Release Notes for Cisco NCS 540 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 540 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 Network Convergence System 540 Passive Cooled Small Density Routers	This release introduces these IOS XR-based cell site routers that extend Cisco's 5G Converged SDN Transport to the edge of the networks as a Cloud Services Router (CSR)/ Network Interface Device (NID)/ Customer Premises Equipment (CPE) with the smallest footprint. The Cisco N540-6Z14S-SYS-D is a cell site router and has the following features: • Temperature-hardened, fixed port, 2.5 rack unit form-factor • 6 X 1G/10G SFP+ ports • 6 X CSFP ports • 4 X 1G SFP ports • 4 X 1G Copper GE ports For more information, see the Cisco Network Convergence System 540 Passive Cooled Small Density Routers Hardware Installation Guide.
Cisco N540X-16Z8Q2C-D Routers	This release introducesthe Cisco N540X-16Z8Q2C-D routers to accommodate specific installation requirements. The router has the following hardware features: • 16 x 1G/10G SFP+ Ports • 8 x 10G/25G SFP+ Ports • 2 x 100G QSFP Ports For more information, see the Cisco NCS 540 Router Hardware Installation Guide.

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

Feature	Description
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	You can now configure the VLAN subinterface as a source for traffic mirroring for: • Traffic ingressing at the interface • Traffic egressing at the interface • Traffic egressing and ingressing at the same interface You could configure mirror functionality only at the main interface level in earlier releases.
Ethernet Link OAM on Physical Interface—(802.3ah) Link Monitoring and Remote Loopback	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: • Link Monitoring • Remote Loopback **Note** Not supported on N540-24Q8L2DD-SYS variant.
L2VPN and Ethernet Services	
MAC Loop Prevention	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 mac secure command. This feature is now supported on routers that operate in native and compatibility modes.
Segment Routing	

Feature	Description
SRv6: Ultimate Segment Decapsulation (USD) behavior	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). 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). 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).
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	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. The **show route** command has been modified to include additional attributes to indicate the external routes.
Optimal Utilization of ECMP FEC Resources	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. In earlier releases, all 4k BGP-LU prefixes consumed all the 4k ECMP FEC resources. Use the **hw-module fib mpls bgp-sr lsr-optimized** command to enable BGP-SR multipath ECMP FEC optimization.
BGP	
BGP-LU Multipath PIC with Auto Protection	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. In earlier releases, path failures led to traffic drops in the absence of auto protection. **Note** Not supported on N540-24Q8L2DD-SYS variant.
Replace BGP AS Path with Custom Values	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. This feature introduces the following command: • 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 releaes 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: • Profile 12: Default MDT - MLDP - P2MP - BGP-AD - BGP C-Mcast Signaling • Profile 14: Partitioned MDT - MLDP P2MP - BGP-AD - BGP C-Mcast Signaling

The following features are supported on N540-24Q8L2DD-SYS variant.

Feature	Description
System Setup and Software Installation	
IOS XR Configuration File in Golden ISO (GISO)	GISO is a customized image with the standard functional components and additional configuration files. This feature extracts the IOS XR configuration file in GISO and automates the updating of configuration files when the router is reloaded with the new GISO. This feature introduces **iso-config [ignore | replace]** keywords to the **install replace** and **install package replace** commands.
Automatic Bridging of Bug Fix RPMs	This feature enables an easy one-step, no prompt upgrade, or downgrade, based on GISO. This removes the dependency on having to manually install the bridging bug fix RPMs before performing an upgrade or a downgrade.

The following features are supported on N540-6Z14S-SYS-D variant.

Feature	Description
Network Synchronization	
Synchronous Ethernet with ESMC and SSM on N540-6Z14S-SYS-D	In this release, the following Cisco NCS 540 router variant supports Synchronous Ethernet with ESMC and SSM: • N540-6Z14S-SYS-D SyncE provides synchronization signals transmitted over the Ethernet physical layer to downstream devices, while the Synchronization Status Message (SSM) indicates the quality level of the transmitting clock to the neighboring nodes, informing the nodes about the level of the network's reliability. Ethernet Synchronization Message Channel (ESMC) is the logical channel that uses an Ethernet PDU (protocol data unit) to exchange SSM information over the SyncE link.
PTP profiles	In this release, the following Cisco NCS 540 router variant supports Synchronous Ethernet with ESMC and SSM: • N540-6Z14S-SYS-D PTP Profiles are specific selections of PTP configurations that allow organizations to achieve a performance that meets the requirement of a particular application. You can configure different PTP profiles for different applications, such as audio and media. PTP profiles ensure the application components stay in sync across multiple devices.
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.

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

Feature	Description
Modular QoS	
Layer 2 Ingress QoS Matching for IPv4 and IPv6 Destination Addresses on Additional Cisco NCS 540 Router Variants	In this release, the Cisco Network Convergence System 540 Small Density Routers support the ability to match class maps to IPv4 and IPv6 destination addresses on Layer 2 networks. This feature provides you with an extra level of classification for aggregated customer traffic at your ingress, thus giving you granular control on traffic flows.

