Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.8.1

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What's New in Cisco IOS XR Release 7.8.1

Cisco IOS XR Release 7.8.1 is a new feature release 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.

New in Documentation

This release introduces rich and intuitive ways for you to access YANG data models supported in the Cisco IOS XR software.

Product	Description
Cisco IOS XR Error Messages	Search by release number, error strings, or compare release numbers to view a detailed repository of error messages and descriptions.
Cisco IOS XR MIBs	Select the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
YANG Data Models Navigator	We have launched the tool as an easy reference to view the Data Models (Native, Unified, OpenConfig) supported in IOS XR platforms and releases. You can explore the data model definitions, locate a specific model, and view the containers and their respective lists, leaves, leaf lists, Xpaths, and much more. As we continue to enhance the tool, we would love to hear your feedback. You are welcome to drop us a note here.
Use Case-based Documentation at Learning Labs	You can now quickly explore and experiment on use-cases without setting up any hardware resources with the new Interactive documentation for Cisco 8000 routers on DevNet Learning Labs. Powered by Jupyter, the automated code blocks within the documentation enable you to configure the desired functionality on the routers and retrieve real-time output swiftly. Check out the new interactive documentation here: • End to end 3-stage CLOS Networks for SONiC • Use cases for QoS and Model-driven Telemetry

Software Features Enhanced and Introduced

To learn about features introduced in other Cisco IOS XR releases, select the release from the Documentation Landing Page.

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

Feature	Description
IP Addresses and Services	
Support for HSRP version 2 Extended Group Range	You can now use HSRP version 2, which has an expanded group IDs up to 4095 with 255 number of (IPv4 and IPv6 combined) HSRP sessions.
	Now, the inter operation with the other routers is supported.
	Earlier, you could configure only up to 255 group IDs with 255 number of (IPv4 and IPv6 combined) HSRP sessions.
L2VPN and Ethernet Services	
Increased VLAN-IDs per VLAN list	From this release, you can configure up to 64 VLAN-IDs per VLAN list. Previously, the number of VLAN-IDs supported were only up to 9, per VLAN list.
	The enhanced VLAN-IDs help to add more number of customers in an Ethernet network.
	Use the encapsulation list-extended dot1q command, to configure up to 64 VLAN-IDs.
Storm Control Configuration for Subinterfaces	Storm control helps prevent LAN ports from being disrupted by a broadcast, multicast, or unicast traffic storm.
	You can now configure different storm control rates for each subinterface on a physical port. This will give you control at a granular level and prevent flooding of excess traffic at the subinterface level.
	In earlier releases, storm control could be configured only at the physical port level or only on one subinterface under a main interface.
	This feature modifies the **hw-module storm-control-combine-policer-bw enable** command to enable per subinterface configuration support for storm control.
Single Tagged VLAN Range Support for Double Tagged Frames	From this release, L2 subinterface configuration with single tagged VLAN range can be matched with the double tagged frames. Previously, the packet matching was done only with single VLAN ID and the double tagged packets were dropped.
	With single tagged VLAN range support for double tagged frames, the traffic can reach the VLAN destination safely.

Feature	Description
MAC Address Limit Configuration for Static Addresses	You can now configure the MAC address limit for bridge domains to learn only static MAC addresses and to drop traffic from unknown sources. Malicious attackers can spoof a Layer 2 MAC address to change dynamic entries in the MAC table. However, with this functionality enabling you to configure the MAC address limit for bridge domains to learn only static MAC addresses, the dynamic MAC addresses are blocked. In addition, a static entry always overrules dynamic entries. This functionality thus prevents the interception of your data by unauthorized users and improves your network security.
Modular QoS	
Support for displaying the QoS hardware module profiles	It is now possible to view the supported QoS hardware module profile names on the router by using the **show qos hw-module-status** command. You can now identify if the profile is configured on the router, and whether it requires a reboot or not.
Network Synchronization	
PTP Holdover Traceability flag override for T-GM and Virtual-port/APTS modes	This feature extends the PTP holdover traceability suppression functionality to T-GM and Virtual-port/APTS modes.
Netflow	

IPFIX Enablement for SRv6 and Services over SRv6 Core	This feature provides improved information about IP traffic flows, through the introduction of sub-menus to two commands.
	
	The **record ipv6** command is modified to support a new optional keyword, **srv6**.
	
	A new subtype for **ipv4 record** and **ipv6 record** is introduced for **l2-l3** records.
	
	For more information, see:
	
	    • **record ipv6**
	
	    • **show flow monitor-map**

Routing	
Configure flex-algo IS-IS maximum-path	This feature introduces the new **algorithm 0** command and provides information on the updated **flex-algo** command. These updates enable individual granularity for flex-algo and regular SPF algorithms.
Segment Routing	

Feature	Description
EVPN VPWS and EVPN ELAN ODN over SRv6-TE policy	This feature enables support for On-Demand Next-Hop over SRv6-TE policy. When SRv6-TE is configured, the ODN policy uses SRv6-TE tunnels, thus improving traffic performance.
Configure SR-TE Head-end Explicit Path with TI-LFA	An SRv6 segment using an IPv6 prefix enables validation of all SIDs in the segment list. Segments in the topology database are validated, providing for improved traffic flow.
Circuit-Style SR-TE Policies	This solution allows Segment Routing to meet the requirements of a connection-oriented transport network, which was historically delivered over circuit-switched SONET/SDH networks. Circuit-style SR-TE policies allow a common network infrastructure to be used for both connection-oriented services and classic IP-based transport. This eliminates the need for multiple parallel networks, which greatly reduces both capital expenditures (CapEx) and operating expenditures (OpEx).
Path Tracing Midpoint	Path Tracing (PT) provides a log or record of the packet path as a sequence of interface IDs along with its time stamp. In Path Tracing, a node can behave as a source, midpoint, or sink node. The Path Tracing Midpoint feature is implemented in this release which measures the hop-by-hop delay, traces the path in the network and collects egress interface load information and interface Id, and stores them in the Midpoint Compressed Data (MCD) section of Hop-by-Hop Path Tracing (HbH-PT) header. This feature provides visibility to the Path Tracing Midpoint node that handles IPv6 transit in Path Tracing and full characterization of the packet delivery path. It provides real time information and the current status of the network. This feature introduces the following command: • **performance-measurement interface**
SR IS-IS Enhancements: max-metric and data plane updates	The new **anomaly** optional keyword is introduced to **affinity flex-algo** command. This keyword helps to advertise the flex-algo affinity when the performance measurement signals a link anomaly, such as an excessive delay on a link. You could use the anomaly option to exclude the link from flex-algo path computations. **affinity flex-algo**
Manual SRv6-TE Policies with Explicit Paths	This feature is now supported on Cisco NCS 540 routers. To enable the native mode, use the **hw-module profile npu native-mode-enable** command in the configuration mode. Ensure that you reload the router after configuring the native mode.

