



# Release Notes for Cisco IOS Release 15.4(2)T

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The following release notes support Cisco IOS Releases 15.4(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, page 2](#)
- [Related Documentation, page 2](#)
- [Limitations, page 2](#)
- [Recommended Configuration Settings, page 4](#)
- [Caveats, page 7](#)
- [Obtaining Documentation and Submitting a Service Request, page 9](#)



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# Image Information and Supported Platforms

**Note**

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

Cisco IOS Release 15.4(2)T includes the following Cisco IOS images:

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

## Related Documentation

The following documentation is available:

- IOS Bulletins—You can find bulletins at <http://www.cisco.com/c/en/us/products/ios-nx-os-software/ios-software-releases-listing.html>

## Limitations

This release has the following limitations:

- The Quality of Service (QoS) policy can only be applied to one outgoing interface the Point-to-Point Protocol over Ethernet (PPPoE) session is traversing.

A QoS output policy can be applied to the Virtual Template or the Virtual Multipoint Interface (VMI), but not at the same time. If a policy is attached, the outgoing physical interfaces (i.e., physical-interface FastEthernet0/0) should not have output policy applied. It is recommended that the policy be attached to the Virtual Template. The other option is to apply the policy to the VMI, but not to the Virtual Template or Ethernet interface.

- When a service policy is applied to the VMI and packets are dropped on the VA due to credit starvation, the **show policy-map int** VMI command will not show these dropped packets. There is no back pressure between the interfaces in this configuration. The VMI does not know that packets were dropped by the Virtual Access (VA) or the Ethernet physical interfaces.
- RFC 5578 credits do not tie into QoS formulas. Credits only indicate to QoS the ability to transmit a packet or not. If there are enough credits a packet will be transmitted from the highest priority queue. When there are not enough credits, packets will be queued.
- QoS policy may drop on an interface when the interface receives an invalid CDR value.
- To prevent dropping QoS policy, the current data rate (CDR) is range checked to a floor value of 10kbps and a ceiling value of the physical interface speed. If CDR is below the floor value, the QoS rate shaping is set to the floor value. If CDR is above the ceiling value, the QoS rate shaping is set to the ceiling value. The floor value is 10kbps. The ceiling value is limited to the physical interface speed.

- Software Release 15.X may have OSPFv3 incompatibility issues while in Mobile Ad Hoc Networks (MANET) mode with software versions 12.4(24)GC or previous versions. To avoid any issues, ensure that all routers run the same version of Cisco IOS.
- CSCtx62099

If the size of the IP mux MTU is larger than the MTU of the outbound interface, a superframe may not be transmitted, or it might be fragmented properly but not re-assembled at the receive side. A format error occurs on the demux interface. This is only an IPv4 issue; IPv6 does not support router packet fragmentation.

**Workaround:** Reduce the MTU size in the profile to the size of the interface MTU.

The Cisco 5915 ESR has the following limitations:

- The Virtual Local Area Network (VLAN) database is maintained in the flash as a file (*vlan.dat*). This file is created or updated only while adding, deleting, or modifying a VLAN to a switchport. Do not delete the *vlan.dat* file.

Copying a configuration, with switch ports configured with VLANs, through Trivial File Transfer Protocol (TFTP) to the Cisco 5915 ESR running configuration, the *vlan.dat* file may not be created automatically in flash. As a result, the VLANs configured in the switch ports do not exist, even though the running config shows the switch ports configured with VLANs. If a VLAN appears as 'Line protocol down' the VLAN association needs to be updated by configuring the VLAN database explicitly by entering the **vlan** *vlan\_number* command.

When you copy any configuration file with VLAN configurations to TFTP server, back up the corresponding *vlan.dat* file to TFTP. And when you copy a configuration file from a TFTP server to the Cisco 5915 ESR, copy the corresponding *vlan.dat* file to C5915 router flash (CSCtq04969).

- When you copy files to the flash, the copy process may become very slow when flash has limited free space. Delete unused files to free up space. If the issue persists, enter the **format flash** command to reclaim space from the deleted files (CSCt142754).
- The Output drops counter may not be accurate under stress. You can verify the number of output drops in output for the **show controller** command (CSCt170552).

## Recommended Configuration Settings

Use the following configuration guidelines when enabling class-based weighted fair-queuing:

- Enter the following command to turn off creation of virtual-template subinterfaces:

```
no virtual-template subinterface
```

- Enter the following commands to create a policy map with class-based weighted fair-queuing and apply the newly created policy-map to the virtual template:

```
class-map match-any chat
  match dscp af11
class-map match-any voice
  match dscp ef

policy-map mypolicy
  class chat
    bandwidth percent 40
  class voice
    bandwidth percent 40

interface virtual-template number
  service-policy output mypolicy
```

- No additional configuration is supported on the policy-map.

