Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.5.1

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What's New in Cisco IOS XR Release 7.5.1

The following features are supported on N540-ACC-SYS, N540X-ACC-SYS, and N540-24Z8Q2C-SYS variants.

Feature	Description
System Security	
SSD Encryption	This feature enables trust and security in the system's steady state by encrypting data at the disk level. The encrypted data can be accessed *only* with a specific key stored in the TAm.

The following features are supported on all the NCS 540 variants.

Feature	Description
Modular QoS	
Prioritization of IS-IS and ARP Packets to Manage Transit Traffic	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. 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. This feature introduces the hw-module profile qos arp-isis-priority-enable command.
Layer 2 Ingress QoS Matching for IPv4 and IPv6 Destination Addresses	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. This feature introduces the following commands: • match destination-address • hw-module profile qos l2-match-dest-addr-v4v6
Support for 2 class-map per policy	This feature enables you to configure 2 class maps per QoS policy. With a smaller class-map size supported, you can now apply QoS policies to more interfaces, thus increasing the scale numbers. This feature introduces the **class-map-size 2 hw-module** command.

Feature	Description
Telemetry	
Push Telemetry Data from Cache for Generic Counters	This feature streams telemetry data about generic counters from the data producer using the telemetry push library. The data producer (statsd) registers the sensor path using `TARGET_DEFINED` subscription mode to stream data with the push library. Any change to the cache, streams the latest data to the collector as event-driven telemetry notifications. This feature introduces support for the following sensor path: `Cisco-IOS-XR-infra-statsd-oper:infra-statistics/interfaces/interface/cache/generic-counters`
Programmability	
gRPC Server on UNIX Sockets	This feature allows local containers on the router to establish gRPC connections over UNIX domain sockets. These sockets provide better inter-process communication eliminating the need to manage passwords for local communications. This feature introduces the **grpc local-connection** command.
Multicast	
Flexible Algorithm for MLDP	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. This feature introduces the **flex-algo** keyword.
MVPN using RSVP-TE P2MP (Profile 22)	This feature uses RSVP-TE to establish MPLS transport LSPs through traffic engineering and securely transmits multicast traffic between the PE routers in a MPLS network.
Application Hosting	
On-Demand Docker Daemon Service	From this release onwards, the Docker daemon service starts on a router only if you configure a third-party hosting application using the **appmgr** command. Such an on-demand service optimizes operating system resources such as CPU, memory, and power. In earlier releases, the Docker daemon service automatically started during the router boot up.
Check Integrity of Golden ISO (GISO) Files	This feature provides an option to verify the integrity of files in GISO using md5sum value. This hexadecimal value is used to compare the source files against the same set of files after building the GISO image. The md5sum values are stored in `giso_info.txt` file in the GISO image, and a match in the values indicate that files are authentic and not manipulated.
L2VPN	

Feature	Description
VPLS over SR-TE, RSVP-TE	For Traffic Engineering, VPLS traffic can be sent using MPLS-TE with RSVP or SR-TE.
	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.
	Segment routing for traffic engineering (SR-TE) uses a "policy" to steer traffic through the network.
Netflow	
Sampled Flow	Sampled flow (sFlow) allows you to monitor real-time traffic in data networks that contain switches and routers. It uses the sampling mechanism in the sFlow agent software on routers to monitor traffic and to forward the sample data to the central data collector.
	sFlow uses version 5 export format to forward sampled data.
System Setup and Software Installation	
Supported Software Upgrade or Downgrade IOS XR Versions	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.
	This feature introduces the **show install upgrade-matrix** command.
Network Synchronization	
PTP Virtual Support	To make a reliable timing source available for devices in backhaul networks, the PTP server and other local timing sources connected to the device are compared, and the best clock source is selected and advertised. Based on ITU-T G.8275 specification, this feature associates a virtual PTP port to an external clock input. The external clock inputs to participate in PTP protocol to select the best available source for the system.
	Please contact your cisco account representative for more information on supported hardware PIDs.
Interfaces and Hardware	
Support for Link Loss Forwarding	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.

The following feature is supported on N540X-16Z4G8Q2C-A/D variants.

