



Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.9.1

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What's New in Cisco IOS XR Release 7.9.1

Cisco IOS XR Release 7.9.1 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 router variants.

Feature	Description
Segment Routing	
SRv6 Services: Services with Remote SIDs from W-LIB	This feature enables an SRv6 headend node to receive and install remote SIDs with Wide (32-bit) functions (Remote W-LIB). The Remote W-LIB is supported for Layer 3 (VPN/BGP global) and Layer 2 EVPN services (ELINE/ELAN). This capability is enabled by default.
SR-TE Explicit Segment Lists with Mix of IPv4 and IPv6 Segments	Explicit segment list can be configured to include IPv6 segments, for example IPv6 adjacency SIDs or IPv6 EPE SIDs. This feature enables use-cases such as Centralized BGP EPE for 6PE in an SR-MPLS Network.
SR-TE Automated Steering Without Service Label	This feature allows traffic to a BGP service route to be steered over an SR-TE policy using the AS principles, and without imposing the service route's prefix label. This feature enables use-cases such as centralized BGP EPE for 6PE in an SR-MPLS network. This feature introduces the following command: • bgp prefix-path-label ignore
IS-IS: Flexible Algorithm Reverse Affinity	This feature enhances the IS-IS Flexible Algorithm link admin group (affinity) constraint to include link colors on links in the reverse direction toward the calculating router. The ability to apply affinity constraints in the reverse direction provides additional control for IS-IS Flexible Algorithm path computation.
Interface and Hardware Component	
Transmission of VLAN-Tagged LLDP Packets	With this release, transmitting (Tx) VLAN-tagged LLDP packets on the subinterface is supported. This feature helps to identify unauthorized devices on the network and discover VLANs configured on the network devices. Use the following commands to enable transmitting tagged LLDP packets globally or on each subinterface: • Globally: lldp subinterface enable • Each subinterface: lldp enable

Feature	Description
Two-pass Forwarding over BVI	Two-pass forwarding of packets is supported over BVI. In two-pass forwarding model, each packet goes through two ingress and egress processing before reaching the destination. This model helps in implementing additional layer 3 features in BVI interfaces.
L2VPN and Ethernet Services	
Call Admission Control for L2VPN P2P Services over Circuit-Style SR-TE Policies	This feature allows you to configure guaranteed bandwidth for Layer 2 P2P services steered over Circuit-Style SR-TE policies. This ensures that a Circuit-Style SR-TE policy has sufficient bandwidth to accommodate a Layer 2 P2P service while preventing a Layer 2 P2P service from being steered over a Circuit-Style SR-TE policy when there is insufficient available bandwidth.
L2PT Support for Layer 2 Control Protocols	This feature provides Layer 2 Protocol Tunneling (L2PT) support for the following extended protocols: • Link Layer Discovery Protocol (LLDP) • Link Aggregation Control Protocol (LACP) • Operation, Administration, Management (OAM) • Ethernet Local Management Interface (ELMI) • EtherChannel Port Aggregation Protocol (PAgP) • Unidirectional Link Detection (UDLD) • Multiple MAC Registration Protocol (MMRP) • Multiple VLAN Registration Protocol (MVRP) Previously only CPSV (C-CDP, P-PVRST, S-STP, V-VTP) protocol set was supported for L2PT. Now with the extended protocol support, all the Layer 2 Control Protocols (L2CP) are supported with L2PT. This allows different network devices to communicate with each other, with high data security for critical applications. This feature introduces the hw-module profile l2pt ext-protocols-enable command. You must reload the router to activate the command.
Modular QoS	
Additional Routers Supported for ACL with Fragment Match	You can prevent malicious users from staging denial of service (DoS) attacks for non-initial IP by configuring an ACL with fragment match and specifying QoS match actions to rate-limit non-initial fragments for IPv4 traffic.
System Management	

