Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 24.4.1

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Network Convergence System 540 Series Routers

BGP and IGP traffic may take approximately 10% longer to start flowing in version 24.4.1 than in version 24.3.1. This delay can occur after any event that triggers new bulk route learning and downloads, such as a router or line card reload, or any other event that can create such a condition.

For example, in the case of BGP IPv4 with a scale of 1 million routes, the route download could take an additional 10 to 15 seconds in the 24.4.1 release compared to the 24.3.1 release.

The BGP and IGP traffic delay is only during the initial route programming phase. Once all routes have been learned, there are no functional impacts.

Delays in starting traffic flow cases occur only in situations involving router or line card reloads when using Fast Re-Route (FRR) and Equal-Cost Multi-Path (ECMP) as redundancy mechanisms for the data path.

What's New in Cisco IOS XR Release 24.4.1

For more details on the Cisco IOS XR release model and associated support, see Software Lifecycle Support Statement - IOS XR.

Software Features Enhanced and Introduced

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

All NCS 540 router variants support these features unless supported or unsupported PIDs are explicitly specified.

Feature	Description
BGP	
Source-based remote traffic black holing	Source-based Remote Traffic Black Holing (S-RTBH) is a network security technique used to drop traffic originating from specific malicious source IP addresses. It leverages BGP updates and Unicast Reverse Path Forwarding (uRPF) to ensure that unwanted traffic is discarded at the network edge. The S-RTBH feature is enabled by default on the **N540-24Q8L2DD-SYS** platform.
L2VPN and Ethernet Services	

Feature	Description
EVPN-IRB ARP and ND proxy suppression	You can now manage and minimize Address Resolution Protocol (ARP) for IPv4 traffic or Neighbor Discovery (ND) for IPv6 traffic on a network segment by configuring full or partial suppression mode.
	If the target host entry is not found in the ARP and ND tables,
	• the full suppression mode prevents ARP and ND request flooding and reduces the consumption of processing resources on network devices.
	• the partial suppression mode broadcasts the packet to all devices within the EVPN Bridge Domain (BD) as it would perform without suppression, ensuring connectivity even if the information isn't immediately available in the EVPN control plane.
	The feature introduces these changes:
	CLI:
	• **arp evpn-proxy mode**
	• **ipv6 nd evpn-proxy mode**
	YANG Data Model:
	• `Cisco-IOS-XR-um-ipv6-nd-cfg.yang`
	• `Cisco-IOS-XR-um-if-arp-cfg.yang`
	(see GitHub, YANG Data Models Navigator)
Fat label-based load balancing on L2VPN decapsulation node	You can now enable traffic load balancing at the decapsulation node based on the MPLS labels, which include both the Flow-Aware Transport (FAT) label and the Virtual Circuit (VC) label.
	The MPLS labels are used for hashing, this results in effective traffic load balancing based on the flow direction.
	By default, fat based load balancing is disabled.
	The *fat-based-hash* keyword is introduced in the **hw-module profile load-balance algorithm** command for L2VPN traffic.
	Unsupported Platform:
	• N540-24Q8L2DD-SYS
MPLS	

Feature	Description
MPLS traffic flow control for TTL and QoS propagation on MPLS push, pop, and penultimate nodes	With this feature, the extended granular control capability for the incoming and outgoing MPLS traffic changes the behavior of the IP TTL and IP QoS DSCP propagation on the MPLS push, pop, and penultimate nodes. This ensures a reduced network latency, enhanced QoS management, and simplified network operations. This feature introduces these changes: **CLI:** • **hw-module fib mpls ip-ttl-propagate-disable exclude mpls-push ttl** • **hw-module fib mpls ip-ttl-propagate-disable exclude mpls-pop ttl-and-cos** • **hw-module fib mpls ip-ttl-propagate-disable exclude mpls-pop-penultimate-hop ttl-and-cos** **YANG Data Model:** New XPaths for Cisco-IOS-XR-um-hw-module-profile-cfg (see Github, YANG Data Models Navigator).
Network Synchronization	
Monitor PTP virtual port using PTP timeReceiver ports	You can now configure a threshold value for the Time of Day (ToD) difference or offset between the PTP virtual port Global Navigation Satellite System (GNSS) and the time received by the timeReceiver ports. The timeReceiver ports receive the timing signal from remote timeTransmitters. As part of the monitoring process, the servo mechanism in the router routinely calculates the ToD offset between the GNSS receiver and the best PTP timeTransmitter. When the offset value exceeds the configured threshold, the router raises a syslog message. Based on the generated syslog message, you can determine if you should switch from the virtual port GNSS to selecting the PTP timeTransmitter as a fallback source. Command introduced: **gm-threshold-breach** *threshold_value* YANG data models: • Cisco-IOS-XR-ptp-cfg, version 3.2.0 • Cisco-IOS-XR-um-ptp-cfg, version 2.0.0 • Cisco-IOS-XR-ptp-oper, version 2.3.0 See (GitHub, Yang Data Models Navigator)

Feature	Description
SyncE preference for PTP receiver interface	You can now mitigate synchronization issues when SyncE and PTP sources come from different, non-traceable origins. This feature ensures that SyncE selection among sources with equal Quality Levels (QL) and user priority prefers the interface on which the PTP receiver is selected. If the PTP source fails or its quality degrades, causing the system to switch to another PTP source, SyncE switches to the new PTP source, provided the new interface has the same SyncE QL and priority as the previously selected interface.
	This feature introduces these changes:
	CLI:
	• **synchronous-ethernet prefer-interface ptp-receiver**
Routing	
BFD CPU offload support for IPv6	You can now enable CPU offloading for IPv6 BFD sessions, allowing the CPU to handle packet transmission and reception directly. This feature provides you the flexibility to choose between hardware-offloaded and CPU-offloaded IPv6 BFD sessions based on your requirements.
	This feature introduces these changes:
	CLI:
	• **hw-module profile bfd offload disable-v6**
Segment Routing	
Delay and synthetic loss measurement for GRE tunnel interfaces	You can now measure the latency or delay experienced by data packets when they traverse a network, and also proactively monitor and address potential network issues before they impact users by measuring key parameters such as packet loss, and jitter for GRE tunnel interfaces.
	This feature enables you to report synthetic Two-Way Active Measurement Protocol (TWAMP) test packets that are deployed in delay-profile or delay measurement sessions, and enables delay measurement for GRE tunnel interfaces.
	The feature introduces these changes:
	CLI:
	The **performance-measurement interface** command supports the **tunnel-ip** keyword.

