



Release Notes for Cisco NCS 560 Series Routers, Cisco IOS XR Release 7.5.1

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What's New in Cisco IOS XR Release 7.5.1

Feature	Description
Hardware	
1G Mode Support on A900-IMA8Z-L Interface Module for Cisco NCS 560-4 and N560-7 Routers	<p>Effective Cisco IOS XR Release 7.5.1, 1G mode is supported on A900-IMA8Z-L interface module.</p> <p>Use the following command to configure A900-IMA8Z-L interface module in 1G mode:</p> <ul style="list-style-type: none">• hw-module quad 1 slot 0 mode 1g <p>For more information, information on the interface module slot and 1G mode support combinations on Cisco NCS 560-4 and Cisco NCS 560-7 routers, see Cisco N560-RSP4 and Cisco N560-RSP4-E Route Processor Hardware Installation Guide and Cisco NCS 560-4 Router Hardware Installation Guide.</p>
Feature	
Description	
Modular QoS	
Egress CoS marking (IP-to-IP) on Layer3 subinterface and BVI	Egress CoS marking (IP-to-IP) on Layer 3 subinterfaces is now supported on BVI interfaces.
Routing	
BFD v6 - HW Offload and IPv6 BFD/BoB (Bundle over Bundle)	The Bidirectional Forwarding detection (BFD) Hardware Offload feature enables the offload of a BFD session in an IPv6 network. With this feature, each bundle member link with IPv6 address runs its own BFD session This feature improves scale and reduces the overall network convergence time by sending rapid failure detection packets to the routing protocols for recalculating the routing table.
BFD on BVI	<p>BFD can be configured on Bridge group Virtual Interface (BVI). BVI is a virtual interface within the router that acts like a normal routed interface that does not support bridging but represents the bridge group for the bridged physical interfaces.</p> <p>BFD detects the Layer3 fault over the BVI much quicker and inform the same to routing protocols.</p>
Support 1000 nodes per IGP domain	The Cisco NCS 560 Router supports 1000 router nodes per IGP domain. Use the show isis topology summary command to view the router nodes.

Feature	Description
System Security	
Command Authorization Using Local User Account	<p>This feature allows locally authenticated users on the router to execute commands even if a remote TACACS+ AAA server is not reachable for authorization. This functionality thereby prevents a complete lockdown of the router that occurred in scenarios where the TACACS+ server was not reachable. The feature also prevents remotely authenticated users from executing any nonpermitted command on the router, thereby preventing any sort of misuse of user privileges on the router.</p> <p>This feature modifies the <code>aaa authorization commands default</code> command.</p>
Segment Routing	
Support for iBGP as PE-CE protocol	This feature introduces support for iBGP as PE-CE protocol.
BGP Route Leaking	This feature adds support for importing routes from default-VRF to non-default VRF and routes from non-default VRF to default VRF.
Per-Prefix SRv6 Locator Assignment	<p>This feature provides the ability to assign a specific SRv6 locator for a given set of prefixes (IPv4/IPv6 GRT, IPv4/IPv6 VPN).</p> <p>The egress PE advertises prefixes with the locator associated with the desired behavior, such as Flex Algo.</p>
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.
SR-PCE: Stateful North-Bound API for Tree-SID	<p>The SR-PCE provides a north-bound HTTP-based API to allow communication between SR-PCE and external clients and applications. The Cisco Crosswork Optimization Engine is an application that leverages the SR-PCE.</p> <p>This release adds support for the following:</p> <ul style="list-style-type: none"> • Stateful North-Bound API for Tree-SID using a subscription model • SR-PCE continuous notifications of modified or deleted Tree-SIDs as they occur
Prefix Metric support for OSPF Flexible Algorithm	<p>This feature extends the current OSPF Flexible Algorithm functionality to support Flex-Algo Prefix Metric.</p> <p>This feature introduces a Flexible Algorithm-specific prefix-metric in the OSPF prefix advertisement. The prefix-metric provides a way to compute the best end-to-end Flexible Algorithm optimized paths across multiple areas or domains.</p>
IS-IS Flexible Algorithm: Exclude-SRLG Constraint	<p>This feature allows the Flexible Algorithm definition to specify Shared Risk Link Groups (SRLGs) that the operator wants to exclude during the Flex-Algorithm path computation.</p> <p>This allows the setup of disjoint paths between two or more Flex Algos by leveraging deployed SRLG configurations.</p>
Multicast	

Feature	Description
Flexible Algorithm for MLDP	<p>This feature gives you the flexibility to customize the metrics that IGP uses to route traffic for MLDP tunnels. With this feature, your router can generate two multicast streams for the same feed, thus ensuring low latency and high availability of multicast traffic.</p> <p>This feature introduces the flex-algo keyword.</p>
System Setup and Software Installation	
Supported Software Upgrade or Downgrade IOS XR Versions	<p>You can determine whether a software version can be upgraded or downgraded to another version using this functionality. Before an actual upgrade or downgrade process, you can also view the hardware or software limitations that could cause the upgrade or downgrade to fail. This feature helps you plan successful software upgrades or downgrades.</p> <p>This feature introduces the show install upgrade-matrix command.</p>
Interfaces and Hardware	
Support for Link Loss Forwarding	<p>This feature enables high availability between two bridged interfaces by disabling both interfaces if any one of them fails. This functionality allows a fault detected on one side of a CFM-protected network to propagate to the other side, enabling the device to re-route around the failure at that end. In earlier releases, a failure on one bridged interface did not disable the other interface, and connected devices remained unaware of the link loss.</p>
Feature	Description
L2VPN	
VPLS over SR-TE, RSVP-TE	<p>For Traffic Engineering, VPLS traffic can be sent using MPLS-TE with RSVP or SR-TE.</p> <p>Resource Reservation Protocol (RSVP) is a signaling protocol that enables systems to request resource reservations from the network. MPLS Traffic Engineering (MPLS-TE) learns the topology and resources available in a network and then maps traffic flows to particular paths, based on resource requirements and network resources such as bandwidth. MPLS-TE uses RSVP to signal LSPs.</p> <p>Segment routing for traffic engineering (SR-TE) uses a “policy” to steer traffic through the network.</p>
Network Synchronization	
PTP Multi-profile support - NCS560	PTP multi-profile is now supported on the Cisco NCS 560 routers.
GNSS Redundancy - Frequency Mgr Sync on NCS560	GNSS can now be configured on both, the active and standby route processors (RP).
Modular QoS	

