Release Notes for Cisco NCS 5000 Series Routers, IOS XR Release 7.3.2

Network Convergence System 5000 Series Routers

✎

Note   Explore the Content Hub, the all new portal that offers an enhanced product documentation experience.

- Use faceted search to locate content that is most relevant to you.

- Create customized PDFs for ready reference.

- Benefit from context-based recommendations.

Get started with the Content Hub at content.cisco.com to craft a personalized documentation experience.

Do provide feedback about your experience with the Content Hub.

Release 7.3.2 Package

Table 1: Release 7.3.2 Packages for Cisco NCS 5000 Series Router

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	ncs5k-mini-x.iso	Contains base image contents that includes: • Host operating system • System Admin boot image • IOS XR boot image • Alarm co-relation
Individually-Installable Optional Packages		
Feature Set	**Filename**	**Description**
Cisco IOS XR Manageability Package	ncs5k-mgbl-3.0.0.0-r732.x86_64..rpm	XML, Parser, HTTP Server, Telemetry, and gRPC.
Cisco IOS XR MPLS Package	ncs5k-mpls-3.1.0.0-r732.x86_64.rpm	Label Distribution Protocol (LDP), MPLS forwarding , MPLS operations , Administration and maintenance (OAM), Layer3-vpn , layer-2 vpn.
Cisco IOS XR MPLS RSVP TE package	ncs5k-mpls-te-rsvp-1.1.0.0-r732.x86_64.rpm	Supports MPLS RSVP-TE (Resource Reservation Protocol with Traffic Engineering extensions)

Cisco IOS XR Security Package	ncs5k-k9sec-3.2.0.0-r732.x86_64.rpm	Support for Encryption, Decryption, and Secure Shell (SSH),
Cisco IOS XR Multicast Package	ncs5k-mcast-2.2.0.0-r732.x86_64.rpm	Multicast routing protocols (PIM, IGMP, Auto-rp, BSR) and infrastructure (Multicast routing information Base) , Multicast forwarding (mfwd)
Cisco IOS XR ISIS package	ncs5k-isis-2.2.0.0-r732.x86_64.rpm	Supports ISIS
Cisco IOS XR OSPF package	ncs5k-ospf-2.0.0.0-r732.x86_64.rpm	Supports OSPF

What's New in Cisco IOS XR Release

Cisco is continuously enhancing the product with every release and this section covers a brief description of key features and enhancements. It also includes links to detailed documentation, where available.

Software Introduced and Enhanced

To learn about features introduced in other Cisco IOS XR releases, select the release from the What's new page.

Feature	Description
System Error Messages	
System Error Messages	An intuitive interface to view, search, compare, and download Cisco IOS XR Error Messages.
Programmability	
Achieving Operational Simplicity Using Automation Scripts	This feature lets you host and execute your automation scripts directly on a router running IOS XR software, instead of managing them on external controllers. The scripts available on-box can now leverage Python libraries, access the underlying router information to execute CLI commands, and monitor router configurations continuously. This results in setting up a seamless automation workflow by improving connectivity, access to resources, and speed of script execution. The following categories of on-box scripts are used to achieve operational simplicity: • Config scripts • Exec scripts • Process scripts • EEM scripts
Contextual Script Infrastructure	When you create and run Python scripts on the router, this feature enables a contextual interaction between the scripts, the IOS XR software, and the external servers. This context, programmed in the script, uses Cisco IOS XR Python packages, modules, and libraries to: • obtain operational data from the router • set configurations and conditions • detect events in the network and trigger an appropriate action