Feature	Description
Global Navigation Satellite System (GNSS) MIBs Traps support	Global Navigation Satellite System (GNSS) is the satellite system which is used as a timing interface. GNSS receiver picks up signals from this satellite system to recalculate position, velocity and local time to high precision. From this release, you can track GNSS module antenna OC alarm status, status of the GNSS satellite visibility (good or bad), and specify the lock status of GNSS module. This release adds the support for the traps: • <code>ciscoGnssAntennaOCAAlarmStatus</code> • <code>ciscoGnssSatelliteVisibilityStatus</code> • <code>ciscoGnssModuleLockStatus</code>
Routing	
Limiting LSA numbers in a OSPF Link-State Database	The nonself-generated link-state advertisements (LSAs) for a given Open Shortest Path First (OSPF) process is limited to 500000. This protection mechanism prevents routers from receiving many LSAs, preventing CPU failure and memory shortages, and is enabled by default from this release onwards. If you have over 500000 LSAs in your network, configure the <code>max-lsa</code> command with the expected LSA scale before upgrading to this release or later This feature modifies the following commands: • <code>show ospf</code> to display the maximum number of redistributed prefixes. • <code>show ospf database database-summary detail</code> to display the number of LSA counts per router. • <code>show ospf database database-summary adv-router router ID</code> to display the router information and the LSAs received from a particular router.
Limiting the Maximum Redistributed Type-3 LSA Prefixes in OSPF	By default, the maximum redistributed Type-3 LSA prefixes for a given OSPF process is now limited to 100000. This mechanism prevents OSPF from redistributing a large number of prefixes as Type-3 LSAs and therefore preventing high CPU utilization and memory shortages. Once the number of redistributed prefixes is reached or exceeds the threshold value, the system log message is generated, and no more prefixes are redistributed. Support was added to count only the number of redistributed prefixes instead of the number of LSAs. Individual prefixes are counted when multiple prefixes are aggregated in an LSA using the <code>summary-prefix</code> command.
Programmability	

Feature	Description
Cisco-IOS-XR-um-mpls-static-cfg.yang	This Unified data model enables you to configure Label Switched Paths (LSPs) with statically assigned ingress labels that are mapped to prefixes or VRFs and egress paths explicitly defined or mapped to next hops. With this release, you can use the data model to disable the default route to resolve issues with the next hop information. We recommend that you use the data model according to the CLI hierarchy.
System Security	
Secure Key Integration Protocol for Routers	Your routers are now capable of handling the Secure Key Integration Protocol (SKIP) protocol. The SKIP protocol enables your routers to communicate with external quantum devices. With this ability, you can use the Quantum Key Distribution (QKD) devices for exchanging MACsec encryption keys between routers. Using QKD eliminates the key distribution problem in a post quantum world where the current cryptographic systems are no longer secure due to the advent of quantum computers. This feature introduces the following: • CLI: • crypto-sks-kme • show crypto sks profile • Yang Data Model: Cisco-IOS-XR-um-sks-server-cfg.yang (see GitHub, YANG Data Models Navigator) For more information on Quantum Key Distribution, see Post Quantum Security Brief.

The following feature is supported only on N540-24Q8L2DD-SYS router variant.

Feature	Description
System Security	
IEEE 802.1X Port-Based Authentication Support for Multiple Authentication and Multiple Host Modes	The IEEE 802.1X port-based authentication allows only authorized supplicants to access the network. The IEEE 802.1X port-based authentication now supports multiple authentication and multiple host modes to allow multiple hosts or MAC addresses on a single port. Applicable to Cisco N540-24Q8L2DD-SYS router variant.

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

Feature	Feature
Programmability	

Feature	Feature
Cisco-IOS-XR-remote-attestation-agent-oper.yang	This Cisco native data model defines the remote attestation of the routers' security posture to assess the trustworthiness of hardware and software on the router. With this release, you can use the data model to send gNMI requests to retrieve the system integrity information such as secure boot status, Attestation Identity Key (AIK), and Secure Unique Device Identifier (SUDI) certificates. gNMI support is introduced for the show platform security attest certificate command.

The following feature is supported only on N540-28Z4C-SYS-A/D and N540-6Z14S-SYS-D router variants.

