Release Notes for Cisco IOS Release 15.6(2)T

The following release notes support Cisco IOS Releases 15.6(2)T 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:

Image Information and Supported Platforms

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

Cisco IOS Release 15.6(2)T includes the following Cisco IOS images:

- c5915-adventerprisek9-mz.SPA
- c5915-entbase-mz.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(2)T.

Add 200Mbps to the 5921

There are new licenses that support additional throughput speeds on the 5921. The c5921 universalk9 and entbasek9 images now support the 200Mbps PIDs shown in the following table.

License PID	Description	Enforced Rate in Mbps
LS-FL-5921-BL5-K9	Cisco 5921 ESR Base SW - 200 Mbps	200
LS-FL-5921-XL5-K9	Cisco 5921 ESR Adv Ent SW - 200 Mbps	200
L-FL-5921-XL5-K9	Cisco 5921 ESR Adv Ent SW - 200 Mbps	200

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
-------------------
```

Linux kernel patch which causes 802.1q tag removal is committed into the following streams:

6.5.z: 2.6.32-431.61.2

6.6.z: 2.6.32-504.23.4.el6

6.7: 2.6.32-511.el6

Any Linux kernel within each of these streams that is at the above versions or later would have the 802.1q removal change. incorporated.

Add the below entry in the SWROPTIONS file when the Linux Kernel/driver strips dot1q tag before the packet reaches the 5921 (if running IOS version is 15.6(2)T).

```
linux-vlan-stripped-from-pak=TRUE
```

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(2)T

The following sections list caveats for Cisco IOS Release 15.6(2)T:

Closed Caveats

- **CSCuy31565**

  BIA address was not taking the NIC mac address in the 5921 router.

- **CSCuy09274**

  When DLEP and multiple VMIs were used, multicast was not forwarded by the receiving router after re-routing between VMI interfaces.

- **CSCuy30908**

  The 5940 router was crashing while launching the R2CP client session.

- **CSCuy33157**

  There existed a condition on the 5921 router where an access point was moved to a disabled state, and then a reload command was issued, causing a crash with the router.

- **CSCuy11462**

  The ping command was failing on the 5921 with Q_in_Q

- **CSCuw55129**

  The 5921 router was unable to read the VLAN tags from Linux kernel-2.6.32-504.23.4.el6.i686 and later.

- **CSCuy01278**

  On the 5921 router, the vlan dot1q tag was not working over bridge interface.

- **CSCuw64684**

  On the 5921 router, packet loss was observed on over-subscription of queue in QOS in testing.

Open Caveats

- **CSCuv99496**

    The CPU utilization reaches 100% while running DLEP v1.7.

    Symptom:

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

    There is no workaround.

- **CSCuy87412**

    The script (c5921-swr-init.sh) that is delivered in the package with the 5921 tar image does not stop all the processes.

    Symptom:

    The c5921 process running on linux will not stop all the process related to the application when the script c5921-swr-init.sh stop is executed.

    Workaround:

    Forcefully kill the process running on the Linux server using the `kill - 9 <process id>` command.

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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