Release Notes for Cisco NCS 560 Series Routers, Cisco IOS XR Release 7.0.1

Revised: May 8, 2023

Network Convergence System 560 Series Routers

Note *This software release has reached end-of-life status. For more information, see the* End-of-Life and End-of-Sale Notices.

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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 7.0.1 Packages

This table lists the Cisco IOS XR Software feature set matrix (packages) with associated filenames.

Table 1: Release 7.0.1 Packages for Cisco NCS 560 Series Router

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR IP Unicast Routing Core Bundle	ncs560-mini-x-7.0.1.iso	Contains base image contents that includes: • 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-r701.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-r701.x86_64.rpm	Supports OSPF
Cisco IOS XR Security Package	ncs560-k9sec-2.0.0.0-r701.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-r701.x86_64.rpm	Supports Multicast Supports Automatic Multicast Tunneling (AMT), IGMP Multicast Listener Discovery (MLD), Multicast Source Discovery Protocol (MSDP) and PIM.
Cisco IOS XR ISIS package	ncs560-isis-2.0.0.0-r701.x86_64.rpm	Supports Intermediate System to Intermediate System (IS-IS).
Cisco IOS XR USB Boot Package	ncs560-usb_boot-7.0.1.zip	Supports Cisco IOS XR USB Boot Package

Composite Package		
Feature Set	**Filename**	**Description**
Cisco IOS XR MPLS Package	ncs560-mpls-1.0.0.0-r701.x86_64.rpm ncs560-mpls-te-rsvp-2.0.0.0-r701.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-r701.x86_64.rpm	Lawful Intercept

Determine Software Version

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

```
RP/0/RP0/CPU0:ROUTER#show version
Fri Aug 30 12:29:20.401 IST
Cisco IOS XR Software, Version 7.0.1
Copyright (c) 2013-2019 by Cisco Systems, Inc.

Build Information:
 Built By     : ahoang
 Built On     : Sun Aug 25 00:10:10 PDT 2019
 Built Host   : iox-ucs-028
 Workspace    : /auto/srcarchive15/prod/7.0.1/ncs560/ws
 Version      : 7.0.1
 Location     : /opt/cisco/XR/packages/

cisco NCS-560 () processor
System uptime is 1 hour 2 minutes

RP/0/RP0/CPU0:ROUTER#
```

