Release Notes for Cisco CSR 1000v Series, Cisco IOS XE Fuji 16.8.x

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Cisco CSR 1000v Series Cloud Services Routers Overview

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Virtual Router

The Cisco Cloud Services Router 1000V (CSR 1000V) is a cloud-based virtual router that is intended for deployment in cloud and virtual data centers. This router is optimized to serve as a single-tenant or a multitenant WAN gateway.

When you deploy a CSR 1000V instance on a VM, the Cisco IOS XE software functions as if it were deployed on a traditional Cisco hardware platform. You can configure different features depending on the Cisco IOS XE software image.

Secure Connectivity

CSR 1000V provides secure connectivity from an enterprise network such as a branch office or a data center, to a public or a private cloud.

Technologies Supported by a Platform

A platform's product landing page lists technology configuration guides for Cisco IOS XE technologies that the platform supports.

In each technology configuration guide, a Feature Information table indicates when a feature was introduced to the technology. For some features, the table also indicates when additional platforms have added support for the feature.

To determine whether a particular platform supports a technology, view the list of technology configuration guides posted on the platform's product landing page. For example, see Cisco Cloud Services Router 1000v Series.

System Requirements

Hardware Requirements

For hardware requirements and installation instructions, see the Cisco CSR 1000v Series Cloud Services Router Software Configuration Guide .

Software Images and Licenses

The following sections describe the licensing and software images for CSR 1000V.

Cisco Smart Licensing

The Cisco CSR 1000V router supports Cisco Smart Licensing. To use Cisco Smart Licensing, you must first configure the Call Home feature and obtain the Cisco Smart Call Home Services. For more information, see Installing CSR 1000V Licenses and Smart Licensing Guide for Access and Edge Routers.

For a more detailed overview on Cisco Licensing, go to https://cisco.com/go/licensingguide.

Cisco CSR 1000v Evaluation Licenses

Evaluation license availability depends on the software version:

- Evaluation licenses valid for 60 days are available at the Cisco Software Licensing (CSL) portal: http:/www.cisco.com/go/license

The following evaluation licenses are available:

- IPBASE technology package license with 10 Gbps maximum throughput
- SEC technology package license with 5 Gbps maximum throughput
- APPX technology package license with 5 Gbps maximum throughput
- AX technology package license with 2.5 Gbps maximum throughput

If you need an evaluation license for the Security technology package, or for an AX technology package with higher throughput, contact your Cisco service representative.

For instructions on obtaining and installing evaluation licenses, see the "Installing CSL Evaluation Licenses for Cisco IOS XE 3.13S and Later" section of the Cisco CSR 1000v Software Configuration Guide .

Cisco CSR 1000v Software Licenses

Cisco CSR 1000v software licenses are divided into feature set licenses. The supported feature licenses depend on the release.

Current License Types

The following are the license types that are supported (Cisco IOS XE Everest 16.4.1 or later):

- IPBase: Basic Networking Routing (Routing, HSRP, NAT, ACL, VRF, GRE, QoS)

- Security: IPBase package + Security features (IP Security VPN, Firewall, MPLS, Multicast)
- AX: IPBase package + Security features + Advanced Networking features (AppNav, AVC, OTV and LISP)
- APPX Package: IPBase package + Advanced Networking features - Security features (IP security features not supported)

Legacy License Types

The three legacy technology packages - Standard, Advanced, and Premium - were replaced in the Cisco IOS XE Release 3.13 with the **IPBase**, **Security**, and **AX** technology packages.

Features Supported by License Packages

For more information about the Cisco IOS XE technologies supported in the feature set packages, see the overview chapter of the Cisco CSR 1000v Series Cloud Services Router Software Configuration Guide.

Throughput

The Cisco CSR 1000v router provides both perpetual licenses and term subscription licenses that support the feature set packages for the following maximum throughput levels:

- 10 Mbps
- 50 Mbps
- 100 Mbps
- 250 Mbps
- 500 Mbps
- 1 Gbps
- 2.5 Gbps
- 5 Gbps
- 10 Gbps

The throughput levels are supported for different feature set packages in each version. For more information about how the maximum throughput levels are regulated on the router, see the Cisco CSR 1000v Cloud Services Router Software Configuration Guide.

Memory Upgrade

A memory upgrade license is available to add memory to the Cisco CSR 1000v router (Cisco IOS XE 3.11S or later). This license is available only for selected technology packages.

Additional Information about Licenses and Activation

For more information about each software license, including part numbers, see the Cisco CSR 1000v Router Datasheet. For more information about the standard Cisco IOS XE software activation procedure, see the Software Activation Configuration Guide, Cisco IOS XE Release 3S.