Feature	Description
System Security	
MACSec for NCS 540	Support for this feature is now extended to additional Cisco NCS 540 router variants.

The following features are supported on N540-ACC-SYS, N540X-ACC-SYS, N540-24Z8Q2C-SYS, N540-28Z4C-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-12Z20G-SYS-A/D, and N540X-12Z16G-SYS-A/D variants.

Feature	Description
L2VPN	
EVPN E-Tree Per-PE (Scenario1b)	he EVPN E-Tree Per-PE feature enables you to configure EVPN E-TREE using **etree leaf** label under the bridge-domain or EVI. This feature allows you to define communication between the leaf and root nodes. The provider edge (PE) nodes can receive L2 traffic either from the attachment circuit (AC) of a bridge domain (BD) or from the remote PE node. For a given BD or EVI, L2 communication can only happen from root to leaf and leaf to root. This feature does not allow any L2 communication between the ACs of two or more leafs.
System Security	
Command Authorization Using Local User Account	This feature allows locally authenticated users—authenticated by the AAA server internal to the router—to run all XR VM commands even if a remote TACACS+ AAA server is not reachable for authorization. It prevents a complete router lockdown. The feature also prevents remotely authenticated users—authenticated using a remote AAA server (say, TACACS+ server)—from running any non-permitted commands on the router, and thus prevents misuse of user privileges. This feature modifies the aaa authorization commands default command to include the **local** option for XR VM command authorization.

The following features are supported on N540-ACC-SYS, N540X-ACC-SYS, N540-24Z8Q2C-SYS, N540-28Z4C-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-12Z20G-SYS-A/D, and N540X-12Z16G-SYS-A/D variants.

Feature	Description
Interfaces and Hardware	
Two-Way Delay Measurement for increased scale	This release enhances the two-way delay measurement feature from 100 to 1500 pps of Delay Measurement Message (DMM) sessions and 1500 pps of Synthetic Loss Measurement (SLM) sessions. Such enhanced measurement helps you monitor more services on your network. It also helps you monitor SLAs more effectively.

The following features are supported on N540-ACC-SYS, N540X-ACC-SYS, N540-24Z8Q2C-SYS, N540-28Z4C-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-12Z20G-SYS-A/D, and N540X-12Z16G-SYS-A/D variants.

Feature	Description
Segment Routing	

Feature	Description
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.
Prefix Metric support for OSPF Flexible Algorithm	This feature extends the current OSPF Flexible Algorithm functionality to support Flex-Algo Prefix Metric. 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.
SR-PCE: Stateful North-Bound API for Tree-SID	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. This release adds support for the following: • Stateful North-Bound API for Tree-SID using a subscription model • SR-PCE continuous notifications of modified or deleted Tree-SIDs as they occur
IS-IS Flexible Algorithm: Exclude-SRLG Constraint	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. This allows the setup of disjoint paths between two or more Flex Algos by leveraging deployed SRLG configurations.
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.
Support for iBGP as PE-CE protocol	This feature introduces support for iBGP as PE-CE protocol.
Per-Prefix SRv6 Locator Assignment	This feature provides the ability to assign a specific SRv6 locator for a given set of prefixes (IPv4/IPv6 GRT, IPv4/IPv6 VPN). The egress PE advertises prefixes with the locator associated with the desired behavior, such as Flex Algo.
Multicast	
Support for IGMP VRF Override in Multicast Routers	Using this feature, you can configure a multicast router interface to override the configuration specified in the local VRF table. When an IGMP client sends a join message to the multicast router, it performs a Reverse-path Forwarding (RPF) lookup for the IGMP join in the local VRF table. If the local VRF table does not have the information, the feature extends the lookup to the default (global) VRF table. This ensures that the interface in a specific VRF table is part of the outgoing list of interfaces in the global routing table for a multicast route.
System Security	

Feature	Description
LI Enablement with Consent Token	This feature prevents service-providers from activating Lawful Intercept (LI) on their routers until the network vendor provides consent with a consent token. This feature is in compliance with the latest ANSSI (*Agence nationale de la sécurité des systèmes d'information*) security standards. Prior to this release, there was no gating for the LI feature on service-provider routers. The associated command is: • request consent-token

The following features are supported on N540-FH-CSR-SYS and N540-FH-AGG-SYS variants.

