Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 25.3.1

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Cisco NCS 540 Series Routers, Release 25.3.1

Cisco IOS XR Release 25.3.1 is a new feature release for Cisco NCS 540 Series routers.

For more details on the Cisco IOS XR release model and associated support, see Software Lifecycle Support Statement - IOS XR.

New software features

This section provides a brief description of the new software features introduced in this release.

Table 1. New software features for Cisco NCS 540 Series Routers, Release 25.3.1

Product impact	Feature	Description
Interface and Hardware Component		
Software reliability	Traffic mirroring to a third-party application	This feature mirrors traffic directly to a third-party application hosted on a route processor. The feature provides an end-to-end traffic flow encryption and improves monitoring solutions within service provider networks. This feature is supported on: • N540-24Q2C2DD-SYS • N540-24Q8L2DD-SYS • N540(X)-ACC-SYS • N540-24Z8Q2C-SYS • N540X-16Z4G8Q2C-D/A • N540-12Z20G-SYS-D/A • N540X-16Z8Q2C-D • N540-28Z4C-SYS-A/D • N540X-12Z16G-SYS-D/A
L2VPN		
Software reliability	Decoupled mode for L2VPN and EVPN VPWS services	Decoupled mode improves fault tolerance by allowing the PE router to maintain the PW in an active state independently of the AC status. Unlike the traditional coupled mode, which requires both AC and PW to be active for traffic flow, decoupled mode ensures uninterrupted PW traffic even during AC failures.
Software reliability	Sub-second convergence for EVPN with BGP PIC-edge	You can maintain continuous service in multi-homed EVPN deployments using sub-second convergence for EVPN with BGP PIC-edge. This functionality rapidly switches traffic to a backup nexthop path when the preferred nexthop fails, delivering fast convergence and high availability for active-active EVPN E-LAN and E-Line services.
Network Synchronization		
Software Reliability	Cisco Smart SFP Destination MAC address	The feature is now supported on these platforms: • N540X-16Z4G8Q2C-A

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Product impact	Feature	Description
		• N540X-16Z8Q2C-D
Ease of Setup	PTP virtual port support for N540-24Q2C2DD-SYS	PTP virtual port is now supported on the N540-24Q2C2DD-SYS router.
Ease of Setup	Assisted partial timing support	Assisted Partial Timing Support (APTS) is supported on the N540-24Q2C2DD-SYS router.
Programmability		
Software Reliability	YANG-Push notifications	YANG-Push provides a real-time telemetry solution by allowing applications to subscribe to specific YANG datastore updates. This feature enables efficient, low-latency streaming of operational state data to subscribed receivers. By reducing the reliance on traditional polling methods, YANG-Push enhances network observability, accelerates troubleshooting, and optimizes data collection for modern network automation and assurance workflows.
Segment Routing		
Software Reliability	Layer 3 service gateway for interconnecting SRv6 domains	Optimize network scalability and interoperability by reducing SID resource usage, and enabling seamless integration between distinct SRv6 domains. The Layer 3 service gateway provides a flexible mechanism to extend Layer 3 services across different SRv6 networks, supporting efficient route summarization, cross-locator compatibility, and consistent service continuity on both control and data planes.
Ease of Use	EVPNv6 (ELAN) L2 Gateway	This feature enables scalable and resilient Layer 2 gateway services over SRv6, supporting advanced multi-homing with ESI filtering and uSID-based service steering. It enhances network flexibility, optimizes traffic management, and improves operational visibility, delivering business value by ensuring high availability, efficient load balancing, and seamless integration across multi-AS environments for service providers and enterprises
Setup and Upgrade		
Upgrade	Optimized IOS XR upgrade or downgrade process	You can now upgrade Cisco IOS XR software from an earlier version to version 25.3.1 or later, and downgrade from version 25.3.1 or later to an earlier version, with certain limitations. These limitations are designed to help prevent failures during the upgrade or downgrade process.
Upgrade	Rollback changes with simplified install process	With the simplified install process that enhances upgrade robustness and scalability between IOS XR versions, rollback packages are no longer available after a release upgrade. You can continue to use the **install rollback** command to reverse operations within the same XR release, and existing rollback commands remain available for reverting operations involving multiple SMUs or optional packages.
System Security		
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

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Product impact	Feature	Description
		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.
Software Reliability	FIPS compliance for IKEv2 sessions	You can now improve security by enforcing Federal Information Processing Standards (FIPS) compliance and visibility for Internet Key Exchange (IKE) protocol sessions on your router. The feature ensures that only FIPS-compliant algorithms are used for new IKEv2 sessions. When you enable FIPS mode, the router terminates all active sessions and allows only compliant sessions to re-establish. The feature modifies the **show ikev2 summary** command output to display the FIPS mode status in IKE process context.
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.

New hardware

There is no new hardware introduced in this release.

Changes in behavior

This section provides a brief description of the behavior changes introduced in this release.

- 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.
- 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.

Open issues

There are no open issues in this release.

