Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.4.1

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Network Convergence System 540 Series Routers

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What's New in Cisco IOS XR Release 7.4.1

Feature	Description
Hardware	
Support for Cisco Network Convergence System 540 Large Density Router	The Cisco NCS 540 Large Density router (N540-24Q8L2DD-SYS) is a 1RU; platform supporting QSFP56-DD ports, that offers customers 400G coherent transport solution. NCS 540 Large Density router enhances the existing NCS 540 portfolio offering high throughput and flexible 400/200/100/50/40/25/10/1GE interfaces. N540-24Q8L2DD-SYS router supports: • 2 x QSFP56-DD for 40/100/200/400GE • 8 x SFP56 for 1/10/25/50GE • 24 x SFP28 for 1/10/25GE

Feature	Description
Support for Cisco Network Convergence System 540 Small Density Routers N540X-4Z14G2Q-A/D	The Cisco NCS 540 Small Density routers (N540X-4Z14G2Q-A/D) are temperature-hardened, fixed port, one rack unit form-factor, conformal coated routers with advanced timing (Class C), security, and QoS features that revolutionize sub-100G routing. An IOS XR based cell site router, the router extends Cisco's 5G Converged SDN Transport to edge of the networks as a CSR/NID/CPE, with the smallest footprint, ever. N540X-4Z14G2Q-A/D router supports: • 2xSFP28 for 1/10/25GE • 4xSFP10 for 1/10GE • 10xSFP for 1GE • 4xCombo RJ45/SFP for 1GE

Note Cisco N540-24Q8L2DD-SYS variant, will have parity with Cisco IOS XR Release 7.3.1 with the rest of the NCS 540 variants.

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

Feature	Description
Interface and Hardware Component	
Speed CLI based bandwidth management	All the controllers are created with the default maximum bandwidth value which is equal to the default speed. Use the new **speed** CLI on the controller to configure the desired bandwidth for the optics. Use the **show controllers npu interface-bandwidth-usage** command in XR EXEC mode, to display the provisioned ports and to know the allocated or the remaining bandwidth availability.

Feature	Description
Network Synchronization	
PTP Static Asymmetry Correction support on N540-24Q8L2DD-SYS	PTP delay asymmetry to offset the static delays on a PTP path is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
PTP Profile Support on N540-24Q8L2DD-SYS	PTP Profiles support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SyncE support on N540-24Q8L2DD-SYS	SyncE support is now extended on the following NCS540 router variant: • N540-24Q8L2DD-SYS

Feature	Description
Segment Routing	
SR - TE support on N540-24Q8L2DD-SYS	Segment Routing – Traffic Engineering (SR-TE) Services are now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SR - PCE support on N540-24Q8L2DD-SYS	Segment Routing – Path Computation Element (SR-PCE) support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SR - OSPF support on N540-24Q8L2DD-SYS	Segment Routing OSPF support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SR - OAM support on N540-24Q8L2DD-SYS	Segment Routing OAM support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SR - ISIS support on N540-24Q8L2DD-SYS	Segment Routing ISIS support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
SR - BGP support on N540-24Q8L2DD-SYS	Segment Routing BGP support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
System Management	
FPD Support on N540-24Q8L2DD-SYS	FPD support is now extended on the following Cisco NCS 540 router variant: • N540-24Q8L2DD-SYS
Support for Flexible Consumption Model on N540-24Q8L2DD-SYS	Support for Flexible Consumption Model (FCM) is now extended to the following Cisco NCS 540 variant: • N540-24Q8L2DD-SYS
System Security	
Support for RPM Signing and Validation on N540-24Q8L2DD-SYS	Support for RPM Signing and Validation is now extended to the following Cisco NCS 540 router varaint: • N540-24Q8L2DD-SYS

Feature	Description
Support for Attestation on N540-24Q8L2DD-SYS	Attestation is a mechanism used by a trusted entity to validate the software integrity of a platform. Support for attestion is now extended to the following Cisco NCS 540 router varaint: • N540-24Q8L2DD-SYS
Support for Secure Boot on N540-24Q8L2DD-SYS	Support for Secure Boot is now extended to the following Cisco NCS 540 router varaint: • N540-24Q8L2DD-SYS

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

Feature	Description
System Security	
Support for Boot Integrity and Trust Visibility (BIV) on N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D	Support for the BIV functionality is now extended to the following Cisco NCS 540 router varaints: • N540X-6Z18G-SYS-A/D • N540X-8Z16G-SYS-A/D • N540X-4Z14G2Q-A/D
Chip Guard Support on N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D	Support for the Chip Guard functionality is now extended to the following Cisco NCS 540 router varaints: • N540X-6Z18G-SYS-A/D • N540X-8Z16G-SYS-A/D • N540X-4Z14G2Q-A/D

The following features are supported only on N540X-8Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, N540-24Z8Q2C-SYS, N540-ACC-SYS, N540X-ACC-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540-12Z20G-SYS-A/D variants.

