



Release Notes for Cisco NCS 560 Series Routers, Cisco IOS XR Release 7.5.2

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What's New in Cisco IOS XR Release 7.5.2

Cisco IOS XR Release 7.5.2 is an Extended Maintenance Release of [Cisco IOS XR Release 7.5.1](#) for Cisco NCS 560 Series routers. For more details on the Cisco IOS XR release model and associated support, see [Guidelines for Cisco IOS XR Software](#).

Feature	Description
Hardware	
Support for Cisco N560-4-PWR-FAN-R (Primary) and N560-4-FAN-H-R (Secondary) Reverse Air Flow Fan Modules	<p>This release introduces the following reverse airflow fan modules:</p> <ul style="list-style-type: none">• N560-4-PWR-FAN-R (primary)• N560-4-FAN-H-R (secondary) <p>These modules direct airflow from the left side of the router to the right side.</p> <p>For more information, see the Cisco NCS 560-4 Router Hardware Installation Guide.</p>
System Monitoring	
SNMP Dying Gasp for IPv4 and IPv6	You can configure the SNMP agent to generate IPv4 and IPv6 SNMP traps when the router triggers a message to the Network Management System (NMS) that a node is going down. Such a message, known as a dying gasp event, is sent when a power failure occurs or the input power source is disconnected.
Interface and Hardware Component	
VLAN Subinterface as Source for Traffic Mirroring	<p>You can now configure the VLAN subinterface as a source for traffic mirroring for:</p> <ul style="list-style-type: none">• Traffic ingressing at the interface• Traffic egressing at the interface• Traffic egressing and ingressing at the same interface <p>You could configure mirror functionality only at the main interface level in earlier releases.</p>

Feature	Description
String-based MAID formats for Hardware Offload CFM Sessions	<p>You can now use the Invalid and String format for hardware-offloaded Connectivity Fault Management (CFM) sessions using the Maintenance Association Identifier (MAID) functionality. Earlier releases supported numerical and ICC formats for hardware-offloaded sessions.</p> <p>The router continues to support 1000 CFM sessions which include 500 hardware offload CFM sessions.</p>
Ethernet Link OAM on Physical Interface—(802.3ah) Link Monitoring and Remote Loopback	<p>Ethernet link OAM operates on a single, physical link and it can be configured to monitor either side or both sides of that link. Ethernet OAM supports:</p> <ul style="list-style-type: none"> • Link Monitoring • Remote Loopback
L2VPN and Ethernet Services	
MAC Loop Prevention	<p>This feature helps reduce network congestion and avoid traffic loss by shutting down a port after it reaches the configured number of MAC moves within the specified move interval. You can configure this feature at the bridge-domain level using the <code>mac secure</code> command.</p> <p>This feature is now supported on routers that operate in native and compatibility modes.</p>
Segment Routing	
SRv6: Ultimate Segment Decapsulation (USD) behavior	<p>This feature supports the Ultimate Segment Decapsulation (USD) variant on SRv6 endpoint nodes using full-length SIDs. Previously, USD variant was supported on SRv6 endpoint nodes using using Micro SIDs (uSIDs).</p> <p>The USD variant enables interworking with SRv6 underlay headend nodes that push SIDs using H.Encaps (SR Headend Behavior with Encapsulation in an SRv6 Policy) or H.Encaps.Red (H.Encaps with reduced Encapsulation) instead of H.Insert (SR Headend with insertion of an SRv6 Policy) or H.Insert.Red (H.Insert with reduced insertion).</p> <p>The USD variant enables interworking with SRv6 underlay headend nodes that push SIDs using H.Encaps (SR Headend Behavior with Encapsulation in an SRv6 Policy) or H.Encaps.Red (H.Encaps with reduced Encapsulation) instead of H.Insert (SR Headend with insertion of an SRv6 Policy) or H.Insert.Red (H.Insert with reduced insertion).</p>