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	

SRv6 Services: Ethernet VPN Emulated LAN (ELAN)	This feature builds upon EVPN BGP signaling to provide Emulated Local Area Network (ELAN) multipoint-to-multipoint Ethernet services over an SRv6-based network.
	This feature introduces the following ELAN-related behaviors:
	• Ingress PE:
	  • H.Encaps.L2.[Red] – Encapsulation of L2/Ether frame using SRv6
	• Egress PE:
	  • End.DT2U – Decapsulation and Unicast MAC L2 Table Lookup
	  • End.DT2M – Decapsulation and L2 Table Flooding
	Automated steering of traffic of an EVPN ELAN service into the path associated with a best-effort or Flex-Algo locator is supported.

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 7.5.2

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

IOS XR 7.5.2 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 Fronthaul Routers Data Sheet
- Cisco Network Convergence System 540 Large Density Router Data Sheet
- Cisco Network Convergence System 540 Medium Density Routers Data Sheet
- Cisco Network Convergence System 540 Small Density Router Data Sheet

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

Release 7.5.2 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, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, and N540-FH-AGG-SYS 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 7.5.2 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.5.2.iso	IOS XR manc
USB Boot Package	ncs540-usb_boot-7.5.2.zip	Package requi Includes the s
Optional Packages not included in the base image		
Package	**Filename**	**Description**

Base Image	Filename	Description
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r752.x86_64.rpm	Supports Extensil gRPC and HTTP
IOS XR MPLS	ncs540-mpls-1.0.0.0-r752.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r752.x86_64.rpm	Supports MPLS a
IOS XR Security	ncs540-k9sec-1.0.0.0-r752.x86_64.rpm	Supports MACse
IOS XR ISIS	ncs540-isis-1.0.0.0-r752.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r752.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r752.x86_64.rpm	Supports Lawful
IOS XR Multicast	ncs540-mcast-1.0.0.0-r752.x86_64.rpm	Supports Multica
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r752.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r752.x86_64.rpm	Supports LI-CTR

Table 2: Release 7.5.2 Software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, and N540-FH-AGG-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540l-x64-7.5.2.iso	IOS XR base ima The base ISO ima • 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

Base Image	Filename	Description
USB Boot Package	ncs540l-usb_boot-7.5.2.zip	Package requi Includes the s
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.5.2.tar	Supports Teln
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.5.2.tar	Supports EIG
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.5.2.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.5.2.tar	Supports 802.
IOS XR RIP (xr-rip)	NCS540l-iosxr-7.5.2.tar	Supports RIP

Table 3: Release 7.5.2 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-aarch64-7.5.2.iso	IOS XR base The ISO imag • xr-bgp • xr-ipsla • xr-is-is • xr-lldp • xr-mcast • xr-mpls- • xr-ncs54 • xr-ncs54 • xr-netflo • xr-ospf • xr-perfm • xr-track These optiona NCS540l-aarc
USB Boot Package	ncs540l-aarch64-usb_boot-7.5.2.zip	Package requi Includes the s
Optional Packages not included in the base image		

Base Image	Filename	Description
Package	**Filename**	**Description**
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.5.2.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.5.2.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.5.2.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.5.2.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-aarch64-iosxr-optional-rpms-7.5.2.tar	Supports RIP

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
Wed Apr 27 14:55:59.804 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 18:53:00 PDT 2022
 Built Host   : iox-lnx-010
 Workspace    : /auto/srcarchive14/prod/7.5.2/ncs540/ws
 Version      : 7.5.2
 Location     : /opt/cisco/XR/packages/
 Label        : 7.5.2

cisco NCS-540 () processor
System uptime is 1 hour 4 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
Wed Apr 27 14:59:51.584 IST
Cisco IOS XR Software, Version 7.5.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Tue Apr 26 23:20:19 UTC 2022
 Build Host   : iox-lnx-011
 Workspace    : /auto/srcarchive14/prod/7.5.2/ncs540l/ws
 Version      : 7.5.2
 Label        : 7.5.2

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540X-16Z4G8Q2C-A (C3708 @ 1.70GHz) processor with 8GB of memory
PE3-EG uptime is 2 hours, 33 minutes
Cisco NCS 540 System with 16x10G+4x1GCu+8x25G+2x100G AC Chassis
```

Log in to the router and enter the **show version** command on the N540-6Z14S-SYS-D, N540X-8Z16G-SYS-A/D, and N540X-6Z18G-SYS-A/D variants:

```
RP/0/RP0/CPU0:R15_PE7_GP#show version
Wed Apr 27 08:58:15.991 UTC
Cisco IOS XR Software, Version 7.5.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Tue Apr 26 23:47:22 UTC 2022
 Build Host   : iox-lnx-023
 Workspace    : /auto/srcarchive14/prod/7.5.2/ncs540l-aarch64/ws
 Version      : 7.5.2
 Label        : 7.5.2

cisco NCS540L
cisco N540-6Z14S-SYS-D processor with 8GB of memory
APE-15 uptime is 2 hours, 44 minutes
Cisco NCS 540 Series Fixed Router 10x1G, 4xCu, 6x1/10G, DC
```

Log in to the router and enter the **show version** command on the N540-24Q8L2DD-SYS variant:

```
RP/0/RP0/CPU0:R1_PE1#show version
Wed Apr 27 09:46:11.123 UTC
Cisco IOS XR Software, Version 7.5.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Tue Apr 26 23:20:19 UTC 2022
 Build Host   : iox-lnx-011
 Workspace    : /auto/srcarchive14/prod/7.5.2/ncs540l/ws
 Version      : 7.5.2
 Label        : 7.5.2

cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
APE-13 uptime is 2 hours, 54 minutes
Cisco NCS540 Series, Fixed Router 2x400G, 8x50G, 24x25G Chassis
```

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
Wed Apr 27 09:43:25.368 UTC
Cisco IOS XR Software, Version 7.5.2 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Tue Apr 26 23:20:19 UTC 2022
 Build Host   : iox-lnx-011
 Workspace    : /auto/srcarchive14/prod/7.5.2/ncs540l/ws
 Version      : 7.5.2
 Label        : 7.5.2

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
APE-12 uptime is 2 hours, 45 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
Wed Apr  27 09:22:47.950 UTC+00:00

============================== ================================================
                                        Field Programmable Device Package
                                ================================================
                                          Req     SW        Min Req     Min Req
Card Type            FPD Description      Reload  Ver       SW Ver    Board Ver
==================== ==================== ======  ========  ==========  =========
N540-24Z8Q2C-M       Bootloader           YES     1.14        1.14      0.0
                     CPU-IOFPGA           YES     0.07        0.07      0.0
                     MB-IOFPGA            YES     0.23        0.23      0.0
                     SATA-M500IT-MC       NO      3.00        3.00      0.0
                     SATA-M500IT-MU-A     NO      5.00        5.00      0.0
                     SATA-M500IT-MU-B     NO      4.00        4.00      0.0
                     SATA-M5100           NO     71.00       71.00      0.0
                     SATA-M600-MCT        NO      5.00        5.00      0.0
                     SATA-SMART-128G      NO    1241.00     1241.00      0.0
-------------------------------------------------------------------------------
N540-ACC-SYS         Bootloader           YES     1.14        1.14      0.0
                     CPU-IOFPGA           YES     0.07        0.07      0.0
                     MB-IOFPGA            YES     0.23        0.23      0.0
                     SATA-M500IT-MC       NO      3.00        3.00      0.0
                     SATA-M500IT-MU-A     NO      5.00        5.00      0.0
                     SATA-M500IT-MU-B     NO      4.00        4.00      0.0
                     SATA-M5100           NO     71.00       71.00      0.0
                     SATA-M600-MCT        NO      5.00        5.00      0.0
                     SATA-SMART-128G      NO    1241.00     1241.00      0.0
-------------------------------------------------------------------------------
N540-PWR400-A        LIT-PriMCU-ACFW      NO      0.04        0.04      0.0
                     LIT-SecMCU-ACFW      NO      0.07        0.07      0.0
-------------------------------------------------------------------------------
N540-PWR400-D        LIT-PriMCU-DCFW      NO      0.04        0.04      0.0
                     LIT-SecMCU-DCFW      NO      0.06        0.06      0.0
                     SDG-PriMCU-DCFW      NO      1.03        1.03      0.0
                     SDG-SecMCU-DCFW      NO      1.03        1.03      0.0
-------------------------------------------------------------------------------
N540-X-24Z8Q2C-M     Bootloader           YES     1.14        1.14      0.0
                     CPU-IOFPGA           YES     0.07        0.07      0.0
                     MB-IOFPGA            YES     0.23        0.23      0.0
                     SATA-M500IT-MC       NO      3.00        3.00      0.0
                     SATA-M500IT-MU-A     NO      5.00        5.00      0.0
                     SATA-M500IT-MU-B     NO      4.00        4.00      0.0
                     SATA-M5100           NO     71.00       71.00      0.0
                     SATA-M600-MCT        NO      5.00        5.00      0.0
                     SATA-SMART-128G      NO    1241.00     1241.00      0.0
-------------------------------------------------------------------------------
N540X-ACC-SYS        Bootloader           YES     1.14        1.14      0.0
                     CPU-IOFPGA           YES     0.07        0.07      0.0
                     MB-IOFPGA            YES     0.23        0.23      0.0
                     SATA-M500IT-MC       NO      3.00        3.00      0.0
                     SATA-M500IT-MU-A     NO      5.00        5.00      0.0
                     SATA-M500IT-MU-B     NO      4.00        4.00      0.0
                     SATA-M5100           NO     71.00       71.00      0.0
                     SATA-M600-MCT        NO      5.00        5.00      0.0
                     SATA-SMART-128G      NO    1241.00     1241.00      0.0
-------------------------------------------------------------------------------

RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Wed Apr  27 09:23:04.331 UTC+00:00
                                                                 FPD Versions
                                                                ==============
```

```
Location  Card type         HWver FPD device       ATR Status      Run      Programd
----------------------------------------------------------------------------------
0/RP0     N540-24Z8Q2C-M    1.0   Bootloader           CURRENT     1.14      1.14
0/RP0     N540-24Z8Q2C-M    1.0   CPU-IOFPGA           CURRENT     0.07      0.07
0/RP0     N540-24Z8Q2C-M    1.0   MB-IOFPGA            CURRENT     0.23      0.23
0/RP0     N540-24Z8Q2C-M    1.0   SATA-M500IT-MU-B     CURRENT     4.00      4.00
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           SDG-PriMCU-ACFW      NOT READY
0/PM1     N540-PWR400-A           SDG-SecMCU-ACFW      NOT READY
```