Feature	Description
IP Addresses and Services	
Jumbo packet handling for DHCPv6	This release introduces the **handle-jumbo-packet** configuration command under the dhcp ipv6 mode. This command enables processing of incoming DHCPv6 packets greater than 1280 bytes and upto 12,800 bytes in size. Prior to this release, the router discarded incoming DHCPv6 packets greater than 1280 bytes. The newly introduced command is: • handle-jumbo-packet

Feature	Description
Custom Prefix Length Selection	By default, /48 prefix length is inserted in the LEM memory. This feature allows you to choose a custom IPv6 prefix length to be inserted into the largest exact match (LEM) memory. This feature introduces the **hw-module fib scale ipv6 custom-lem** command.
L2VPN and Ethernet Services	

Control-word support for EVPN Bridge-Mode (E-LAN)	Control word is now supported and enabled by default in ELAN mode. If the **control-word-disable** command is not configured, ensure to configure it under EVPN or EVI configuration mode before an upgrade to avoid inconsistent behaviour with routers before this release.
	`Router# configure`
	`Router(config)# evpn`
	`Router(config-evpn)# evi 1`
	`Router(config-evpn-instance)# control-word-disable // Apply to interop with older releases EVPN ELAN`
	If you want to enable **control-word** command for EVPN Bridging feature, then you must configure it only when both the endpoints run Release 7.4.1 or later.

PPPoE Traffic-Based Load Balance using Flow-Aware Transport Labels	This feature allows you to load balance the incoming PPPoE traffic received based on the inner PPPoE payload, source and destination IPv4 or IPv6 header. When you enable this feature, the router generates a unique Flow-Aware Transport (FAT) label for the incoming traffic based on inner IPv4 or IPv6 headers and uses the FAT labels for load balancing the PPPoE traffic. This feature introduces the **hw-module profile load-balance algorithm PPPoE** command.
VLAN list	VLANs separated by a comma are called VLAN lists. This feature allows you to configure a VLAN list on the L2 sub interface. VLAN-IDs of up to 9 are supported, per VLAN list. This feature overrides any limit set on the number of customers that can be supported in an Ethernet network.
Maximum MAC addresses on UNI port	This feature introduces MAC limit and MAC limit action on bridge port, which was earlier only available on bridge domain. This feature supports: • MAC limit of 1-64K • MAC limit action of flood and shutdown Thus, allowing you to limit the maximum number of clients connected to a bridge on a site.
L3VPN	

Feature	Description
Inter-AS Option B for L3VPN	This feature allows ISPs to provide MPLS Layer 3 VPN services to their end customers where the routing boundaries for a customer are spread across different geographical locations. Separate autonomous systems with autonomous system boundary routers (ASBRs) from different service providers can communicate by exchanging VPN-IPv4 addresses or IPv4 routes and MPLS labels. This feature provides better scalability as it requires only one BGP session to exchange all VPN prefixes between the ASBRs.
Modular QoS	
Packets-Per-Second-Based Policer	Prior to this functionality, when configuring policers, the only available option for policer rates was bit-rate measured in units of bits per second (bps). With this release, you can configure policer rates in units of packets per second (pps) as well. pps-based policer is critical in fending off malicious attacks—when attackers target your specific resources with a vast amount of traffic that contain higher number of packets, but move at a slower packet rate. Protection from such attacks is possible because pps-based policers ensure that regardless of the packet size and rate, the policer only accepts a fixed number of packets per second. This functionality modifies the **police rate** command.
Multicast	
Support for Multicast Over IPV4 Unicast GRE Tunnels	This feature allows encapsulation of multicast packets using GRE tunnels, thereby enabling transport of multicast packets securely between source and destination routers located in different IP clouds.
Draft-Rosen Multicast VPN (Profile 0)	Rosen draft (profile 0) is a widely used MVPN model and uses GRE tunnels to securely transmit multicast traffic between the PE routers. It also enables ease of deployment by using the Protocol-Independent Multicast (PIM) protocol between edge routers (PE) and hosts (CE), and between PE routers that are running in VRF mode.
Designated Router Election Using StickyDR	With this feature, the router sends a PIM *hello* message with a special PIM DR priority value on a multi-access LAN. The router with this special DR priority value is always elected as the designated router. The traffic now flows in the same path even when a new router is added. This feature introduces the **sticky-dr** command.
Programmability	
CLI to Yang Describer Tool	This tool provides a quick reference of IOS XR CLIs and the corresponding YANG data model that could be used. New command introduced for this feature: **yang describe**.
Transitioning Native Models to Unified Models (UM)	Unified models are CLI-based YANG models that are designed to replace the native schema-based models. UM models are generated directly from the IOS XR CLIs and mirror them in several ways. This results in improved usability and faster adoption of YANG models. You can access the new unified models from the Github repository.