Feature	Description
SRv6 Services: Ethernet VPN Emulated LAN (ELAN)	<p>This feature builds upon EVPN BGP signaling to provide Emulated Local Area Network (ELAN) multipoint-to-multipoint Ethernet services over an SRv6-based network.</p> <p>This feature introduces the following ELAN-related behaviors:</p> <ul style="list-style-type: none"> • Ingress PE: <ul style="list-style-type: none"> • H.Encaps.L2.[Red] – Encapsulation of L2/Ether frame using SRv6 • Egress PE: <ul style="list-style-type: none"> • End.DT2U – Decapsulation and Unicast MAC L2 Table Lookup • End.DT2M – Decapsulation and L2 Table Flooding <p>Automated steering of traffic of an EVPN ELAN service into the path associated with a best-effort or Flex-Algo locator is supported.</p>
Flexible Algorithm to Exclude SRLGs for OSPF	You can now configure the flexible algorithm to exclude any link belonging to the Shared Risk Link Groups (SRLGs) from the path computation for OSPF. The ability to exclude the at-risk links ensures that the rest of the links in the network remain unaffected.
Flexible Algorithm Prefix-SID Redistribution for External Route Propagation	<p>This feature enables the propagation of flexible algorithm prefix-SIDs and their algo-specific metric from other domains into OSPF, and from OSPF to other domains.</p> <p>The show route command has been modified to include additional attributes to indicate the external routes.</p>
Optimal Utilization of ECMP FEC Resources	<p>BGP-SR multipath ECMP FEC optimization is enhanced to support 32k BGP-LU prefixes (from the earlier 4k BGP-LU prefixes) on multipath with the same outgoing label. This results in the consumption of lesser ECMP FEC resources, thus avoiding out-of-resource (OOR) situations for your router.</p> <p>In earlier releases, all 4k BGP-LU prefixes consumed all the 4k ECMP FEC resources.</p> <p>Use the hw-module fib mpls bgp-sr lsr-optimized command to enable BGP-SR multipath ECMP FEC optimization.</p>
BGP	
BGP-LU Multipath PIC with Auto Protection	<p>BGP-LU multipath prefix independent convergence (PIC) supports auto protection. Each active path has a backup path, ensuring almost immediate restoration of multicast traffic when a path fails.</p> <p>In earlier releases, path failures led to traffic drops in the absence of auto protection.</p>
Replace BGP AS Path with Custom Values	<p>You can now configure to replace the AS Path in BGP with custom values, based on route policy. While selecting BGP best path, a shorter AS Path makes the selection process simple and flexible.</p> <p>This feature introduces the following command:</p> <ul style="list-style-type: none"> • replace as-path all

Feature	Description
RIPng	RIPng (RIP next generation) is a RIPv2 extension that supports IPv6 which is the next-generation Internet Protocol. RIPng provides routing functionalities for an IPv6-based network. RIPng functions as an interior gateway protocol (IGP) in moderate-sized autonomous systems. RIPng uses Bellman-Ford distance-vector algorithm to determine the best route to an IPv6 destination. RIP enhancements for IPv6 include support for IPv6 addresses and prefixes; and the use of the all-RIP-devices multicast group address FF02::9 as the destination address for RIP update messages.
Programmability	
New Unified Models	Unified models are CLI-based YANG models that are designed to replace the native schema-based models. This release introduces new unified models. You can access the new unified models from the Github repository.
Modular QoS	
Setting MPLS Experimental Bits on Inner MPLS Headers to Classify Traffic	For MPLS over GRE scenarios that tunnel MPLS traffic over non-MPLS networks across CE devices, you can now perform QoS classification for specific traffic or applications by setting MPLS EXP bit field values in the inner MPLS header. In earlier releases, you could perform QoS classification only in the outer GRE IP header using DiffServ Code Point (DSCP) or IP precedence bits that helped you achieve the required line rate minus the granularity. This feature introduces the hw-module profile qos gre-exp-classification-enable command.
Multicast	
Flexible Algorithm for Multicast VPN profiles	Flexible Algorithm is now available for the following profiles: <ul style="list-style-type: none"> • Profile 12: Default MDT - MLDP - P2MP - BGP-AD - BGP C-Mcast Signaling • Profile 14: Partitioned MDT - MLDP P2MP - BGP-AD - BGP C-Mcast Signaling

Restrictions and Limitations on the Cisco NCS 560 Series Router

- The standby RP may get into 'NOT READY' state intermittently due to some network churn, though the corresponding VM is up and running. But this is a transient state and shows that some data aren't in sync between active and standby due to the network churn. After both active and standby are in sync with respect to all the parameters, then the standby RP comes into 'READY' state.
- Unlabeled BGP PIC EDGE for global prefixes is not supported.