Feature	Description
Network Synchronization	
PTP Multi-profile support on NCS540-FH	Support for this feature is now extended to additional Cisco NCS 540 router variants.
PTP Static Asymmetry Correction on NCS540-FH	Support for this feature is now extended to additional Cisco NCS 540 router variants.
GNSS support on NCS540-FH	Support for this feature is now extended to additional Cisco NCS 540 router variants.

The following features are supported on N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.

Feature	Description
Network Synchronization	
PTP Static Asymmetry Correction NCS540	Support for this feature is now extended to additional Cisco NCS 540 router variants.
PTP Multi-profile support on NCS540	Support for this feature is now extended to additional Cisco NCS 540 router variants.

The following feature is supported on N540-ACC-SYS and N540X-16Z4G8Q2C-A/D variants.

Feature	Description
Network Synchronization	
TDM2IP Smart SFP Optics support	This feature that enables transparent forwarding of SDH signals, is now supported on Transparent SDH over Packet (TPoP) and Channelized SDH over Packet (CSoP) protocols with smart SFP on NCS 540 variants.

Restrictions and Limitations on the Cisco NCS 540 Series Router

- Fabric multicast queue stats are not supported in N540X-8Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.

- Unlabeled BGP PIC EDGE for global prefixes is not supported.

- The **show inventory** and the **show diagnostic** commands do not display the fan serial number for N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, and N540X-12Z16G-SYS-A/D variants.

- 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 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.

- 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.

Cisco IOS XR Caveats Release 7.5.1

Bug ID	Headline
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

IOS XR 7.5.1 Base Images and Optional Packages

For more information on system setup and software installation process, see System Setup and Software Installation Guide for Cisco NCS 540 Series Routers.

For general and ordering information see:

- Cisco Network Convergence System 540 Medium Density Routers Data Sheet

- Cisco Network Convergence System 540 Small Density Router Data Sheet

- Cisco Network Convergence System 540 Large Density Router Data Sheet

To install the Cisco NCS 540 Series Routers, see Cisco NCS 540 Router Hardware Installation Guide.

Release 7.5.1 Software

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

- The first table lists the supported software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants.

- The second table lists the supported software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540-12Z20G-SYS-A/D variants.

- The third table lists the supported software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D variants.

Table 1: Release 7.5.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.5.1.iso	IOS XR mandato
USB Boot Package	ncs540-usb_boot-7.5.1.zip	Package required
		Includes the same
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r751.x86_64.rpm	Supports Extensil gRPC and HTTP
IOS XR MPLS	ncs540-mpls-1.0.0.0-r751.x86_64.rpm	Supports MPLS a
	ncs540-mpls-te-rsvp-1.0.0.0-r751.x86_64.rpm	
IOS XR Security	ncs540-k9sec-1.0.0.0-r751.x86_64.rpm	Supports MACse
IOS XR ISIS	ncs540-isis-1.0.0.0-r751.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r751.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r751.x86_64.rpm	Supports Lawful
IOS XR Multicast	ncs540-mcast-1.0.0.0-r751.x86_64.rpm	Supports Multica
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r751.x86_64.rpm	Supports EIGRP

Table 2: Release 7.5.1 Software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540-12Z20G-SYS-A/D

Base Image	Filename	Description

IOS XR Base Image	ncs540l-x64-7.5.1.iso	IOS XR base
		The base ISO
		• xr-bgp
		• xr-ipsla
		• xr-is-is
		• xr-lldp
		• xr-mcast
		• xr-mpls-c
		• xr-ncs54
		• xr-ncs54
		• xr-netflo
		• xr-ospf
		• xr-perfm
		• xr-track
		These optiona
USB Boot Package	ncs540l-usb_boot-7.5.1.zip	Package requi
		Includes the s
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.5.1.tar	Supports Teln
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.5.1.tar	Supports EIG
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.5.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.5.1.tar	Supports 802.