Determine Firmware Support

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

```
RP/0/RP0/CPU0:ROUTER#show fpd package
Fri Aug 30 12:28:16.166 IST

================================ ================================================
                                        Field Programmable Device Package
                                 ================================================
                                           Req     SW      Min Req   Min Req
Card Type            FPD Description       Reload  Ver     SW Ver  Board Ver
================== ========================= ====== ======= ======== =========
--------------------------------------------------------------------------------
A900-IMA8CS1Z-CC     IMFPGA                    YES     1.76    1.76    0.0
```

```
--------------------------------------------------------------------------------
A900-IMA8CS1Z-M      IMFPGA                    YES     1.76    1.76    0.0
--------------------------------------------------------------------------------
A900-IMA8Z           IMFPGA                    YES    17.02   17.02    0.0
--------------------------------------------------------------------------------
A900-IMA8Z-CC        IMFPGA                    YES    17.02   17.02    0.0
--------------------------------------------------------------------------------
A900-PWR1200-A       DCA-PriMCU(A)             NO      0.11    0.11    0.0
                     DCA-SecMCU(A)             NO      1.04    1.04    0.0
--------------------------------------------------------------------------------
A900-PWR1200-D       LIT-PriMCU(A)             NO      2.04    0.04    0.0
                     LIT-SecMCU(A)             NO      1.23    1.23    0.0
--------------------------------------------------------------------------------
A900-PWR1200-D-E     QCS-PriMCU(A)             NO      1.82    1.82    0.0
                     QCS-SecMCU(A)             NO      1.84    1.84    0.0
--------------------------------------------------------------------------------
N560-4-FAN-H         PSOC(A)                   NO      2.160   2.160   0.0
--------------------------------------------------------------------------------
N560-4-FAN-H-CC      PSOC(A)                   NO      2.160   2.160   0.0
--------------------------------------------------------------------------------
N560-4-PWR-FAN       PSOC(A)                   NO      2.192   2.192   0.0
--------------------------------------------------------------------------------
N560-4-PWR-FAN-CC    PSOC(A)                   NO      2.192   2.192   0.0
--------------------------------------------------------------------------------
N560-4-RSP4          ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
N560-4-RSP4-CC       ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
N560-4-RSP4E         ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
N560-4-RSP4E-CC      ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
N560-FAN-H           PSOC(A)                   NO      2.02    2.02    0.0
--------------------------------------------------------------------------------
N560-IMA2C-CC        IMFPGA                    YES     3.04    3.04    0.0
--------------------------------------------------------------------------------
N560-RSP4            ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
N560-RSP4-E          ADM(A)                    NO      1.04    1.04    0.0
                     IOFPGA(A)                 YES     0.53    0.53    0.0
                     PRIMARY-BIOS(A)           YES     0.15    0.15    0.0
                     SATA(A)                   YES     1.30    1.30    0.0
--------------------------------------------------------------------------------
NCS560-IMA2C         IMFPGA                    YES     3.04    3.04    0.0
RP/0/RP0/CPU0:ROUTER#

RP/0/RP0/CPU0:ROUTER#show hw-module fpd
Fri Aug 30 12:29:46.410 IST
                                                              FPD Versions
```

```
                                                                 ================
Location   Card type              HWver FPD device       ATR Status   Running Programd
-------------------------------------------------------------------------------------
0/0        A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/1        A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/2        A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/3        A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/4        A900-IMA8Z             0.0   IMFPGA               CURRENT   17.02   17.02
0/5        A900-IMA8Z             0.0   IMFPGA               CURRENT   17.02   17.02
0/7        N560-IMA2C             0.0   IMFPGA               CURRENT    3.04    3.04
0/9        N560-IMA2C             0.0   IMFPGA               CURRENT    3.04    3.04
0/10       A900-IMA8Z             0.0   IMFPGA               CURRENT   17.02   17.02
0/11       A900-IMA8Z             0.0   IMFPGA               CURRENT   17.02   17.02
0/12       A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/13       A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/14       NCS4200-1T16G-PS       0.0   IMFPGA               CURRENT    1.76    1.76
0/15       A900-IMA8CS1Z-M        0.0   IMFPGA               CURRENT    1.76    1.76
0/RP0      N560-RSP4-E            0.0   ADM                  CURRENT    1.04    1.04
0/RP0      N560-RSP4-E            0.0   IOFPGA               CURRENT    0.53    0.53
0/RP0      N560-RSP4-E            0.0   PRIMARY-BIOS         CURRENT    0.15    0.15
0/RP0      N560-RSP4-E            0.0   SATA                 CURRENT    1.30    1.30
0/RP1      N560-RSP4-E            0.0   ADM                  CURRENT    1.04    1.04
0/RP1      N560-RSP4-E            0.0   IOFPGA               CURRENT    0.53    0.53
0/RP1      N560-RSP4-E            0.0   PRIMARY-BIOS         CURRENT    0.15    0.15
0/RP1      N560-RSP4-E            0.0   SATA                 CURRENT    1.30    1.30
0/FT0      N560-FAN-H             0.256 PSOC                 CURRENT    2.02    2.02
RP/0/RP0/CPU0:ROUTER#
```

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**.

Supported Software Features

ERSPAN

Encapsulated Remote Switched Port Analyzer (ERSPAN) transports mirrored traffic over an IP network. The traffic is encapsulated at the source router and is transferred across the network. The packet is decapsulated at the destination router and then sent to the destination interface.

For more information, see *Interface and Hardware Component Configuration Guide for Cisco NCS 560 Series Routers, IOS XR Release 7.0.x*.

Ethernet Fault Detection

Ethernet Fault Detection (EFD) is a mechanism that allows Ethernet OAM protocols, such as CFM, to control the “line protocol” state of an interface.

For more information, see *Interface and Hardware Component Configuration Guide for Cisco NCS 560 Series Routers, IOS XR Release 7.0.x*.

Netflow Full Packet Capture

This feature helps capturing the exact packet size of the ingress Netflow packet.

Earlier, when a L2VPN packet with a destination MAC address starting with number 6 is received, the packet gets wrongly decoded as IPv6 packet; the packet size consequently gets reported inaccurately to the collector.

For more information on Netflow, see the *Netflow Configuration Guide for Cisco NCS 560 Series Routers*.

OSPF Segment Routing Flexible Algorithm

This release introduces OSPF extensions to support Segment Routing Flexible Algorithm.