Cisco IOS XR Caveats Release 7.5.2

Bug ID	Headline
CSCwb40266	ipv6 MTU is not changing after configuring form 1500--> 8986

Supported Packages and System Requirements

For more information on system upgrade and package installation process, see [Perform System Upgrade and Install Feature Packages](#).

For a complete list of supported optics, hardware and ordering information, see the [Cisco NCS 560 Series Routers Interface Modules Data Sheet](#) and [Cisco Network Convergence System 560-4 Router Data Sheet](#).

To install the Cisco NCS 560 Series Routers, see [Cisco N560-RSP4 and Cisco N560-RSP4-E Route Processor Hardware Installation Guide](#) and [Cisco NCS 560-4 Router Hardware Installation Guide](#).

Release 7.5.2 Packages

This following table lists the supported packages and their corresponding file names.

Table 1: Release 7.5.2 Packages for Cisco NCS 560 Series Router

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	ncs560-mini-x-7.5.2.iso	Contains base image contents that includes: <ul style="list-style-type: none"> • Host operating system • System Admin boot image • IOS XR boot image • BGP packages • OS • Admin • Base • Forwarding • Modular Services Card • Routing • SNMP Agent • Alarm Correlation
Cisco IOS XR Manageability Package	ncs560-mgbl-2.0.0.0-r752.x86_64.rpm	Telemetry, Extensible Markup Language (XML), Parser, and HTTP server packages, NETCONF, YANG Models, gRPC.
Cisco IOS XR OSPF package	ncs560-ospf-2.0.0.0-r752.x86_64.rpm	Supports OSPF

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR Security Package	ncs560-k9sec-2.0.0.0-r752.x86_64.rpm	Support for Encryption, Decryption, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI)
Multicast Package	ncs560-mcast-2.0.0.0-r752.x86_64.rpm	Supports Multicast Supports Automatic Multicast Tunneling (AMT), IGMP Multicast Listener Discovery (MLD), Multicast Label Distribution Protocol (MLDP), Multicast Source Discovery Protocol (MSDP) and PIM.
Cisco IOS XR ISIS package	ncs560-isis-2.0.0.0-r752.x86_64.rpm	Supports Intermediate System to Intermediate System (IS-IS).
Cisco IOS XR USB Boot Package	ncs560-usb_boot-7.5.2.zip	Supports Cisco IOS XR USB Boot Package
Cisco IOS XR MPLS Package	ncs560-mpls-1.0.0.0-r752.x86_64.rpm ncs560-mpls-te-rsvp-2.0.0.0-r752.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE) RPM. Label Distribution Protocol (LDP), MPLS Forwarding, MPLS Operations, Administration, and Maintenance (OAM), Link Manager Protocol (LMP), Optical User Network Interface (OUNI) and Layer-3 VPN. Cisco IOS XR MPLS-TE and RSVP Package MPLS Traffic Engineering (MPLS-TE) and Resource Reservation Protocol (RSVP).
Cisco IOS XR LI Package	ncs560-li-1.0.0.0-r752.x86_64.rpm	Lawful Intercept
Cisco IOS XR EIGRP Package	ncs560-eigrp-1.0.0.0-r752.x86_64.rpm	(Optional) Includes EIGRP protocol support software

Determine Software Version

Log in to the router and enter the **show version** command.

```
RP/0/RP0/CPU0:R3_PE3_RSP4#show version
Wed Apr 27 15:28:54.013 IST
Cisco IOS XR Software, Version 7.5.2
Copyright (c) 2013-2022 by Cisco Systems, Inc.
```

Build Information:

```

Built By      : ingunawa
Built On     : Tue Apr 26 17:39:19 PDT 2022
Built Host   : iox-ucs-054
Workspace    : /auto/srcarchive14/prod/7.5.2/ncs560/ws
Version      : 7.5.2
Location     : /opt/cisco/XR/packages/
Label       : 7.5.2

```

```

cisco NCS-560 () processor
System uptime is 1 hour 23 minutes

```

Determine Firmware Support

Log in to the router and enter the **show hw-module fpd** command to know the release image.

```

RP/0/RP0/CPU0:R3_PE3_RSP4#show fpd package
Wed Apr 27 09:59:46.408 UTC+00:00