Feature	Description
Unique Commit ID for Configuration State	The network orchestrator is a central point of management for the network and typical workflow involves synchronizing the configuration states of the routers it manages. Loading configurations for comparing the states involves unnecessary data and subsequent comparisons are load intensive. This feature synchronizes the configuration states between the orchestrator and the router using a unique commit ID that the router maintains for each configuration commit. The orchestrator retrieves this commit ID from the router using NETCONF Remote Procedure Calls (RPCs) to identify whether the router has the latest configuration.
Routing	
Multihop BFD over BVI	The multihop BFD over BVI feature introduces support for multihop BFD over Bridge Group Virtual Interface (BVI). A multihop BFD session can be set up between two endpoints that have IP connectivity. This session is set up between a unique source-destination address pair provided by the client. This feature allows you to extend BFD on arbitrary paths. These arbitrary paths can span multiple network hops, thereby detecting link failures.
Coexistence of BFD over bundle and BFD over logical bundle	This feature provides the benefits of both BOB and BLB. This feature enables you to configure both BFD over bundle (BOB) and BFD over logical bundle (BLB) over physical bundle interfaces and subinterfaces. BOB functionality allows you to detect failures in physical bundle interfaces. BLB functionality allows you to detect failures in the client protocols configured on the subinterfaces.
RIPv2	This feature enables RIP as the IGP of your network. RIP broadcasts UDP data packets to exchange routing information in networks that are flat rather than hierarchical, reducing network complexity and network management time.
Segment Routing	
Advertisement of Link Attributes for IS-IS Flexible Algorithm	Link attribute advertisements used during Flexible Algorithm path calculation must use the Application-Specific Link Attribute (ASLA) advertisements, as defined in IETF draft draft-ietf-lsr-flex-algo. This feature introduces support for ASLA advertisements during IS-IS Flexible Algorithm path calculation.
OSPF: Microloop Avoidance for Flexible Algorithm	This feature extends the current Microloop Avoidance functionality to support OSPF.
Path Invalidation Drop	By default, if an SR Policy becomes invalid (for example, if there is no valid candidate path available), traffic falls back to the native SR forwarding path. In some scenarios, a network operator may require that certain traffic be only carried over the path associated with an SR policy and never allow the native SR LSP to be used. This feature allows the SR policy to stay up in the control plane (to prevent prefixes mapped to the SR policy from falling back to the native SR LSP) but drop the traffic sent on the SR policy.

Feature	Description
Per-Flow Automated Steering: L3 / L2 BGP Services + BSID Steering	This feature introduces support for BGP VPNv6 (6VPE) and BGP EVPN (single-home/multi-homed) over PFP, labeled traffic (Binding SID as top-most label in the stack) steering over per-flow policy (PFP). An ingress QoS policy applied to an input interface is used to classify flows and set corresponding MPLS experimental values.
SR ECMP-FEC Optimization L2 and L3 Recursive Services	This feature adds support for L2VPN service Label Edge Router (LER) and BGP PIC for Layer 3 BGP services when SR ECMP-FEC Optimization is enabled.
TE Metric Support for IS-IS Flex Algo	Flexible Algorithm allows for user-defined algorithms where the IGP computes paths based on a user-defined combination of metric type (path optimization objective) and constraint. This feature add support for TE metric as a metric type for IS-IS Flexible Algorithm. This allows the TE metric, along with IGP and delay metrics, to be used when running shortest path computations.
Unprotected Adjacency SIDs	By default, the SR-TE process prefers the protected Adj-SID of the link if one is available. If there is no protected Adj-SID available, the policy will come up with unprotected Adj-SID. This feature allows you to specify the Adj-SID protection behavior of the SR-TE process to prefer the protected or unprotected Adj-SID, or to use only the protected or unprotected Adj-SID.
Link Anomaly Detection with IGP Penalty	This feature allows you to define thresholds above the measured delay that is considered “anomalous” or unusual. When this threshold is exceeded, an anomaly (A) bit/flag is set along with link delay attribute that is sent to clients.
System Management	
Smart Transport Support	You can now use Smart transport to communicate with CSSM. Smart transport is a transport method where a Smart Licensing (JSON) message is contained within an HTTPs message, and exchanged between a product instance and CSSM, to communicate. The following Smart transport configuration options are available: • Smart transport: In this method, a product instance uses a specific Smart transport licensing server URL. This must be configured exactly as shown in the workflow section. • Smart transport through an HTTPs proxy: In this method, a product instance uses a proxy server to communicate with the licensing server, and eventually, CSSM.

Feature	Description
YANG Data Models for Smart Licensing	With this feature, you can use data models for all the smart licensing operations such as registering your device with a token, renewing token ID, deregistering device to remove the software entitlements and so on using NETCONF remote procedure calls (RPCs). The following data models are introduced: • Cisco-IOS-XR-smart-license-cfg.yang • Cisco-smart-license.yang • Cisco-IOS-XR-smartlicense-platform-oper.yang • Cisco-IOS-XR-infra-smartlicense-oper.yang • Cisco-IOS-XR-smart-license-act.yang You can access these data models from the Github repository.
Essential and Advantage smart licenses in a combined entitlement	With this release, the Advanced licenses are now referred to as the Advantage licenses, without essential entitlement. Also, a new license model – Advantage with Essentials, has been introduced that contains both Essential and Advantage licenses as a combined entitlement in a single PID. This simplifies the license procurement and management effort by eliminating the need to procure separate PIDs for Essential and Advantage licenses.
System Setup	
Roll back to a previously-saved installation point	A maximum of 900MB of disk space is used to store all rollback points. You can delete older rollback points to make space for newer or smaller rollback points such as, SMUs. The following NCS 540 variants allow up to 900MB of disk space for rollback points: • N540-28Z4C-SYS-A/D • N540X-16Z4G8Q2C-A/D • N540-12Z20G-SYS-A/D • N540X-12Z16G-SYS-A/D This feature introduces the following commands: • install commit description—sets the description for a transaction ID • install label id *id* description *description*—adds a new description or overwrites the description of the specified transaction ID The following command is updated to include the keyword, oldest *n*: • clear install rollback oldest*n*—deletes the specified number of rollback points

