Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 25.2.1

Contents

Cisco NCS 5500 Series Routers, IOS XR Release 25.2.1

Cisco IOS XR Release 25.2.1 is a new feature and hardware release for Cisco NCS 5500 Series routers. Key highlights include increased Layer 2 and Layer 3 overlay scale, telemetry enhancements, DDoS edge protection, EVPN scalability, selective multicast, IS-IS static neighbor, and SRv6 hardware offload. The release also features a new hardware, Cisco 400G QSFP-DD Ultra Long Haul Coherent Optics.

New software features

Table 1. New software features for Cisco NCS 5500 Series Routers, Release 25.2.1

Product Impact	Feature	Description
System Setup and Software Installation		
Software Reliability	Hardware MDB profiles for Layer 2 and Layer 3 services overlay scale increased to 32000	Introduced in this release on: NCS 5700 fixed port routers, NCS 5700 line cards [Mode: Native] You can now configure hardware MDB profiles for Layer 2 and Layer 3 services over SRv6 services, enabling you to set overlay scales to 32000 in terms of the number of routers and sessions. This release adds the following hardware MDB profiles to the hw-module profile mdb command: • l2max-srv6 • l2max-se-srv6 • l3max-srv6 • l3max-se-srv6
Telemetry		
Software Reliability	Stream telemetry data for IPv4 and IPv6 data on interfaces	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native] You can now enhance network reliability and resource optimization for efficient data collection and analysis by monitoring interface performance and operational status across platforms. This ensures consistent management, proactive troubleshooting, and optimization in multi-vendor environments by using openconfig-interfaces.yang data models. This can be achieved by enabling telemetry to configure specific sensor paths for tracking interface states.
Application Hosting		
Upgrade	Cisco Secure DDoS Edge Protection	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native]) You can now enable the router to detect DDoS attacks targeting MPLS traffic using DDoS edge protection. The router analyzes MPLS flows to identify malicious traffic patterns, ensuring the availability and performance of services traversing MPLS networks.
Interface and Hardware Component		

Product Impact	Feature	Description
Hardware Reliability	QDD OLS support on QSFP28 ports	Introduced in this release on: NCS 5500 modular routers (select variants only*) The QDD Optical Line System (OLS) pluggable optical amplifier is now supported on QSFP28 ports. *This feature is supported on NCS-55A2-MOD-SE-S via NC55-MPA-1TH2H-S
L2VPN and Ethernet Services		
Software Reliability	Improved scalability and convergence for EVPN single-flow active using ARP pacing	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native]) You now have the ability to converge 8,000 hosts in less than a second, with bidirectional traffic. This feature enables the network to recover quickly from failures or changes in topology, ensuring continuous service and balanced data transmission. This capability is achieved by optimizing the management of MAC and IP routes through ARP pacing.
Software Reliability	Selective Multicast with IGMP proxy	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native]) Selective Multicast with IGMP Proxy addresses the issue of unnecessary flooding of multicast traffic in EVPN fabrics. It ensures multicast traffic is only forwarded to peers with active receivers, optimizing bandwidth usage.
Routing		
Ease of Setup	IS-IS static neighbor	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native]) IS-IS static neighbor allows the advertisement of an IS-IS link without forming an actual IS-IS adjacency. This feature is useful when a link is required in the topology for the controller, but IS-IS is not actively running on the link.
System Management		
Software Reliability	Cisco Smart SFP destination MAC address	Introduced in this release on: NCS 5500 fixed port routers (*select variant only) We now allow seamless interoperability between Cisco Smart SFPs and third-party devices that require MAC address validation. This capability is achieved by allowing the configuration of a destination MAC address directly on Cisco Smart SFPs. You can configure a specific destination MAC address on Transparent PDH over Packet (tpop) and Channelized SDH over Packet (csop) Smart SFPs enabling Cisco Smart SFPs to ensure that data packets are successfully accepted by the destination device. By default, the destination MAC address on the Cisco smart SFPs is zero. *This feature is supported on: • NCS-55A2-MOD-SE-S • NCS-55A2-MOD-HD-S
Segment Routing		

Product Impact	Feature	Description
Software Reliability	Hardware offload SRv6 liveness monitoring	Introduced in this release on: NCS 5500 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards) You can now offload SRv6 liveness monitoring for performance measurement to the router's hardware, which is the Network Processing Unit (NPU). This hardware-based approach improves efficiency and scalability, helping you meet delay-sensitive Service Level Agreements (SLAs). Previously, this monitoring was handled in software. Using hardware to offload performance monitoring tasks improves efficiency and reduce the load on the main processor. You can enable by using the existing npu-offload under the performance-measurement liveness-profile name liveness profile command.
API Experience	gRPC based North Bound API for BGP-LS objects	Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native]) 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.