Feature	Description
IS-IS Unreachable Prefix Announcement	The Unreachable Prefix Announcement (UPA) notifies the loss of prefix reachability between areas or domains, for prefixes that are covered by the summary address range during inter-area or inter-domain summarization.
	This feature helps in identifying the routers that are facing prefix unreachability issues faster and fix it.
	The new commands introduced for this feature are:
	• summary-prefix
	• prefix-unreachable
Full-Replace Migration to SRv6 Micro-SID	This feature enables migration of existing SRv6 SID format1 to SRv6 Micro-SIDs (f3216) formats.
	Earlier, only one format was supported at a time, and you had to choose either format1 or Micro-SID format for the deployment of services. Migration from Full-length SIDs to SRv6 Micro-SIDs was not possible.
	The **hw-module profile segment-routing srv6 mode base-and-micro-segment-f3216** subcommand is introduced under **hw-module profile segment-routing srv6 mode**.
System Management	
Smart Licensing Per Port for Segment Routing-Traffic Engineering	Cisco Smart Licensing is a cloud-based, flexible software licensing model that enables you to activate and manage Cisco software licenses across your organization. Under the flexible, automated software licensing model, we have Advantage licenses which are required on top of Essential Licenses for ports that use advanced features like L3VPN.
	This release allows you to allocate the Advantage licenses to the Segment Routing Traffic Engineering (SR-TE) based on the active ports under MPLS or SRV6. Before this release, when you configured SR-TE, all the ports used to consume Advantage licenses. This allows you to manage advantage licenses for SR-TE.

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

Feature	Feature
System Management	
Y.1564 Service Activation Test in Native Mode	Y.1564 - Ethernet Service Activation Test (or performance test methodology) is a testing procedure which tests service turn-up, installation, and troubleshooting of Ethernet-based services. This test methodology was created to have a standard way of measuring Ethernet-based services in the industry.
	This testing procedure is now supported on Cisco N540-24Q8L2DD-SYS routers that are installed and operate in the Native mode.
Segment Routing	

Feature	Feature
Automated Steering of L3 BGP-based services	This feature is now supported on Cisco NCS 540 routers. To enable the native mode, use the **hw-module profile npu native-mode-enable** command in the configuration mode. Ensure that you reload the router after configuring the native mode.

The following features are supported on all the NCS 540 variants, but not supported on N540-ACC-SYS, N540X-ACC-SYS, and N540-24Z8Q2C-SYS variants.

Feature	Feature
System Security	
Secure Boot Status	You can now verify whether the router is securely booted up with an authentic Cisco software image. We have introduced a **show** command to verify the secure boot status of the router. If the software image was tampered with, then the secure boot fails, and the router does not boot up. Before this release, there was no provision on the router to verify the secure boot status. The feature introduces these: - CLI: **show platform security integrity log secure-boot status** command. - YANG Data Model: `Cisco-IOS-XR-attestation-agent-oper.yang` Cisco native model (see Github) The feature is supported only on the following Cisco NCS 540 router variants: - N540-28Z4C-SYS-A/D - N540X-16Z4G8Q2C-A/D - N540X-16Z8Q2C-D - N540-12Z20G-SYS-A/D - N540X-12Z16G-SYS-A/D - N540X-6Z18G-SYS-A/D - N540X-8Z16G-SYS-A/D - N540X-4Z14G2Q-A/D - N540-6Z18G-SYS-A/D - N540-6Z14S-SYS-D
Programmability	

Feature	Feature
gNOI System Service Revision 1.0.0	With the gRPC Network Operations Interface (gNOI) Revision 1.0.0, you can: • Cancel a pending reboot request using the `CancelReboot` RPC • Terminate a process using the `KillProcess` RPC You can access the gNOI system RPC messages from the Github repository.

The following features are supported on N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.

Feature	Description
System Security	
Selective Authentication Methods for SSH Server	You now have the flexibility to choose the preferred SSH server authentication methods on the router. These methods include password authentication, keyboard-interactive authentication, and public-key authentication. This feature allows you to selectively disable these authentication methods. By allowing the SSH clients to connect to the server only through these permitted authentication methods, this functionality provides additional security for router access through SSH. Before this release, by default, the SSH server allowed all these authentication methods for establishing SSH connections. The feature introduces these changes: • **CLI**: New **disable auth-methods** command • **YANG Data Model**: New XPaths for `Cisco-IOS-XR-crypto-ssh-cfg.yang` Cisco native model (see GitHub)

Feature	Description
Reimage Protection for Routers	By disallowing USB and PXE boots, this feature aims to prevent the reimage of stolen routers. Such an intervention ensures that attackers can't use the USB or PXE boot facility to erase the existing configuration and boot the stolen router with a fresh IOS Rx image for resale.
	This feature is supported on the following Cisco NCS 540 router variants:
	• N540-28Z4C-SYS-A/D
	• N540X-16Z4G8Q2C-A/D
	• N540X-16Z8Q2C-D
	• N540-6Z14S-SYS-D
	• N540-12Z20G-SYS-A/D
	• N540X-12Z16G-SYS-A/D
	• N540X-6Z18G-SYS-A/D
	• N540X-8Z16G-SYS-A/D
	• N540X-4Z14G2Q-A/D
	• N540-6Z18G-SYS-A/D

The following feature is supported only on N540X-6Z18G-SYS-A/D router variants.

Feature	Description
Time Division Multiplexing (TDM)	
TDM2IP Smart SFP Optics is supported on N540X-6Z18G-SYS-A/D router variants	TDM2IP Smart SFP Optics is supported on N540X-6Z18G-SYS-A/D router variants.
	The TPoP and CSoP Smart SFPs enable operators to migrate and integrate their TDM based transport network onto a single technology packet network for both data and TDM transport, which helps to streamline operations and to reduce operational expenditures.

The following feature is supported on N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, N540X-4Z14G2Q-A/D, N540-6Z14S-SYS-D, and N540-6Z18G-SYS-A/D variants.

Feature	Description
System Security	

Feature	Description
IMA Enforcement	We now use Integrity Measurement Architecture (IMA) to provide a higher level of trust and runtime security for the routers. With IMA appraisal, you can detect modifications to a file or executable within the router. These modifications could be accidental or malicious, carried out remotely or locally. In addition to logging an integrity violation, the IMA policy also enforces an appraisal by blocking any operation (open or run) for a compromised executable. IMA Enforcement is now introduced on the following Cisco NCS 540 router variants: • N540X-6Z18G-SYS-A/D • N540X-8Z16G-SYS-A/D • N540X-4Z14G2Q-A/D • N540-6Z18G-SYS-A/D • N540-6Z14S-SYS-D

The following feature is supported only on N540X-12Z16G-SYS-A/D variants.

Feature	Description
System Security	
IP Security (IPSec) for Management Traffic	You can now use IP Security (IPSec), a protocol suite that authenticates and encrypts packets of data to provide secure communication over an unprotected network for all management traffic flows between routers. With IPSec, management traffic data is sent across a public network without observation, modification, or spoofing. This feature introduces the following commands: • **ikev2 policy** • **ikev2 profile** • **ikev2 proposal** • **ipsec profile** • **ipsec transform-set** • **keyring** • **show ikev2 session detail** • **show ikev2 session** • **show ikev2 summary** • **show ipsec sa** This feature modifies the **tunnel mode** command.

Hardware Introduced

Hardware	Description

Optics	**Note** Optics support varies across devices (routers, line cards, RPs, and so on). To know if an optics is compatible with a specific Cisco device, refer to the Transceiver Module Group (TMG) Compatibility Matrix.
	