Segment Routing Flexible Algorithm allows operators to customize IGP shortest path computation according to their own needs. An operator can assign custom SR prefix-SIDs to realize forwarding beyond link-cost-based SPF. As a result, Flexible Algorithm provides a traffic engineered path automatically computed by the IGP to any destination reachable by the IGP.

The SR architecture associates prefix-SIDs to an algorithm which defines how the path is computed. Flexible Algorithm allows for user-defined algorithms where the IGP computes paths based on a user-defined combination of metric type and constraint.

See .

PTP Asymmetry Readjustment

In any network, there can be static delays on PTP path due to different route selection for forward and reverse PTP traffic or due to any node having different delay for ingress or egress path. These delays can impact PTP accuracy due to the asymmetry in PTP.

PTP asymmetry readjustment feature provides an option to configure this static delay on slave for every master. This value can be configured in nanoseconds.

For more information on PTP asymmetry, see *Network Synchronization Configuration Guide for Cisco NCS 560 Series Routers, IOS XR Release 7.0.x*.

QoS L2 Re-Marking of Ethernet Packets on L3 Flows in Egress Direction

With this release, you now have the ability to perform Layer 2 (802.1p) marking on Layer 3 flows in the egress direction. This allows you to re-mark the priority of Ethernet packets on L3VPN traffic, but only in the peering mode. (To enable the peering feature, use the **hw-module profile qos ingress-model peering** configuration. You must reload the router for the hw-module configuration to be functional.)

See Modular QoS Configuration Guide for Cisco NCS 560 Series Routers.

Segment Routing Data Plane Monitoring

Unreported traffic drops in MPLS networks could be difficult to detect and isolate. They can be caused by user configuration, out-of-sync neighbors, or incorrect data-plane programming. Segment Routing Data Plane Monitoring (SR DPM) provides a scalable solution to address data-plane consistency verification and detection of unreported traffic drops. SR DPM validates the actual data plane status of all FIB entries associated with SR IGP prefix SIDs. SR DPM uses existing MPLS OAM tools and leverages SR forwarding principles to enforce test traffic paths.

See .

Segment Routing IS-IS Flexible Algorithm Prefix-SID Redistribution

Previously, prefix redistribution from IS-IS to another IS-IS instance or protocol was limited to SR algorithm 0 (regular SPF) prefix SIDs; SR algorithm 1 (Strict SPF) and SR algorithms 128-255 (Flexible Algorithm) prefix SIDs were not redistributed along with the prefix. The Segment Routing IS-IS Flexible Algorithm Prefix SID Redistribution feature allows redistribution of strict and flexible algorithms prefix SIDs from IS-IS to another IS-IS instance or protocols. This feature is enabled automatically when you configure redistribution of IS-IS Routes with strict or Flexible Algorithm SIDs.

See .

Smart Agent Upgrade to Latest SA 64 bit

Smart Agent is upgraded to smart agent 64 bit.

Segment Routing Anycast SID-Aware Path Computation

An Anycast SID is a type of prefix SID that identifies a set of nodes and is configured with n-flag clear. The set of nodes (Anycast group) is configured to advertise a shared prefix address and prefix SID. Anycast routing enables the steering of traffic toward multiple advertising nodes, providing load-balancing and redundancy. Packets addressed to an Anycast address are forwarded to the topologically nearest nodes.

See .

Tunable MAC Address Aging Timer

The Tunable MAC Address Aging Timer feature allows you to configure the MAC aging time between 300 seconds to 30,000 seconds. The defualt value is 300 seconds.

For more information about this feature, see the *Configure Multipoint Layer 2 Services* chapter in the *L2VPN and Ethernet Services Configuration Guide for Cisco NCS 560 Series Routers*.

Additional Feature Support

Following are some of the additional features supported for this release:

- PTP in VRF
- Improve Label Stacking Depth via packet recycle (up to 12)
- IP SLA v4: ICMP, MPLS, UDP, Responder
- CFM - EVPN/Port Channel
- CLI Show Command for Fabric Multicast Queues (FMQs)
- Lawful Intercept

Supported Hardware Features

There are no new hardware features introduced in this release.

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.

Restrictions and Limitations on the Cisco NCS 560 Series Router

- The **show inventory** and the **show diagnostic** commands do not display the fan serial number.
- The **hw-module profile mfib statistics** command is not supported.
- Ensure that the ISIS hello interval-timer value is not greater than six seconds, otherwise it may result in an ISIS adjacency flap.
- Do not use the Cisco N560-RSP4 and Cisco N560-RSP4-E route processors together in the same router.