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
Wed Apr 27 15:02:52.049 IST

=============================== ================================================
                                        Field Programmable Device Package
                                ================================================
                                              Req    SW      Min Req   Min Req
Card Type            FPD Description          Reload Ver     SW Ver  Board Ver
=================== ========================== ====== ======= ======== =========
--------------------------------------------------------------------------------
N540-12Z20G-SYS-A    ADMConfig                  YES     1.05      1.05       0.0
                     IoFpga                     YES     2.07      2.07       0.0
                     IoFpgaGolden               YES     2.07      2.03       0.0
                     Primary-BIOS               YES     1.33      1.33       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
--------------------------------------------------------------------------------
N540-12Z20G-SYS-D    ADMConfig                  YES     1.05      1.05       0.0
                     IoFpga                     YES     2.07      2.07       0.0
                     IoFpgaGolden               YES     2.07      2.03       0.0
                     Primary-BIOS               YES     1.33      1.33       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
--------------------------------------------------------------------------------
N540-24Q8L2DD-SYS    ADM-DBConfig               YES     2.03      2.03       0.0
                     ADM-MBConfig               YES     2.01      2.01       0.0
                     IoFpga                     YES     2.12      2.12       0.0
                     IoFpgaGolden               YES     2.12      2.12       0.0
                     Primary-BIOS               YES     1.08      1.08       0.0
                     StdbyFpga                  YES     2.59      2.59       0.0
                     StdbyFpgaGolden            YES     2.56      2.39       0.0
                     TamFw                      YES     6.05      6.05       0.0
                     TamFwGolden                YES     6.05      6.05       0.0
--------------------------------------------------------------------------------
N540-28Z4C-SYS-A     ADMConfig                  YES     1.05      1.05       0.0
                     IoFpga                     YES     2.07      2.07       0.0
                     IoFpgaGolden               YES     2.07      2.03       0.0
                     Primary-BIOS               YES     1.33      1.33       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
--------------------------------------------------------------------------------
N540-28Z4C-SYS-D     ADMConfig                  YES     1.05      1.05       0.0
                     IoFpga                     YES     2.07      2.07       0.0
```