Software Image Nomenclature for OVA, ISO, and QCOW2 Installation Files

The Cisco CSR 1000v installation file nomenclature indicates properties supported by the router in a given release.

For example, these are filename examples for the Cisco IOS XE Everest 16.4.1 release:

- csr1000v-universalk9.16.04.01.ova
- csr1000v-universalk9.16.04.01.iso
- csr1000v-universalk9.16.04.01.qcow2

The filename attributes are listed below, along with the release properties.

Table 1: OVA Installation Filename Attributes

Filename Attribute	Properties
Example:universalk9	Installed image package.
03.09.00a.S.153-2.S0a	Indicates that the software image is for the Cisco IOS XE 3.9.0aS release image (mapped to the Cisco IOS 15.3(2) release).
std or ext	Standard release or extended maintenance support release.

Features and Notes: Cisco IOS XE Fuji 16.8.1a

Features

Features—Cisco IOS XE Fuji 16.8.1a

The following new software features are supported on the Cisco CSR 1000v for Cisco IOS XE Fuji 16.8.1a.

- Utility Reporting—collects usage data from products that have Cisco Smart Licensing and Utility Reporting enabled and sends the data in Resource Utilization Measurement (RUM) format to the Cisco Service Billing Platform (SBP). The SBP produces daily reports and licensing costs are based on the usage data. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/routers/csr1000/software/configuration/b_CSR1000v_Configuration_Guide/b_CSR1000v_Configuration_Guide_chapter_01000.html.

  For a more detailed overview on Cisco Licensing, go to https://cisco.com/go/licensingguide.

- Pay-as-you-go licensing model support on Microsoft Azure—this allows you to choose between a Pay-as-you-go (PAYG) licensing model (which uses hourly billing) or a Bring-your-own-license (BYOL) licensing model (which uses CSL or Smart Licensing). For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs//routers/csr1000/software/azu/b_csr1000config-azure.html.

- The **show interfaces** command has changed to display information that identifies a virtual router. For a Cisco CSR 1000v or ISRv the media type is "Virtual". See the Cisco IOS Interface and Hardware Component Command Reference.

- IPv6 enablement—SGACL Enforcement. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/sec_usr_cts/configuration/xe-16-8/sec-usr-cts-xe-16-8-book/sec-cts-sgacl.html.
- IPv6 enablement—Inline Tagging and Caching. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/sec_usr_cts/configuration/xe-16-8/sec-usr-cts-xe-16-8-book/sec-cts-sgacl.html.
- Increase the number of aaa authorization configuration YYY group YYYY commands. The aaa authorization command configures user access to a network. For details, see: Cisco IOS Security Command Reference.
- Support SPAN on Drop for Packets Dropped via the Forwarding Pipeline. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/lanswitch/configuration/xe-16-8/lanswitch-xe-16-8-book/lnsw-conf-erspan.html.
- PKI—OCSP enhancement for US Federal. The Online Certificate Status Protocol (OCSP) for the Public Key Infrastructure (PKI) component supports receiving multiple OCSP single-responses in Cisco IOS. You can use PKI debugs such as “CRYPTO_PKI: Number of singleResponses in OCSP response: 10” to see the number of single responses received in an OCSP response. For more details, see RFC 6960.
- PKI Serviceability. Serviceability helps to understand certificate enrolment, reenrolment, and rollover failures, triggering of events related to the mentioned events, as well as CRL failures. As part of this feature, the following serviceability improvements are supported for Public Key Infrastructure (PKI), which helps track the sequence of events that happened before a certificate expiry or a certificate validation failure: Syslog improvements and **show tech-support** PKI. Refer to the Security Command Reference for details about this show command.
- VXLAN Fragment UDP Source Port. For detailed information, see the following Cisco document: http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/cether/configuration/xe-16-8/ce-xe-16-8-book/vxlan-gpe-tunnel.html.
- Clear PPP sessions per VRF. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/bbdsl/command/bba-cr-book/bba-a1.html.
- Line command access class VRF awareness. For detailed information, see the following Cisco document: https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/bbdsl/configuration/xe-16-8/bba-xe-16-8-book/bba-xe-16-8-book_chapter_0100101.html.
- Web User Interface—Supports an embedded Graphical User Interface based device-management tool that provides the ability to provision the device, simplifies device deployment and manageability, and enhances user experience. The following features are supported on the Web User Interface from Cisco IOS XE Fuji 16.8.1a:
  - Day Zero Configuration
  - Debug Bundle
  - Python Developer Sandbox
  - Troubleshooting Audit Support

  For information on how to access the Web User Interface, see the Configure the Router for Web User Interface section.
- Programmability—Model-Based AAA. Implements the NETCONF Access Control Model (NACM). NACM is a form of role-based access control (RBAC) specified in RFC 6536.

