal:           no
      Receive flow control:            enabled
      Transmit flow control:           enabled
      VLAN mode:                       enabled   <== LOOK FOR THIS
      Auto speed detect:               disabled
      Speed select:                    1000Mb/s
      Force speed:                     no
      Force duplex:                    no
```

If the VLAN mode is enabled, this indicates that the driver is stripping the VLAN tags.

To remedy this using CentOS, please upgrade to the latest e1000e driver by following these steps from the Linux command line:

```
#yum install kernel-devel gcc gcc-c++ make wget
#reboot

#mkdir /usr/local/src/e1000e
#cd /usr/local/src/e1000e
#wget http://sourceforge.net/projects/e1000/files/e1000e%20stable/3.0.4/
#tar zxf e1000e-3.0.4.tar.gz
#cd e1000e-3.0.4
#cd src
#make install
```

If the process ends with the following message, ignore it:

```
/bin/sh: man: command not found

#rmmod e1000e
#modprobe e1000e
```

From the Linux command line, verify that the new driver has been activated:

```
[root@centos src]# ethtool -i eth0
driver: e1000e
version: 3.0.4-NAPI    <== LOOK FOR THIS
firmware-version: 2.1-2
bus-info: 0000:02:00.0
supports-statistics: yes
supports-test: yes
supports-eeprom-access: yes
supports-register-dump: yes
supports-priv-flags: no
-------------------
```

Caveats

Caveats describe unexpected behavior in Cisco IOS releases. Caveats listed as open in a prior release are carried forward to the next release as either open or closed (resolved).

Cisco IOS Release 15.6(1)M

The following sections list caveats for Cisco IOS Release 15.6(1)M:

Closed Caveats

- **CSCuv60913**

  Symptom:

  Minor performance improvement on the CPU utilization on the c5921.

  Conditions:

  Fast path thread goes to sleep when it utilize more then 50% of CPU.

- **CSCuv01746**

  Symptom:

  Physical interface configured under a certain VRF, breaks DLEP adjacency with radio device.

- **CSCuj05125**

  Need to be able to change OSPFv3 metric OC

  Symptom:

  Router-dynamic cost for OSPFv3 = OC + (S1) + (S2) + (S3) + (S4)

  Requests to be able to adjust the OC value

  Workaround

  OC is derived from the Maximum Data Rate (MDR). It would be much more meaningful to derive OC from the Current Data Rate and zero the remaining components of the metric calculation for MANET use here.

- **CSCun78903**

  On the 5921 a memory leak over dlep session occurred when OSPF changed to EIGRP

  Symptom:

  While connecting with MANET infra server we will get a new virtual-access interface created every time for the same connection. The old virtual-access will still be there until you brought your router down or reboot.

- **CSCur61052**

  When running DLEPv1.5, OSPF route cost was not being calculated as expected

  Symptom:

  When modem sends destination up message with the default link metrics value, the Route Cost doesn't change for new MANET neighbor.

- **CSCus68229**

   Symptom:

   On the 5915 series router running 15.2(4)GC2 IOS version, OSPFv3 is leaking memory.

- **CSCut23386**

   Symptom:

   IPv4 and IPV6 Multicast traffic does not pass through VMI interfaces. This happens only when Multicast traffic has to be forwarded over VMI interfaces.

- **CSCut50780**

   Symptom:

   Router crashes at bma_soutput

- **CSCuv01746**

   Symptom:

   Physical interface configured under a certain VRF, breaks DLEP adjacency with radio device.

- **CSCuv60523**

   Symptom:

   On the 5930, accurate accounting of CPU usage was not available.

- **CSCuw11898**

   On the 5930, a crash leaded by BADSHARE messages occurred when shaping traffic

   Symptom:

   1. Apply a shaper on LAN interface that is oversubscribed by traffic coming in on a DMVPN tunnel

   2. The following error messages may be seen

   -Traceback= 58D6348z 4203E28z 4048508z 402CA64z 42409ACz 4019D24z 4019D24z 4240A68z 4225890z 4225890z 422C6F4z

   *Feb 9 14:10:59.743: %SYS-2-BADSHARE: Bad refcount in datagram_done, ptr=12494B08, count=0

Open Caveats

- **CSCuw55129**

   The c5921 is unable to read the VLAN tags from Linux kernel-2.6.32-504.23.4.el6.i686 and later, with one exception: using latest e1000 driver, 8.0.35-NAPI, with 2.6.36 kernel and dot1q works as expected.

   Workaround:

   No known workaround after kernel-2.6.32-504.23.4.el6.i686.

   kernel-2.6.32-504.16.2.el6.i686 and Linux kernel 2.6.36 is working.

- **CSCut75596**

   The 5940 needs to be able to limit the number of simultaneous login sessions per user. This applies to management connections via the VTY lines.

- **CSCuv99496**

  CPU Utilization reaches 100% while running DLEPv1.7

  Symptom:

  May hit the problem when running the combination of DLEPv1.7, R2CP and PPPOE

  Workaround:

  None

- **CSCuw64684**

  Packet loss observed during oversubscription of QOS in c5921

  Symptom:

  More packet loss is observed in all the queue on sending traffic using IXnetwork for QOS configuration

  Conditions:

  On oversubscribing a particular queue for example Q1

  Workaround:

  None

- **CSCuu32711**

  DLEP cost not same on uut & neighbor router, after neighbors are brought up

  Symptom:

  After the DLEP client session is established, Configure OSPF and bring up the neighbors on uut and neighbor router. Once the VMI state changes to FULL on both sides, check the cost on both routers. The cost is not same on uut and neighbor router. It shows 1 on uut and 251 on peer router.

  Workaround:

  None

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation at: http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html.

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