Feature	Description
Fallback delay advertisement for interfaces	You can now advertise fallback delay value, retaining delay information in performance metrics even when delay metrics for interfaces are temporarily unavailable due to hardware, synchronization, or network connectivity issues. The feature ensures optimal routing decisions, by maintaining network stability and continuous performance, even when real-time metrics are temporarily inaccessible. Previously, the performance metrics did not include delay metrics when they were temporarily inaccessible, resulting in visibility gaps in the network and less effective routing. The feature introduces these changes: **CLI:** The performance-measurement interface command is modified with a new **advertise-delay fallback** keyword. **YANG Data Models:** • Cisco-IOS-XR-um-performance-measurement-cfg.yang See (GitHub, Yang Data Models Navigator)
Far-end delay metrics in one-way measurement mode	SR PM now enables network operators to compute both far-end (T4 − T3) and near-end (T2 − T1) delay metrics, providing a complete view of end-to-end delay across the entire data path. Measuring the far-end delay from the responder to the querier node improves visibility, and allows operators to accurately monitor and evaluate network performance. Previously, you could measure the near-end delay metrics for a given data path.
SR-TE policy with enhanced flexible algorithm metric types	We have enhanced the SR-TE policy at headend with flexible algorithm that supports additional metric types, user-defined and bandwidth, ensuring consistent path computation across flexible algorithm metric types and constraints, on both intra-IGP and inter-IGP domains. The feature also supports headend computed inter-domain SR policies with Flex Algo constraints and IGP redistribution or leaking. The feature introduces these changes: **CLI:** • The **flex-algo-metric-type** keyword is introduced in the **effective-metric admin-distance** command. **YANG Data Models:** • New Xpaths are introduced for Cisco-IOS-XR-infra-statsd-oper.yang (see GitHub, YANG Data Models Navigator)

Feature	Description
SRv6 double recursion for multilayer BGP underlay	The feature introduces support to SRv6 double recursion where network service such as BGP VPN (Layer 2/Layer 3) requires multiple layers of resolution, specifically where one routing layer resolves over another before reaching its final destination. You can achieve double recursion by collapsing the underlay, which typically involves protocols like IGP or BGP in the packet forwarding chain, allowing three-level load balancing and even distribution of traffic across multiple layers of the network stack. The feature is supported on the ingress Provider Edge (PE) router. Previously, SRv6 supported only two levels of load balancing, which works for traditional service provider setups. The feature introduces these changes: **CLI:** • **tag-map tag** *<value>* **map forwarding-hierarchy level-2-used-as-nexthop** • The **show cef ipv6** *ipv6-prefixes* and **show cef ipv4** *ipv4-prefixes* commands now include the Layer 2 prefix information, which resolve as nexthop Layer 3 prefixes. **YANG Data Models:** • `Cisco-IOS-XR-um-router-rib-cfg:router` (see GitHub, Yang Data Models Navigator) data model. Supported Platform: • N540-24Q8L2DD-SYS
VRF-to-VRF route leaking in SRv6 core	VRF-to-VRF route leaking enables sharing of routes between VRFs while maintaining their isolation. This feature allows the source VRF to send leaked routes to remote PEs or Route Reflectors (RRs) across an SRv6 core network, similar to an MPLS core network, enabling communication between different service tenants or administrative domains without compromising VRF isolation.
mLDP LSP protection with optimal TI-LFA backup paths	With this release, the Topology Independent Loop-Free Alternate (TI-LFA) calculates an optimal, loop-free post-convergence path and enforces it by encoding the path as a list of segments. You can now enhance the protection and convergence for Multicast Label Distribution Protocol Label Switched Paths (mLDP LSP) using TI-LFA backup paths. TI-LFA supports zero-segment and single-segment backup paths, enabling native Point-to-Multipoint (P2MP) over SR code with a Tree Segment Identifier (Tree-SID) profile.
System Monitoring	

Feature	Description
Monitor interface	The **filter physical** keyword was introduced, along with new columns `InDrops` and `OutDrops` in the output, to provide enhanced monitoring capabilities for physical interfaces. **CLI:** • The **filter physical** keyword is added to the **monitor interface** command.
System Security	
Lawful Intercept on MPLS Layer 3	You can now enable Lawful Intercept (LI) within an MPLS Layer 3 network that supports both IPv4 and IPv6 traffic. This capability provides access to MPLS-labeled traffic at a disposition node.To enable LI, use SNMPv3, noting that it is restricted to per-VRF label mode and does not support MPLS disposition traffic allocated per-prefix or per-CE.This centralized management streamlines compliance with Law Enforcement Agency (LEA) requests and reduces administrative effort. This feature is supported only on N540-24Q8L2DD-SYS routers.

RADIUS with TLS protection	Remote Authentication Dial-In User Service (RADIUS) over Transport Layer Security (TLS) or RADSEC is now supported on Cisco IOS XR NCS 540 routers. You can configure the RADIUS protocol on the Cisco router (RADIUS client) to redirect RADIUS packets to a remote RADIUS server connected over TLS for Authentication, Authorization, and Accounting (AAA) services.
	
	Without TLS, RADIUS packets may be subject to potential security vulnerabilities, including data exposure, replay attacks, weak authentication, and encryption vulnerabilities, especially when transmitted across untrusted networks.
	
	The feature introduces these changes:
	
	CLI:
	
	• The keyword **radsec-server** is introduced in the **radius-server host** command.
	