Feature	Description
Support for loading an image over the network	There is no longer a need to copy an ISO image on the router to install XR7. Starting with this release, you can fetch an ISO or tar file of RPMs over the network as part of Install operation. You can also directly install the image from an FTP or HTTP server that hosts the image. The install source can also be a URL to a tar file (a file with extensions, .tar, .tgz, or .tar.gz). This feature modifies the following commands: • install replace • install package replace • install source • install package add source
System Security	
Support for Display Compact Option	This release introduces: • Display compact option in the dossier CLI, thereby allowing you to obtain IMA event logs in the **protobuf** format, which can be decoded at a client site. This provides flexibility to use any decoding mechanism. Use the `display compact` keyword with the existing `show platform security integrity dossier include system-integrity-snapshot` command.
Telemetry	
Filter Telemetry Data Using Regex Keys in Sensor Paths	Streaming huge telemetry data can create congestion in the network. With this feature, you can use the regular expression (regex) keys in the sensor path configuration on the router. The keys limit the amount of data that can be streamed, thereby ensuring better bandwidth utilization.

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

Feature	Description
System Security	
IMA Enforcement	Before this release, the Integrity Measurement Architecture (IMA) appraisal created an audit log when any executable on your system was modified without authorization. In this scenario, you could still open the compromised executable. In this release, the IMA enforces its appraisal instead of simply logging an issue. It does so by blocking any operation (open or run) for a compromised executable. This enforced mode of appraisal ensures a higher level of trust and security at runtime.

Feature	Description
CiscoSSH	CiscoSSH leverages OpenSSH implementation, by using the Linux TCP/IP stack to transmit and receive SSH packets over the management Ethernet interface and line card interfaces on the router. CiscoSSH provides additional security features like FIPS compliance and X.509 digital certification. It supports packet path features like MPP, ACL and VRF support, and ensures interoperability with various existing SSH implementations.
Hardware	
GPIO external alarms support on N540X-16Z4G8Q2C-A/D, and N540X-12Z16G-SYS-A/D	Effective Cisco IOS XR Release 7.4.1, you can enable external alarms, such as external doors, voltage, fire, thermal, water sensors, and so on, on the Cisco NCS 540 router variants. • N540X-16Z4G8Q2C-A/D • N540X-12Z16G-SYS-A/D For more information, see the Cisco NCS 540 Router Hardware Installation Guide.

The following feature is supported on N540-24Q8L2DD-SYS, N540-28Z4C-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, and N540X-8Z16G-SYS-A/D variants.

Feature	Description
System Security	
Secure Storage for Third Party Applications	In today's networking world, it is highly important to securely store, and control access and use of secrets. In earlier releases TAm services layer provided this functionality to all IOS XR based applications. In Release 7.4.1, the secure vault feature provides this functionality to non-native or third party applications running on your router.

The following features are supported only on N540X-4Z14G2Q-A/D variants.

Feature	Description
Network Synchronization	
ITU-T G.8262 / Y.1362 support on N540X-4Z14G2Q-A/D	ITU-T G.8262 support is now extended on the following Cisco NCS 540 router variants: • N540X-4Z14G2Q-A • N540X-4Z14G2Q-D
PTP Profiles Support on N540X-4Z14G2Q-A/D	PTP Profiles support is now extended on the following Cisco NCS 540 router variants: • N540X-4Z14G2Q-A • N540X-4Z14G2Q-D

Feature	Description
Support for Frequency Synchronization	Based on the ITU-T G.8262 recommendations, precision frequency is enabled on timing devices to deliver frequency synchronization for bandwidth, frequency accuracy, holdover, and noise generation. This support allows for correct network operations when synchronous equipment is timed from either another synchronous equipment clock or a higher-quality clock.
System Management	
Support for Flexible Consumption Model on N540X-4Z14G2Q-SYS-A/D	Support for Flexible Consumption Model (FCM) is now extended to the following Cisco NCS 540 variants: • N540X-4Z14G2Q-A • N540X-4Z14G2Q-D

The following feature is supported only on N540X-4Z14G2Q-A/D, and N540-24Q8L2DD-SYS variants.