Use the following configuration guidelines when disabling Point to Point Protocol (PPP) keepalives:

- You can turn off the PPP keepalive messages to decrease overhead when the radio alerts the router with a PPPoE Active Discovery Terminate (PADT) message that the layer-2 RF connection is no longer available. Turning off the PPP keepalive messages may also avoid the potential for the router to terminate the connection based on missed PPP keepalives over a poor radio frequency (RF) link.
- To turn off the PPP keepalive messages, enter the following command for the virtual-template:

```
interface virtual-template number
  no keepalive
```

Use the following configuration guidelines for setting the recommended Open Shortest Path First (OSPF) values of radio link metrics:

- You may have to dampen the amount of changes in order to reduce network-wide churn because cost components may change rapidly.
- The following recommended values are intended as a starting point for optimizing an OSPFv3 network and are based on network simulations that may reduce the rate of network changes. Each network may have unique characteristics that require different settings to optimize actual network performance.

You must configure these values for both OSPFv3 IPv4 and IPv6:

S1 = ipv6 ospf dynamic weight throughout

Recommended value = 0

Default=100

S2 = ipv6 ospf dynamic weight resources

Recommended value = 29

Default = 100

S3 = ipv6 ospf dynamic weight latency

Recommended value = 29

Default = 100

S4 = ipv6 ospf dynamic weight L2 factor  
 Recommended value = 29  
 Default = 100

The following is an example configuration for a VMI interface on the virtual template when running bypass mode:

```
interface vmi1
...
ipv6 ospf cost dynamic weight throughput 0
ipv6 ospf cost dynamic weight resources 29
ipv6 ospf cost dynamic weight latency 29
ipv6 ospf cost dynamic weight L2-factor 29
...
ospfv3 cost dynamic weight throughput 0
ospfv3 cost dynamic weight resources 29
ospfv3 cost dynamic weight latency 29
ospfv3 cost dynamic weight L2-factor 29
```

For more information on OSPF commands, refer to the following URL:

[http://www.cisco.com/en/US/docs/ios/iproute\\_ospf/command/reference/iro\\_book.html](http://www.cisco.com/en/US/docs/ios/iproute_ospf/command/reference/iro_book.html)

Use the following configuration guidelines for disabling split horizon in EIGRP:

- By default split horizon is enabled in EIGRP. You can disable split horizon by entering the **no ip split-horizon eigrp** command for the respective autonomous system number.

```
interface vmi number
no ip split-horizon eigrp as-number
```

- Enter the following command to disable the ip redirects on the vmi interface when you are configuring the vmi interface for EIGRP:

```
interface vmi number
no ip redirects
```

Use the following configuration guidelines for setting EIGRP values of radio link metrics:

- EIGRP monitors the following metrics on an interface allowing the tuning of the EIGRP metric calculations; use the metric weights router configuration command:

```
metric weights tos k1 k2 k3 k4 k5
```

where *tos* denotes type of service (currently, it must always be zero) and use the following default values for weights:

```
k1 - 1
k2 - 0
k3 - 1
k4 - 0
k5 - 0
```




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**Note** The **no metric weights** command restores the K-values to the defaults listed above.

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- Most configurations use the Delay and Bandwidth metrics with Bandwidth taking precedence.
- You must set the weights identically on all routers in an autonomous system.



**Note** If you wish to use the default K-values you do not need to enter the **metric weights** command.

- To set the metric dampening value for EIGRP, enter the following commands for either change-based or interval-based dampening of metric updates received through VMI:

- Change Based Dampening:

```
ip50-1(config)#int vmi 4
ip50-1(config-if)#eigrp 100 interface dampening-change 40
```

Default Value for Change Based Dampening:  
50%

To enable change-based dampening using the default Value, enter the following command:

```
eigrp 100 interface dampening-change
```

To disable change-based dampening, enter the following command:

```
no eigrp 100 interface dampening-change
```

- Interval-based Dampening:

```
ip50-1(config)#int vmi 4
ip50-1(config-if)#eigrp 100 interface dampening-interval 20
```

Default Timer value for Interval-based Dampening:  
30 seconds

To enable interval-based dampening using the default Value, enter the following command:

```
eigrp 100 interface dampening-interval
```

To disable interval-based dampening, enter the following command:

```
no eigrp 100 interface dampening-interval
```

- The following exceptions will result in an immediate update:
  - a down interface
  - a down route
  - any change in a metric triggered outside the scope of the VMI metric update