	YANG Data Models:
	
	• New Xpath for
	
	`Cisco-IOS-XR-um-aaa-cfg.yang`
	
	• New Xpath for
	
	`Cisco-IOS-XR-aaa-lib-cfg.yang`
	
	(see GitHub, YANG Data Models Navigator)

YANG Data Models Introduced and Enhanced

This release introduces or enhances the following data models. For detailed information about the supported and unsupported sensor paths of all the data models, see the Github repository. To get a comprehensive list of the data models supported in a release, navigate to the Available-Content.md file for the release in the Github repository. The unsupported sensor paths are documented as deviations. For example,

`openconfig-acl.yang`provides details about the supported sensor paths, whereas `cisco-xr-openconfig-acl-deviations.yang` provides the unsupported sensor paths for `openconfig-acl.yang` on Cisco IOS XR routers.

You can also view the data model definitions using the YANG Data Models Navigator tool. This GUI-based and easy-to-use tool helps you explore the nuances of the data model and view the dependencies between various containers in the model. You can view the list of models supported across Cisco IOS XR releases and platforms, locate a specific model, view the containers and their respective lists, leaves, and leaf lists presented visually in a tree structure.

To get started with using data models, see the *Programmability Configuration Guide for Cisco NCS 540 Series Routers*.

Feature	Description
Programmability	
Cisco-IOS-XR-ptp-cfg.yang Version 3.2.0	This Cisco native data model is revised to introduce the **gm-threshold-breach** command.
Cisco-IOS-XR-um-ptp-cfg.yang Version 2.0.0	This Cisco unified YANG data model is revised to introduce the **gm-threshold-breach** command.
Cisco-IOS-XR-ptp-oper.yang Version 2.3.0	This Cisco unified YANG data oper model includes the offset values in the leaf **offset-from-vp**.
Cisco-IOS-XR-um-aaa-cfg.yang	This Cisco unified YANG data model enables you to configure the RADIUS protocol on the Cisco router (RADIUS client) to redirect RADIUS packets to a remote RADIUS server connected over TLS for Authentication, Authorization, and Accounting (AAA) services.
Cisco-IOS-XR-aaa-lib-cfg.yang	This Cisco native data model enables you to configure the RADIUS protocol on the Cisco router (RADIUS client) to redirect RADIUS packets to a remote RADIUS server connected over TLS for Authentication, Authorization, and Accounting (AAA) services.
Cisco-IOS-XR-um-performance-measurement-cfg.yang	This Cisco unified YANG data model is enhanced with a new container **fallback** to advertise a fallback delay value, retaining delay information in performance metrics even when the delay metrics for interfaces are temporarily unavailable due to hardware, synchronization, or network connectivity issues.
Cisco-IOS-XR-um-router-rib-cfg:router.yang	This Cisco unified YANG data model enables you to achieve SRv6 double recursion by collapsing the underlay, which typically involves protocols like IGP or BGP in the packet forwarding chain, allowing three-level load balancing and even distribution of traffic across multiple layers of the network stack.

Feature	Description
Cisco-IOS-XR-um-hw-module-profile-cfg.yang	This Cisco unified YANG data model is enhanced to have a new container, **ip-ttl-propagate-disable**, which is used to exclude the propagation of the IP Time-To-Live (TTL) and QoS capability to and from the MPLS header using the MPLS Push, Pop, and Penultimate Hop Pop (PHP) operations with these three sub-containers: • **mpls-push** - This container uses its sub-container, **ttl**, to change the IP TTL propagation on the MPLS Push (imposition) node to uniform mode. • **mpls-pop** - Changes the IP TTL and QoS DSCP propagation to uniform mode on the MPLS Pop (disposition) node using the sub-container, **ttl-and-cos**. • **mpls-pop-penultimate-hop** - Uses the additional three sub-containers, **ttl**, **cos**, and **ttl-and-cos** to change the IP TTL and QoS DSCP propagation to uniform mode on the MPLS PHP node. If cos is used, the TTL propagation remains in the pipe mode. If ttl is used, the QoS propagation remains in pipe mode.
Cisco-IOS-XR-segment-routing-ms-cfg.yang	This native yang model is enhanced to include a new container **flex-algo-metric-types**, with leaves **flex-algo-metric-type** and **admin-distance**. With this, you can utilize the additional metric types, generic and bandwidth, to ensure consistent path computation across flexible algorithm metric types.
Cisco-IOS-XR-um-if-arp-cfg.yang	This Cisco unified YANG data model is revised to introduce a new **arp evpn-proxy** container which drops the ARP request if the target entry is not available in the ARP tables on the EVPN control plane.
Cisco-IOS-XR-um-ipv6-nd-cfg.yang	This Cisco unified YANG data model is revised to introduce a new **ipv6** and **evpn-proxy** container which drops the ND request if the target entry is not available in the ND tables on the EVPN control plane.

Hardware Introduced

Note Before you install the Cisco router, you must prepare your site for the installation, for more details on site planning and environmental requirements, see Hardware Installation Guide.

Hardware	Description

Optics	This release introduces new optics on specific hardware within the product portfolio.
	
	• Cisco Bidirectional Pluggable Transceivers
	
	    • QSFP-100G-B40D-I
	
	    • QSFP-100G-B40U-I
	
	For details refer to the [Transceiver Module Group (TMG) Compatibility Matrix](#)

Behavior Changes

- From this release, the default order of authentication methods for SSH clients on Cisco IOS XR routers running Cisco IOS XR SSH is changed to: **public-key**, **keyboard-interactive**, and **password**.

  Prior to this release, the default order was: **public-key**, **password**, and **keyboard-interactive**.

- Cisco Secure DDoS Edge Protection is supported from Cisco IOS XR Release 7.10.1 on Cisco NCS 540 series routers. But the smart licensing usage and utilization reporting for the edge protection feature remains disabled. Usage details of the edge protection functionality will be enabled only in the future release. Hence, the **Smart Account In Use** utilization report for edge protection will show as 0 (zero) consumed.

- 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** *index***address 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 adjacency***address* 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

- The statistics collection may time out due to CPU overload during route churn. In such scenarios, statistics collection will resume when the CPU becomes available after the route churn is complete.

- Autonegotiation is disabled by default on the fixed GigE - 0/0/0/0 - 0/0/0/4 copper ports of N540X-16Z4G8Q2C-A/D and N540X-12Z16G-SYS-A/D router variants. To enable autonegotiation, use the **negotiation auto** command.