	 This release introduces the following new optics:
	
	 • Cisco Quad Small Form-Factor Pluggable Double Density (QSFP-DD)
	
	    • QDD-2X100-CWDM4-S
	    • QDD-2X100-LR4-S
	    • QDD-2X100-SR4-S
	    • QDD-4X100G-FR-S
	    • QDD-400-AOCxM
	    • QDD-400G-LR4-S
	    • QDD-4X100G-LR-S
	
	 • Cisco 10GBASE SFP+ Module
	
	    • ONS-SI+-10G-ZR

N540-6Z18G-SYS-A/D Routers	The new N540-6Z18G-SYS-A/D routers are fixed port, one rack unit form-factor, non-conformal coated routers, with security, and QoS features that revolutionize sub-100G routing. An IOS-XR based router, this router extends as Network Interface Device (NID)/Customer Premises Equipment (CPE), with the smallest footprint, ever. The N540-6Z18G-SYS-A/D routers support the following ports: • 18 x 1G SFP+ ports • 6 x 1G/10G SFP+ ports

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.

Caveats

Table 1: Cisco IOS XR NCS 540 Routers Specific Bugs

Bug ID	Headline
CSCwd64936	ADM-MBConfig version reverts back to 2.01 from 2.02 after reload

IOS XR 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 7.8.1 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, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, N540X-16Z8Q2C-D and N540-FH-AGG-SYS variants.

- The third table lists the supported software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-6Z18G-SYS-A/D variants.

Visit the Cisco Software Download page to download the Cisco IOS XR software images.

Table 2: Release 7.8.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename
IOS XR Base Image	ncs540-mini-x-7.8.1.iso
USB Boot Package	ncs540-usb_boot-7.8.1.zip
Optional Packages not included in the base image	
Package	**Filename**
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r781.x86_64.rpm
IOS XR MPLS	ncs540-mpls-1.0.0.0-r781.x86_64.rpm
	ncs540-mpls-te-rsvp-1.0.0.0-r781.x86_64.rpm
IOS XR Security	ncs540-k9sec-1.0.0.0-r781.x86_64.rpm
IOS XR ISIS	ncs540-isis-1.0.0.0-r781.x86_64.rpm
IOS XR OSPF	ncs540-ospf-1.0.0.0-r781.x86_64.rpm
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r781.x86_64.rpm
IOS XR Multicast	ncs540-mcast-1.0.0.0-r781.x86_64.rpm
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r781.x86_64.rpm
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r781.x86_64.rpm

Table 3: Release 7.8.1 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, N540X-16Z8Q2C-D and N540-FH-AGG-SYS

Base Image	Filename

IOS XR Base Image	ncs540l-x64-7.8.1.iso
USB Boot Package	ncs540l-usb_boot-7.8.1.zip

Optional Packages not included in the base image

Package	Filename
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.8.1.tar
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.8.1.tar
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.8.1.tar
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.8.1.tar
IOS XR RIP (xr-rip)	NCS540l-iosxr-7.8.1.tar

Table 4: Release 7.8.1 Software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-6Z18G-SYS-A/D

Base Image	Filename
IOS XR Base Image	ncs540l-aarch64-7.8.1.iso
USB Boot Package	ncs540l-aarch64-usb_boot-7.8.1.zip

Optional Packages not included in the base image

Package	Filename
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.8.1.tar
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.8.1.tar

IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.8.1.tar
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.8.1.tar
IOS XR RIP (xr-rip)	NCS540l-aarch64-iosxr-optional-rpms-7.8.1.tar

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:Router#show version
Cisco IOS XR Software, Version 7.8.1
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Nov 30 08:33:36 PST 2022
 Built Host   : iox-lnx-066
 Workspace    : /auto/srcarchive13/prod/7.8.1/ncs540/ws
 Version      : 7.8.1
 Location     : /opt/cisco/XR/packages/
 Label        : 7.8.1

cisco NCS-540 () processor
System uptime is 3 hours 31 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:Router#show version
Cisco IOS XR Software, Version 7.8.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Nov 30 13:00:28 UTC 2022
 Build Host   : iox-lnx-069
 Workspace    : /auto/srcarchive13/prod/7.8.1/ncs540l/ws
 Version      : 7.8.1
 Label        : 7.8.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-28Z4C-SYS-A (C3708 @ 1.70GHz) processor with 8GB of memory
ncs540l uptime is 1 hour, 6 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:Router# show version
Cisco IOS XR Software, Version 7.8.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Nov 30 13:00:28 UTC 2022
 Build Host   : iox-lnx-077
 Workspace    : /auto/srcarchive13/prod/7.8.1/ncs540l-aarch64/ws
 Version      : 7.8.1
 Label        : 7.8.1
```

```
cisco NCS540L
cisco N540-6Z14S-SYS-D processor with 8GB of memory
ncs540l-aarch64 uptime is 19 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:Router# show version
Cisco IOS XR Software, Version 7.8.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Nov 30 13:00:28 UTC 2022
 Build Host   : iox-lnx-069
 Workspace    : /auto/srcarchive13/prod/7.8.1/ncs540l/ws
 Version      : 7.8.1
 Label        : 7.8.1

cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
N540-24Q8L2DD-SYS uptime is 5 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:Router# show version
Cisco IOS XR Software, Version 7.8.1 LNT
Copyright (c) 2013-2022 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Nov 30 13:00:28 UTC 2022
 Build Host   : iox-lnx-069
 Workspace    : /auto/srcarchive13/prod/7.8.1/ncs540l/ws
 Version      : 7.8.1
 Label        : 7.8.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 17 minutes
Cisco NCS 540 FH with 8xCPRI+4xCPRI/10G+8x10G+6x25G+2x100G
```

Determine Firmware Support

Use the 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:

Note   If the **Req Reload** field is mentioned as **Yes** in the output, then it indicates the need for a router reboot for the FPD's latest version to take effect.

```
RP/0/RP0/CPU0:Router# show fpd package
================================= ===================================================
                                                Field Programmable Device Package
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Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
===================	===========================	======	=======	========	=========
N540-24Z8Q2C-M	Bootloader(A)	YES	1.16	1.16	0.0
	CPU-IOFPGA(A)	YES	0.10	0.10	0.0
	MB-IOFPGA(A)	YES	0.26	0.26	0.0
	MB-MIFPGA	YES	0.05	0.05	0.0
	SATA-INTEL_240G(A)	NO	1132.00	1132.00	0.0
	SATA-INTEL_480G(A)	NO	1132.00	1132.00	0.0
	SATA-M500IT-MC(A)	NO	3.00	3.00	0.0
	SATA-M500IT-MU-A(A)	NO	5.00	5.00	0.0
	SATA-M500IT-MU-B(A)	NO	4.00	4.00	0.0
	SATA-M5100(A)	NO	75.00	75.00	0.0
	SATA-M600-MCT(A)	NO	5.00	5.00	0.0
	SATA-M600-MU(A)	NO	6.00	6.00	0.0
	SATA-Micron(A)	NO	1.00	1.00	0.0
	SATA-SMART-128G(A)	NO	1241.00	1241.00	0.0
	SSFP_E1F_0	NO	13.01	13.01	0.0
	SSFP_E1F_1	NO	13.01	13.01	0.0
	SSFP_E1F_10	NO	13.01	13.01	0.0
	SSFP_E1F_11	NO	13.01	13.01	0.0
	SSFP_E1F_12	NO	13.01	13.01	0.0
	SSFP_E1F_13	NO	13.01	13.01	0.0
	SSFP_E1F_14	NO	13.01	13.01	0.0
	SSFP_E1F_15	NO	13.01	13.01	0.0
	SSFP_E1F_16	NO	13.01	13.01	0.0
	SSFP_E1F_17	NO	13.01	13.01	0.0
	SSFP_E1F_18	NO	13.01	13.01	0.0
	SSFP_E1F_19	NO	13.01	13.01	0.0
	SSFP_E1F_2	NO	13.01	13.01	0.0
	SSFP_E1F_20	NO	13.01	13.01	0.0
	SSFP_E1F_21	NO	13.01	13.01	0.0
	SSFP_E1F_22	NO	13.01	13.01	0.0
	SSFP_E1F_23	NO	13.01	13.01	0.0
	SSFP_E1F_24	NO	13.01	13.01	0.0
	SSFP_E1F_25	NO	13.01	13.01	0.0
	SSFP_E1F_26	NO	13.01	13.01	0.0
	SSFP_E1F_27	NO	13.01	13.01	0.0
	SSFP_E1F_28	NO	13.01	13.01	0.0
	SSFP_E1F_29	NO	13.01	13.01	0.0
	SSFP_E1F_3	NO	13.01	13.01	0.0
	SSFP_E1F_30	NO	13.01	13.01	0.0
	SSFP_E1F_31	NO	13.01	13.01	0.0
	SSFP_E1F_4	NO	13.01	13.01	0.0
	SSFP_E1F_5	NO	13.01	13.01	0.0
	SSFP_E1F_6	NO	13.01	13.01	0.0
	SSFP_E1F_7	NO	13.01	13.01	0.0
	SSFP_E1F_8	NO	13.01	13.01	0.0
	SSFP_E1F_9	NO	13.01	13.01	0.0
	SSFP_OC3_STM1_0	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_1	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_10	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_11	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_12	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_13	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_14	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_15	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_16	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_17	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_18	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_19	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_2	NO	12.01	12.01	0.0
	SSFP_OC3_STM1_20	NO	12.01	12.01	0.0

