

Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.3.2

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Network Convergence System 540 Series Routers



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- Note** Cisco IOS XR Release 7.3.2 is an Extended Maintenance Release of [Cisco IOS XR Release 7.3.1](#) for Cisco NCS 540 Series routers. For more details on the Cisco IOS XR release model and associated support, see [Guidelines for Cisco IOS XR Software](#).
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What's New in Cisco IOS XR Release 7.3.2

Feature	Description
Hardware	

Feature	Description
Support for Cisco Network Convergence System 540 Fronthaul Routers	<p>The Cisco NCS 540 Fronthaul 1RU routers extend Cisco's mobile xHaul solution.</p> <p>The Cisco N540-FH-CSR-SYS router has the following network interfaces:</p> <ul style="list-style-type: none"> • 8 x Common Public Radio Interface (CPRI) (Option 3-8) • 4 x 1G/10G Ethernet or CPRI (Option 3-8) • 2 x 10G/25G TSN • 8 x 1G/10G • 4 x 1G/10G/25G • 2 x 100G <p>The Cisco N540-FH-AGG-SYS router has the following network interfaces:</p> <ul style="list-style-type: none"> • 24 x 1G/10G/25G or 10G/25G TSN or CPRI (Option 3-8) • 4 x 100G



Note Cisco N540-24Q8L2DD-SYS and N540X-4Z14G2Q-A/D routers are not supported in Cisco IOS XR Release 7.3.2.

The following features are supported only on N540-FH-CSR-SYS and N540-FH-AGG-SYS variants.

Feature	Description
L2VPN	
EVPN-VPWS support to RoE interface	This feature extends support in carrying the Radio over Ethernet (RoE) packets from Cell Site Router (CSR) to the aggregation router.
Modular QoS	
Low Latency Queuing for Specific QoS Flows	This feature allows you to configure low latency or priority for specific QoS flows at the class-level within a policy map. It enables delay-sensitive data to be prioritized and transmitted before other packets in other queues.

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	

Feature	Description
CiscoSSH	<p>This release introduces CiscoSSH, a newer implementation of SSH on NCS 540 Small Density, NCS 540 Large Density, NCS 540 Medium Density (except N540-ACC-SYS, NC540X-ACC-SYS, N540-24Z8Q2C-SYS variants).</p> <p>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.</p> <p>Note Cisco IOS XR SSH, the SSH implementation that existed prior to this release, is now deprecated on all variants of NCS 540 except for N540-ACC-SYS, NC540X-ACC-SYS, N540-24Z8Q2C-SYS.</p>
System Setup	
ZTP over Layer 2	<p>Previously available over Layer 3, this feature is now available to auto-provision your routers and DHCP devices on Layer 2 networks.</p> <p>This functionality is essential because many service provider topologies have services configured for various Layer 2 VLAN tags, requiring cost-effective and reliable provisioning.</p>

The following features are supported only on N540-ACC-SYS, N540X-ACC-SYS, N540-24Z8Q2C-SYS, N540-28Z4C-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, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D variants.

Feature	Description
System Security	
Graceful Termination of SSH Sessions	<p>This functionality gracefully terminates the active SSH sessions on the router by returning a successful exit code (0) to the SSH client. This functionality is mainly helpful for automation scenarios such as image installation on a router initiated by a client through an SSH session, where the router reloads automatically post-upgrade. This functionality existed earlier with Cisco IOS XR SSH and is now getting introduced with CiscoSSH.</p> <p>Without this functionality, the SSH sessions terminated abruptly by returning a failure error code (255) to the SSH client, causing the automation scripts to fail.</p> <p>The new functionality is applicable only for upgrade and router reload scenarios; not for RP failovers and active RP reload scenarios.</p>