For detailed information about programmability, see the following Cisco documents:

https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/prog/configuration/168/b_168_programmability_cg.html

https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/prog/command/168/b_168_programmability_cr/b_168_programmability_cr_chapter_01.html

- Programmability—NETCONF Global Session Lock and Kill Session. Provides a global lock and the ability to kill non-responsive sessions in NETCONF. During a session conflict or client misuse of the global lock, NETCONF sessions can be monitored via the **show netconf-yang sessions** command, and non-responsive sessions can be cleared using the **clear configuration lock** command.
- Programmability—NETCONF and RESTCONF Debug commands. Commands for debugging have been added.
- Programmability—YANG Data Models. For the list of Cisco IOS XE YANG models available with this release, navigate to https://github.com/YangModels/yang/tree/master/vendor/cisco/xe/1681. Revision statements embedded in the YANG files indicate if there has been a model revision. The README.md file in the same github location highlights changes that have been made in the release.

Notes

The following section includes important notes about the Cisco CSR 1000v for Cisco IOS XE Fuji 16.8.

Encrypted Traffic Analytics records may not be exported after a reload if an "inactive timeout" command has been configured

When the router is reloaded with a large configuration, which generates many messages for initializing features in the data plane, the Encrypted Traffic Analytics (ETA) records may not be exported. This occurs if the ETA **inactive timeout** command is included in the configuration.

Workaround

Remove **inactive timeout** command from the ETA configuration. After a reload, you can add the **inactive timeout** command to the configuration.

VMware ESXi Multicast Register Failure

Summary

The following multicast register failure message may be shown (Cisco IOS XE Fuji 16.7.1 or later) if you have configured a multicast feature such as CDP or HSRP.

Example: `Dec 13 03:51:48.192 EST: %VXE_VNIC_IF-3-MSGINITERROR: VXE vNIC interface command: multicast_register failed: -1 for GigabitEthernet`

This failure has been noticed for a Cisco CSR 1000v running in one of these environments: VMware ESXi or KVM (RHEL) 7.4.

Details

The environment upon which the Cisco CSR 1000v is running (e.g VMware ESXi) prevents the Cisco CSR 1000v from being able to set MAC addresses, after a limit on the number of MAC addresses is reached. This occurs as a result of configuring a multicast address on an interface (for example, when configuring CDP or HSRP). .

Workaround

Reboot the guest Cisco CSR 1000v. Note that in some environments (for example, RHEL KVM 7.4) this workaround is ineffective—after you reboot, the error messages continue to appear.

Deferrals

Cisco IOS software images are subject to deferral. We recommend that you view the deferral notices at the following location to determine whether your software release is affected:

https://tools.cisco.com/security/center/publicationListing.x

Field Notices

- Field Notices—We recommend that you view the field notices to determine whether your software or hardware platforms are affected. You can find the field notices at the following location:

  http://www.cisco.com/c/en/us/support/web/tsd-products-field-notice-summary.html

Limitations and Restrictions in Cisco IOS XE Fuji 16.8.1a

There are no new limitations and restrictions in Cisco IOS XE Fuji 16.8.1a.

Caveats

Overview

Caveats, or "bugs," describe unexpected behavior. Severity 1 caveats are the most serious. Severity 2 caveats are less serious. Severity 3 caveats are moderate caveats. This section includes severity 1, severity 2, and selected severity 3 caveats.

Terminology

The Dictionary of Internetworking Terms and Acronyms contains definitions of acronyms that are not defined in this document:

http://docwiki.cisco.com/wiki/Category:Internetworking_Terms_and_Acronyms_(ITA)

Bug Search Tool

If you have an account on Cisco.com, you can also use the Bug Search Tool (BST) to find select caveats of any severity. To reach the Bug Search Tool, log into Cisco.com and go to https://tools.cisco.com/bugsearch/search .

If a defect that you have requested cannot be displayed, it may be because the defect number does not exist or the defect does not have a description available.

You can use to the Bug Search Tool to view new and updated caveats: https://tools.cisco.com/bugsearch/search .

For Best Bug Search Tool Results

For best results when using the Bug Search Tool:

- In the **Product** field, enter Cloud Services Router.
- In the **Releases** field, enter one or more Cisco IOS XE releases of interest. The search results include caveats related to any of the releases entered in this field.

The tool provides autofill while you type in these fields to assist in entering valid values.

A search using release number **16.6** should find the caveats for Cisco IOS XE Everest 16.6.1.