- If you're migrating from previous XR versions, then you must enable autonegotiation for fixed copper ports using the **negotiation auto** command before performing the software upgrade to avoid any links going down.

- Enabling or disabling frame preemption on the Time Sensitive Networking (TSN) port results in traffic drop for N540-FH-CSR-SYS. The port Twenty Five G0/0/12 is used as the TSN port.

- 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

There are no caveats in this release.

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 24.4.1 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 1: Release 24.4.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-24.4.1.iso	IOS XR mandatory base image.
USB Boot Package	ncs540-usb_boot-24.4.1.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-r2441.x86_64.rpm	Supports Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server
IOS XR MPLS	ncs540-mpls-1.0.0.0-r2441.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r2441.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE)
IOS XR Security	ncs540-k9sec-1.0.0.0-r2441.x86_64.rpm	Supports MACsec and 802.1X
IOS XR ISIS	ncs540-isis-1.0.0.0-r2441.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r2441.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r2441.x86_64.rpm	Supports Lawful Intercept (LI)

IOS XR Multicast	ncs540-mcast-1.0.0.0-r2441.x86_64.rpm	Supports Multicast
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r2441.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r2441.x86_64.rpm	Supports LI-CTRL

Table 2: Release 24.4.1 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-x64-24.4.1.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-24.4.1.tar.
USB Boot Package	ncs540l-usb_boot-24.4.1.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-24.4.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-24.4.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-iosxr-24.4.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.24.4.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-iosxr-24.4.1.tar	Supports RIP

Table 3: Release 24.4.1 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

IOS XR Base Image	ncs540l-aarch64-24.4.1.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-lldp
		• 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-24.4.1.tar.
USB Boot Package	ncs540l-aarch64-usb_boot-24.4.1.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-24.4.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-24.4.1.tar	Supports EIGRP

IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-24.4.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.24.4.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-aarch64-iosxr-optional-rpms-24.4.1.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 24.4.1
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
 Built By     : swtools
 Built On     : Tue Dec 17 07:45:22 PST 2024
 Built Host   : iox-lnx-125
 Workspace    : /auto/srcarchive10/prod/24.4.1/ncs540/ws
 Version      : 24.4.1
 Location     : /opt/cisco/XR/packages/
 Label        : 24.4.1

cisco NCS-540 () processor

System uptime is 2 hours 58 minutes
```

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 24.4.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
Built By : cisco
Built On : Tue Dec 17 14:10:45 UTC 2024
Build Host : iox-lnx-117
Workspace : /auto/srcarchive10/prod/24.4.1/ncs540l/ws/
Version : 24.4.1
Label : 24.4.1

cisco NCS540L
cisco N540X-4Z14G2Q-A processor with 8GB of memory
DARWIN_ROUTER uptime is 33 minutes
Cisco NCS 540 Series Fixed Router 12x1G, 4xCu, 2x10G, 2x25G, 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 24.4.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
 Built By     : cisco
 Built On     : Sun Dec 15 21:50:18 UTC 2024
 Build Host   : iox-lnx-117
 Workspace    : /auto/srcarchive10/prod/24.4.1/ncs540l/ws/
 Version      : 24.4.1
 Label        : 24.4.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 18 minutes
Cisco NCS 540 FH with 8xCPRI+4xCPRI/10G+8x10G+6x25G+2x100G
```

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 24.4.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
 Built By     : cisco
 Built On     : Sun Dec 15 21:50:18 UTC 2024
 Build Host   : iox-lnx-117
 Workspace    : /auto/srcarchive10/prod/24.4.1/ncs540l/ws/
 Version      : 24.4.1
 Label        : 24.4.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 18 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
                                  =================================================
                                          Req    SW      Min Req   Min Req
Card Type          FPD Description        Reload Ver     SW Ver    Board Ver
================== ========================= ====== ======= ======== =========
------------------------------------------------------------------------------
N540-24Z8Q2C-M     Bootloader(A)           YES    1.18      1.18      0.0
                   CPU-IOFPGA(A)           YES    0.10      0.10      0.0
                   MB-IOFPGA(A)            YES    0.28      0.28      0.0
                   MB-MIFPGA               YES    0.08      0.08      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-M1100(A)           NO     50.00     50.00     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    1535.00   1535.00    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_32               NO    13.01     13.01      0.0
SSFP_E1F_33               NO    13.01     13.01      0.0
SSFP_E1F_34               NO    13.01     13.01      0.0
SSFP_E1F_35               NO    13.01     13.01      0.0
SSFP_E1F_36               NO    13.01     13.01      0.0
SSFP_E1F_37               NO    13.01     13.01      0.0
SSFP_E1F_38               NO    13.01     13.01      0.0
SSFP_E1F_39               NO    13.01     13.01      0.0
SSFP_E1F_4                NO    13.01     13.01      0.0
SSFP_E1F_40               NO    13.01     13.01      0.0
SSFP_E1F_41               NO    13.01     13.01      0.0
SSFP_E1F_42               NO    13.01     13.01      0.0
SSFP_E1F_43               NO    13.01     13.01      0.0
SSFP_E1F_44               NO    13.01     13.01      0.0
SSFP_E1F_45               NO    13.01     13.01      0.0
SSFP_E1F_46               NO    13.01     13.01      0.0
SSFP_E1F_47               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_32        NO    12.01    12.01    0.0
SSFP_OC3_STM1_33        NO    12.01    12.01    0.0
SSFP_OC3_STM1_34        NO    12.01    12.01    0.0
SSFP_OC3_STM1_35        NO    12.01    12.01    0.0
SSFP_OC3_STM1_36        NO    12.01    12.01    0.0
SSFP_OC3_STM1_37        NO    12.01    12.01    0.0
SSFP_OC3_STM1_38        NO    12.01    12.01    0.0
SSFP_OC3_STM1_39        NO    12.01    12.01    0.0
SSFP_OC3_STM1_4         NO    12.01    12.01    0.0
SSFP_OC3_STM1_40        NO    12.01    12.01    0.0
SSFP_OC3_STM1_41        NO    12.01    12.01    0.0
SSFP_OC3_STM1_42        NO    12.01    12.01    0.0
SSFP_OC3_STM1_43        NO    12.01    12.01    0.0
SSFP_OC3_STM1_44        NO    12.01    12.01    0.0
SSFP_OC3_STM1_45        NO    12.01    12.01    0.0
SSFP_OC3_STM1_46        NO    12.01    12.01    0.0
SSFP_OC3_STM1_47        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
SSFP_STM1_TSOP_0        NO    13.00    13.00    0.0
SSFP_STM1_TSOP_1        NO    13.00    13.00    0.0
SSFP_STM1_TSOP_10       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_11       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_12       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_13       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_14       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_15       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_16       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_17       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_18       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_19       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_2        NO    13.00    13.00    0.0
SSFP_STM1_TSOP_20       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_21       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_22       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_23       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_24       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_25       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_26       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_27       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_28       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_29       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_3        NO    13.00    13.00    0.0
SSFP_STM1_TSOP_30       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_31       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_32       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_33       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_34       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_35       NO    13.00    13.00    0.0
SSFP_STM1_TSOP_36       NO    13.00    13.00    0.0
```