Feature	Description
SSH Port Forwarding	<p>With this feature enabled, the SSH client on a local host forwards the traffic coming on a given port to the specified host and port on a remote server, through an encrypted SSH channel. Legacy applications that do not otherwise support data encryption can leverage this functionality to ensure network security and confidentiality to the traffic that is sent to remote application servers.</p> <p>This feature introduces the ssh server port-forwarding local command.</p> <p>Note For the following Cisco NCS 540 router variants, this feature is supported with Cisco IOS XR SSH:</p> <ul style="list-style-type: none"> • N540-ACC-SYS • N540X-ACC-SYS (Premium) • N540-24Z8Q2C-SYS <p>For all other Cisco NCS 540 router variants, this feature is supported with CiscoSSH, an OpenSSH-based implementation of SSH.</p>
Programmability	
Cisco IOS XR mpls-ping-act and Cisco IOS XR mpls-traceroute-act YANG data model	<p>This feature introduces the Cisco-IOX-XR-mpls-ping-act and Cisco-IOX-XR-mpls-traceroute-act YANG data models to accommodate OAM RPCs for MPLS and SR-MPLS.</p> <p>You can access these Cisco IOS XR native data models from the Github repository.</p>
Routing	
Fast Path - Graceful Conflict Identification or Resolution for Encapsulation-ID	
BGP	
BGP PIC: Export of Backup Path Agnostic to its Multipath Eligibility	<p>Prior to this release, you could only import the backup paths of a prefix to the respective VRFs only when the backup paths are multipath eligible. For backup paths to be multipath eligible, all the following attributes in the backup paths must be the same: weight, local preference, autonomous system path, origin code, Multi Exit Discriminator (MED), and Interior Gateway Protocol (iGP) distance. Also, the next hop router for each multipath must be different. This feature introduces flexibility to allow the import of backup paths to the VRF even if the said attributes are not the same.</p>
Segment Routing	
Dual-Stack L3VPNServices (IPv4, IPv6) (SRv6 Micro-SID)	<p>This feature introduces support for Dual-stack (VPNv4/VPNv6) VRFs. VPNv4/VPNv6 Dual-stack supports both IPv4 (uDT4) and IPv6 (uDT6) based SRv6 L3VPN service on the same interface, sub-interface, or VRF.</p>

Feature	Description
SRv6 Services: EVPN VPWS—All-Active Multi-Homing (SRv6 Micro SID)	<p>This feature provides an ELINE (P2P) service with all-active multihoming capability over an SRv6 network.</p> <p>All-Active Multi-Homing enables an operator to connect a customer edge (CE) device to two or more provider edge (PE) devices to provide load balancing and redundant connectivity. With All-Active Multi-Homing, all the PEs can forward traffic to and from the multi-homed device.</p>
BGP-LU Inter-AS Option-C Interworking with LDP and IGP SR-MPLS using Proxy BGP-SR	<p>This feature extends the current Proxy BGP-SR functionality by allowing the BGP-LU ASBR router with Proxy BGP-SR configured to also interconnect attached LDP domains.</p> <p>The Proxy BGP-SR feature allows interconnection of IGP SR-MPLS domains and legacy domains via BGP-LU Inter-AS option-C. It provides a prefix-to-SID mapping for BGP-LU prefixes that are learned without a Prefix-SID.</p>
SR-TE BGP Soft Next-Hop Validation For ODN Policies	<p>This feature addresses BGP Next-Hop reachability issues through BGP Next-Hop soft validation, and also enhances BGP best path selection.</p> <ul style="list-style-type: none"> • nexthop validation color-extcomm disable • nexthop validation color-extcomm sr-policy • bgp bestpath igp-metric sr-policy
SR-TE PCE Groups	<p>This feature allows an SR policy to be delegated to a set of PCE servers configured under a PCE group. Multiple PCE groups can be configured to allow SR policies on the same head-end to be delegated to different sets of PCEs.</p> <p>With this functionality, an operator can designate sets of PCEs for various purposes, such as PCE-per-service-type or PCE-per-wholesale-customers.</p>
Autoroute Include	<p>This feature allows you to steer specific IGP (IS-IS, OSPF) prefixes, or all prefixes, over non-shortest paths and to divert the traffic for those prefixes on to an SR-TE policy.</p>
SR-PCE: North-Bound API for SRv6 and Flexible Algorithm in Cisco Optimization Engine (COE) v3.0 release	<p>The SR-PCE provides a north-bound HTTP-based API to allow communication between SR-PCE and external clients and applications. The Cisco Crosswork Optimization Engine is an application that leverages the SR-PCE.</p> <p>This release adds support for the following:</p> <ul style="list-style-type: none"> • Reporting of Flexible Algorithm participation and definitions • SRv6 topology information (nodes, links, Node uSIDs and Adj uSIDs) • SRv6 uSID list and uB6 SIDs allocated for a policy <p>For more information, refer to the Cisco Crosswork Optimization Engine User Guides.</p>
IP Endpoint Delay Measurement and Liveness Monitoring	<p>This feature measures the end-to-end delay and monitors liveness of a specified IP endpoint node, including VRF-aware (awareness of multiple customers belonging to different VRFs).</p> <p>This feature is supported on IPv4, IPv6, and MPLS data planes.</p>