Table 3: Release 7.5.1 Software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D

Base Image	**Filename**	**Description**

IOS XR Base Image	ncs540l-aarch64-7.5.1.iso	IOS XR base ima...
		The ISO image al...
		• xr-bgp
		• xr-ipsla
		• xr-is-is
		• xr-lldp
		• xr-mcast
		• xr-mpls-oam...
		• xr-ncs540l-n...
		• xr-ncs540l-n...
		• xr-netflow
		• xr-ospf
		• xr-perfmgmt...
		• xr-track
		These optional pa... NCS540l-aarch64...
USB Boot Package	ncs540l-aarch64-usb_boot-7.5.1.zip	Package required...
		Includes the same...

Optional Packages not included in the base image

Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.5.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.5.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.5.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.5.1.tar	Supports 802.1X

Determine Software Version

Log in to the router and enter the **show version** command on the N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants:

```
RP/0/RP0/CPU0:R1_PE1#show version
Mon Nov 29 12:26:48.140 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 11:02:59 PST 2021
```

```
 Built Host   : iox-lnx-010
 Workspace    : /auto/srcarchive15/prod/7.5.1/ncs540/ws
 Version      : 7.5.1
 Location     : /opt/cisco/XR/packages/
 Label        : 7.5.1

cisco NCS-540 () processor
System uptime is 6 minutes
```

Log in to the router and enter the **show version** command on the N540X-16Z4G8Q2C-A/D,
N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540-12Z20G-SYS-A/D variants:

```
RP/0/RP0/CPU0:R11_PE5_EG#show version
Mon Nov 29 13:35:28.858 PST
Cisco IOS XR Software, Version 7.5.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Sun Nov 28 17:12:50 UTC 2021
 Build Host   : iox-lnx-011
 Workspace    : /auto/srcarchive15/prod/7.5.1/ncs540l/ws
 Version      : 7.5.1
 Label        : 7.5.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-28Z4C-SYS-A (C3708 @ 1.70GHz) processor with 8GB of memory
Leaf1 uptime is 4 minutes
Cisco NCS 540 Series Fixed Router 28x1/10G, 4x100G, AC Chassis
```

Log in to the router and enter the **show version** command on the N540X-8Z16G-SYS-A/D, and
N540X-6Z18G-SYS-A/D variants:

```
RP/0/RP0/CPU0:R15_PE7_GP#show version
Mon Nov 29 21:32:01.010 UTC
Cisco IOS XR Software, Version 7.5.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Sun Nov 28 17:06:27 UTC 2021
 Build Host   : iox-lnx-023
 Workspace    : /auto/srcarchive15/prod/7.5.1/ncs540l-aarch64/ws
 Version      : 7.5.1
 Label        : 7.5.1

cisco NCS540L
cisco N540X-6Z18G-SYS-A processor with 8GB of memory
Leaf5 uptime is 13 minutes
Cisco NCS 540 Series Fixed Router 18x1G, 6x1/10G, AC
```

Log in to the router and enter the **show version** command on the N540-FH-CSR-SYS variant:

```
RP/0/RP0/CPU0:R1_PE1#show version
Mon Nov 29 13:38:02.442 PST
Cisco IOS XR Software, Version 7.5.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Sun Nov 28 17:12:50 UTC 2021
 Build Host   : iox-lnx-011
 Workspace    : /auto/srcarchive15/prod/7.5.1/ncs540l/ws
 Version      : 7.5.1
 Label        : 7.5.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
Spine1 uptime is 5 minutes
Cisco NCS 540 FH with 8xCPRI+4xCPRI/10G+8x10G+6x25G+2x100G
```

Determine Firmware Support

Usethe show command in EXEC mode to view the hardware components with their current FPD version and status. The status of the hardware must be "CURRENT"; Running and Programed version must be the same. The Golden FPDs with "NEED UPGD" can be ignored, the Golden FPDs are not upgradable.