```
                          SSFP_STM1_TSOP_37        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_38        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_39        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_4         NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_40        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_41        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_42        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_43        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_44        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_45        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_46        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_47        NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_5         NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_6         NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_7         NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_8         NO     13.00     13.00      0.0
                          SSFP_STM1_TSOP_9         NO     13.00     13.00      0.0
-----------------------------------------------------------------------------------
N540-ACC-SYS              Bootloader(A)            YES     1.18      1.18      0.0
                          CPU-IOFPGA(A)            YES     0.10      0.10      0.0
                          MB-IOFPGA(A)             YES     0.28      0.28      0.0
                          MB-MIFPGA                YES     0.08      0.08      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-M1100(A)            NO     50.00     50.00      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   1535.00   1535.00      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_32              NO     13.01     13.01      0.0
                          SSFP_E1F_33              NO     13.01     13.01      0.0
                          SSFP_E1F_34              NO     13.01     13.01      0.0
                          SSFP_E1F_35              NO     13.01     13.01      0.0
                          SSFP_E1F_36              NO     13.01     13.01      0.0
```

```
SSFP_E1F_37                NO    13.01    13.01    0.0
SSFP_E1F_38                NO    13.01    13.01    0.0
SSFP_E1F_39                NO    13.01    13.01    0.0
SSFP_E1F_4                 NO    13.01    13.01    0.0
SSFP_E1F_40                NO    13.01    13.01    0.0
SSFP_E1F_41                NO    13.01    13.01    0.0
SSFP_E1F_42                NO    13.01    13.01    0.0
SSFP_E1F_43                NO    13.01    13.01    0.0
SSFP_E1F_44                NO    13.01    13.01    0.0
SSFP_E1F_45                NO    13.01    13.01    0.0
SSFP_E1F_46                NO    13.01    13.01    0.0
SSFP_E1F_47                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_32           NO    12.01    12.01    0.0
SSFP_OC3_STM1_33           NO    12.01    12.01    0.0
SSFP_OC3_STM1_34           NO    12.01    12.01    0.0
SSFP_OC3_STM1_35           NO    12.01    12.01    0.0
SSFP_OC3_STM1_36           NO    12.01    12.01    0.0
SSFP_OC3_STM1_37           NO    12.01    12.01    0.0
SSFP_OC3_STM1_38           NO    12.01    12.01    0.0
SSFP_OC3_STM1_39           NO    12.01    12.01    0.0
SSFP_OC3_STM1_4            NO    12.01    12.01    0.0
SSFP_OC3_STM1_40           NO    12.01    12.01    0.0
SSFP_OC3_STM1_41           NO    12.01    12.01    0.0
SSFP_OC3_STM1_42           NO    12.01    12.01    0.0
SSFP_OC3_STM1_43           NO    12.01    12.01    0.0
SSFP_OC3_STM1_44           NO    12.01    12.01    0.0
SSFP_OC3_STM1_45           NO    12.01    12.01    0.0
SSFP_OC3_STM1_46           NO    12.01    12.01    0.0
SSFP_OC3_STM1_47           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
                        SSFP_STM1_TSOP_0           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_1           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_10          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_11          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_12          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_13          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_14          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_15          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_16          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_17          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_18          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_19          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_2           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_20          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_21          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_22          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_23          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_24          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_25          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_26          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_27          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_28          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_29          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_3           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_30          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_31          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_32          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_33          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_34          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_35          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_36          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_37          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_38          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_39          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_4           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_40          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_41          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_42          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_43          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_44          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_45          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_46          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_47          NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_5           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_6           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_7           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_8           NO     13.00     13.00     0.0
                        SSFP_STM1_TSOP_9           NO     13.00     13.00     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     1.18      1.18     0.0
                        CPU-IOFPGA(A)              YES     0.10      0.10     0.0
                        MB-IOFPGA(A)               YES     0.28      0.28     0.0
                        MB-MIFPGA                  YES     0.08      0.08     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-M1100(A)            NO    50.00     50.00     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  1535.00   1535.00     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_32              NO    13.01     13.01     0.0
SSFP_E1F_33              NO    13.01     13.01     0.0
SSFP_E1F_34              NO    13.01     13.01     0.0
SSFP_E1F_35              NO    13.01     13.01     0.0
SSFP_E1F_36              NO    13.01     13.01     0.0
SSFP_E1F_37              NO    13.01     13.01     0.0
SSFP_E1F_38              NO    13.01     13.01     0.0
SSFP_E1F_39              NO    13.01     13.01     0.0
SSFP_E1F_4               NO    13.01     13.01     0.0
SSFP_E1F_40              NO    13.01     13.01     0.0
SSFP_E1F_41              NO    13.01     13.01     0.0
SSFP_E1F_42              NO    13.01     13.01     0.0
SSFP_E1F_43              NO    13.01     13.01     0.0
SSFP_E1F_44              NO    13.01     13.01     0.0
SSFP_E1F_45              NO    13.01     13.01     0.0
SSFP_E1F_46              NO    13.01     13.01     0.0
SSFP_E1F_47              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_32          NO    12.01    12.01    0.0
SSFP_OC3_STM1_33          NO    12.01    12.01    0.0
SSFP_OC3_STM1_34          NO    12.01    12.01    0.0
SSFP_OC3_STM1_35          NO    12.01    12.01    0.0
SSFP_OC3_STM1_36          NO    12.01    12.01    0.0
SSFP_OC3_STM1_37          NO    12.01    12.01    0.0
SSFP_OC3_STM1_38          NO    12.01    12.01    0.0
SSFP_OC3_STM1_39          NO    12.01    12.01    0.0
SSFP_OC3_STM1_4           NO    12.01    12.01    0.0
SSFP_OC3_STM1_40          NO    12.01    12.01    0.0
SSFP_OC3_STM1_41          NO    12.01    12.01    0.0
SSFP_OC3_STM1_42          NO    12.01    12.01    0.0
SSFP_OC3_STM1_43          NO    12.01    12.01    0.0
SSFP_OC3_STM1_44          NO    12.01    12.01    0.0
SSFP_OC3_STM1_45          NO    12.01    12.01    0.0
SSFP_OC3_STM1_46          NO    12.01    12.01    0.0
SSFP_OC3_STM1_47          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
SSFP_STM1_TSOP_0          NO    13.00    13.00    0.0
SSFP_STM1_TSOP_1          NO    13.00    13.00    0.0
SSFP_STM1_TSOP_10         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_11         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_12         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_13         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_14         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_15         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_16         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_17         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_18         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_19         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_2          NO    13.00    13.00    0.0
SSFP_STM1_TSOP_20         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_21         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_22         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_23         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_24         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_25         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_26         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_27         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_28         NO    13.00    13.00    0.0
SSFP_STM1_TSOP_29         NO    13.00    13.00    0.0
```