Feature	Description
System Management	
Smart License support on N540X-4Z14G2Q-A/D, and N540-24Q8L2DD-SYS	Smart Licensing support is now extended on the following Cisco NCS 540 router variants: • N540X-4Z14G2Q-A • N540X-4Z14G2Q-D • N540-24Q8L2DD-SYS

Behavior Change Introduced in This Release

Note From Release 7.4.1 Control word is enabled by default. If the **control-word-disable** command is not configured, ensure to configure it under EVPN or EVI configuration mode before an upgrade to avoid inconsistent behaviour with routers running before Release 7.4.2.

If you want to enable **control-word** command for EVPN Bridging feature, then you must configure it only when both the endpoints run Release 7.4.1 or later.

Restrictions and Limitations on the Cisco NCS 540 Series Router

- Fabric multicast queue stats are not supported in N540X-8Z16G-SYS-A/D, N540X-6Z18G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.
- Unlabeled BGP PIC EDGE for global prefixes is not supported.
- The **show inventory** and the **show diagnostic** commands do not display the fan serial number for N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, and N540X-12Z16G-SYS-A/D variants.

- The interface ports 0/0/0/24 to 0/0/0/31 do not support 1G Copper SFPs on N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants. Also, these ports do not support Auto-Negotiation with 1GE optical SFPs and they cannot act as 1GE Synchronous Ethernet sources.
- The interface ports 0/0/0/20 to 0/0/0/27 do not support 1G Copper SFPs on N540X-16Z4G8Q2C-A and N540X-16Z4G8Q2C-D variants. Also, these ports do not support Auto-Negotiation with 1GE optical SFPs and they cannot act as 1GE Synchronous Ethernet sources.
- Remove the speed settings on the 1G Copper optics when 10M/100M is configured and replaced with 1G SFP optics.
- The **hw-module profile mfib statistics** command is not supported.

Caveats

This section describes open and resolved severity 1 and 2 caveats and select severity 3 caveats:

- The “Open Caveats” sections list open caveats that apply to the current release and may apply to previous releases. A caveat that is open for a prior release and is still unresolved applies to all future releases until it is resolved.
- The “Resolved Caveats” sections list caveats resolved in a specific release, but open in previous releases.

The bug IDs are sorted alphanumerically.

Note The Caveats section includes the bug ID and a short description of the bug. For details on the symptoms, conditions, and workaround for a specific caveat you must use the Bug Search Tool.

Cisco IOS XR Caveats Release 7.4.1

Bug ID	Headline
CSCvy99157	Yang response of "show install active" showing non xr packages.
CSCvy78718	CFM Rx Punt not Happening on J based boxes causing CFM Sessions to go Down
CSCvy84540	SSH failed when MPP is configured on MPLS-TE over physical and bundle interfaces

Bug Search Tool

Use the Cisco Bug Search Tool to access open and resolved bugs for a release.

The tool allows you to search for a specific bug ID, or for all bugs specific to a product and a release.

IOS XR 7.4.1 Base Images and Optional Packages

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

For general and ordering information see:

- Cisco Network Convergence System 540 Medium Density Routers Data Sheet
- Cisco Network Convergence System 540 Small Density Router Data Sheet
- Cisco Network Convergence System 540 Large Density Router Data Sheet

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

Release 7.4.1 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, and N540-12Z20G-SYS-A/D variants.
- The third table lists the supported software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D variants.

Table 1: Release 7.4.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	**Filename**	**Description**
IOS XR Base Image	ncs540-mini-x-7.4.1.iso	IOS XR mandato
USB Boot Package	ncs540-usb_boot-7.4.1.zip	Package required Includes the same
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r741.x86_64.rpm	Supports Extensil gRPC and HTTP
IOS XR MPLS	ncs540-mpls-1.0.0.0-r741.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r741.x86_64.rpm	Supports MPLS a
IOS XR Security	ncs540-k9sec-1.0.0.0-r741.x86_64.rpm	Supports MACse
IOS XR ISIS	ncs540-isis-1.0.0.0-r741.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r741.x86_64.rpm	Supports OSPF

IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r741.x86_64.rpm	Supports Law
IOS XR Multicast	ncs540-mcast-1.0.0.0-r741.x86_64.rpm	Supports Mul
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r741.x86_64.rpm	Supports EIG

Table 2: Release 7.4.1 Software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540-12Z20G-SYS-A/D

Base Image	**Filename**	**Description**
IOS XR Base Image	ncs540l-x64-7.4.1.iso	IOS XR base The base ISO • xr-bgp • xr-ipsla • xr-is-is • xr-lldp • xr-mcast • xr-mpls- • xr-ncs54 • xr-ncs54 • xr-netflo • xr-ospf • xr-perfm • xr-track These optiona
USB Boot Package	ncs540l-usb_boot-7.4.1.zip	Package requi Includes the s
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.4.1.tar	Supports Teln
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.4.1.tar	Supports EIG
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.4.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.4.1.tar	Supports 802.

