Release Notes for Cisco IOS XRv 9000 Routers, IOS XR Release 25.3.1

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Cisco XRv 9000 Routers, IOS XR Release 25.3.1

Cisco IOS XR Release 25.3.1 for XRv 9000 routers delivers key enhancements, including advanced segment routing with CNC v7.2 and transactional gRPC APIs, enhanced SSH session management, class-based MPLS traffic steering, and support for Red Hat Enterprise Linux (RHEL) 9.4. The release also features VPP dataplane upgrade to version 23.06, PacketIO infrastructure migration with Linux kernel 6.6, a gRPC-based northbound API for BGP-LS, support for VMware ESXi 8.0, delivering improved programmability, virtualization, and operational efficiency, and improved security—including TACACS+ with TLS protection.

New software features

Table 1. New software features for Cisco XRv 9000 Routers, Release 25.3.1

Product impact	Feature	Description
Ease of Use	Cisco Network Controller (CNC) v7.2: Multiple SID-List with Preserve or Transactional gRPC API	This feature enables advanced segment routing path computation by supporting multiple SID lists and atomic, transactional updates through gRPC API. This ensures reliable, consistent policy changes and enhances network stability. It supports high availability with state synchronization across multiple SR-PCEs and integrates with Path Computation Clients for comprehensive traffic engineering across multi-AS topologies. This improves network programmability, scalability, and reduces configuration errors.
Software Reliability	Unused connection timeout for SSH sessions	You can prevent session limit exhaustion and maintain optimal system performance by automatically disconnecting SSH connections with no active channels. The feature introduces a configurable timeout for unused SSH connections, ensuring stale sessions do not occupy resources on your routers. The router monitors each SSH connection and terminates it when all channels remain closed and SSH clients do not create new channels within the configured timeout period.
Software Reliability	Channel timeout for SSH sessions	You can improve resource efficiency and minimize potential security risks by automatically closing idle SSH channels on the routers after a specific period of inactivity. The feature introduces a configurable timeout for SSH channels which ensures that unused channels do not persist while the parent SSH connection remains active. The router monitors each SSH channel and closes any channel where no data is sent or received within the configured timeout period.
Upgrade	VPP Dataplane Upgrade to Version 23.06	The Vector Packet Processing (VPP) component used in the software dataplane has been upgraded to version 23.06.
Software Reliability	Support for RHEL 9.4	This release brings in support for Red Hat Enterprise Linux (RHEL) 9.4 on Cisco XRv9000 Routers. It delivers enhanced virtualization performance and improved CPU and memory management to optimize XRv9000 resource utilization.
Software Reliability	Class-Based MPLS Traffic Steering	You can now enable precise traffic management to improve network efficiency and control by classifying MPLS traffic using the three-bit EXP field. This feature classifies and steers MPLS traffic based on the EXP value, with the SWAN agent or controller pushing MPLS routes to Label Switch Router (LSR) nodes. Each node forwards traffic

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Product impact	Feature	Description
		according to these class-based rules, selecting the next hop based on EXP-defined classes.
API Experience	gRPC based North Bound API for BGP-LS objects	This gRPC-based API exports BGP-LS topology objects, which include Nodes, Links, IPv4 and IPv6 Prefixes, SRv6 SIDs, and SR Policy Candidate Paths. The API is designed to provide real-time updates to external controllers and applications, enabling them to perform tasks such as re-optimization, service placement, and network visualization. For more information, refer to the Cisco Crosswork Optimization Engine User Guides.
Security Efficacy	TACACS+ with TLS protection	You can significantly enhance security and reduce the risk of attacks on weak encryption by using TACACS+ over TLS. This method ensures the secure transmission of all Authentication, Authorization, and Accounting (AAA) data between the client and server. It provides robust protection for sensitive environments by supporting mutual authentication through a TLS X.509 certificate-based infrastructure. This feature is compatible with both TLS versions 1.3 and 1.2.

Changes in behavior

- SR-PCE: Single PCE scale enhancement: With this feature, support for a single PCE is enhanced to 50000 nodes, 100000 LSPs, 500000 links, and 2000 PCEP sessions. Nodes in this context includes both topology and virtual nodes. Virtual nodes are generated by PCE for each redistributed IPv4 prefix advertised to PCE.Use the show pce [ipv4 | ipv6] topology summary command to verify the current PCE topology size.
- Full Outgoing Interface Name in Cisco-IOS-XR-mpls-forwarding-oper: The outgoing-interface leaf of Cisco-IOS-XR-mpls-forwarding-oper has been updated to include the full outgoing interface name instead of the shortened interface name.
- Call Home transport mode deprecated: Starting with Release 25.3.1, IOS XR software no longer supports Call Home transport mode for Licensing. Please configure CSLU or Smart Transport to ensure seamless operation of the licensing solution.

Open issues

There are no open caveats in this release.

Known issues

There are no known issues in this release.

Compatibility

Appliance model

Cisco IOS XRv 9000 Appliance is the pre-installed Cisco IOS XRv 9000 Router software that is sent from the factory on a bare metal UCS server hardware. It supports hyper scalability as it can scale to 70 million route prefixes when run as a Virtual Route Reflector. Therefore, the extra layer of software (hypervisor) is not required.

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The Appliance also supports Zero Touch Provisioning (ZTP) which allows easier insertion into existing networks.