Feature	Description
Layer 2 Ingress QoS Matching for IPv4 and IPv6 Destination Addresses	<p>Using this feature, you can match class maps to IPv4 and IPv6 destination addresses on Layer 2 networks. The Layer 2 interface service policy has the relevant class maps, actioning them for ingress QoS operations. This feature provides you with an additional level of classification for aggregated customer traffic at your ingress, thus giving you granular control on traffic flows.</p> <p>This feature introduces the following commands:</p> <ul style="list-style-type: none"> • match destination-address • hw-module profile qos l2-match-dest-addr-v4v6
Prioritization of IS-IS and ARP Packets to Manage Transit Traffic	<p>This feature gives you the option to assign the highest priority to Integrated Intermediate System-to-Intermediate System (IS-IS) and Address Resolution Protocol (ARP) packets in transit. This feature is disabled by default.</p> <p>The feature provides more flexibility in transit traffic management on a per-hop basis and also fine-tunes the traffic profile management for transit traffic.</p> <p>This feature introduces the hw-module profile qos arp-isis-priority-enable command.</p>

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 7.5.1

Bug ID	Headline
CSCvz87349	BFD sessions in DOWN state remain in standby RP due to congestion, after peer reload
CSCvz85617	fia_driver and imfpga Coredumps seen following OIR NCS560 IM
CSCvz41392	Kernel panic after reloading the router with "admin reload rack 0"
CSCvz90723	Alarm status is None in show controller optics <interface> o/p when remote interface admin down
CSCvz53722	Commit replace failed with message "'OSPFV3' detected the 'resource not available' condition"
CSCwa19042	Login banner text is missing on Cisco-IOS-XR-um-banner-cfg when text exceeds 1015 characters

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 7.5.1 Packages

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

Table 1: Release 7.5.1 Packages for Cisco NCS 560 Series Router

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR IP Unicast Routing Core Bundle	ncs560-mini-x-7.5.1.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-r751.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-r751.x86_64.rpm	Supports OSPF

Composite Package		
Feature Set	Filename	Description
Cisco IOS XR Security Package	ncs560-k9sec-2.0.0.0-r751.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-r751.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-r751.x86_64.rpm	Supports Intermediate System to Intermediate System (IS-IS).
Cisco IOS XR USB Boot Package	ncs560-usb_boot-7.5.1.zip	Supports Cisco IOS XR USB Boot Package
Cisco IOS XR MPLS Package	ncs560-mpls-1.0.0.0-r751.x86_64.rpm ncs560-mpls-te-rsvp-2.0.0.0-r751.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-r751.x86_64.rpm	Lawful Intercept
Cisco IOS XR EIGRP Package	ncs560-eigrp-1.0.0.0-r751.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
Mon Nov 29 12:39:22.793 PST
Cisco IOS XR Software, Version 7.5.1
Copyright (c) 2013-2021 by Cisco Systems, Inc.
```

```

Build Information:
  Built By      : ingunawa
  Built On     : Sun Nov 28 10:31:58 PST 2021
  Built Host   : iox-ucs-054
  Workspace    : /auto/srcarchive15/prod/7.5.1/ncs560/ws
  Version     : 7.5.1
  Location     : /opt/cisco/XR/packages/
  Label       : 7.5.1

cisco NCS-560 () processor
System uptime is 7 minutes

```

Determine Firmware Support

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

```

RP/0/RP0/CPU0:R3_PE3_RSP4#show hw-module fpd
Mon Nov 29 12:39:25.461 PST

```

Auto-upgrade:Enabled

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/2	A900-IMA8Z	0.0	IMFPGA	CURRENT	17.05	17.05
0/11	A900-IMA8Z	0.0	IMFPGA	CURRENT	17.05	17.05
0/12	A900-IMA8Z	0.0	IMFPGA	CURRENT	17.05	17.05
0/RP0	N560-RSP4-E	0.0	ADM	CURRENT	1.06	1.06
0/RP0	N560-RSP4-E	0.0	IOFPGA	CURRENT	0.67	0.67
0/RP0	N560-RSP4-E	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP0	N560-RSP4-E	0.0	SATA	CURRENT	2.10	2.10
0/RP1	N560-RSP4-E	0.0	ADM	CURRENT	1.06	1.06
0/RP1	N560-RSP4-E	0.0	IOFPGA	CURRENT	0.67	0.67
0/RP1	N560-RSP4-E	0.0	PRIMARY-BIOS	CURRENT	0.21	0.21
0/RP1	N560-RSP4-E	0.0	SATA	CURRENT	2.10	2.10
0/FT0	N560-FAN-H	1.0	PSOC	CURRENT	2.02	2.02

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_7.5.1.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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