New hardware

Table 2. New hardware for Cisco NCS 5500 Series Routers, Release 25.2.1

Hardware	Description
Optics	This release launches the following new optics on selective hardware within the product portfolio. For details, refer to the Transceiver Module Group (TMG) Compatibility Matrix. Cisco 400G QSFP-DD Ultra Long Haul Coherent Optics DP04QSDD-ULH

Changes in behavior

- Autoroute announce with IPv6 destination address for ISIS: Two new keywords, **destination** and **ipv6**, were added to the **autoroute announce** command to provide the IPv6 destination address to ISIS thus allowing an MPLS-TE tunnel as the nexthop for IPv6 destinations. ISIS uses this address when filtering prefixes.
- Customize docker run options using application manager: The **--cap-add=NET_RAW** option has been added to the docker run configuration which enables application manager containers to perform advanced network-level operations, improving the functionality of containerized applications.
- Type6 server output enhancements: The **show type6 server** command now includes two new outputs that provides additional details for enhanced server management and troubleshooting:

- Masterkey Length
- Masterkey Hash

- gRPC remote-connection: A new command, **grpc remote-connection disable**, has been introduced. This command allows users to disable TCP connections on the router, providing greater control over network configurations.
- When performing a statistics collection via gNMI from the router for **Cisco-IOS-XR-platforms-ofa-oper:ofa/stats/nodes/node/Cisco-IOS-XR-ofa-npu-stats-oper:asic-statistics/asic-statistics-drop-for-npu-ids/asic-statistics-drop-for-npu-id**, the precision is incorrectly reported in microseconds instead of nanoseconds.
- Full overwrite for gNMI union-replace operations: The gNMI union-replace operation has been enhanced to align more closely with the intended behavior defined in the gNMI specification. Instead of merging new configuration data with existing configuration, the operation now performs a full commit-replace, ensuring that the resulting configuration reflects only the contents of the union-replace request.
- The **Cisco-IOS-XR-pmengine-oper.yang** data model has been updated to ensure consistency. The naming convention has been standardized by renaming elements such as **hour24fec** to **hour24-fec**, **minute15pcs** to **minute15-pcs**, and **second30pcs** to **second30-pcs** across all layers, including OTN, OTNSEC, PCS, FEC, PRBS, Ether, and GFP. For more details on the sensor paths or the updated 25.2.1 Yang models, refer to the GitHub repository.

Open issues

There are no open caveats in this release.

Known issues

- The Cisco NCS 5500 series modular routers with Cisco NCS 5700 line cards no longer support new features in compatibility mode. All Cisco IOS XR releases will continue to support features that were already enabled in compatibility mode until release 25.1.1. However, no new features will be added to compatibility mode. To take advantage of new features in current and subsequent releases, enable native mode by using the **hw-module profile npu native-mode-enable** command.

Compatibility

Compatibility matrix for EPNM and Crosswork with Cisco IOS XR software

The compatibility matrix lists the version of EPNM and Crosswork that are supported with Cisco IOS XR Release in this release.

Table 3. Compatibility Matrix for EPNM and Crosswork with Cisco IOS XR Software

Cisco IOS XR	Crosswork	EPNM
Release 25.2.1	Crosswork Optimization Engine 6.0	Evolved Programmable Network Manager 7.1.1

System requirements

Use the **show hw-module fpd** command in EXEC and Admin mode to view the hardware components with their current FPD version and status. The status of the hardware must be CURRENT; Running and

Programed version must be the same. You can also use the **show fpd package** command in Admin mode to check the fpd versions.