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                          SSFP_OC3_STM1_21          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_22          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_23          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_24          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_25          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_26          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_27          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_28          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_29          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_3           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_30          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_31          NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_4           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_5           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_6           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_7           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_8           NO     12.01    12.01     0.0
                          SSFP_OC3_STM1_9           NO     12.01    12.01     0.0
--------------------------------------------------------------------------------
N540-ACC-SYS              Bootloader(A)             YES     1.16     1.16     0.0
                          CPU-IOFPGA(A)             YES     0.10     0.10     0.0
                          MB-IOFPGA(A)              YES     0.26     0.26     0.0
                          MB-MIFPGA                 YES     0.05     0.05     0.0
                          SATA-INTEL_240G(A)        NO   1132.00  1132.00     0.0
                          SATA-INTEL_480G(A)        NO   1132.00  1132.00     0.0
                          SATA-M500IT-MC(A)         NO      3.00     3.00     0.0
                          SATA-M500IT-MU-A(A)       NO      5.00     5.00     0.0
                          SATA-M500IT-MU-B(A)       NO      4.00     4.00     0.0
                          SATA-M5100(A)             NO     75.00    75.00     0.0
                          SATA-M600-MCT(A)          NO      5.00     5.00     0.0
                          SATA-M600-MU(A)           NO      6.00     6.00     0.0
                          SATA-Micron(A)            NO      1.00     1.00     0.0
                          SATA-SMART-128G(A)        NO   1241.00  1241.00     0.0
                          SSFP_E1F_0                NO     13.01    13.01     0.0
                          SSFP_E1F_1                NO     13.01    13.01     0.0
                          SSFP_E1F_10               NO     13.01    13.01     0.0
                          SSFP_E1F_11               NO     13.01    13.01     0.0
                          SSFP_E1F_12               NO     13.01    13.01     0.0
                          SSFP_E1F_13               NO     13.01    13.01     0.0
                          SSFP_E1F_14               NO     13.01    13.01     0.0
                          SSFP_E1F_15               NO     13.01    13.01     0.0
                          SSFP_E1F_16               NO     13.01    13.01     0.0
                          SSFP_E1F_17               NO     13.01    13.01     0.0
                          SSFP_E1F_18               NO     13.01    13.01     0.0
                          SSFP_E1F_19               NO     13.01    13.01     0.0
                          SSFP_E1F_2                NO     13.01    13.01     0.0
                          SSFP_E1F_20               NO     13.01    13.01     0.0
                          SSFP_E1F_21               NO     13.01    13.01     0.0
                          SSFP_E1F_22               NO     13.01    13.01     0.0
                          SSFP_E1F_23               NO     13.01    13.01     0.0
                          SSFP_E1F_24               NO     13.01    13.01     0.0
                          SSFP_E1F_25               NO     13.01    13.01     0.0
                          SSFP_E1F_26               NO     13.01    13.01     0.0
                          SSFP_E1F_27               NO     13.01    13.01     0.0
                          SSFP_E1F_28               NO     13.01    13.01     0.0
                          SSFP_E1F_29               NO     13.01    13.01     0.0
                          SSFP_E1F_3                NO     13.01    13.01     0.0
                          SSFP_E1F_30               NO     13.01    13.01     0.0
                          SSFP_E1F_31               NO     13.01    13.01     0.0
                          SSFP_E1F_4                NO     13.01    13.01     0.0
                          SSFP_E1F_5                NO     13.01    13.01     0.0
                          SSFP_E1F_6                NO     13.01    13.01     0.0
                          SSFP_E1F_7                NO     13.01    13.01     0.0
                          SSFP_E1F_8                NO     13.01    13.01     0.0
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                        SSFP_E1F_9               NO    13.01    13.01    0.0
                        SSFP_OC3_STM1_0          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_1          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_10         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_11         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_12         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_13         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_14         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_15         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_16         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_17         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_18         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_19         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_2          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_20         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_21         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_22         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_23         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_24         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_25         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_26         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_27         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_28         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_29         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_3          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_30         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_31         NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_4          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_5          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_6          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_7          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_8          NO    12.01    12.01    0.0
                        SSFP_OC3_STM1_9          NO    12.01    12.01    0.0
--------------------------------------------------------------------------------
N540-PWR400-A           LIT-PriMCU-ACFW(A)       NO     0.04     0.04    0.0
                        LIT-SecMCU-ACFW(A)       NO     0.07     0.07    0.0
--------------------------------------------------------------------------------
N540-PWR400-D           LIT-PriMCU-DCFW(A)       NO     0.04     0.04    0.0
                        LIT-SecMCU-DCFW(A)       NO     0.06     0.06    0.0
                        SDG-PriMCU-DCFW(A)       NO     1.03     1.03    0.0
                        SDG-SecMCU-DCFW(A)       NO     1.03     1.03    0.0
--------------------------------------------------------------------------------
N540-X-24Z8Q2C-M        Bootloader(A)            YES    1.16     1.16    0.0
                        CPU-IOFPGA(A)            YES    0.10     0.10    0.0
                        MB-IOFPGA(A)             YES    0.26     0.26    0.0
                        MB-MIFPGA                YES    0.05     0.05    0.0
                        SATA-INTEL_240G(A)       NO  1132.00  1132.00    0.0
                        SATA-INTEL_480G(A)       NO  1132.00  1132.00    0.0
                        SATA-M500IT-MC(A)        NO     3.00     3.00    0.0
                        SATA-M500IT-MU-A(A)      NO     5.00     5.00    0.0
                        SATA-M500IT-MU-B(A)      NO     4.00     4.00    0.0
                        SATA-M5100(A)            NO    75.00    75.00    0.0
                        SATA-M600-MCT(A)         NO     5.00     5.00    0.0
                        SATA-M600-MU(A)          NO     6.00     6.00    0.0
                        SATA-Micron(A)           NO     1.00     1.00    0.0
                        SATA-SMART-128G(A)       NO  1241.00  1241.00    0.0
                        SSFP_E1F_0               NO    13.01    13.01    0.0
                        SSFP_E1F_1               NO    13.01    13.01    0.0
                        SSFP_E1F_10              NO    13.01    13.01    0.0
                        SSFP_E1F_11              NO    13.01    13.01    0.0