```
                    IoFpgaGolden              YES     2.07      2.03      0.0
                    Primary-BIOS              YES     1.33      1.33      0.0
                    StdbyFpga                 YES     0.40      0.40      0.0
                    StdbyFpgaGolden           YES     0.40      0.40      0.0
                    TamFw                     YES     4.11      4.11      0.0
                    TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540-FH-AGG-SYS     ADM1_Config               YES     1.02      1.02      1.0
                    ADM2_Config               YES     1.02      1.02      1.0
                    DpFpgaCpri                YES     0.20      0.20      0.0
                    DpFpgaEth                 YES     1.18      1.18      0.0
                    IoFpga                    YES     1.30      1.30      0.0
                    IoFpgaGolden              YES     1.30      1.30      0.0
                    Primary-BIOS              YES     1.33      1.33      0.0
                    StdbyFpga                 YES     0.46      0.46      0.0
                    StdbyFpgaGolden           YES     0.46      0.46      0.0
                    TamFw                     YES     6.05      6.05      0.0
                    TamFwGolden               YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-FH-CSR-SYS     ADM1_Config               YES     0.09      0.09      0.0
                    ADM1_Config               YES     1.01      1.01      2.0
                    ADM2_Config               YES     0.09      0.09      0.0
                    ADM2_Config               YES     1.01      1.01      2.0
                    DpFpga                    YES     0.19      0.19      0.0
                    IoFpga                    YES     1.30      1.30      0.0
                    IoFpgaGolden              YES     1.30      1.30      0.0
                    Primary-BIOS              YES     1.33      1.33      0.0
                    StdbyFpga                 YES     0.46      0.46      0.0
                    StdbyFpgaGolden           YES     0.46      0.46      0.0
                    TamFw                     YES     6.05      6.05      0.0
                    TamFwGolden               YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-FH-IP65-SYS    DpFpga                    YES     0.19      0.19      0.0
                    IoFpga                    YES     1.24      1.24      0.0
                    IoFpgaGolden              YES     1.24      1.24      0.0
                    Primary-BIOS              YES     1.17      1.17      0.0
                    StdbyFpga                 YES     0.43      0.43      0.0
                    StdbyFpgaGolden           YES     0.43      0.43      0.0
                    TamFw                     YES     6.05      6.05      0.0
                    TamFwGolden               YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-PWR400-A       LI-PrimMCU                NO      0.04      0.04      0.0
                    LI-SecMCU                 NO      0.06      0.06      0.0
                    PrimMCU                   NO      1.02      1.02      0.0
                    SecMCU                    NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR400-D       LI-PrimMCU                NO      0.04      0.04      0.0
                    LI-SecMCU                 NO      0.06      0.06      0.0
                    PrimMCU                   NO      1.03      1.03      0.0
                    SecMCU                    NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-A       EM-PrimMCU                NO      1.02      1.02      0.0
                    EM-SecMCU                 NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-D       EM-PrimMCU                NO      1.03      1.03      0.0
                    EM-SecMCU                 NO      3.01      3.01      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-A  ADMConfig                 YES     1.05      1.05      0.0
                    IoFpga                    YES     2.07      2.07      0.0
                    IoFpgaGolden              YES     2.07      2.03      0.0
                    Primary-BIOS              YES     1.33      1.33      0.0
                    StdbyFpga                 YES     0.40      0.40      0.0
                    StdbyFpgaGolden           YES     0.40      0.40      0.0
                    TamFw                     YES     4.11      4.11      0.0
```

```
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-D   ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-A    ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-D    ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-A      ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-D      ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0

RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Wed Apr 27 15:03:23.226 IST

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-16Z4G8Q2C-A     0.3   ADMConfig            NEED UPGD  1.03    1.03
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   IoFpga               CURRENT    2.07    2.07
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   IoFpgaGolden     B   NEED UPGD          1.31
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   Primary-BIOS      S  CURRENT    1.33    1.33
  0/RP0
```