Feature	Description
Time Division Multiplexing (TDM)	
TDM2IP Smart SFP Optics is supported on N540-28Z4C-SYS-A/D and N540-6Z14S-SYS-D router variants	TDM2IP Smart SFP Optics is supported on N540-28Z4C-SYS-A/D and N540-6Z14S-SYS-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 N540-ACC-SYS, N540X-ACC-SYS, and N540-24Z8Q2C-SYS variants.

Feature	Description
System Security	
Securely retrieve dynamic NACM with LDAP over TLS authentication	You can now securely retrieve the NETCONF Access Control Model (NACM) policies or rules from a remote Lightweight DirectoryAccess Protocol (LDAP) server using Transport Layer Security (TLS) authentication. With TLS authentication, the communication between the router and the LDAP server is encrypted for security. Before this release, the communication between the LDAP server and the router was not secured.

The following feature is supported on N540-6Z18G-SYS-A/D router variants.

Feature	Feature
Licensing	

Feature	Feature
Support for Flexible Consumption Model on N540-6Z18G-SYS-A/D	The Flexible Consumption Model (FCM) provides the capability and flexibility to purchase software capacity as needed. FCM delivers the carrier-class IOS-XR software feature set with two software suites, Essentials and Advantage, that simplifies license management. Support for FCM is now extended to the following Cisco NCS 540 variant: • N540-6Z18G-SYS-A/D

Hardware Introduced

The following new optics is supported only on N540-24Q8L2DD-SYS router variant.

Hardware	Description
Optics	This release launches Coherent 100GE transceiver optics on selective hardware within the product portfolio. For details and other new supported transceivers refer to the Transceiver Module Group (TMG) Compatibility Matrix. • Cisco Quad Small Form-Factor Pluggable Double Density (QSFP-DD) • DP01QSDD-ZF1

Behavior Changes

- Prior to Cisco IOS XR Release 7.2.1, a segment of an explicit segment list can be configured as an IPv4 address (representing a Node or a Link) using the **index indexaddress ipv4 address** command.

Starting with Cisco IOS XR Release 7.2.1, an IPv4-based segment (representing a Node or a Link) can also be configured with the new **index index mpls adjacencyaddress** command. The configuration is stored in NVRAM in the same CLI format used to create it. There is no conversion from the old CLI to the new CLI.

Starting with Cisco IOS XR Release 7.9.1, the old CLI has been deprecated. Old configurations stored in NVRAM will be rejected at boot-up.

As a result, explicit segment lists with IPv4-based segments using the old CLI must be re-configured using the new CLI.

There are no CLI changes for segments configured as MPLS labels using the **index index mpls label label** command.

- If you are on a release before Cisco IOS XR Release 7.4.1, you can configure SR-ODN with Flexible Algorithm constraints using the **segment-routing traffic-eng on-demand color color dynamic sid-algorithm algorithm-number** command.

Starting with Cisco IOS XR Release 7.4.1, you can also configure SR-ODN with Flexible Algorithm constraints using the new **segment-routing traffic-eng on-demand color** *color constraints segments sid-algorithm algorithm-number* command.

From Cisco IOS XR Release 7.9.1, the **segment-routing traffic-eng on-demand color** *color dynamic sid-algorithm algorithm-number* command is deprecated. Previous configurations stored in NVRAM will be rejected at boot-up.

Hence, for Cisco IOS XR Release 7.9.1, you must reconfigure all SR-ODN configurations with Flexible Algorithm constraints that use the **on-demand dynamic sid-algorithm** with the **on-demand constraints** command.

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, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.
- Unlabeled BGP PIC EDGE for global prefixes is not supported.
- 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, N540X-16Z8Q2C-D, 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.
- The 1G ports on the N540-24Q8L2DD-SYS variant do not support Auto-Negotiation with 1GE optical SFPs.
- 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
CSCwd99486	BVI 2-pass: MTU fragmentation is not working for L3-L2 BVI traffic