                        SSFP_E1F_12              NO    13.01    13.01    0.0
                        SSFP_E1F_13              NO    13.01    13.01    0.0
                        SSFP_E1F_14              NO    13.01    13.01    0.0
                        SSFP_E1F_15              NO    13.01    13.01    0.0
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                           SSFP_E1F_16                    NO    13.01     13.01      0.0
                           SSFP_E1F_17                    NO    13.01     13.01      0.0
                           SSFP_E1F_18                    NO    13.01     13.01      0.0
                           SSFP_E1F_19                    NO    13.01     13.01      0.0
                           SSFP_E1F_2                     NO    13.01     13.01      0.0
                           SSFP_E1F_20                    NO    13.01     13.01      0.0
                           SSFP_E1F_21                    NO    13.01     13.01      0.0
                           SSFP_E1F_22                    NO    13.01     13.01      0.0
                           SSFP_E1F_23                    NO    13.01     13.01      0.0
                           SSFP_E1F_24                    NO    13.01     13.01      0.0
                           SSFP_E1F_25                    NO    13.01     13.01      0.0
                           SSFP_E1F_26                    NO    13.01     13.01      0.0
                           SSFP_E1F_27                    NO    13.01     13.01      0.0
                           SSFP_E1F_28                    NO    13.01     13.01      0.0
                           SSFP_E1F_29                    NO    13.01     13.01      0.0
                           SSFP_E1F_3                     NO    13.01     13.01      0.0
                           SSFP_E1F_30                    NO    13.01     13.01      0.0
                           SSFP_E1F_31                    NO    13.01     13.01      0.0
                           SSFP_E1F_4                     NO    13.01     13.01      0.0
                           SSFP_E1F_5                     NO    13.01     13.01      0.0
                           SSFP_E1F_6                     NO    13.01     13.01      0.0
                           SSFP_E1F_7                     NO    13.01     13.01      0.0
                           SSFP_E1F_8                     NO    13.01     13.01      0.0
                           SSFP_E1F_9                     NO    13.01     13.01      0.0
                           SSFP_OC3_STM1_0               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_1               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_10              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_11              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_12              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_13              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_14              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_15              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_16              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_17              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_18              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_19              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_2               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_20              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_21              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_22              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_23              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_24              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_25              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_26              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_27              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_28              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_29              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_3               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_30              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_31              NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_4               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_5               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_6               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_7               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_8               NO    12.01     12.01      0.0
                           SSFP_OC3_STM1_9               NO    12.01     12.01      0.0
-------------------------------------------------------------------------------
N540X-ACC-SYS              Bootloader(A)                 YES    1.16      1.16      0.0
                           CPU-IOFPGA(A)                 YES    0.10      0.10      0.0
                           MB-IOFPGA(A)                  YES    0.26      0.26      0.0
                           MB-MIFPGA                     YES    0.05      0.05      0.0
                           SATA-INTEL_240G(A)            NO    1132.00   1132.00    0.0
                           SATA-INTEL_480G(A)            NO    1132.00   1132.00    0.0
                           SATA-M500IT-MC(A)             NO    3.00      3.00      0.0
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SATA-M500IT-MU-A(A)          NO      5.00      5.00      0.0
SATA-M500IT-MU-B(A)          NO      4.00      4.00      0.0
SATA-M5100(A)                NO     75.00     75.00      0.0
SATA-M600-MCT(A)             NO      5.00      5.00      0.0
SATA-M600-MU(A)              NO      6.00      6.00      0.0
SATA-Micron(A)               NO      1.00      1.00      0.0
SATA-SMART-128G(A)           NO   1241.00   1241.00      0.0
SSFP_E1F_0                   NO     13.01     13.01      0.0
SSFP_E1F_1                   NO     13.01     13.01      0.0
SSFP_E1F_10                  NO     13.01     13.01      0.0
SSFP_E1F_11                  NO     13.01     13.01      0.0
SSFP_E1F_12                  NO     13.01     13.01      0.0
SSFP_E1F_13                  NO     13.01     13.01      0.0
SSFP_E1F_14                  NO     13.01     13.01      0.0
SSFP_E1F_15                  NO     13.01     13.01      0.0
SSFP_E1F_16                  NO     13.01     13.01      0.0
SSFP_E1F_17                  NO     13.01     13.01      0.0
SSFP_E1F_18                  NO     13.01     13.01      0.0
SSFP_E1F_19                  NO     13.01     13.01      0.0
SSFP_E1F_2                   NO     13.01     13.01      0.0
SSFP_E1F_20                  NO     13.01     13.01      0.0
SSFP_E1F_21                  NO     13.01     13.01      0.0
SSFP_E1F_22                  NO     13.01     13.01      0.0
SSFP_E1F_23                  NO     13.01     13.01      0.0
SSFP_E1F_24                  NO     13.01     13.01      0.0
SSFP_E1F_25                  NO     13.01     13.01      0.0
SSFP_E1F_26                  NO     13.01     13.01      0.0
SSFP_E1F_27                  NO     13.01     13.01      0.0
SSFP_E1F_28                  NO     13.01     13.01      0.0
SSFP_E1F_29                  NO     13.01     13.01      0.0
SSFP_E1F_3                   NO     13.01     13.01      0.0
SSFP_E1F_30                  NO     13.01     13.01      0.0
SSFP_E1F_31                  NO     13.01     13.01      0.0
SSFP_E1F_4                   NO     13.01     13.01      0.0
SSFP_E1F_5                   NO     13.01     13.01      0.0
SSFP_E1F_6                   NO     13.01     13.01      0.0
SSFP_E1F_7                   NO     13.01     13.01      0.0
SSFP_E1F_8                   NO     13.01     13.01      0.0
SSFP_E1F_9                   NO     13.01     13.01      0.0
SSFP_OC3_STM1_0              NO     12.01     12.01      0.0
SSFP_OC3_STM1_1              NO     12.01     12.01      0.0
SSFP_OC3_STM1_10             NO     12.01     12.01      0.0
SSFP_OC3_STM1_11             NO     12.01     12.01      0.0
SSFP_OC3_STM1_12             NO     12.01     12.01      0.0
SSFP_OC3_STM1_13             NO     12.01     12.01      0.0
SSFP_OC3_STM1_14             NO     12.01     12.01      0.0
SSFP_OC3_STM1_15             NO     12.01     12.01      0.0
SSFP_OC3_STM1_16             NO     12.01     12.01      0.0
SSFP_OC3_STM1_17             NO     12.01     12.01      0.0
SSFP_OC3_STM1_18             NO     12.01     12.01      0.0
SSFP_OC3_STM1_19             NO     12.01     12.01      0.0
SSFP_OC3_STM1_2              NO     12.01     12.01      0.0
SSFP_OC3_STM1_20             NO     12.01     12.01      0.0
SSFP_OC3_STM1_21             NO     12.01     12.01      0.0
SSFP_OC3_STM1_22             NO     12.01     12.01      0.0
SSFP_OC3_STM1_23             NO     12.01     12.01      0.0
SSFP_OC3_STM1_24             NO     12.01     12.01      0.0
SSFP_OC3_STM1_25             NO     12.01     12.01      0.0
SSFP_OC3_STM1_26             NO     12.01     12.01      0.0
SSFP_OC3_STM1_27             NO     12.01     12.01      0.0
SSFP_OC3_STM1_28             NO     12.01     12.01      0.0
SSFP_OC3_STM1_29             NO     12.01     12.01      0.0
SSFP_OC3_STM1_3              NO     12.01     12.01      0.0
SSFP_OC3_STM1_30             NO     12.01     12.01      0.0
```