Caveats

This section describes open and resolved severity 1 and 2 caveats and select severity 3 caveats:

- The “Open Caveats” sections list open caveats that apply to the current release and may apply to previous releases. A caveat that is open for a prior release and is still unresolved applies to all future releases until it is resolved.
- The “Resolved Caveats” sections list caveats resolved in a specific release, but open in previous releases.

The bug IDs are sorted alphanumerically.

Note The Caveats section includes the bug ID and a short description of the bug. For details on the symptoms, conditions, and workaround for a specific caveat you must use the Bug Search Tool.

Cisco IOS XR Caveats Release 7.0.1

Caveat ID Number	Descriptiom
CSCvp84100	NCS560 : High two way time error on 8x10G DPFPGA and Non DPFPGA port combination
CSCvn99774	FPD upgrade is not happening with auto FPD upgrade CLI
CSCvj78189	NSR Support on NCS-560

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 (NCS560_Upgrade_MOP_7.0.1.pdf) is available along with the software images.

Downgrade from Cisco IOS XR Release 7.0.1 or Later

Note The downgrade is applicable only to Cisco N540-24Z8Q2C-M, N540X-ACC-SYS, and N540-ACC-SYS variants.

This section explains the procedure to downgrade from Cisco IOS XR Release 7.0.1 or later release to an earlier release.

From Cisco IOS XR Release 7.0.1 and later, three new type encryption methods are supported:

- type-8 (SHA-256)
- type-9 (scrypt)
- type-10 (SHA-512)

Note type-10 is used as the default encryption for all the username configurations.

For versions earlier than Cisco IOS XR Release 7.0.1, these type encryption methods are not supported and may result in authentication failure, downgrade abort, or shut down of XR-VM.

To configure username in Cisco IOS XR Release 7.0.1, run the following commands:

```
RP/0/RP0/CPU0:ios#conf
Thu Aug 8 09:14:52.613 UTC
RP/0/RP0/CPU0:ios(config)#username lab1 secret lab
RP/0/RP0/CPU0:ios(config)#commit
Thu Aug 8 09:15:07.694 UTC
RP/0/RP0/CPU0:ios(config)#sh run username lab1
Thu Aug 8 09:15:17.967 UTC
username lab1
secret 10
$6$3N9/n/qGkQ2A5n/.$fjvvwhtDdlZJ45aECxC5j0tIoLgRd3kCafRtHNZ2zUt86x.wC59sG/.h/z9fhdBvF.k1Z5v2UDcVzTn0WGqO00
!
RP/0/RP0/CPU0:ios(config)#
```

To downgrade:

Procedure

Step 1 Delete the user configurations on both VMs before you downgrade.

Step 2 Perform the installation for downgrade, but do not enable install activate.

Step 3 Back up the user configurations on both the VMs and delete the data from the VMs.

Step 4 Create new user credentials when prompted for the first root-system user creation.

Step 5 Login with the new user credentials.

Step 6 Apply the configurations from that you saved on both the VMs.

After successful downgrade, in the configurations that have the type-8, type-9 and type-10 encryption, the entire string **<type><space><hashed text>** becomes a cleartext and is encrypted to type-5 encryption. Existing username configuration with type-5 encryption is not affected. Use **<type><space><hashed text>** as password to log in.

Example

```
RP/0/RP0/CPU0:ios#conf
Thu Aug 8 09:14:52.613 UTC
RP/0/RP0/CPU0:ios(config)#username lab1 secret lab
RP/0/RP0/CPU0:ios(config)#commit
Thu Aug 8 09:15:07.694 UTC
RP/0/RP0/CPU0:ios(config)#show run username lab1
Thu Aug 8 09:15:17.967 UTC
username lab1
secret 5 $1$jnah$UboU0EVgzhBPiiYY8OjSD/
!
RP/0/RP0/CPU0:ios(config)#
```

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at Cisco Profile Manager.
- To get the business impact you're looking for with the technologies that matter, visit Cisco Services.
- To submit a service request, visit Cisco Support.
- To discover and browse secure, validated enterprise-class apps, products, solutions and services, visit Cisco Marketplace.
- To obtain general networking, training, and certification titles, visit Cisco Press.
- To find warranty information for a specific product or product family, access Cisco Warranty Finder.

Cisco Bug Search Tool

Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

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