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 7.9.1 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, N540-6Z18G-SYS-A/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 7.9.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.9.1.iso	IOS XR mandatory base image.
USB Boot Package	ncs540-usb_boot-7.9.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
Optional Packages not included in the base image		
Package	Filename	Description
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r791.x86_64.rpm	Supports Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server
IOS XR MPLS	ncs540-mpls-1.0.0.0-r791.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r791.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE)
IOS XR Security	ncs540-k9sec-1.0.0.0-r791.x86_64.rpm	Supports MACsec and 802.1X
IOS XR ISIS	ncs540-isis-1.0.0.0-r791.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r791.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r791.x86_64.rpm	Supports Lawful Intercept (LI)

IOS XR Multicast	ncs540-mcast-1.0.0.0-r791.x86_64.rpm	Supports Multicast
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r791.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r791.x86_64.rpm	Supports LI-CTRL

Table 3: Release 7.9.1 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	Description
IOS XR Base Image	ncs540l-x64-7.9.1.iso	IOS XR base image with mandatory packages. The base ISO image also includes the following optional packages: • xr-bgp • xr-cdp • xr-eigrp • xr-ipsla • xr-is-is • xr-k9sec • xr-lictrl • xr-lldp • xr-mcast • xr-mpls-oam • xr-netflow • xr-ospf • xr-perf-meas • xr-perfmgmt • xr-rip • xr-telnet • xr-track These optional packages are also included in NCS540l-iosxr-7.9.1.tar.
USB Boot Package	ncs540l-usb_boot-7.9.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.

Optional Packages not included in the base image		
Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.9.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.9.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.9.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.9.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-iosxr-7.9.1.tar	Supports RIP

Table 4: Release 7.9.1 Software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-6Z18G-SYS-A/D

Base Image	Filename	Description
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IOS XR Base Image	ncs540l-aarch64-7.9.1.iso	IOS XR base image with mandatory packages. The ISO image also includes the following optional packages: • xr-bgp • xr-cdp • xr-eigrp • xr-ipsla • xr-is-is • xr-k9sec • xr-lictrl • xr-lddp • xr-mcast • xr-mpls-oam • xr-ncs540l-mcast • xr-ncs540l-netflow • xr-netflow • xr-ospf • xr-perf-meas • xr-perfmgmt • xr-rip • xr-telnet • xr-track These optional packages are also included in NCS540l aarch64 iosxr optional rpms-7.9.1.tar.
USB Boot Package	ncs540l-aarch64-usb_boot-7.9.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
Optional Packages not included in the base image		
Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.9.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.9.1.tar	Supports EIGRP

IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.9.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.9.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-aarch64-iosxr-optional-rpms-7.9.1.tar	Supports RIP

Determine Software Version

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.9.1
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Sun Apr  2 01:22:32 PDT 2023
Built Host    : iox-ucs-030
Workspace     : /auto/srcarchive15/prod/7.9.1/ncs540/ws
Version       : 7.9.1
Location      : /opt/cisco/XR/packages/
Label        : 7.9.1
```

```
cisco NCS-540 () processor
System uptime is 5 hours 09 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 7.9.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Sun Apr 02 06:50:19 UTC 2023
Build Host    : iox-ucs-043
Workspace     : /auto/srcarchive15/prod/7.9.1/ncs540l/ws
Version       : 7.9.1
Label        : 7.9.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540X-16Z4G8Q2C-A (C3708 @ 1.70GHz) processor with 8GB of memory
EG-PE4 uptime is 3 hours 45 minutes
Cisco NCS 540 System with 16x10G+4x1GCU+8x25G+2x100G DC
```

Log in to the router and enter the **show version** command on the N540X-4Z14G2Q-A/D, N540-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-6Z18G-SYS-A/D variants:

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.9.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Sun Apr 02 06:50:19 UTC 2023
Build Host    : iox-ucs-045
Workspace     : /auto/srcarchive15/prod/7.9.1/ncs540l-aarch64/ws
Version       : 7.9.1
```