**Note** No recommended values other than default are currently available.

For more information on EIGRP commands, refer to:

[http://www.cisco.com/en/US/docs/ios/iproute\\_eigrp/command/reference/ire\\_book.html](http://www.cisco.com/en/US/docs/ios/iproute_eigrp/command/reference/ire_book.html)

Use the following configuration guidelines to enable Waas Express:

- Enter the following command to turn Waas Express on the Wan interface:

```
waas enable
```

- Enter the following commands to enable full optimizations:

```
parameter-map type waas waas_global
tfo optimize full
```

- Enter the following commands to enable application accelerators:

```
parameter-map type waas waas_global
accelerator http-express
enable
accelerator cifs-express
enable
accelerator ssl-express
enable
```

For more information on Waas Express configuration, refer to the following URLs:

[http://www.cisco.com/en/US/docs/ios/wan/configuration/guide/cfg\\_waas\\_exp.pdf](http://www.cisco.com/en/US/docs/ios/wan/configuration/guide/cfg_waas_exp.pdf)

[http://www.cisco.com/en/US/docs/ios-xml/ios/wan\\_waas/configuration/15-2mt/wan-cfg-waas-exp.html](http://www.cisco.com/en/US/docs/ios-xml/ios/wan_waas/configuration/15-2mt/wan-cfg-waas-exp.html)

## 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 15.4(2)T

The following sections list caveats for Cisco IOS Release 15.4(2)T:

### Open Caveats

#### 5915 systems

- **CSCum46854**

For the 5915 ESR configured with 'ip mobile router-service', when an ethernet cable is unplugged from the FA 0/0 interface the router crashes.

**Workaround:** Use the shutdown command to shutdown the port before unplugging the cable.

#### 5921 systems

- **CSCud07882**

For the 5921 ESR, when 802.1Q is configured on the IOS interface but is not configured on the Linux interface, max MTU outbound packets will be dropped.

**Workaround:** Increase the linux mtu by 4 bytes to 1504 instead of 1500. This will allow the 5921 to send full MTU sized packet of 1500 in IOS without Fragmentation.

- **CSCun11206**

For the 5921 ESR a condition exists where several subinterfaces are created on a physical port and you cannot ping or arp across a dot1q interface.

**Workaround:** None

- **CSCue62144**

When the console of the 5921 is active, and the 5921 is under an active packet forwarding load, there is an increase in the CPU usage consumed by the IOS process. This condition is seen using the Linux process monitoring tool, top.

**Workaround:** Do not start the swrvcon process unless you need to use the console.

- **CSCuj35636**

For the 5921 ESR, in certain instances performing a "shutdown" on an interface can result in excessively high CPU utilization. The CPU utilization can be determined by using the Linux application, "top".

**Workaround:** Either leave the interface in a "no shutdown" state, or unplug the cable.

- **CSCum79890**

EIGRP Update packets are getting dropped over a VMI interface between the C5921 IOS and the Linux interface when a DLEP session is established between peers.

**Workaround:** None

#### 5940 systems

- **CSCum13603**

With NAT enabled on a VRF, you may experience a crash and reload when making changes to an interface IP address.

**Condition:** This has only been seen when NAT is enabled on a VRF.

**Workaround:** None

#### All systems

- **CSCuc32258**

A video call on any ESR platform between SIP phones comes up without video channel. If the receiving phone puts the phone on hold and resumes the call, the video displays.

**Workaround:** Configure asymmetric payload support for dynamic codecs on the voice service:

```
(conf)# voice service voip
(conf-voi-serv)# sip
(conf-voi-serv)# asymmetric payload dynamic-codecs
```

- **CSCum77865**

A router configured to NAT an encrypted (IPsec) GRE tunnel source doesn't actually do the NAT-ing unless CEF is disabled.

**Workaround:** Disable IP CEF switching ('no ip route-cache cef') on the physical interface, where the data packets arrive that are being forwarded out through the tunnel.



## Closed Caveats

- **CSCul87225**  
On the 5921 ESR, during the launch of the image, a segmentation fault can occur when the Voip Null0 interface goes down.
- **CSCty54465**  
When an ACL is placed on an inbound interface, and IP multiplexing is enabled on the interface, traffic that was "not filtered" was received after being de-muxed by IP multiplexing.
- **CSCuj17818**  
When PPPoE is configured on radio interfaces between two routers, and a shut and no shut are issued on the remote interface of router2, packets are stuck in the Router1 input queue.
- **CSCua49735**  
The WAAS-Express router crashes when HTTP-Express Accelerator is enabled and HTTP traffic is going through the WAAS-Express router. This condition is only seen if the response header is split across multiple receives on WAASX.

## 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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