```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Run	Programd
0/RP0	N560-4-RSP4	0.0	ADM	CURRENT	1.06	1.06
0/RP0	N560-4-RSP4	0.0	IOFPGA	CURRENT	0.67	0.55
0/RP0	N560-4-RSP4	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP0	N560-4-RSP4	0.0	SATA_MAR	CURRENT	1.30	1.30
0/RP1	N560-4-RSP4	0.0	ADM	CURRENT	1.06	1.06
0/RP1	N560-4-RSP4	0.0	IOFPGA	CURRENT	0.67	0.55
0/RP1	N560-4-RSP4	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP1	N560-4-RSP4	0.0	SATA_MAR	CURRENT	1.30	1.30
0/FT0	N560-4-PWR-FAN-R	1.0	PSOC	CURRENT	177.08	177.08
0/FT1	N560-4-FAN-H-R	1.0	PSOC	CURRENT	177.02	177.02
0/FT2	N560-4-FAN-H-R	1.0	PSOC	CURRENT	177.02	177.02

Log in to the router and enter the **show hw-module fpd** command to know the current version.

```

RP/0/RP0/CPU0:R3_PE3_RSP4#show hw-module fpd
Wed Apr 27 15:29:20.165 IST

```

```
Auto-upgrade:Enabled
```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/2	A900-IMA8CS1Z-M	0.0	IMFPGA	CURRENT	1.113	1.113
0/3	A900-IMA8CS1Z-M	0.0	IMFPGA	CURRENT	1.113	1.113
0/4	A900-IMA8Z	0.0	IMFPGA	CURRENT	17.05	17.05
0/5	A900-IMA8Z	0.0	IMFPGA	CURRENT	17.05	17.05
0/RP0	N560-4-RSP4	0.0	ADM	CURRENT	1.06	1.06
0/RP0	N560-4-RSP4	0.0	IOFPGA	CURRENT	0.67	0.55
0/RP0	N560-4-RSP4	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP0	N560-4-RSP4	0.0	SATA_MAR	CURRENT	1.30	1.30
0/RP1	N560-4-RSP4	0.0	ADM	CURRENT	1.06	1.06
0/RP1	N560-4-RSP4	0.0	IOFPGA	CURRENT	0.67	0.55
0/RP1	N560-4-RSP4	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP1	N560-4-RSP4	0.0	SATA_MAR	CURRENT	1.30	1.30
0/FT0	N560-4-PWR-FAN-R	1.0	PSOC	CURRENT	177.08	177.08
0/FT1	N560-4-FAN-H-R	1.0	PSOC	CURRENT	177.02	177.02
0/FT2	N560-4-FAN-H-R	1.0	PSOC	CURRENT	177.02	177.02

Important Information

Supported Transceiver Modules

For more information on the supported transceiver modules, see [Transceiver Module Group \(TMG\) Compatibility Matrix](#). In the **Begin your Search** search box, enter the keyword NCS560 and click **Enter**.

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).

The upgrade document for Cisco NCS 560 router is available along with the software image in *NCS560_Upgrade_MOP_7.5.2.tar* file.

Use user-class Option 'xr-config' Instead Of 'exr-config' To Provision ZTP

In Cisco IOS XR Release 7.3.1 and earlier, the system accepts the device sending **user-class = "exr-config"**; however starting Cisco IOS XR Release 7.3.2 and later, you must use only **user-class = "xr-config"**.

In Cisco IOS XR Release 7.3.2 and later, use:

```
host cisco-rp0 {
  hardware ethernet e4:c7:22:be:10:ba;
  fixed-address 172.30.12.54;
  if exists user-class and option user-class = "iPXE" {
    filename = "http://172.30.0.22/boot.ipxe";
  } elseif exists user-class and option user-class = "xr-config" {
    filename = "http://172.30.0.22/scripts/cisco-rp0_ztp.sh";
  }
}
```

Additional References

Supported MIBs

The Cisco NCS 5500 MIB support list is also applicable to the Cisco NCS 560 Series Routers. For the list of supported MIBs, see the [Cisco NCS5500 MIB Support List](#).

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