```
                                    SSFP_STM1_TSOP_3          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_30         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_31         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_32         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_33         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_34         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_35         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_36         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_37         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_38         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_39         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_4          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_40         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_41         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_42         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_43         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_44         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_45         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_46         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_47         NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_5          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_6          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_7          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_8          NO    13.00      13.00       0.0
                                    SSFP_STM1_TSOP_9          NO    13.00      13.00       0.0
---------------------------------------------------------------------------------
N540X-ACC-SYS       Bootloader(A)               YES    1.18       1.18        0.0
                    CPU-IOFPGA(A)               YES    0.10       0.10        0.0
                    MB-IOFPGA(A)                YES    0.28       0.28        0.0
                    MB-MIFPGA                   YES    0.08       0.08        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-M1100(A)               NO    50.00      50.00        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    1535.00    1535.00      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_32                  NO    13.01    13.01    0.0
SSFP_E1F_33                  NO    13.01    13.01    0.0
SSFP_E1F_34                  NO    13.01    13.01    0.0
SSFP_E1F_35                  NO    13.01    13.01    0.0
SSFP_E1F_36                  NO    13.01    13.01    0.0
SSFP_E1F_37                  NO    13.01    13.01    0.0
SSFP_E1F_38                  NO    13.01    13.01    0.0
SSFP_E1F_39                  NO    13.01    13.01    0.0
SSFP_E1F_4                   NO    13.01    13.01    0.0
SSFP_E1F_40                  NO    13.01    13.01    0.0
SSFP_E1F_41                  NO    13.01    13.01    0.0
SSFP_E1F_42                  NO    13.01    13.01    0.0
SSFP_E1F_43                  NO    13.01    13.01    0.0
SSFP_E1F_44                  NO    13.01    13.01    0.0
SSFP_E1F_45                  NO    13.01    13.01    0.0
SSFP_E1F_46                  NO    13.01    13.01    0.0
SSFP_E1F_47                  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_32             NO    12.01    12.01    0.0
SSFP_OC3_STM1_33             NO    12.01    12.01    0.0
SSFP_OC3_STM1_34             NO    12.01    12.01    0.0
SSFP_OC3_STM1_35             NO    12.01    12.01    0.0
SSFP_OC3_STM1_36             NO    12.01    12.01    0.0
SSFP_OC3_STM1_37             NO    12.01    12.01    0.0
SSFP_OC3_STM1_38             NO    12.01    12.01    0.0
SSFP_OC3_STM1_39             NO    12.01    12.01    0.0
SSFP_OC3_STM1_4              NO    12.01    12.01    0.0
SSFP_OC3_STM1_40             NO    12.01    12.01    0.0
SSFP_OC3_STM1_41             NO    12.01    12.01    0.0
SSFP_OC3_STM1_42             NO    12.01    12.01    0.0
SSFP_OC3_STM1_43             NO    12.01    12.01    0.0
```

```
                              SSFP_OC3_STM1_44              NO    12.01   12.01     0.0
                              SSFP_OC3_STM1_45              NO    12.01   12.01     0.0
                              SSFP_OC3_STM1_46              NO    12.01   12.01     0.0
                              SSFP_OC3_STM1_47              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
                              SSFP_STM1_TSOP_0              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_1              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_10             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_11             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_12             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_13             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_14             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_15             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_16             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_17             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_18             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_19             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_2              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_20             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_21             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_22             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_23             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_24             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_25             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_26             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_27             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_28             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_29             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_3              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_30             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_31             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_32             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_33             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_34             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_35             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_36             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_37             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_38             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_39             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_4              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_40             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_41             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_42             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_43             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_44             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_45             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_46             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_47             NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_5              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_6              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_7              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_8              NO    13.00   13.00     0.0
                              SSFP_STM1_TSOP_9              NO    13.00   13.00     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    0.08      0.08
```

```
0/RP0        N540-24Z8Q2C-M        1.0    Bootloader           CURRENT      1.18      1.18