Software version

To verify the software version running on the router, use **show version** command in the EXEC mode.

```
Router# show version
Cisco IOS XR Software, Version 25.2.1
Copyright (c) 2013-2025 by Cisco Systems, Inc.

Build Information:
 Built By     : swtools
 Built On     : Mon Jun 16 07:24:26 PDT 2025
 Built Host   : iox-lnx-049
 Workspace    : /auto/srcarchive11/prod/25.2.1/ncs5500/ws
 Version      : 25.2.1
 Location     : /opt/cisco/XR/packages/
 Label        : 25.2.1-iso

cisco NCS-5500 () processor
System uptime is 9 hours 51 minutes
```

Supported software packages

The following tables lists the Cisco IOS XR Software feature set matrix (packages) with associated filenames. Visit the Cisco Software Download page to download the Cisco IOS XR software images.

Table 4. Supported software for NCS 5500 Series Routers, Release 25.2.1

Feature Set	Filename	Description
Composite Package		
Cisco IOS XR IP Unicast Routing Core Bundle	ncs5500-mini-x.iso	Contains base image contents that includes: Host operating system System Admin boot image IOS XR boot image BGP packages
Individually-Installable Optional Packages		
Cisco IOS XR Manageability Package	ncs5500-mgbl-3.0.0.0-r2521.x86_64.rpm	Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server packages.
Cisco IOS XR MPLS Package	ncs5500-mpls-2.1.0.0-r2521.x86_64.rpm ncs5500-mpls-te-rsvp-2.2.0.0-r2521.x86_64.rpm	MPLS and MPLS Traffic Engineering (MPLS-TE) RPM.

Feature Set	Filename	Description
Cisco IOS XR Security Package	ncs5500-k9sec-3.1.0.0-r2521.x86_64.rpm	Support for Encryption, Decryption, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI)
Cisco IOS XR ISIS package	ncs5500-isis-1.2.0.0-r2521.x86_64.rpm	Support ISIS
Cisco IOS XR OSPF package	ncs5500-ospf-2.0.0.0-r2521.x86_64.rpm	Support OSPF
Lawful Intercept (LI) Package	ncs5500-li-1.0.0.0-r2521.x86_64.rpm	Includes LI software images
Multicast Package	ncs5500-mcast-1.0.0.0-r2521.x86_64rpm	Support Multicast
EIGRP	ncs5500-eigrp-1.0.0.0-r2521.x86_64.rpm	Supports Enhanced Interior Gateway Routing Protocol
Lawful Intercept Control	ncs5500-lictrl-1.0.0.0-r2521x86_64.rpm	Supports Lawful Intercept Control
Healthcheck	ncs5500-healthcheck-1.0.0.0-r2521.x86_64.rpm	Supports System Health Check

Table 5. TAR files for Cisco NCS 5500 Series Router, Release 25.2.1

Feature Set	Filename
NCS 5500 IOS XR Software 3DES	NCS5500-iosxr-k9-25.2.1.tar
NCS 5500 IOS XR Software	NCS5500-iosxr-25.2.1.tar
NCS 5500 IOS XR Software	NCS5500-docs-25.2.1.tar
NCS 5500 IOS XR Software 3DES	NCS5500-iosxr-k9-25.2.1.tar
NCS 5500 IOS XR Software	NCS5500-iosxr-25.2.1.tar

Table 6. Packages for Cisco NCS 5700 Series Router, Release 25.2.1

Feature Set	Filename
NCS 5700 IOS XR Software	ncs5700-x64-25.2.1.iso
NCS 5700 IOS XR Software (only k9 RPMs)	ncs5700-k9sec-rpms.25.2.1.tar
NCS 5700 IOS XR Software Optional Package	NCS5700-optional-rpms.25.2.1.tar This TAR file contains the following RPMS: optional-rpms/cdp/* optional-rpms/eigrp/* optional-rpms/telnet/*

Related resources

Table 7. Related resources

Resource	Description
Cisco feature finder	Assists in locating features introduced across Cisco IOS XR releases and platforms.
Smart licensing	Provides information about Smart Licensing Using Policy solutions and their deployment on IOS XR routers.
Cisco NCS 5500 documentation	Provides CDC documentation for Cisco NCS 5500 series 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.

Legal information