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Known issues

- The statistics collection may time out due to CPU overload during route churn. In such scenarios, statistics collection will resume when the CPU becomes available after the route churn is complete.
- Autonegotiation is disabled by default on the fixed GigE - 0/0/0/0 - 0/0/0/4 copper ports of N540X-16Z4G8Q2C-A/D and N540X-12Z16G-SYS-A/D router variants. To enable autonegotiation, use the **negotiation auto** command.
- If you're migrating from previous XR versions, then you must enable autonegotiation for fixed copper ports using the **negotiation auto** command before performing the software upgrade to avoid any links going down.
- Enabling or disabling frame preemption on the Time Sensitive Networking (TSN) port results in traffic drop for N540-FH-CSR-SYS. The port Twenty Five G0/0/12 is used as the TSN port.
- Fabric multicast queue stats are not supported in N540X-8Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.
- Unlabeled BGP PIC EDGE for global prefixes is not supported.
- The interface ports 0/0/0/24 to 0/0/0/31 do not support 1G Copper SFPs on N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants. Also, these ports do not support Auto-Negotiation with 1GE optical SFPs and they cannot act as 1GE Synchronous Ethernet sources.
- The interface ports 0/0/0/20 to 0/0/0/27 do not support 1G Copper SFPs on N540X-16Z4G8Q2C-A, N540X-16Z8Q2C-D, and N540X-16Z4G8Q2C-D variants. Also, these ports do not support Auto-Negotiation with 1GE optical SFPs and they cannot act as 1GE Synchronous Ethernet sources.
- The 1G ports on the N540-24Q8L2DD-SYS variant do not support Auto-Negotiation with 1GE optical SFPs.
- Remove the speed settings on the 1G Copper optics when 10M/100M is configured and replaced with 1G SFP optics.
- The **hw-module profile mfib statistics** command is not supported.

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 2. Compatibility Matrix

Cisco IOS XR	Crosswork	EPNM
Release 25.3.1	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 Programmed version must be the same. You can also use the `show fpd package` command in Admin mode to check the fpd versions.

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Software Version

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

```
Router# show version
Tue Sep 16 12:31:31.860 IST
Cisco IOS XR Software, Version 25.3.1 LNT
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Build Information:
 Built By     : swtools
 Built On     : Mon Sep 15 22:29:03 UTC 2025
 Build Host   : iox-lnx-016
 Workspace    : /auto/srcarchive12/prod/25.3.1/ncs540l/ws
 Version      : 25.3.1
 Label        : 25.3.1-RN3

cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
PE6-Arches uptime is 6 minutes
Cisco NCS540 Series, Fixed Router 2x400G, 8x50G, 24x25G Chassis
```

Supported software packages

The following tables list the supported base images and optional packages and their corresponding file names.

Visit the Cisco Software Download page to download the Cisco IOS XR software images.

Table 3. Release 25.3.1 software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Package	Filename	Description
Base image		
IOS XR Base Image	ncs540-mini-x-25.3.1.iso	IOS XR mandatory base image.
USB Boot Package	ncs540-usb_boot-25.3.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
Optional packages not included in the base image		
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r2531.x86_64.rpm	Supports Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server
IOS XR MPLS	ncs540-mpls-1.0.0.0-r2531.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r2531.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE)

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Package	Filename	Description
IOS XR Security	ncs540-k9sec-1.0.0.0-r2531.x86_64.rpm	Supports MACsec and 802.1X
IOS XR ISIS	ncs540-isis-1.0.0.0-r2531.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r2531.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r2531.x86_64.rpm	Supports Lawful Intercept (LI)
IOS XR Multicast	ncs540-mcast-1.0.0.0-r2531.x86_64.rpm	Supports Multicast
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r2531.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r2531.x86_64.rpm	Supports LI-CTRL

Table 4. Release 25.3.1 Software for N540-24Q8L2DD-SYS, N540-24Q2C2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, N540X-16Z8Q2C-D, and N540-FH-AGG-SYS

Package	Filename	Description
Base Image		
IOS XR Base Image	ncs540l-x64-25.3.1.iso	IOS XR base image with mandatory packages. The base ISO image also includes the following optional packages: xr-bgp xr-cdp xr-eigrp xr-ipsla xr-is-is xr-k9sec xr-lictrl xr-lldp xr-mcast xr-mpls-oam xr-netflow xr-ospf xr-perf-meas xr-perfmgmt xr-rip xr-telnet xr-track These optional packages are also included in NCS540l-iosxr-25.3.1.tar.

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Package	Filename	Description
USB Boot Package	ncs540l-usb_boot-25.3.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
Optional packages not included in the base image		
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-25.3.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-25.3.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-iosxr-25.3.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.25.3.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-iosxr-25.3.1.tar	Supports RIP

Table 5. Release 25.3.1 Software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-6Z18G-SYS-A/D

Package	Filename	Description
Base image		

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Package	Filename	Description
IOS XR Base Image	ncs540l-aarch64-25.3.1.iso	IOS XR base image with mandatory packages. The ISO image also includes the following optional packages: xr-bgp xr-cdp xr-eigrp xr-ipsla xr-is-is xr-k9sec xr-lictrl xr-lldp xr-mcast xr-mpls-oam xr-ncs540l-mcast xr-ncs540l-netflow xr-netflow xr-ospf xr-perf-meas xr-perfmgmt xr-rip xr-telnet xr-track These optional packages are also included in NCS540l aarch64 iosxr optional rpms-25.3.1.tar.
USB Boot Package	ncs540l-aarch64-usb_boot-25.3.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
Optional packages not included in the base image		
Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-25.3.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-25.3.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-25.3.1.tar	Supports CDP

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Package	Filename	Description
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.25.3.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-aarch64-iosxr-optional-rpms-25.3.1.tar	Supports RIP

Related resources

Table 6. Related resources

Document	Description
Cisco feature finder	An interactive tool that assists in locating features introduced across Cisco IOS XR releases and platforms.
Smart licensing	Information about Smart Licensing Using Policy solutions and their deployment on IOS XR Routers.
Cisco NCS 540 documentation	CCO Documentation for Cisco NCS 540 Series Routers
Transceiver Module Group (TMG) compatibility matrix	Search 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	Search by release number, error strings, or compare release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Select the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
YANG data models	A user-friendly reference designed to easily explore and understand the various data models supported in Cisco IOS XR platforms and releases.
Yang data models in Github	Repository containing the folders with yang data models introduced and enhanced in every IOS XR release.

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