```
                              SSFP_OC3_STM1_31          NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_4           NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_5           NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_6           NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_7           NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_8           NO      12.01    12.01     0.0
                              SSFP_OC3_STM1_9           NO      12.01    12.01     0.0

RP/0/RP0/CPU0:Router# show hw-module fpd
Auto-upgrade:Enabled

                                                                           FPD Versions
                                                                          ===============
Location   Card type              HWver FPD device       ATR Status      Running  Programd
--------------------------------------------------------------------------------------------
0/RP0      N540-24Z8Q2C-M         1.0   MB-MIFPGA             CURRENT     0.05      0.05
0/RP0      N540-24Z8Q2C-M         1.0   Bootloader            CURRENT     1.16      1.16
0/RP0      N540-24Z8Q2C-M         1.0   CPU-IOFPGA            CURRENT     0.10      0.10
0/RP0      N540-24Z8Q2C-M         1.0   MB-IOFPGA             CURRENT     0.26      0.26
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          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, N540X-16Z8Q2C-D, and N540X-16Z4G8Q2C-A/D variants:

```
RP/0/RP0/CPU0:Router# show fpd package
=============================== ====================================================
                                         Field Programmable Device Package
                                =====================================================
                                           Req    SW       Min Req  Min Req
Card Type                       FPD Description        Reload Ver      SW Ver   Board Ver
================== ========================= ====== ======= ======== =========
--------------------------------------------------------------------------------
N540-12Z20G-SYS-A  ADM_FW                    YES    14.03    14.03     0.0
                   ADMConfig                 NO     1.05     1.05      0.0
                   IoFpga                    YES    2.12     2.12      0.0
                   IoFpgaGolden              YES    2.07     2.03      0.0
                   Primary-BIOS              YES    1.42     1.42      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  ADM_FW                    YES    14.03    14.03     0.0
                   ADMConfig                 NO     1.05     1.05      0.0
                   IoFpga                    YES    2.12     2.12      0.0
                   IoFpgaGolden              YES    2.07     2.03      0.0
                   Primary-BIOS              YES    1.42     1.42      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              NO     2.03     2.03      0.0
                   ADM-MBConfig              NO     2.02     2.02      0.0
                   IoFpga                    YES    2.12     2.12      0.0
                   IoFpgaGolden              YES    2.12     2.12      0.0
                   Primary-BIOS              YES    4.06     4.06      0.0
                   SsdSAMSA64G3              YES    12.41    12.41     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    ADM_FW                    YES    14.03    14.03      0.0
                          ADMConfig                 NO      1.05     1.05      0.0
                          IoFpga                    YES     2.12     2.12      0.0
                          IoFpgaGolden              YES     2.07     2.03      0.0
                          Primary-BIOS              YES     1.42     1.42      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    ADM_FW                    YES    14.03    14.03      0.0
                          ADMConfig                 NO      1.05     1.05      0.0
                          IoFpga                    YES     2.12     2.12      0.0
                          IoFpgaGolden              YES     2.07     2.03      0.0
                          Primary-BIOS              YES     1.42     1.42      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               NO      1.02     1.02      1.0
                          ADM2_Config               NO      1.02     1.02      1.0
                          DpFpgaCpri                YES     0.22     0.22      0.0
                          DpFpgaEth                 YES     1.20     1.20      0.0
                          IoFpga                    YES     1.30     1.30      0.0
                          IoFpgaGolden              YES     1.30     1.30      0.0
                          Primary-BIOS              YES     1.42     1.42      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               NO      0.09     0.09      0.0
                          ADM1_Config               NO      1.01     1.01      2.0
                          ADM2_Config               NO      0.09     0.09      0.0
                          ADM2_Config               NO      1.01     1.01      2.0
                          DpFpga                    YES     0.21     0.21      0.0
                          IoFpga                    YES     1.30     1.30      0.0
                          IoFpgaGolden              YES     1.30     1.30      0.0
                          Primary-BIOS              YES     1.42     1.42      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-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  ADM_FW                    YES    14.03    14.03      0.0
```

```
                           ADMConfig                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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         ADM_FW                       YES  14.03   14.03    0.0
                           ADMConfig                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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          ADM_FW                       YES  14.03   14.03    0.0
                           ADMConfig                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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          ADM_FW                       YES  14.03   14.03    0.0
                           ADMConfig                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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                    NO    1.05    1.05    0.0
                           IoFpga                       YES   2.12    2.12    0.0
                           IoFpgaGolden                 YES   2.07    2.03    0.0
                           Primary-BIOS                 YES   1.42    1.42    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:Router# show hw-module fpd
Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                            FPD Versions
                                                            ==============
Location    Card type            HWver FPD device     ATR Status   Running Programd
Reload Loc
------------------------------------------------------------------------------------
```

```
0/RP0/CPU0 N540-28Z4C-SYS-A    4.0   ADM_FW           CURRENT  14.03  14.03
NOT REQ
0/RP0/CPU0 N540-28Z4C-SYS-A    4.0   ADMConfig        CURRENT   1.05   1.05
NOT REQ
0/RP0/CPU0 N540-28Z4C-SYS-A    4.0   IoFpga           CURRENT   2.12   2.12
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A    4.0   IoFpgaGolden    B CURRENT          2.07
  0/RP0
0/RP0/CPU0 N540-28Z4C-SYS-A    4.0   Primary-BIOS    S CURRENT   1.42   1.42
  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:Router# show fpd package
================================= ====================================================
                                  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                 NO     5.03      5.03      0.0
                      BckUp-BootLoader          YES   20.08     20.08      0.0
                      IoFpga                    YES    0.17      0.17      0.0
                      IoFpgaGolden              YES    0.15      0.15      0.0
                      Prim-BootLoader           YES   20.08     20.08      0.0
                      StdbyFpga                 YES    2.05      2.05      0.0
                      StdbyFpgaGolden           YES    0.33      0.33      0.0
                      TamFw                     YES    6.05      6.05      0.0
                      TamFwGolden               YES    6.05      6.05      0.0
-------------------------------------------------------------------------------
N540-6Z18G-SYS-A      ADMConfig                 NO     5.03      5.03      0.0
                      BckUp-BootLoader          YES   20.07     20.07      0.0
                      IoFpga                    YES    0.05      0.05      0.0
                      IoFpgaGolden              YES    0.03      0.03      0.0
                      Prim-BootLoader           YES   20.07     20.07      0.0
                      StdbyFpga                 YES    2.05      2.05      0.0
                      StdbyFpgaGolden           YES    0.33      0.33      0.0
                      TamFw                     YES    6.05      6.05      0.0
                      TamFwGolden               YES    6.05      6.05      0.0
-------------------------------------------------------------------------------
N540-6Z18G-SYS-D      ADMConfig                 NO     5.03      5.03      0.0
                      BckUp-BootLoader          YES   20.07     20.07      0.0
                      IoFpga                    YES    0.05      0.05      0.0
                      IoFpgaGolden              YES    0.03      0.03      0.0
                      Prim-BootLoader           YES   20.07     20.07      0.0
                      StdbyFpga                 YES    2.05      2.05      0.0
                      StdbyFpgaGolden           YES    0.33      0.33      0.0
                      TamFw                     YES    6.05      6.05      0.0
                      TamFwGolden               YES    6.05      6.05      0.0