```
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   StdbyFpga          S  CURRENT    0.40     0.40
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   StdbyFpgaGolden    BS NEED UPGD           0.00
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   TamFw              S  CURRENT    4.11     4.11
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     0.3   TamFwGolden        BS NEED UPGD           0.00
  0/RP0
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-6Z14S-SYS-D, N540X-6Z18G-SYS-A/D, and N540X-8Z16G-SYS-A/D variants:

```
RP/0/RP0/CPU0:R15_PE7_GP#show fpd package
Wed Apr 27 08:58:56.981 UTC

================================ ============================================
                                        Field Programmable Device Package
                                 ============================================
                                           Req      SW       Min Req   Min Req
Card Type            FPD Description       Reload   Ver      SW Ver    Board Ver
================== ========================= ====== ======= ======== =========
--------------------------------------------------------------------------------
N540-6Z14S-SYS-D     ADMConfig                  YES     5.03      5.03       0.0
                     BckUp-BootLoader           YES    20.04     20.04       0.0
                     IoFpga                     YES     0.17      0.17       0.0
                     IoFpgaGolden               YES     0.17      0.17       0.0
                     Prim-BootLoader            YES    20.04     20.04       0.0
                     StdbyFpga                  YES     1.09      1.09       0.0
                     StdbyFpgaGolden            YES     1.09      1.09       0.0
                     TamFw                      YES     6.05      6.05       0.0
                     TamFwGolden                YES     6.05      6.05       0.0
--------------------------------------------------------------------------------
N540X-4Z14G2Q-A      ADMConfig                  YES     5.00      5.00       0.0
                     BckUp-BootLoader           YES    20.04     20.04       0.0
                     IoFpga                     YES     0.17      0.17       0.0
                     IoFpgaGolden               YES     0.17      0.17       0.0
                     Prim-BootLoader            YES    20.04     20.04       0.0
                     StdbyFpga                  YES     1.09      1.09       0.0
                     StdbyFpgaGolden            YES     0.34      0.34       0.0
                     TamFw                      YES     6.05      6.05       0.0
                     TamFwGolden                YES     6.05      6.05       0.0
--------------------------------------------------------------------------------
N540X-4Z14G2Q-D      ADMConfig                  YES     5.00      5.00       0.0
                     BckUp-BootLoader           YES    20.04     20.04       0.0
                     IoFpga                     YES     0.17      0.17       0.0
                     IoFpgaGolden               YES     0.17      0.17       0.0
                     Prim-BootLoader            YES    20.04     20.04       0.0
                     StdbyFpga                  YES     1.09      1.09       0.0
                     StdbyFpgaGolden            YES     0.34      0.34       0.0
                     TamFw                      YES     6.05      6.05       0.0
                     TamFwGolden                YES     6.05      6.05       0.0
--------------------------------------------------------------------------------
N540X-6Z18G-SYS-A    ADMConfig                  YES     5.00      5.00       0.0
                     BckUp-BootLoader           YES    20.04     20.04       0.0
                     IoFpga                     YES     0.17      0.17       0.0
                     IoFpgaGolden               YES     0.17      0.17       0.0
                     Prim-BootLoader            YES    20.04     20.04       0.0
                     StdbyFpga                  YES     1.09      1.09       0.0
                     StdbyFpgaGolden            YES     0.34      0.34       0.0
                     TamFw                      YES     6.05      6.05       0.0
                     TamFwGolden                YES     6.05      6.05       0.0
--------------------------------------------------------------------------------
N540X-6Z18G-SYS-D    ADMConfig                  YES     5.00      5.00       0.0
                     BckUp-BootLoader           YES    20.04     20.04       0.0
                     IoFpga                     YES     0.17      0.17       0.0
```

```
                    IoFpgaGolden               YES     0.17      0.17      0.0
                    Prim-BootLoader            YES    20.04     20.04      0.0
                    StdbyFpga                  YES     1.09      1.09      0.0
                    StdbyFpgaGolden            YES     0.34      0.34      0.0
                    TamFw                      YES     6.05      6.05      0.0
                    TamFwGolden                YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540X-8Z16G-SYS-A   ADMConfig                  YES     5.00      5.00      0.0
                    BckUp-BootLoader           YES    20.04     20.04      0.0
                    IoFpga                     YES     0.17      0.17      0.0
                    IoFpgaGolden               YES     0.17      0.17      0.0
                    Prim-BootLoader            YES    20.04     20.04      0.0
                    StdbyFpga                  YES     1.09      1.09      0.0
                    StdbyFpgaGolden            YES     0.34      0.34      0.0
                    TamFw                      YES     6.05      6.05      0.0
                    TamFwGolden                YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540X-8Z16G-SYS-D   ADMConfig                  YES     5.00      5.00      0.0
                    BckUp-BootLoader           YES    20.04     20.04      0.0
                    IoFpga                     YES     0.17      0.17      0.0
                    IoFpgaGolden               YES     0.17      0.17      0.0
                    Prim-BootLoader            YES    20.04     20.04      0.0
                    StdbyFpga                  YES     1.09      1.09      0.0
                    StdbyFpgaGolden            YES     0.34      0.34      0.0
                    TamFw                      YES     6.05      6.05      0.0
                    TamFwGolden                YES     6.05      6.05      0.0

RP/0/RP0/CPU0:Leaf5#show hw-module fpd
Wed Apr 27 08:59:29.144 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 N540-6Z14S-SYS-D      0.2   ADMConfig            CURRENT    5.03    5.03
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   IoFpga               CURRENT    0.17    0.17
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   IoFpgaGolden     B   NEED UPGD          0.15
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   Prim-BootLoader      CURRENT   20.04   20.04
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   StdbyFpga         S  CURRENT    1.09    1.09
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   StdbyFpgaGolden  BS  NEED UPGD          0.33
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   TamFw             S  CURRENT    6.05    6.05
  0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2   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 N540-24Q8L2DD-SYS variant:

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Wed Apr 27 09:46:51.293 UTC

================================ ================================================
                                        Field Programmable Device Package
                                 ================================================
                                              Req      SW       Min Req    Min Req
Card Type            FPD Description          Reload   Ver      SW Ver   Board Ver
```