Table 3: Release 7.4.1 Software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D

Base Image	Filename	Description
IOS XR Base Image	ncs540l-aarch64-7.4.1.iso	IOS XR base ima The ISO image al • xr-bgp • xr-ipsla • xr-is-is • xr-lldp • xr-mcast • xr-mpls-oam • xr-ncs540l-n • xr-ncs540l-n • xr-netflow • xr-ospf • xr-perfmgmt • xr-track These optional pa NCS540l-aarch64
USB Boot Package	ncs540l-aarch64-usb_boot-7.4.1.zip	Package required Includes the same
Optional Packages not included in the base image		
Package	**Filename**	**Description**
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.4.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.4.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.4.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.4.1.tar	Supports 802.1X

Determine Software Version

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

```
RP/0/RP0/CPU0:R1_PE1#show version
Thu Aug  5 08:53:27.783 IST
Cisco IOS XR Software, Version 7.4.1
```

```
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Aug  4 02:15:18 PDT 2021
 Built Host   : iox-lnx-011
 Workspace    : /auto/srcarchive17/prod/7.4.1/ncs540/ws
 Version      : 7.4.1
 Location     : /opt/cisco/XR/packages/
 Label        : 7.4.1

cisco NCS-540 () processor
System uptime is 5 minutes
```

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

```
RP/0/RP0/CPU0:R11_PE5_EG#show version
Thu Aug  5 09:17:11.416 IST
Cisco IOS XR Software, Version 7.4.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Wed Aug 04 08:42:35 UTC 2021
 Build Host   : iox-lnx-010
 Workspace    : /auto/srcarchive17/prod/7.4.1/ncs540l/ws
 Version      : 7.4.1
 Label        : 7.4.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540X-16Z4G8Q2C-A (C3708 @ 1.70GHz) processor with 8GB of memory
BB3_EG uptime is 57 minutes
Cisco NCS 540 System with 16x10G+4x1GCu+8x25G+2x100G AC Chassis
```

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

```
RP/0/RP0/CPU0:R1_PE1#show version
Thu Aug  5 08:40:32.022 IST
Cisco IOS XR Software, Version 7.4.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
 Built By     : ingunawa
 Built On     : Sat Jul 31 18:32:22 UTC 2021
 Build Host   : iox-lnx-010
 Workspace    : /auto/srcarchive17/prod/7.4.1/ncs540l/ws
 Version      : 7.4.1
 Label        : 7.4.1

cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
Arches_PE42 uptime is 29 minutes
Cisco NCS540 Series, Fixed Router 2x400G, 8x50G, 24x25G Chassis
```

Log in to the router and enter the **show version** command on the N540X-4Z14G2Q-A/D variants:

```
RP/0/RP0/CPU0:R1_PE1#show version
Thu Aug  5 07:49:27.846 IST
Cisco IOS XR Software, Version 7.4.1 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.

Build Information:
Built By     : ingunawa
Built On     : Wed Aug 04 08:28:43 UTC 2021
Build Host   : iox-lnx-021
```

```
Workspace    : /auto/srcarchive17/prod/7.4.1/ncs540l-aarch64/ws
Version      : 7.4.1
Label        : 7.4.1

cisco NCS540L
cisco N540X-4Z14G2Q-A processor with 8GB of memory
Fitzroy uptime is 9 hours, 40 minutes
Cisco NCS 540 Series Fixed Router 12x1G, 4xCu, 2x10G, 2x25G, AC
```

Determine Firmware Support

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

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

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Thu Aug  5 08:53:30.962 IST

================================ ================================================
                                        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     1.13      1.13      0.0
                     CPU-IOFPGA(A)              YES     0.07      0.07      0.0
                     MB-IOFPGA(A)               YES     0.23      0.23      0.0
                     MB-MIFPGA                  YES     0.05      0.05      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-M600-MCT(A)           NO      5.00      5.00      0.0
                     SATA-SMART-128G(A)         NO    1241.00   1241.00     0.0
------------------------------------------------------------------------------
N540-ACC-SYS         Bootloader(A)              YES     1.13      1.13      0.0
                     CPU-IOFPGA(A)              YES     0.07      0.07      0.0
                     MB-IOFPGA(A)               YES     0.23      0.23      0.0
                     MB-MIFPGA                  YES     0.05      0.05      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-M600-MCT(A)           NO      5.00      5.00      0.0
                     SATA-SMART-128G(A)         NO    1241.00   1241.00     0.0
------------------------------------------------------------------------------
N540-PWR400-D        PriMCU-DCFW(A)             NO      1.03      1.03      0.0
                     SecMCU-DCFW(A)             NO      1.03      1.03      0.0
------------------------------------------------------------------------------
N540X-ACC-SYS        Bootloader(A)              YES     1.13      1.13      0.0
                     CPU-IOFPGA(A)              YES     0.07      0.07      0.0
                     MB-IOFPGA(A)               YES     0.23      0.23      0.0
                     MB-MIFPGA                  YES     0.05      0.05      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-M600-MCT(A)           NO      5.00      5.00      0.0
                     SATA-SMART-128G(A)         NO    1241.00   1241.00     0.0
```

```
RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Thu Aug  5 08:53:34.103 IST