Determine Firmware Support

```
Label          : 7.9.1
```

```
cisco NCS540L
cisco N540X-6Z18G-SYS-A processor with 8GB of memory
R13-Darwin-CE1 uptime is 2 hours 54 minutes
Cisco NCS 540 Series Fixed Router 18x1G, 6x1/10G, AC
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.9.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
  Built By      : ingunawa
  Built On     : Sun Apr 02 06:50:19 UTC 2023
  Build Host   : iox-ucs-043
  Workspace    : /auto/srcarchive15/prod/7.9.1/ncs540l/ws
  Version      : 7.9.1
  Label        : 7.9.1
```

```
cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
R18_PE9_Arches uptime is 3 hours 18 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 7.9.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
  Built By      : ingunawa
  Built On     : Sun Apr 02 06:50:19 UTC 2023
  Build Host   : iox-ucs-043
  Workspace    : /auto/srcarchive15/prod/7.9.1/ncs540l/ws
  Version      : 7.9.1
  Label        : 7.9.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
R16_PE8_Jaguar uptime is 2 hours 45 minutes
N540-FH-CSR-SYS
```

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
```

=====					
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	0.27	0.27	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	1427.00	1427.00	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	0.27	0.27	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	1427.00	1427.00	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	0.27	0.27	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	1427.00	1427.00	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	0.27	0.27	0.0
	MB-MIFPGA	YES	0.05	0.05	0.0

Determine Firmware Support

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	1427.00	1427.00	0.0

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

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0	N540-ACC-SYS	1.0	MB-MIFPGA	CURRENT	0.05	0.05
0/RP0	N540-ACC-SYS	1.0	Bootloader	CURRENT	1.16	1.16
0/RP0	N540-ACC-SYS	1.0	CPU-IOFPGA	CURRENT	0.10	0.10
0/RP0	N540-ACC-SYS	1.0	MB-IOFPGA	CURRENT	0.27	0.27
0/RP0	N540-ACC-SYS	1.0	SATA-M500IT-MU-B	CURRENT	4.00	4.00
0/PM0	N540-PWR400-A	1.256	LIT-PrimMCU-ACFW	CURRENT	0.04	0.04
0/PM0	N540-PWR400-A	1.256	LIT-SecMCU-ACFW	CURRENT	0.07	0.07
0/PM1	N540-PWR400-A	1.0	SDG-PrimMCU-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					
Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req 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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
N540-24Q8L2DD-SYS	ADM-DBConfig	NO	2.04	2.04	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
	SsdSAMS64G3	YES	12.41	12.41	0.0

	StdbbyFpga	YES	2.59	2.59	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.46	0.46	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.46	0.46	0.0
	StdbbyFpgaGolden	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

Determine Firmware Support

	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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
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Location Reload Loc	Card type	HWver	FPD device	ATR Status	Running Programd	
0/RP0/CPU0 NOT REQ	N540X-16Z4G8Q2C-A	0.2	ADM_FW	CURRENT	14.03	14.03
0/RP0/CPU0 NOT REQ	N540X-16Z4G8Q2C-A	0.2	ADMConfig	CURRENT	1.05	1.05
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	IoFpga	CURRENT	2.12	2.12
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	IoFpgaGolden	B CURRENT		2.03
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	Primary-BIOS	SA CURRENT	1.46	1.46
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	StdbbyFpga	S CURRENT	0.40	0.40
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	StdbbyFpgaGolden	BS NEED UPGD		0.00
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	TamFw	S CURRENT	4.11	4.11
0/RP0/CPU0 0/RP0	N540X-16Z4G8Q2C-A	0.2	TamFwGolden	BS NEED UPGD		0.00

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540X-4Z14G2Q-A/D, N540-6Z18G-SYS-A/D, N540X-6Z18G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-8Z16G-SYS-A/D variants:

RP/0/RP0/CPU0:Router#**show fpd package**

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

N540-6Z14S-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
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	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	20.08	20.08	0.0
	IoFpga	YES	0.05	0.05	0.0
	IoFpgaGolden	YES	0.03	0.03	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	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	20.08	20.08	0.0
	IoFpga	YES	0.05	0.05	0.0
	IoFpgaGolden	YES	0.03	0.03	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0

Determine Firmware Support

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
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
N540X-4Z14G2Q-D	TamFwGolden	YES	6.05	6.05	0.0
	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
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	YES	0.33	0.33	0.0
N540X-6Z18G-SYS-A	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
	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
	StdbbyFpga	YES	2.05	2.05	0.0
N540X-6Z18G-SYS-D	StdbbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
	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
N540X-8Z16G-SYS-A	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
	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
N540X-8Z16G-SYS-D	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbbyFpga	YES	2.05	2.05	0.0
	StdbbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
	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

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
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Location Reload Loc	Card type	HWver	FPD device	ATR Status	Running Programd
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	ADMConfig	NEED UPGD	1.02 1.02
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	IoFpga	CURRENT	0.17 0.17
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	IoFpgaGolden	B NEED UPGD	0.00
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	Prim-BootLoader	A CURRENT	20.08 20.08
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	StdbyFpga	S CURRENT	2.05 2.05
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	StdbyFpgaGolden	BS NEED UPGD	0.00
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	TamFw	S CURRENT	6.05 6.05
0/RP0/CPU0 0/RP0	N540X-6Z18G-SYS-A	0.2	TamFwGolden	BS CURRENT	6.05

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					
Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req 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	1.46	1.46	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	1.46	1.46	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	2.04	2.04	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

Determine Firmware Support

	IoFpga	YES	2.12	2.12	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.46	1.46	0.0
	StdbypFpga	YES	0.40	0.40	0.0
	StdbypFpgaGolden	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	1.46	1.46	0.0
	StdbypFpga	YES	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	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	1.46	1.46	0.0
	StdbypFpga	YES	0.46	0.46	0.0
	StdbypFpgaGolden	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	1.46	1.46	0.0
	StdbypFpga	YES	0.46	0.46	0.0
	StdbypFpgaGolden	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	1.46	1.46	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	2.0	ADM-DBConfig	NEED UPGD	1.51	1.51
NOT REQ						
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	ADM-MBConfig	CURRENT	2.02	2.02
NOT REQ						

Determine Firmware Support