N540-12Z20G-SYS-A	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-12Z20G-SYS-D	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-24Q8L2DD-SYS	ADM-DBConfig	YES	2.03	2.03	0.0
	ADM-MBConfig	YES	2.01	2.01	0.0
	IoFpga	YES	2.12	2.12	0.0
	IoFpgaGolden	YES	2.12	2.12	0.0
	Primary-BIOS	YES	1.08	1.08	0.0
	StdbyFpga	YES	2.59	2.59	0.0
	StdbyFpgaGolden	YES	2.56	2.39	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
N540-28Z4C-SYS-A	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-28Z4C-SYS-D	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-FH-AGG-SYS	ADM1_Config	YES	1.02	1.02	1.0
	ADM2_Config	YES	1.02	1.02	1.0
	DpFpgaCpri	YES	0.20	0.20	0.0
	DpFpgaEth	YES	1.18	1.18	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.46	0.46	0.0
	StdbyFpgaGolden	YES	0.46	0.46	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
N540-FH-CSR-SYS	ADM1_Config	YES	0.09	0.09	0.0
	ADM1_Config	YES	1.01	1.01	2.0
	ADM2_Config	YES	0.09	0.09	0.0
	ADM2_Config	YES	1.01	1.01	2.0

```
                    DpFpga                  YES     0.19      0.19      0.0
                    IoFpga                  YES     1.30      1.30      0.0
                    IoFpgaGolden            YES     1.30      1.30      0.0
                    Primary-BIOS            YES     1.33      1.33      0.0
                    StdbyFpga               YES     0.46      0.46      0.0
                    StdbyFpgaGolden         YES     0.46      0.46      0.0
                    TamFw                   YES     6.05      6.05      0.0
                    TamFwGolden             YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-FH-IP65-SYS    DpFpga                  YES     0.19      0.19      0.0
                    IoFpga                  YES     1.24      1.24      0.0
                    IoFpgaGolden            YES     1.24      1.24      0.0
                    Primary-BIOS            YES     1.17      1.17      0.0
                    StdbyFpga               YES     0.43      0.43      0.0
                    StdbyFpgaGolden         YES     0.43      0.43      0.0
                    TamFw                   YES     6.05      6.05      0.0
                    TamFwGolden             YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-PWR400-A       LI-PrimMCU              NO      0.04      0.04      0.0
                    LI-SecMCU               NO      0.06      0.06      0.0
                    PrimMCU                 NO      1.02      1.02      0.0
                    SecMCU                  NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR400-D       LI-PrimMCU              NO      0.04      0.04      0.0
                    LI-SecMCU               NO      0.06      0.06      0.0
                    PrimMCU                 NO      1.03      1.03      0.0
                    SecMCU                  NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-A       EM-PrimMCU              NO      1.02      1.02      0.0
                    EM-SecMCU               NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-D       EM-PrimMCU              NO      1.03      1.03      0.0
                    EM-SecMCU               NO      3.01      3.01      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-A  ADMConfig               YES     1.05      1.05      0.0
                    IoFpga                  YES     2.07      2.07      0.0
                    IoFpgaGolden            YES     2.07      2.03      0.0
                    Primary-BIOS            YES     1.33      1.33      0.0
                    StdbyFpga               YES     0.40      0.40      0.0
                    StdbyFpgaGolden         YES     0.40      0.40      0.0
                    TamFw                   YES     4.11      4.11      0.0
                    TamFwGolden             YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-D  ADMConfig               YES     1.05      1.05      0.0
                    IoFpga                  YES     2.07      2.07      0.0
                    IoFpgaGolden            YES     2.07      2.03      0.0
                    Primary-BIOS            YES     1.33      1.33      0.0
                    StdbyFpga               YES     0.40      0.40      0.0
                    StdbyFpgaGolden         YES     0.40      0.40      0.0
                    TamFw                   YES     4.11      4.11      0.0
                    TamFwGolden             YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-A   ADMConfig               YES     1.05      1.05      0.0
                    IoFpga                  YES     2.07      2.07      0.0
                    IoFpgaGolden            YES     2.07      2.03      0.0
                    Primary-BIOS            YES     1.33      1.33      0.0
                    StdbyFpga               YES     0.40      0.40      0.0
                    StdbyFpgaGolden         YES     0.40      0.40      0.0
                    TamFw                   YES     4.11      4.11      0.0
                    TamFwGolden             YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-D   ADMConfig               YES     1.05      1.05      0.0
                    IoFpga                  YES     2.07      2.07      0.0
                    IoFpgaGolden            YES     2.07      2.03      0.0
```

```
                    Primary-BIOS                YES     1.33      1.33      0.0
                    StdbyFpga                   YES     0.40      0.40      0.0
                    StdbyFpgaGolden             YES     0.40      0.40      0.0
                    TamFw                       YES     4.11      4.11      0.0
                    TamFwGolden                 YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-A     ADMConfig                   YES     1.05      1.05      0.0
                    IoFpga                      YES     2.07      2.07      0.0
                    IoFpgaGolden                YES     2.07      2.03      0.0
                    Primary-BIOS                YES     1.33      1.33      0.0
                    StdbyFpga                   YES     0.40      0.40      0.0
                    StdbyFpgaGolden             YES     0.40      0.40      0.0
                    TamFw                       YES     4.11      4.11      0.0
                    TamFwGolden                 YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-D     ADMConfig                   YES     1.05      1.05      0.0
                    IoFpga                      YES     2.07      2.07      0.0
                    IoFpgaGolden                YES     2.07      2.03      0.0
                    Primary-BIOS                YES     1.33      1.33      0.0
                    StdbyFpga                   YES     0.40      0.40      0.0
                    StdbyFpgaGolden             YES     0.40      0.40      0.0
                    TamFw                       YES     4.11      4.11      0.0
                    TamFwGolden                 YES     4.11      4.11      0.0
```

```
RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Wed Apr 27 09:47:14.880 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 N540-24Q8L2DD-SYS     3.0   ADM-DBConfig         NEED UPGD  2.02    2.02
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   ADM-MBConfig         NEED UPGD  1.02    1.02
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   IoFpga               CURRENT    2.12    2.12
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   IoFpgaGolden     B   CURRENT            2.12
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   Primary-BIOS      S  NOT READY  1.05    1.05
    N/A
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   StdbyFpga         S  CURRENT    2.59    2.59
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   StdbyFpgaGolden  BS  NEED UPGD          0.00
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   TamFw             S  CURRENT    6.05    6.05
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   TamFwGolden      BS  NEED UPGD          0.00
  0/RP0
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
```