0/RP0        N540-24Z8Q2C-M        1.0    CPU-IOFPGA           CURRENT      0.10      0.10

0/RP0        N540-24Z8Q2C-M        1.0    MB-IOFPGA            CURRENT      0.28      0.28

0/RP0        N540-24Z8Q2C-M        1.0    SATA-M500IT-MU-B     CURRENT      4.00      4.00
```

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
Mon Dec 16 17:17:09.006 IST


=============================== =================================================
                                             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     20.08    20.08     0.0
                   IoFpga                     YES     0.08     0.08      0.0
                   IoFpgaGolden               YES     0.03     0.03      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-D   ADMConfig                  NO      5.03     5.03      0.0
                   BckUp-BootLoader           YES     20.08    20.08     0.0
                   IoFpga                     YES     0.08     0.08      0.0
                   IoFpgaGolden               YES     0.03     0.03      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-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,PM excluded
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 N540X-4Z14G2Q-A       0.2  ADMConfig            NEED UPGD  1.02     1.02
    NOT REQ
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2  IoFpga               CURRENT    0.17     0.17
       0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2  IoFpgaGolden     B   NEED UPGD           0.00
       0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2  Prim-BootLoader  A   CURRENT   20.08    20.08
```

```
        0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A        0.2   StdbyFpga        S   CURRENT        2.05     2.05
        0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A        0.2   StdbyFpgaGolden  BS  NEED UPGD               0.26
        0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A        0.2   TamFw            S   CURRENT        6.05     6.05
        0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A        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    3.08     3.08      0.0
                       IoFpgaGolden       YES    2.07     2.03      0.0
                       Primary-BIOS       YES    1.51     1.51      0.0
                       StdbyFpga          YES    0.50     0.50      0.0
                       StdbyFpgaGolden    YES    0.50     0.40      0.0
                       TamFw              YES    4.13     4.13      0.0
                       TamFwGolden        YES    4.13     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    3.08     3.08      0.0
                       IoFpgaGolden       YES    2.07     2.03      0.0
                       Primary-BIOS       YES    1.51     1.51      0.0
                       StdbyFpga          YES    0.50     0.50      0.0
                       StdbyFpgaGolden    YES    0.50     0.40      0.0
                       TamFw              YES    4.13     4.13      0.0
                       TamFwGolden        YES    4.13     4.11      0.0
------------------------------------------------------------------------------
N540-24Q8L2DD-SYS      ADM-DBConfig       NO     2.05     2.05      0.0
                       ADM-MBConfig       NO     2.05     2.05      0.0
                       IoFpga             YES    2.12     2.12      0.0
                       IoFpgaGolden       YES    2.12     2.12      0.0
                       Primary-BIOS       YES    4.07     4.07      0.0
                       SsdSAMSA64G3       YES    12.41    12.41     0.0
                       SsdSRM24M2         YES    14.02    14.02     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    3.08     3.08      0.0
                       IoFpgaGolden       YES    2.07     2.03      0.0
                       JMAC1-Config       YES    3.00     3.00      0.0
                       JMAC2-Config       YES    3.00     3.00      0.0
                       JMAC3-Config       YES    3.00     3.00      0.0
                       JMAC4-Config       YES    3.00     3.00      0.0
                       JMAC5-Config       YES    3.00     3.00      0.0
                       Primary-BIOS       YES    1.51     1.51      0.0
                       StdbyFpga          YES    0.50     0.50      0.0
```