Field Notices

We recommend that you view the field notices for the current release to determine whether your software or hardware platforms are affected. You can access the field notices from the following location:

http://www.cisco.com/c/en/US/support/tsd_products_field_notice_summary.html

Caveats: Cisco IOS XE Fuji 16.8.2

Open Caveats—Cisco IOS XE Fuji 16.8.1a

Caveat ID Number	Description
CSCvh57340	DMVPN: Crypto session stuck into UP-IDLE status after reconfiguring tunnel

Resolved Caveats—Cisco IOS XE Fuji 16.8.1a

Caveat ID Number	Description
CSCvi53898	Microsoft Azure: CSR 1000v occasionally experiencing high traffic latency
CSCux20847	R0/0: ASR1002-X kernel: bullseye_i2c_master_xfer Error Repeats Every Hour
CSCvg31607	IPv4 PLU mtrie lookup return invalid oce_chain_p
CSCvg52012	ARP request in not triggered in half-duplex VRF with the additional VRF
CSCvg77128	ASR1009-X FAN SN in show inventory displays incorrectly after replacing the FAN and an RP switchover
CSCvg78665	ISR1100 Pause frame generation is not working
CSCvg93355	ASR 1000 Series SSL VPN CLI should be blocked
CSCvh02294	ISR 4000 Series SW MTP configured as TRP does not relay sRTCP messages
CSCvh04245	TDM-IP, QoS marking is varying to 0 and EF for the same RTP stream
CSCvh16478	Invalid QFP load calculation (Recommit CSCvg92754)
CSCvh22589	Preempt timer does not work, due to an old HSRP Hello packet get just after interface up
CSCvh28859	Interoperability failure between some Fortitude Ports and SmartJack Westell NIU
CSCvh26277	T38 Faxes Fail Going IP to PRI When Coming From A BDI with DOT1Q Tagging
CSCvh26560	ESP crashes with high scale QoS configuration
CSCvh29981	Suite-B Not Supported with ESP-200 on ASR1000-X Platform
CSCvh51205	In B2B HA, active box is not generating syslog alert for watermark high/low value.

Caveat ID Number	Description
CSCvh53691	FP crash with scaled IKE sessions.
CSCvh57091	ESP crash when flapping interface with l2tp tunnels that have qos applied to the tunnels.
CSCvh57242	cpp-mcplo-ucode crash when layer 2 switching packet
CSCvh57402	ISR4451-X sometime drop the packet when volume -based rekey occurred
CSCvh58702	Router crashes after interface flap where sessions get moved from one interface to another
CSCvh61384	16.6: VFR-related drops are not observed in the CSR 1000v platform
CSCvh64729	FP crash @cpp_qm_create_queue while adding fair-queue
CSCvh69641	16.6 :ISR4k Core file seen @cvmx_pow_work_response_async
CSCvh70356	ASR1K - ECMP load-balance w/ DPI L2TP Tunnel visibility and QoS may generate ucode crash
CSCvh70557	CPP crash in MMA
CSCvh71997	[UniScale]csr1k1vCPU crashed while verifying performance at IPv4 ACLs per system scale
CSCvh74076	Performance monitor related field (like SSRC) is not collected.
CSCvh10891	CFT: Improve processing of elephant flows for NBAR
CSCvh16478	CSR1000v: invalid QFP load calculation (Recommit CSCvg92754)

Caveats: Cisco IOS XE Fuji 16.8.2

Open Caveats—Cisco IOS XE Fuji 16.8.2

Caveat ID Number	Description
CSCvj78876	CUBE: FPI Hung Sessions and Provisioning Failures observed in Standby CUBE
CSCvj92548	CSR1k-FlexVPN: Spoke to Spoke: Implicit NHRP entry due to expired resolution request handling.
CSCvk02072	Hoot-n-holler multicast traffic marked with DSCP 0
CSCvk02773	Standby crashed when defaulting vlan config reconfig vlan config with fnf/et-analytics
CSCvk53405	Router crash - AFW_application_process
CSCvk71907	Adaptive QOS : Target shape rate is set to floor rate when lower floor and ceiling rates are used
CSCvm01420	CUBE crashes at sipSPI_ipip_vcc_CheckCodecSetType

Caveat ID Number	Description
CSCvm20167	CSRs failing due to kernel panic within AWS
CSCvm27109	DHCP Relay not working after power outage
CSCvm51112	"clear crypto sa vrf MyVrf" triggers crash after updating pre-shared-keys
CSCvm55465	BGP updates missing ISIS advertising-bits led to LDP label purge on peer.
CSCvm61279	Crash under AFW_application_process with shared-line configuration
CSCvm20374	Cisco IOS XE 16 Router - CPUHog - SNMP ENGINE crashed with Watchdog timeout