-------------------------------------------------------------------------------
N540X-4Z14G2Q-A       ADMConfig                 NO     5.00      5.00      0.0
                      BckUp-BootLoader          YES   20.08     20.08      0.0
                      IoFpga                    YES    0.17      0.17      0.0
                      IoFpgaGolden              YES    0.15      0.15      0.0
                      Prim-BootLoader           YES   20.08     20.08      0.0
```

```
                              StdbyFpga               YES    2.05     2.05     0.0
                              StdbyFpgaGolden         YES    0.33     0.33     0.0
                              TamFw                   YES    6.05     6.05     0.0
                              TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
N540X-4Z14G2Q-D     ADMConfig               NO     5.00     5.00     0.0
                    BckUp-BootLoader        YES    20.08    20.08    0.0
                    IoFpga                  YES    0.17     0.17     0.0
                    IoFpgaGolden            YES    0.15     0.15     0.0
                    Prim-BootLoader         YES    20.08    20.08    0.0
                    StdbyFpga               YES    2.05     2.05     0.0
                    StdbyFpgaGolden         YES    0.33     0.33     0.0
                    TamFw                   YES    6.05     6.05     0.0
                    TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
N540X-6Z18G-SYS-A   ADMConfig               NO     5.00     5.00     0.0
                    BckUp-BootLoader        YES    20.08    20.08    0.0
                    IoFpga                  YES    0.17     0.17     0.0
                    IoFpgaGolden            YES    0.15     0.15     0.0
                    Prim-BootLoader         YES    20.08    20.08    0.0
                    StdbyFpga               YES    2.05     2.05     0.0
                    StdbyFpgaGolden         YES    0.33     0.33     0.0
                    TamFw                   YES    6.05     6.05     0.0
                    TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
N540X-6Z18G-SYS-D   ADMConfig               NO     5.00     5.00     0.0
                    BckUp-BootLoader        YES    20.08    20.08    0.0
                    IoFpga                  YES    0.17     0.17     0.0
                    IoFpgaGolden            YES    0.15     0.15     0.0
                    Prim-BootLoader         YES    20.08    20.08    0.0
                    StdbyFpga               YES    2.05     2.05     0.0
                    StdbyFpgaGolden         YES    0.33     0.33     0.0
                    TamFw                   YES    6.05     6.05     0.0
                    TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
N540X-8Z16G-SYS-A   ADMConfig               NO     5.00     5.00     0.0
                    BckUp-BootLoader        YES    20.08    20.08    0.0
                    IoFpga                  YES    0.17     0.17     0.0
                    IoFpgaGolden            YES    0.15     0.15     0.0
                    Prim-BootLoader         YES    20.08    20.08    0.0
                    StdbyFpga               YES    2.05     2.05     0.0
                    StdbyFpgaGolden         YES    0.33     0.33     0.0
                    TamFw                   YES    6.05     6.05     0.0
                    TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
N540X-8Z16G-SYS-D   ADMConfig               NO     5.00     5.00     0.0
                    BckUp-BootLoader        YES    20.08    20.08    0.0
                    IoFpga                  YES    0.17     0.17     0.0
                    IoFpgaGolden            YES    0.15     0.15     0.0
                    Prim-BootLoader         YES    20.08    20.08    0.0
                    StdbyFpga               YES    2.05     2.05     0.0
                    StdbyFpgaGolden         YES    0.33     0.33     0.0
                    TamFw                   YES    6.05     6.05     0.0
                    TamFwGolden             YES    6.05     6.05     0.0
-------------------------------------------------------------------------------
RP/0/RP0/CPU0:Router# show hw-module fpd
Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                              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
NOT REQ
```

```
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    CURRENT            0.15
   0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2    Prim-BootLoader  A    CURRENT   20.08   20.08
   0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2    StdbyFpga        S    CURRENT    2.05    2.05
   0/RP0
0/RP0/CPU0 N540-6Z14S-SYS-D      0.2    StdbyFpgaGolden  BS   CURRENT            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:Router# show fpd package
============================== ====================================================
                                    Field Programmable Device Package
                               ====================================================
                                      Req    SW        Min Req   Min Req
Card Type               FPD Description           Reload Ver       SW Ver   Board Ver
================== ========================= ====== ======= ======== =========
------------------------------------------------------------------------------
N540-12Z20G-SYS-A       ADM_FW                    YES    14.03     14.03     0.0
                        ADMConfig                 NO     1.05      1.05      0.0
                        IoFpga                    YES    2.12      2.12      0.0
                        IoFpgaGolden              YES    2.07      2.03      0.0
                        Primary-BIOS              YES    1.42      1.42      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       ADM_FW                    YES    14.03     14.03     0.0
                        ADMConfig                 NO     1.05      1.05      0.0
                        IoFpga                    YES    2.12      2.12      0.0
                        IoFpgaGolden              YES    2.07      2.03      0.0
                        Primary-BIOS              YES    1.42      1.42      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              NO     2.03      2.03      0.0
                        ADM-MBConfig              NO     2.02      2.02      0.0
                        IoFpga                    YES    2.12      2.12      0.0
                        IoFpgaGolden              YES    2.12      2.12      0.0
                        Primary-BIOS              YES    4.06      4.06      0.0
                        SsdSAMSA64G3              YES    12.41     12.41     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        ADM_FW                    YES    14.03     14.03     0.0
                        ADMConfig                 NO     1.05      1.05      0.0
                        IoFpga                    YES    2.12      2.12      0.0
                        IoFpgaGolden              YES    2.07      2.03      0.0
                        Primary-BIOS              YES    1.42      1.42      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            ADM_FW                    YES   14.03   14.03    0.0
                            ADMConfig                 NO     1.05    1.05    0.0
                            IoFpga                    YES    2.12    2.12    0.0
                            IoFpgaGolden              YES    2.07    2.03    0.0
                            Primary-BIOS              YES    1.42    1.42    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               NO     1.02    1.02    1.0
                            ADM2_Config               NO     1.02    1.02    1.0
                            DpFpgaCpri                YES    0.22    0.22    0.0
                            DpFpgaEth                 YES    1.20    1.20    0.0
                            IoFpga                    YES    1.30    1.30    0.0
                            IoFpgaGolden              YES    1.30    1.30    0.0
                            Primary-BIOS              YES    1.42    1.42    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               NO     0.09    0.09    0.0
                            ADM1_Config               NO     1.01    1.01    2.0
                            ADM2_Config               NO     0.09    0.09    0.0
                            ADM2_Config               NO     1.01    1.01    2.0
                            DpFpga                    YES    0.21    0.21    0.0
                            IoFpga                    YES    1.30    1.30    0.0
                            IoFpgaGolden              YES    1.30    1.30    0.0
                            Primary-BIOS              YES    1.42    1.42    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-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         ADM_FW                    YES   14.03   14.03    0.0
                            ADMConfig                 NO     1.05    1.05    0.0
                            IoFpga                    YES    2.12    2.12    0.0
                            IoFpgaGolden              YES    2.07    2.03    0.0
                            Primary-BIOS              YES    1.42    1.42    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         ADM_FW                    YES   14.03   14.03    0.0
```

```
                          ADMConfig                   NO     1.05     1.05      0.0
                          IoFpga                       YES    2.12     2.12      0.0
                          IoFpgaGolden                 YES    2.07     2.03      0.0
                          Primary-BIOS                 YES    1.42     1.42      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         ADM_FW                       YES    14.03    14.03     0.0
                          ADMConfig                    NO     1.05     1.05      0.0
                          IoFpga                       YES    2.12     2.12      0.0