Table 2. Specification of the Cisco XRv 9000 Appliance

Parameters	Supported
Form Factor	1 RU
Processor	4th Gen Intel Xeon Scalable processor Intel I5420+ 2GHz/205W 28C/52.5MB DDR5 4400MT/s
Memory size	128GB (8x16GB DDR5-4800 RDIMM 1Rx8)
Internal storage	480GB M.2 Boot SATA Intel SSD
Software version	Cisco IOS-XR version 24.4.2 and later
Firmware version	BIOS version: C220M7.4.3.5b.0_XRV9K CIMC/BMC version: 4.3(5.250001)
Physical NICs	25G Model: Cisco-Intel E810XXVDA4L 4x25/10 GbE SFP28 PCIe 100G Model: Cisco-MLNX MCX623106AS-CDAT 2x100GbE QSFP56 PCIe Cisco-MLNX MCX623106AS-CDAT 2x100GbE QSFP56 PCIe

Hypervisors

A hypervisor enables multiple operating systems to share a single hardware host machine. While each operating system appears to have the dedicated use of the host's processor, memory, and other resources; the hypervisor controls and allocates only needed resources to each operating system and ensures that the operating systems (VMs) do not disrupt each other.

Installation of the Cisco IOS XRv 9000 Router is supported on selected Type 1 (native, bare metal) hypervisors. Installation is not supported on Type 2 (hosted) hypervisors, such as VMware Fusion, VMware Player, or Virtual Box. The following table lists release specific supported hypervisor versions.

Table 3. Support Matrix for Hypervisor Versions

Cisco IOS XR Version	VMWare ESXi	Kernel Based Virtual Machine (KVM)
Release 25.3.1	Version 8.0	Linux KVM based on Red Hat Enterprise Linux 9.4

Virtual machines

Cisco IOS XRv 9000 Router virtual machines must meet the following requirements:

Table 4. VM Requirement for VMware Environment

Parameters	Supported
VMware ESXi	Version 8.0

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Parameters	Supported
Virtual CPU cores	1 socket with a minimum of 4 cores Note: For multicast heavy deployments we recommend configuring 8 cores (with 4 assigned for control plane and 4 assigned for data plane). Note: For production environment minimum of 4 cores is recommended.
Virtual Machine memory size	24GB minimum for VRR, recommended to increase as per VM requirements
Virtual Machine hard disk size	64GB minimum for vPE and vRR image variants
Virtual Interfaces	• E1000 • VMXNET3 for traffic interfaces only
Physical NICs	For pass-through: • Intel X710, XXV710 • Mellanox ConnectX 6 SR-IOV supported for: • Intel E810 XXV, E810 C • Intel X710, XXV710
Number of interfaces	Maximum of 11 NICs where: • 1 for management • 2 are reserved • 8 for traffic
Default video, SCSI controller set	Required SCSI controller not required for IDE disk.
Virtual CD/DVD drive installed	Virtual CD/DVD is required when installing the Cisco IOS XRv 9000 Router on the VM using ISO template.
IDE hard disk	Single IDE hard disk Note: Multiple hard disk drives on a VM are not supported.

Firmware update available for UCS M7 appliance (xrv9k-ucs-c220m7-huu-container-4.3.5.250001.tar.gz)

A firmware update package, xrv9k-ucs-c220m7-huu-container-4.3.5.250001.tar.gz, is now available for the UCS M7 appliance. This package includes firmware for both the CIMC and BIOS, incorporating a mandatory security fix.

The SHA256 checksum for the package is:

fbc684125becb2918191481637dcc3421d01c87b9063e8432843a5c256b0361f

The SHA256 checksum for the CIMC and BIOS binaries are:

- bios.pkg 16b8640249ec199cf096f462601dc587deed9346442a2f2081548da7dab5a4f0
- cimc.bin 8f932da5114bfbd220dad06b9ec74a3bc45fcbf69a5d732519231f4970040ef8

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For detailed instructions on extracting and installing the firmware, please refer to the documentation at Firmware Files.

Optics support

Table 5. Optics support for the XRv 9000 Routers

Product	Product Code	Product Recommendation
Cisco 100GBASE LR4 QSFP Transceiver, LC, 10km over SMF	Cisco QSFP-100G-LR4-S	XRv9000 Appliance with UCS-C220 M7 server, 2X100G
Cisco 100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF	Cisco QSFP-100G-SR4-S	
Cisco 10GBASE SFP+, Short Range	Cisco SFP-10G-SR	XRv9000 Appliance with UCS-C220 M7 server - 4X10/25G
Cisco 10GBASE SFP+, Long Range	Cisco SFP-10G-LR	

Related resources

Table 6. Related resources

Resource	Description
Smart licensing	Provides information about Smart Licensing Using Policy solutions and their deployment on IOS XR routers.
Cisco XRv 9000 documentation	Provides CDC documentation for Cisco XRv 9000 routers.
Transceiver Module Group (TMG) compatibility matrix	Allows searching by product family, product ID, data rate, reach, cable type, or form factor to determine the transceivers that Cisco hardware device supports.
Cisco IOS XR Error messages	Allows searching by release number, error strings, or comparing release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Allows selecting the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
Yang data models in GitHub	Provides yang data models introduced and enhanced in every IOS XR release.
Recommended release	Provides a general guide in case of upgrading IOS XR routers or new deployments that involve IOS XR routers.

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