Auto-upgrade:Disabled
                                                                                FPD Versions
                                                                               ==============
Location   Card type             HWver FPD device       ATR Status    Running   Programd
-------------------------------------------------------------------------------------------
0/RP0      N540-ACC-SYS          1.0   MB-MIFPGA            CURRENT     0.05      0.05
0/RP0      N540-ACC-SYS          1.0   Bootloader           CURRENT     1.13      1.13
0/RP0      N540-ACC-SYS          1.0   CPU-IOFPGA           CURRENT     0.07      0.07
0/RP0      N540-ACC-SYS          1.0   MB-IOFPGA            CURRENT     0.23      0.23
0/RP0      N540-ACC-SYS          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 N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D and N540X-16Z4G8Q2C-A/D variants:

```
RP/0/RP0/CPU0:R11_PE5_EG#show fpd package
Thu Aug 5 09:17:16.358 IST

================================ ================================================
                                          Field Programmable Device Package
                                 ================================================
                                            Req      SW       Min Req   Min Req
Card Type            FPD Description       Reload   Ver      SW Ver    Board Ver
==================== ========================= ====== ======= ======== =========
-------------------------------------------------------------------------------
N540-12Z20G-SYS-A    ADMConfig                  YES     1.04      1.04       0.0
                     IoFpga                     YES     2.03      2.03       0.0
                     IoFpgaGolden               YES     2.03      2.03       0.0
                     Primary-BIOS               YES     1.32      1.32       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
-------------------------------------------------------------------------------
N540-12Z20G-SYS-D    ADMConfig                  YES     1.04      1.04       0.0
                     IoFpga                     YES     2.03      2.03       0.0
                     IoFpgaGolden               YES     2.03      2.03       0.0
                     Primary-BIOS               YES     1.32      1.32       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
-------------------------------------------------------------------------------
N540-28Z4C-SYS-A     ADMConfig                  YES     1.04      1.04       0.0
                     IoFpga                     YES     2.03      2.03       0.0
                     IoFpgaGolden               YES     2.03      2.03       0.0
                     Primary-BIOS               YES     1.32      1.32       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
-------------------------------------------------------------------------------
N540-28Z4C-SYS-D     ADMConfig                  YES     1.04      1.04       0.0
                     IoFpga                     YES     2.03      2.03       0.0
                     IoFpgaGolden               YES     2.03      2.03       0.0
                     Primary-BIOS               YES     1.32      1.32       0.0
                     StdbyFpga                  YES     0.40      0.40       0.0
                     StdbyFpgaGolden            YES     0.40      0.40       0.0
                     TamFw                      YES     4.11      4.11       0.0
                     TamFwGolden                YES     4.11      4.11       0.0
-------------------------------------------------------------------------------
```

```
N540X-12Z16G-SYS-A   ADMConfig                 YES     1.04      1.04      0.0
                     IoFpga                    YES     2.03      2.03      0.0
                     IoFpgaGolden              YES     2.03      2.03      0.0
                     Primary-BIOS              YES     1.32      1.32      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-12Z16G-SYS-D   ADMConfig                 YES     1.04      1.04      0.0
                     IoFpga                    YES     2.03      2.03      0.0
                     IoFpgaGolden              YES     2.03      2.03      0.0
                     Primary-BIOS              YES     1.32      1.32      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-A    ADMConfig                 YES     1.04      1.04      0.0
                     IoFpga                    YES     2.03      2.03      0.0
                     IoFpgaGolden              YES     2.03      2.03      0.0
                     Primary-BIOS              YES     1.32      1.32      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
--------------------------------------------------------------------------------
N540X-16Z4G8Q2C-D    ADMConfig                 YES     1.04      1.04      0.0
                     IoFpga                    YES     2.03      2.03      0.0
                     IoFpgaGolden              YES     2.03      2.03      0.0
                     Primary-BIOS              YES     1.32      1.32      0.0
                     StdbyFpga                 YES     0.40      0.40      0.0
                     StdbyFpgaGolden           YES     0.40      0.40      0.0
                     TamFw                     YES     4.11      4.11      0.0
                     TamFwGolden               YES     4.11      4.11      0.0
```

```
RP/0/RP0/CPU0:R1_PE1# show hw-module location all fpd
Thu Aug 5 09:17:21.334 IST

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                                        FPD Versions
                                                                        ==============
Location   Card type             HWver FPD device       ATR Status    Running Programd
Reload Loc
-------------------------------------------------------------------------------------------
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   ADMConfig            CURRENT    1.04    1.04
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   IoFpga               CURRENT    2.03    2.03
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   IoFpgaGolden     B   NEED UPGD          1.31
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   Primary-BIOS      S  CURRENT    1.32    1.32
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   StdbyFpga         S  CURRENT    0.40    0.40
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   StdbyFpgaGolden  BS  NEED UPGD          0.37
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   TamFw             S  CURRENT    4.11    4.11
  0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A     1.0   TamFwGolden      BS  CURRENT            4.11
  0/RP0
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-24Q8L2DD-SYS variant:

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Tue Aug  3 12:55:40.255 IST

================================ ============================================
                                        Field Programmable Device Package
                                 ============================================
                                           Req      SW       Min Req   Min Req
Card Type            FPD Description       Reload   Ver      SW Ver   Board Ver
================== ========================= ====== ======= ======== =========
------------------------------------------------------------------------------
N540-24Q8L2DD-SYS    ADM-DBConfig            YES     0.09      0.09      0.0
                     ADM-MBConfig            YES     0.09      0.09      0.0
                     IoFpga                  YES     2.12      2.12      0.0
                     IoFpgaGolden            YES     2.12      2.12      0.0
                     Primary-BIOS            YES     1.07      1.07      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

RP/0/RP0/CPU0:R1_PE1# show hw-module fpd
Tue Aug  3 12:56:07.888 IST

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                                          FPD Versions
                                                                         ==============
Location   Card type             HWver FPD device       ATR Status   Running Programd
Reload Loc
-------------------------------------------------------------------------------------------------
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   IoFpga               CURRENT    2.12    2.12
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   IoFpgaGolden     B   NEED UPGD          0.00
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   Primary-BIOS      S  CURRENT    1.07    1.07
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   StdbyFpga         S  CURRENT    2.59    2.59
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   StdbyFpgaGolden  BS  NEED UPGD          0.00
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   TamFw             S  CURRENT    6.05    6.05
  0/RP0
0/RP0/CPU0 N540-24Q8L2DD-SYS     2.0   TamFwGolden      BS  NEED UPGD          0.00
  0/RP0
```