Feature	Description
Enhancements to oc-platform YANG data model	The openconfig-platform YANG data model provides a structure for querying hardware and software router components via the NETCONF protocol. This release delivers an enhanced openconfig-platform YANG data model to provide information about: • software version • golden ISO (GISO) label • committed IOS XR packages You can access this data model from the Github repository.
Manage Automation Scripts Using YANG RPCs	This feature enables you to use remote procedure calls (RPCs) on YANG data models to perform the same automated operations as CLIs, such as edit configurations or retrieve router information.
Model-driven CLI to Display Running Configuration in XML and JSON Formats	This feature enables you to display the configuration data for Cisco IOS XR platforms in both JSON and XML formats. This feature introduces the **show run	[xml	json]** command.
Model-driven CLI to Show YANG Operational Data	This feature enables you to use a traditional CLI command to display YANG data model structures on the router console and also obtain operational data from the router in JSON or XML formats. The functionality helps you transition smoothly between CLI and YANG models, easing data retrieval from your router and network. This feature introduces the **show yang operational** command.
IP Addresses and Services	
Monitor LPTS host path drops via YANG data model	This feature allows you to use the `Cisco-IOS-XR-lpts-pre-ifib-oper.yang` data model to monitor the policer action for Local Packet Transport Services (LPTS) flow type for all IOS XR platforms. To access this data model, see the Github repository.
L2VPN and Ethernet Services	
GTP Load Balancing	In addition to the source IP address, destination IP address, and port number, this functionality enables using the unique tunnel endpoint identifier (TEID) to compute load balancing (or hashing) of traffic in tunnels between ports. Using the TEID ensures that load balancing occurs even if the other parameters don't have unique values, thus enabling efficient use of bandwidth and providing a reliable network. This functionality introduces the **hw-module loadbalancing gtp enable** command.
MPLS	
Encapsulation: RSVP-TE: Backoff Timer Enhancement	When an LSP path error occurs on a head-end router, you can guide the incoming traffic for the LSP in these ways - Update the initial and total time duration for which the head-end router retries sending traffic over the LSP, or instruct MPLS-TE to send traffic over a different LSP, without a waiting period. The feature provides flexibility to choose different actions when an LSP path error occurs. New commands: • **mpls traffic-eng timers backoff-timer**

Feature	Description
System Security	
SSH Port Forwarding	With this feature enabled, the SSH client on a local host forwards the traffic coming on a given port to the specified host and port on a remote server, through an encrypted SSH channel. Legacy applications that do not otherwise support data encryption can leverage this functionality to ensure network security and confidentiality to the traffic that is sent to remote application servers. This feature introduces the ssh server port-forwarding local command.

Caveats

These caveats are applicable for Cisco IOS XR Software:

Bug ID	Headline
CSCvy13197	Telemetry Syslog events are not received by telemetry client
CSCvz48418	L2VPN VPLS forwarding breaks when FRR is triggered

Supported Packages and System Requirements

Supported Hardware

For a complete list of supported optics, hardware and ordering information for NCS 5001 and NCS 5002 series router, see the *Cisco NCS 5000 Series Data Sheet*

For a complete list of supported optics, hardware and ordering information for NCS 5011 router, see the *Cisco NCS 5011 Series Data Sheet*

To install the Cisco NCS 5000 series routers, see *Hardware Installation Guide for Cisco NCS 5000 Series Routers*.

Other Important Notes

Upgrading Cisco IOS XR Software

Cisco IOS XR Software is installed and activated from modular packages, allowing specific features or software patches to be installed, upgraded, or downgraded without affecting unrelated processes. Software packages can be upgraded or downgraded on all supported card types, or on a single card (node).

Before starting the software upgrade, use the **show install health** command in the admin mode. This command validates if the statuses of all relevant parameters of the system are ready for the software upgrade without interrupting the system.

> **Note**
>
> If you use a TAR package to upgrade from a Cisco IOS XR release prior to 7.x, the output of the **show install health** command in admin mode displays the following error messages:
>
> ```
> sysadmin-vm:0_RSP0# show install health
> . . .
> ERROR /install_repo/gl/xr -rw-r--r--. 1 8413 floppy 3230320 Mar 14 05:45 <platform>-isis-2.2.0.0-r702.x86_64
> ERROR /install_repo/gl/xr -rwxr-x---. 1 8413 165 1485781 Mar 14 06:02 <platform>-k9sec-3.1.0.0-r702.x86_64
> ERROR /install_repo/gl/xr -rw-r--r--. 1 8413 floppy 345144 Mar 14 05:45 <platform>-li-1.0.0.0-r702.x86_64
> ```
>
> You can ignore these messages and proceed with the installation operation.

Production Software Maintenance Updates (SMUs)

A production SMU is a SMU that is formally requested, developed, tested, and released. Production SMUs are intended for use in a live network environment and are formally supported by the Cisco TAC and the relevant development teams. Software bugs identified through software recommendations or Bug Search Tools are not a basis for production SMU requests.

For information on production SMU types, refer the Production SMU Types section of the *IOS XR Software Maintenance Updates (SMUs)* guide.

Cisco IOS XR Error messages

To view, search, compare, and download Cisco IOS XR Error Messages, refer to the Cisco IOS XR Error messages tool.

Cisco IOS XR MIBs

To determine the MIBs supported by platform and release, refer to the Cisco IOS XR MIBs tool.

Related Documentation

The most current Cisco router documentation is located at the following URL:

https://www.cisco.com/c/en/us/td/docs/iosxr/ncs-5000-series-routers.html