Resolved Caveats—Cisco IOS XE Fuji 16.8.2

Caveat ID Number	Description
CSCuz14861	IOS-XE Fails to correctly populate RTCP SSRC Field
CSCve76719	Cisco IOS XE Software for Cisco ISRv Router Static Credential Vulnerability
CSCvf07576	router reloaded when doing show BGP RT filter routes
CSCvf29213	PFRV3: Site Prefix shows unreachable after removing and adding the specific route for the prefix
CSCvg29037	Traceback is observed during mid-call media IP and port change
CSCvg62161	Prefix SID delete after SSO.
CSCvh57108	CPUHOG on QoS statistics collection for DMVPN. QoS crash with DMVPN/NHRP.
CSCvh57657	NAT MIB not populated when using traditional NAT
CSCvh82112	Polaris Routers - Memory leak under process RECMSPAPP in IOSd
CSCvh83319	Interop vrrp doesnt work between cedge and vedge
CSCvh85788	Local LAN-only prefix present in master route-import table but not present in site prefix DB
CSCvh92275	QoS Overrides loadbalancing to per prefix even with only session level policing applied
CSCvi01558	iBGP dynamic peer using TTL 1
CSCvi02816	ZBF not able to identify the WAAS optimized flow and drops ACK
CSCvi04447	Throughput defaults to 1000kbps after license expires
CSCvi06312	Subsystem stopped: ios-emul-oper-db due to bgp table issue
CSCvi08470	OSPF: process crashed when the interface priority is configured for 0.
CSCvi22835	Vz: Non-Polaris to Polaris ISSU compatibility issue

Caveat ID Number	Description
CSCvi25380	Cisco IOS XE Software Authent., Author., and Accounting Login Authent. Remote Code Execution Vuln.
CSCvi26061	RP crash @policymap_associated_to_multiple_instances
CSCvi35232	CME/BE4K crashes when trying to check help command for new device type BEKEM
CSCvi36875	Restored DB is session-lock locked out with insane timeout after boot
CSCvi48471	active SUP crash when active run 16.7.1 and standby run 3.18.2aSP
CSCvi54878	Memory leaks seen at PKI_name_list_add(0xa139cc0)+0x3e
CSCvi62764	OSPF SSPF/SRTE: absolute value configured for the SRTE tunnel not configured by OSPF.
CSCvi65958	Standby RP crashes due to Memory usage in ospf_insert_multicast_workQ
CSCvi72996	NMR TTL is wrongly considering eid-record of 0.0.0.0/0 for its calculation
CSCvi74088	link local multicast packets are received when the SVI is in down state
CSCvi83419	Router crash when removing route-target and with hard clear
CSCvi91714	IPv6 address not assigned or delayed when RA Guard is enabled
CSCvi95775	Reverse-tunnel routes under PMIPv6 MAG config not using configured distance metric
CSCvi96450	Router crashed when lsp-mtu is changed
CSCvi98373	msmr+xtr carsh during scale wireless roaming
CSCvj41224	Crash when doing SNMP walk and applying QOS over a GRE tunnel
CSCvj49476	Telnet Sessions Hang/Become unavailable at execution of "show run"
CSCvj52681	dynamic vlan assignment causes all sisf entires under the port to be deleted
CSCvj71845	Backup path incorrect for ring topology where high ISIS cost is configured on 1 link.
CSCvj73544	ospf routing loop for external route with multiple VLINKs/ABRs
CSCvj78083	Path of Last Resort Sending Probes in Standby State
CSCvj90089	Crash while doing a conference call
CSCvj95351	OSPF SR uloop : After issuing "clear ip ospf process". ospf process crashed.
CSCvk00446	BGP high CPU when config 256k vxlan static route
CSCvk37875	High Availability system with two Voice Gateways - Crash
CSCvk42631	CSR1000v running inside Citrix XenServer 7.0 crashed
CSCvk50734	Device Tracking - Memory leak observed with IPv6 NS/NA Packets .

Caveat ID Number	Description
CSCvk52495	IP SLA multicast appear as "Unknown"
CSCvk66880	CUBE incorrectly fomats SIP SDP
CSCvk69093	CUBE is not responding to SIP INFO
CSCvm32630	Crash due to out-of-memory condition Memory leak@CENT-BR-0

Related Documentation

For information about the Cisco CSR 1000v Series and associated services, see: Documentation Roadmap for Cisco CSR 1000v Series, Cisco IOS XE 16.

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