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540X-4Z14G2Q-A/D variants:

```
RP/0/RP0/CPU0:R1_PE1# show fpd package
Thu Aug  5 07:49:53.553 IST

================================ ============================================
                                        Field Programmable Device Package
                                 ============================================
                                           Req      SW       Min Req   Min Req
Card Type            FPD Description       Reload   Ver      SW Ver   Board Ver
================== ========================= ====== ======= ======== =========
------------------------------------------------------------------------------
N540X-4Z14G2Q-A      BckUp-BootLoader        YES    20.04     20.04      0.0
                     IoFpga                  YES     0.15      0.15      0.0
                     IoFpgaGolden            YES     0.15      0.15      0.0
                     Prim-BootLoader         YES    20.04     20.04      0.0
                     StdbyFpga               YES     0.33      0.33      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      BckUp-BootLoader          YES    20.04     20.04      0.0
                     IoFpga                    YES     0.15      0.15      0.0
                     IoFpgaGolden              YES     0.15      0.15      0.0
                     Prim-BootLoader           YES    20.04     20.04      0.0
                     StdbyFpga                 YES     0.33      0.33      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:R1_PE1# show hw-module location all fpd
Thu Aug  5 07:49:43.859 IST

Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
                                                                          FPD Versions
                                                                          ============
Location   Card type             HWver FPD device       ATR Status    Running Programd
Reload Loc
-------------------------------------------------------------------------------------------
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2   IoFpga               CURRENT     0.15     0.15
  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      CURRENT    20.04    20.04
  0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2   StdbyFpga         S  CURRENT     0.33     0.33
  0/RP0
0/RP0/CPU0 N540X-4Z14G2Q-A       0.2   StdbyFpgaGolden   BS  NEED UPGD           0.00
  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
```

Other Important Information

Supported Transceiver Modules

For more information on the supported transceiver modules, see Transceiver Module Group (TMG) Compatibility Matrix. In the **Begin your Search** search box, enter the keyword NCS540 and click **Enter**.

Upgrading Cisco IOS XR Software

Cisco IOS XR Software is installed and activated from modular packages, allowing specific features or software patches to be installed, upgraded, or downgraded without affecting unrelated processes.

The upgrade document for N540-24Z8Q2C-SYS, N540X-ACC-SYS, and N540-ACC-SYS variants is available along with the software image in *NCS540-docs-7.4.1.tar* file.

The upgrade document for N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, and N540X-16Z4G8Q2C-A/D variants is available along with the software image in *NCS540l-docs-7.4.1.tar* file.

Use user-class Option 'xr-config' Instead Of 'exr-config' To Provision ZTP

In Cisco IOS XR Release 7.3.1 and earlier, the system accepts the device sending **user-class = "exr-config"**; however starting Cisco IOS XR Release 7.3.2 and later, you must use only **user-class = "xr-config"**.

In Cisco IOS XR Release 7.3.2 and later, use:

```
host cisco-rp0 {
   hardware ethernet e4:c7:22:be:10:ba;
   fixed-address 172.30.12.54;
   if exists user-class and option user-class = "iPXE" {
      filename = "http://172.30.0.22/boot.ipxe";
   } elsif exists user-class and option user-class = "xr-config" {
      filename = "http://172.30.0.22/scripts/cisco-rp0_ztp.sh";
   }
}
```

Additional References

Supported MIBs

The Cisco NCS 5500 MIB support list is also applicable to the Cisco NCS 540 Series Routers. For the list of supported MIBs, see the Cisco NCS5500 MIB Support List.