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-24Z8Q2C-SYS, N540X-ACC-SYS, and N540-ACC-SYS variants:

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Mon Nov 29 12:27:04.930 PST

Auto-upgrade:Enabled

                                                               FPD Versions
                                                               ==============
Location   Card type          HWver FPD device      ATR Status   Running   Programd
----------------------------------------------------------------------------------
0/RP0      N540-24Z8Q2C-M     1.1   MB-MIFPGA            CURRENT   0.05      0.05
0/RP0      N540-24Z8Q2C-M     1.1   Bootloader           CURRENT   1.14      1.14
0/RP0      N540-24Z8Q2C-M     1.1   CPU-IOFPGA           CURRENT   0.07      0.07
0/RP0      N540-24Z8Q2C-M     1.1   MB-IOFPGA            CURRENT   0.23      0.23
0/RP0      N540-24Z8Q2C-M     1.1   SATA-SMART-128G      CURRENT   1241.00   1241.00
0/PM0      N540-PWR400-A      1.0   SDG-PriMCU-ACFW      CURRENT   0.00      0.00
0/PM0      N540-PWR400-A      1.0   SDG-SecMCU-ACFW      CURRENT   0.00      0.00
0/PM1      N540-PWR400-A      1.0   SDG-PriMCU-ACFW      CURRENT   0.00      0.00
0/PM1      N540-PWR400-A      1.0   SDG-SecMCU-ACFW      CURRENT   0.00      0.00


RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Wed Nov 24 06:21:30.020 PST

Auto-upgrade:Enabled

                                                               FPD Versions
                                                               ==============
Location   Card type          HWver FPD device      ATR Status   Running   Programd
----------------------------------------------------------------------------------
0/RP0      N540-24Z8Q2C-M     1.1   MB-MIFPGA            CURRENT   0.05      0.05
0/RP0      N540-24Z8Q2C-M     1.1   Bootloader           CURRENT   1.14      1.14
0/RP0      N540-24Z8Q2C-M     1.1   CPU-IOFPGA           CURRENT   0.07      0.07
0/RP0      N540-24Z8Q2C-M     1.1   MB-IOFPGA            CURRENT   0.23      0.23
0/RP0      N540-24Z8Q2C-M     1.1   SATA-SMART-128G      CURRENT   1241.00   1241.00
0/PM0      N540-PWR400-A      1.0   SDG-PriMCU-ACFW      CURRENT   0.00      0.00
0/PM0      N540-PWR400-A      1.0   SDG-SecMCU-ACFW      CURRENT   0.00      0.00
0/PM1      N540-PWR400-A      1.0   SDG-PriMCU-ACFW      CURRENT   0.00      0.00
0/PM1      N540-PWR400-A      1.0   SDG-SecMCU-ACFW      CURRENT   0.00      0.00
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D and N540X-16Z4G8Q2C-A/D variants:

```
RP/0/RP0/CPU0:R11_PE5_EG#show fpd package
Mon Nov 29 13:35:47.632 PST
Node            Type                   State              Config state
----------------------------------------------------------------------------
0/RP0/CPU0      N540-28Z4C-SYS-A(Active) IOS XR RUN        NSHUT
```

```
0/PM0                   N540-PSU-FIXED-A        OPERATIONAL              NSHUT
0/FT0                   N540-FAN                OPERATIONAL              NSHUT

RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Mon Nov 29 13:36:23.086 PST


Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                                    FPD Versions
                                                                    ==============
Location    Card type              HWver FPD device      ATR Status    Running Programd
Reload Loc
--------------------------------------------------------------------------------------
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   ADMConfig            CURRENT   1.05    1.05
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   IoFpga               CURRENT   2.07    2.07
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   IoFpgaGolden     B   NEED UPGD         1.31
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   Primary-BIOS     S   CURRENT   1.32    1.32
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   StdbyFpga        S   CURRENT   0.40    0.40
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   StdbyFpgaGolden  BS  CURRENT           0.40
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   TamFw            S   CURRENT   4.11    4.11
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A        4.0   TamFwGolden      BS  CURRENT           4.11
  0/RP0
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540X-6Z18G-SYS-A/D, and N540X-8Z16G-SYS-A/D variants:

```
RP/0/RP0/CPU0:R15_PE7_GP#show fpd package
Mon Nov 29 21:32:03.027 UTC
Node             Type                    State                 Config state
--------------------------------------------------------------------------------
0/RP0/CPU0       N540X-6Z18G-SYS-A(Active) IOS XR RUN           NSHUT
0/PM0            N540L-PSU-FIXED-A       OPERATIONAL            NSHUT
0/PM1            N540L-PSU-FIXED-A       OPERATIONAL            NSHUT
0/FT0            N540L-FAN               OPERATIONAL            NSHUT

RP/0/RP0/CPU0:Leaf5#show hw-module fpd
Mon Nov 29 21:32:05.637 UTC


Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                                    FPD Versions
                                                                    ==============
Location    Card type              HWver FPD device      ATR Status    Running Programd
Reload Loc
--------------------------------------------------------------------------------------
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   ADMConfig            NEED UPGD 3.00    3.00
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   IoFpga               CURRENT   0.17    0.17
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   IoFpgaGolden     B   NEED UPGD         0.15
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   Prim-BootLoader      CURRENT   20.04   20.04
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   StdbyFpga        S   CURRENT   0.34    0.34
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   StdbyFpgaGolden  BS  NEED UPGD         0.32
  0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A       1.0   TamFw            S   CURRENT   6.05    6.05
```

```
   0/RP0
0/RP0/CPU0 N540X-6Z18G-SYS-A    1.0   TamFwGolden    BS  CURRENT              6.05
   0/RP0
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-FH-CSR-SYS variant:

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Mon Nov 29 13:38:05.477 PST
Node              Type                    State                    Config state
-----------------------------------------------------------------------------
0/RP0/CPU0        N540-FH-CSR-SYS(Active) IOS XR RUN               NSHUT
0/PM0             N540-PWR400-A           OPERATIONAL              NSHUT
0/PM1             N540-PWR400-A           OPERATIONAL              NSHUT
0/FT0             N540-FAN                OPERATIONAL              NSHUT


RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Mon Nov 29 13:38:08.403 PST

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                              FPD Versions
                                                              ==============
Location   Card type        HWver FPD device     ATR Status   Running Programd
Reload Loc
------------------------------------------------------------------------------------
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   ADM1_Config         NEED UPGD 0.08   0.08
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   ADM2_Config         NEED UPGD 0.08   0.08
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   DpFpga              CURRENT   0.19   0.19
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   IoFpga              CURRENT   1.30   1.30
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   IoFpgaGolden    B   NEED UPGD        1.23
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   Primary-BIOS    S   CURRENT   1.33   1.33
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   StdbyFpga       S   CURRENT   0.46   0.46
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   StdbyFpgaGolden BS  NEED UPGD        0.43
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   TamFw           S   CURRENT   6.05   6.05
   0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS  1.0   TamFwGolden     BS  CURRENT          6.05
   0/RP0
0/PM0      N540-PWR400-A    0.0   PrimMCU             CURRENT   1.02   1.02
NOT REQ
0/PM0      N540-PWR400-A    0.0   SecMCU              CURRENT   1.03   1.03
NOT REQ
0/PM1      N540-PWR400-A    0.0   PrimMCU             CURRENT   1.02   1.02
NOT REQ
0/PM1      N540-PWR400-A    0.0   SecMCU              CURRENT   1.03   1.03
NOT REQ
```

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 NCS540 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.

The upgrade document for N540-24Z8Q2C-SYS, N540X-ACC-SYS, and N540-ACC-SYS variants is available along with the software image in *NCS540-docs-7.5.1.tar* file.

The upgrade document for N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-24Q8L2DD-SYS, N540-FH-AGG-SYS, and N540-FH-CSR-SYS variants is available along with the software image in *NCS540l-docs-7.5.1.tar* file.

The upgrade document for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, and N540X-6Z18G-SYS-A/D variants is available along with the software image in *NCS540l-aarch64-docs-7.5.1.tar* file.

Note Quad configurations will be lost when you perform a software downgrade on Cisco NCS 540 Routers that support quad configurations from IOS XR Release 7.5.1 onwards to a release prior to IOS XR Release 7.5.1 due to a non-backward compatibility change. The lost configuration can be applied manually after the downgrade.

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";
   } elsif 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 540 Series Routers. For the list of supported MIBs, see the Cisco NCS5500 MIB Support List.