```

0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 IoFpga CURRENT 2.12 2.12
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 IoFpgaGolden B NEED UPGD 2.10
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 Primary-BIOS S CURRENT 4.06 4.06
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 SsdSAMS64G3 S CURRENT 12.41 12.41
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 StdbFpga S CURRENT 2.59 2.59
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 StdbFpgaGolden BS NEED UPGD 0.00
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 TamFw S CURRENT 6.05 6.05
0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS 2.0 TamFwGolden BS NEED UPGD 0.00
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

```

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
=====
Card Type          FPD Description          Req  SW   Min Req  Min Req
                        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   1.46    1.46    0.0
                    StdbFpga                   YES   0.40    0.40    0.0
                    StdbFpgaGolden            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   1.46    1.46    0.0
                    StdbFpga                   YES   0.40    0.40    0.0
                    StdbFpgaGolden            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    2.04    2.04    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
                    SsdSAMS64G3             YES   12.41   12.41    0.0
                    StdbFpga                   YES   2.59    2.59    0.0
                    StdbFpgaGolden            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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.46	0.46	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.46	0.46	0.0
	StdbbyFpgaGolden	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

Determine Firmware Support

	Primary-BIOS	YES	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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	1.46	1.46	0.0
	StdbbyFpga	YES	0.40	0.40	0.0
	StdbbyFpgaGolden	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		1.13
0/RP0							
0/RP0/CPU0	N540-FH-CSR-SYS	1.0	Primary-BIOS	SA	CURRENT	1.46	1.46
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		0.42
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/PM1	N540-PWR400-A	0.0	PrimMCU		CURRENT	1.02	1.02
NOT REQ							
0/PM1	N540-PWR400-A	0.0	SecMCU		NEED UPGD	1.02	1.02
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-7.9.1.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-7.9.1.tar* file.

The upgrade document for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-6Z18G-SYS-A/D variants is available along with the software image in *NCS540l-aarch64-docs-7.9.1.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.

Cisco IOS XR Error messages

To view, search, compare, and download Cisco IOS XR Error Messages, refer to the [Cisco IOS XR Error messages](#) tool.

Cisco IOS XR MIBs

To determine the MIBs supported by platform and release, refer to the [Cisco IOS XR MIBs](#) tool.

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>