                          IoFpgaGolden                 YES    2.07     2.03      0.0
                          Primary-BIOS                 YES    1.42     1.42      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         ADM_FW                       YES    14.03    14.03     0.0
                          ADMConfig                    NO     1.05     1.05      0.0
                          IoFpga                       YES    2.12     2.12      0.0
                          IoFpgaGolden                 YES    2.07     2.03      0.0
                          Primary-BIOS                 YES    1.42     1.42      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                    NO     1.05     1.05      0.0
                          IoFpga                       YES    2.12     2.12      0.0
                          IoFpgaGolden                 YES    2.07     2.03      0.0
                          Primary-BIOS                 YES    1.42     1.42      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                    NO     1.05     1.05      0.0
                          IoFpga                       YES    2.12     2.12      0.0
                          IoFpgaGolden                 YES    2.07     2.03      0.0
                          Primary-BIOS                 YES    1.42     1.42      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:Router# show hw-module fpd
Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                                    FPD Versions
                                                                    ==============
Location    Card type            HWver FPD device      ATR Status   Running Programd
Reload Loc
--------------------------------------------------------------------------------
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   ADM-DBConfig         CURRENT   2.03    2.03
NOT REQ
0/RP0/CPU0 N540-24Q8L2DD-SYS     3.0   ADM-MBConfig         CURRENT   2.02    2.02
NOT REQ
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:Router# show fpd package
============================== =====================================================
                                       Field Programmable Device Package
                               =====================================================
                                   Req    SW       Min Req   Min Req
Card Type              FPD Description        Reload Ver      SW Ver    Board Ver
================== ========================== ====== ======= ========= ==========
------------------------------------------------------------------------------
N540-12Z20G-SYS-A     ADM_FW                 YES    14.03    14.03     0.0
                      ADMConfig              NO     1.05     1.05      0.0
                      IoFpga                 YES    2.12     2.12      0.0
                      IoFpgaGolden           YES    2.07     2.03      0.0
                      Primary-BIOS           YES    1.42     1.42      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     ADM_FW                 YES    14.03    14.03     0.0
                      ADMConfig              NO     1.05     1.05      0.0
                      IoFpga                 YES    2.12     2.12      0.0
                      IoFpgaGolden           YES    2.07     2.03      0.0
                      Primary-BIOS           YES    1.42     1.42      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           NO     2.03     2.03      0.0
                      ADM-MBConfig           NO     2.02     2.02      0.0
                      IoFpga                 YES    2.12     2.12      0.0
                      IoFpgaGolden           YES    2.12     2.12      0.0
                      Primary-BIOS           YES    4.06     4.06      0.0
                      SsdSAMSA64G3           YES    12.41    12.41     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      ADM_FW                 YES    14.03    14.03     0.0
                      ADMConfig              NO     1.05     1.05      0.0
                      IoFpga                 YES    2.12     2.12      0.0
                      IoFpgaGolden           YES    2.07     2.03      0.0
                      Primary-BIOS           YES    1.42     1.42      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      ADM_FW               YES     14.03      14.03       0.0
                      ADMConfig            NO       1.05       1.05       0.0
                      IoFpga               YES      2.12       2.12       0.0
                      IoFpgaGolden         YES      2.07       2.03       0.0
                      Primary-BIOS         YES      1.42       1.42       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          NO       1.02       1.02       1.0
                      ADM2_Config          NO       1.02       1.02       1.0
                      DpFpgaCpri           YES      0.22       0.22       0.0
                      DpFpgaEth            YES      1.20       1.20       0.0
                      IoFpga               YES      1.30       1.30       0.0
                      IoFpgaGolden         YES      1.30       1.30       0.0
                      Primary-BIOS         YES      1.42       1.42       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          NO       0.09       0.09       0.0
                      ADM1_Config          NO       1.01       1.01       2.0
                      ADM2_Config          NO       0.09       0.09       0.0
                      ADM2_Config          NO       1.01       1.01       2.0
                      DpFpga               YES      0.21       0.21       0.0
                      IoFpga               YES      1.30       1.30       0.0
                      IoFpgaGolden         YES      1.30       1.30       0.0
                      Primary-BIOS         YES      1.42       1.42       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-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    ADM_FW               YES     14.03      14.03       0.0
                      ADMConfig            NO       1.05       1.05       0.0
                      IoFpga               YES      2.12       2.12       0.0
                      IoFpgaGolden         YES      2.07       2.03       0.0
                      Primary-BIOS         YES      1.42       1.42       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    ADM_FW               YES     14.03      14.03       0.0
                      ADMConfig            NO       1.05       1.05       0.0
                      IoFpga               YES      2.12       2.12       0.0
```

```
                          IoFpgaGolden              YES    2.07     2.03       0.0
                          Primary-BIOS              YES    1.42     1.42       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   ADM_FW                YES    14.03    14.03      0.0
                          ADMConfig                 NO     1.05     1.05       0.0
                          IoFpga                    YES    2.12     2.12       0.0
                          IoFpgaGolden              YES    2.07     2.03       0.0
                          Primary-BIOS              YES    1.42     1.42       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   ADM_FW                YES    14.03    14.03      0.0
                          ADMConfig                 NO     1.05     1.05       0.0
                          IoFpga                    YES    2.12     2.12       0.0
                          IoFpgaGolden              YES    2.07     2.03       0.0
                          Primary-BIOS              YES    1.42     1.42       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             NO     1.05     1.05       0.0
                          IoFpga                    YES    2.12     2.12       0.0
                          IoFpgaGolden              YES    2.07     2.03       0.0
                          Primary-BIOS              YES    1.42     1.42       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             NO     1.05     1.05       0.0
                          IoFpga                    YES    2.12     2.12       0.0
                          IoFpgaGolden              YES    2.07     2.03       0.0
                          Primary-BIOS              YES    1.42     1.42       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:Router# show hw-module fpd
Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
                                                                    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
NOT REQ
0/RP0/CPU0 N540-FH-CSR-SYS      1.0   ADM2_Config           CURRENT  0.09    0.09
NOT REQ
0/RP0/CPU0 N540-FH-CSR-SYS      1.0   DpFpga                CURRENT  0.21    0.21
   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      SA  CURRENT  1.42    1.42
   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 Notes

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-7.8.1.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, N540X-16Z8Q2C-D, and N540-FH-CSR-SYS variants is available along with the software image in NCS540l-docs-7.8.1.tar file.

The upgrade document for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-6Z18G-SYS-A/D variants is available along with the software image in NCS540l-aarch64-docs-7.8.1.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.

Production Software Maintenance Updates (SMUs)

A production SMU is a SMU that is formally requested, developed, tested, and released. Production SMUs are intended for use in a live network environment and are formally supported by the Cisco TAC and the relevant development teams. Software bugs identified through software recommendations or Bug Search Tools are not a basis for production SMU requests.

For information on production SMU types, refer the Production SMU Types section of the *IOS XR Software Maintenance Updates (SMUs)* guide.

Related Documentation

The most current Cisco NCS 540 router documentation is located at the following URL:

https://www.cisco.com/c/en/us/td/docs/iosxr/ncs-540-series-routers.html