	StdbyFpgaGolden	YES	0.50	0.40	0.0
	TamFw	YES	4.13	4.13	0.0
	TamFwGolden	YES	4.13	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	3.08	3.08	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	JMAC1-Config	YES	3.00	3.00	0.0
	JMAC2-Config	YES	3.00	3.00	0.0
	JMAC3-Config	YES	3.00	3.00	0.0
	JMAC4-Config	YES	3.00	3.00	0.0
	JMAC5-Config	YES	3.00	3.00	0.0
	Primary-BIOS	YES	1.51	1.51	0.0
	StdbyFpga	YES	0.50	0.50	0.0
	StdbyFpgaGolden	YES	0.50	0.40	0.0
	TamFw	YES	4.13	4.13	0.0
	TamFwGolden	YES	4.13	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	0.24	0.24	0.0
	DpFpgaEth	YES	1.22	1.22	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.49	1.49	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	0.23	0.23	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.49	1.49	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	3.08	3.08	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0

```
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    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   3.08    3.08    0.0
                        IoFpgaGolden              YES   2.07    2.03    0.0
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    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   3.08    3.08    0.0
                        IoFpgaGolden              YES   2.07    2.03    0.0
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    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   3.08    3.08    0.0
                        IoFpgaGolden              YES   2.07    2.03    0.0
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    4.11    0.0
-------------------------------------------------------------------------------
N540X-16Z8Q2C-A         ADMConfig                 NO    1.05    1.05    0.0
                        IoFpga                    YES   3.08    3.08    0.0
                        IoFpgaGolden              YES   2.07    2.03    0.0
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    4.11    0.0
-------------------------------------------------------------------------------
N540X-16Z8Q2C-D         ADMConfig                 NO    1.05    1.05    0.0
                        IoFpga                    YES   3.08    3.08    0.0
                        IoFpgaGolden              YES   2.07    2.03    0.0
                        Primary-BIOS              YES   1.51    1.51    0.0
                        StdbyFpga                 YES   0.50    0.50    0.0
                        StdbyFpgaGolden           YES   0.50    0.40    0.0
                        TamFw                     YES   4.13    4.13    0.0
                        TamFwGolden               YES   4.13    4.11    0.0
-------------------------------------------------------------------------------
RP/0/RP0/CPU0:Router#show hw-module fpd
Auto-upgrade:Enabled,PM excluded
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      0.23    0.23
      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      1.49    1.49
      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        1.1   PrimMCU             CURRENT      1.02    1.02
      NOT REQ
0/PM0      N540-PWR400-A        1.1   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   3.08     3.08      0.0
                    IoFpgaGolden              YES   2.07     2.03      0.0
                    Primary-BIOS              YES   1.51     1.51      0.0
                    StdbyFpga                 YES   0.50     0.50      0.0
                    StdbyFpgaGolden           YES   0.50     0.40      0.0
                    TamFw                     YES   4.13     4.13      0.0
                    TamFwGolden               YES   4.13     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   3.08     3.08      0.0
                    IoFpgaGolden              YES   2.07     2.03      0.0
                    Primary-BIOS              YES   1.51     1.51      0.0
                    StdbyFpga                 YES   0.50     0.50      0.0
                    StdbyFpgaGolden           YES   0.50     0.40      0.0
                    TamFw                     YES   4.13     4.13      0.0
                    TamFwGolden               YES   4.13     4.11      0.0
------------------------------------------------------------------------------
N540-24Q8L2DD-SYS   ADM-DBConfig              NO    2.05     2.05      0.0
                    ADM-MBConfig              NO    2.05     2.05      0.0
                    IoFpga                    YES   2.12     2.12      0.0
                    IoFpgaGolden              YES   2.12     2.12      0.0
                    Primary-BIOS              YES   4.07     4.07      0.0
                    SsdSAMSA64G3              YES   12.41    12.41     0.0
                    SsdSRM24M2                YES   14.02    14.02     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      3.08     3.08    0.0
                    IoFpgaGolden            YES      2.07     2.03    0.0
                    JMAC1-Config            YES      3.00     3.00    0.0
                    JMAC2-Config            YES      3.00     3.00    0.0
                    JMAC3-Config            YES      3.00     3.00    0.0
                    JMAC4-Config            YES      3.00     3.00    0.0
                    JMAC5-Config            YES      3.00     3.00    0.0
                    Primary-BIOS            YES      1.51     1.51    0.0
                    StdbyFpga               YES      0.50     0.50    0.0
                    StdbyFpgaGolden         YES      0.50     0.40    0.0
                    TamFw                   YES      4.13     4.13    0.0
                    TamFwGolden             YES      4.13     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      3.08     3.08    0.0
                    IoFpgaGolden            YES      2.07     2.03    0.0
                    JMAC1-Config            YES      3.00     3.00    0.0
                    JMAC2-Config            YES      3.00     3.00    0.0
                    JMAC3-Config            YES      3.00     3.00    0.0
                    JMAC4-Config            YES      3.00     3.00    0.0
                    JMAC5-Config            YES      3.00     3.00    0.0
                    Primary-BIOS            YES      1.51     1.51    0.0
                    StdbyFpga               YES      0.50     0.50    0.0
                    StdbyFpgaGolden         YES      0.50     0.40    0.0
                    TamFw                   YES      4.13     4.13    0.0
                    TamFwGolden             YES      4.13     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      0.24     0.24    0.0
                    DpFpgaEth               YES      1.22     1.22    0.0
                    IoFpga                  YES      1.30     1.30    0.0
                    IoFpgaGolden            YES      1.30     1.30    0.0
                    Primary-BIOS            YES      1.49     1.49    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      0.23     0.23    0.0
                    IoFpga                  YES      1.30     1.30    0.0
                    IoFpgaGolden            YES      1.30     1.30    0.0
                    Primary-BIOS            YES      1.49     1.49    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    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
                        TamFw                 YES    4.13     4.13     0.0
                        TamFwGolden           YES    4.13     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    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
                        TamFw                 YES    4.13     4.13     0.0
                        TamFwGolden           YES    4.13     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    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
                        TamFw                 YES    4.13     4.13     0.0
                        TamFwGolden           YES    4.13     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    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
                        TamFw                 YES    4.13     4.13     0.0
                        TamFwGolden           YES    4.13     4.11     0.0
-------------------------------------------------------------------------------
N540X-16Z8Q2C-A         ADMConfig             NO     1.05     1.05     0.0
                        IoFpga                YES    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
                        TamFw                 YES    4.13     4.13     0.0
                        TamFwGolden           YES    4.13     4.11     0.0
-------------------------------------------------------------------------------
N540X-16Z8Q2C-D         ADMConfig             NO     1.05     1.05     0.0
                        IoFpga                YES    3.08     3.08     0.0
                        IoFpgaGolden          YES    2.07     2.03     0.0
                        Primary-BIOS          YES    1.51     1.51     0.0
                        StdbyFpga             YES    0.50     0.50     0.0
                        StdbyFpgaGolden       YES    0.50     0.40     0.0
```

```
                              TamFw                        YES      4.13      4.13      0.0
                              TamFwGolden                  YES      4.13      4.11      0.0
RP/0/RP0/CPU0:Router#show hw-module fpd
Auto-upgrade:Enabled,PM excluded
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      4.0   ADM-DBConfig           CURRENT     2.05     2.05
    NOT REQ
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   ADM-MBConfig           CURRENT     2.05     2.05
    NOT REQ
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   IoFpga                 CURRENT     2.12     2.12
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   IoFpgaGolden      B    CURRENT              2.12
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   Primary-BIOS      S    CURRENT     4.07     4.07
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   SsdSAMSA64G3      S    CURRENT    12.41    12.41
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   StdbyFpga         S    CURRENT     2.59     2.59
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   StdbyFpgaGolden   BS   CURRENT              2.59
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   TamFw             S    CURRENT     6.05     6.05
    0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS      4.0   TamFwGolden       BS   CURRENT              6.05
    0/RP0
0/PM1      PWR-400-AC             1.0   LI-PrimMCU             CURRENT     0.04     0.04
    NOT REQ
0/PM1      PWR-400-AC             1.0   LI-SecMCU              CURRENT     0.07     0.07
    NOT REQ
```

Important Notes

Licensing

Starting with Cisco IOS XR Release 24.1.1, Smart Licensing Using Policy (SLP) is the default Licensing model. When you upgrade to the Cisco IOS XR Release 24.1.1 release or later, the Smart Licensing Using Policy is enabled by default.

You can migrate your devices to Smart Licensing with Policy model, see *Migrating from Smart Licensing to Smart Licensing Using Policy*, Smart Licensing Using Policy on Cisco IOS XR Routers.

We recommend that you update to the latest version of SSM On-Prem or Cisco Smart Licensing Utility.

Note SSM On-Prem and CSSM both support SLP devices and SL devices. SLP devices and SL devices can coexist in a network. The Smart Licensing (SL) model is available in releases Cisco IOS XR Release 7.11.1 and earlier.

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

Note For software installation and upgrades, refer to the respective upgrade/downgrade docs *.tar* files based on your 540 router varaint.

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-24.4.1.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-24.4.1.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-24.4.1.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