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
Wed Apr 27 09:44:56.091 UTC

================================ ============================================
                                      Field Programmable Device Package
```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-12Z20G-SYS-A	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-12Z20G-SYS-D	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-24Q8L2DD-SYS	ADM-DBConfig	YES	2.03	2.03	0.0
	ADM-MBConfig	YES	2.01	2.01	0.0
	IoFpga	YES	2.12	2.12	0.0
	IoFpgaGolden	YES	2.12	2.12	0.0
	Primary-BIOS	YES	1.08	1.08	0.0
	StdbyFpga	YES	2.59	2.59	0.0
	StdbyFpgaGolden	YES	2.56	2.39	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
N540-28Z4C-SYS-A	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-28Z4C-SYS-D	ADMConfig	YES	1.05	1.05	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
N540-FH-AGG-SYS	ADM1_Config	YES	1.02	1.02	1.0
	ADM2_Config	YES	1.02	1.02	1.0
	DpFpgaCpri	YES	0.20	0.20	0.0
	DpFpgaEth	YES	1.18	1.18	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.33	1.33	0.0
	StdbyFpga	YES	0.46	0.46	0.0
	StdbyFpgaGolden	YES	0.46	0.46	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
N540-FH-CSR-SYS	ADM1_Config	YES	0.09	0.09	0.0

```
                     ADM1_Config               YES     1.01      1.01      2.0
                     ADM2_Config               YES     0.09      0.09      0.0
                     ADM2_Config               YES     1.01      1.01      2.0
                     DpFpga                    YES     0.19      0.19      0.0
                     IoFpga                    YES     1.30      1.30      0.0
                     IoFpgaGolden              YES     1.30      1.30      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.46      0.46      0.0
                     StdbyFpgaGolden           YES     0.46      0.46      0.0
                     TamFw                     YES     6.05      6.05      0.0
                     TamFwGolden               YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-FH-IP65-SYS     DpFpga                    YES     0.19      0.19      0.0
                     IoFpga                    YES     1.24      1.24      0.0
                     IoFpgaGolden              YES     1.24      1.24      0.0
                     Primary-BIOS              YES     1.17      1.17      0.0
                     StdbyFpga                 YES     0.43      0.43      0.0
                     StdbyFpgaGolden           YES     0.43      0.43      0.0
                     TamFw                     YES     6.05      6.05      0.0
                     TamFwGolden               YES     6.05      6.05      0.0
--------------------------------------------------------------------------------
N540-PWR400-A        LI-PrimMCU                NO      0.04      0.04      0.0
                     LI-SecMCU                 NO      0.06      0.06      0.0
                     PrimMCU                   NO      1.02      1.02      0.0
                     SecMCU                    NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR400-D        LI-PrimMCU                NO      0.04      0.04      0.0
                     LI-SecMCU                 NO      0.06      0.06      0.0
                     PrimMCU                   NO      1.03      1.03      0.0
                     SecMCU                    NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-A        EM-PrimMCU                NO      1.02      1.02      0.0
                     EM-SecMCU                 NO      1.03      1.03      0.0
--------------------------------------------------------------------------------
N540-PWR750-D        EM-PrimMCU                NO      1.03      1.03      0.0
                     EM-SecMCU                 NO      3.01      3.01      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-A   ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-D   ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-A    ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
```

```
N540X-16Z4G8Q2C-D    ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-A      ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z8Q2C-D      ADMConfig                 YES     1.05      1.05      0.0
                     IoFpga                    YES     2.07      2.07      0.0
                     IoFpgaGolden              YES     2.07      2.03      0.0
                     Primary-BIOS              YES     1.33      1.33      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0

RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Wed Apr 27 09:45:15.446 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 N540-FH-CSR-SYS       1.0   ADM1_Config          CURRENT    0.09    0.09
  0/RP0
0/RP0/CPU0 N540-FH-CSR-SYS       1.0   ADM2_Config          CURRENT    0.09    0.09
  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
```

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-7.5.2.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 are available along with the software image in *NCS540l-docs-7.5.2.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-7.5.2.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.