Feature	Description
OSPF: Microloop Avoidance for Flexible Algorithm	This feature extends the current OSPF Flexible Algorithm functionality to support Microloop Avoidance.
SRv6TE Phase1: PCC/PCE (PCEPv6) uSID Introduction - PCE Delegated, Constraints: Disjoint, affinity, Metric: IGP, TE, Latency, L3 Services ODN/AS	<p>This feature brings the Segment Routing Traffic Engineering features to the SRv6 data plane.</p> <p>This release supports the following features:</p> <ul style="list-style-type: none"> • SRv6-TE with SRv6 micro-SIDs (uSIDs) • SRv6 policies • Manual SRv6 policies • On-Demand SRv6 policies - SR On-Demand Next-Hop (SR-ODN) • Automated steering for Layer 3-based BGP services (IPv4 L3VPN, IPv6 L3VPN, IPv4 BGP global, IPv6 BGP global) • SRv6-aware Path Computation Element (PCE) • PCEPv6 • Path computation optimization objectives (TE, IGP, latency) • Path computation constraints (affinity, disjointness)

Behavior Change Introduced in This Release



Note The crypto fips-mode isn't supported on the following Cisco NCS 540 router variants:

- N540X-6Z18G-SYS-A
- N540X-6Z18G-SYS-D
- N540X-8Z16G-SYS-A
- N540X-8Z16G-SYS-D



Note Cisco IOS XR Release 7.3.2 introduces dual-rate optics support for N540-ACC-SYS, N540X-ACC-SYS, and N540-24Z8Q2C-SYS variants. If you use an optical transceiver, you must configure the interface speed to correctly match with the required transceivers speed.

Restrictions and Limitations on the Cisco NCS 540 Series Router

- FMQ stats are not supported in N540X-8Z16G-SYS-A/D, and N540X-6Z18G-SYS-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.
- 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 7.3.2

Caveat ID Number	Description
CSCvy13197	Telemetry Syslog events are not received by telemetry client.

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 7.3.2 Base Images and Optional Packages

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

For general and ordering information see:

- [Cisco Network Convergence System 540 Medium Density Routers Data Sheet](#)
- [Cisco Network Convergence System 540 Small Density Router Data Sheet](#)
- [Cisco Network Convergence System 540 Fronthaul Routers Data Sheet](#)

To install the Cisco NCS 540 Series Routers, see [Cisco NCS 540 Router Hardware Installation Guide](#).

Release 7.3.2 Software

The following tables list the supported base images and optional packages and their corresponding file names.

- The first table lists the supported software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants.
- The second table lists the supported software for N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, and N540-FH-AGG-SYS variants.
- The third table lists the supported software for N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D variants.

Table 1: Release 7.3.2 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.3.2.iso	IOS XR mandator
USB Boot Package	ncs540-usb_boot-7.3.2.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-r732.x86_64.rpm	Supports Extensibil gRPC and HTTP
IOS XR MPLS	ncs540-mpls-1.0.0.0-r732.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r732.x86_64.rpm	Supports MPLS a
IOS XR Security	ncs540-k9sec-1.1.0.0-r732.x86_64.rpm	Supports MACse
IOS XR ISIS	ncs540-isis-1.0.0.0-r732.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-2.0.0.0-r732.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r732.x86_64.rpm	Supports Lawful
IOS XR Multicast	ncs540-mcast-1.0.0.0-r732.x86_64.rpm	Supports Multica
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r732.x86_64.rpm	Supports EIGRP

Table 2: Release 7.3.2 Software for N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, and N540-FH-AGG-SYS

Base Image	Filename	Description
IOS XR Base Image	ncs540l-x64-7.3.2.iso	IOS XR base The base ISO <ul style="list-style-type: none"> • 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-7.3.2.zip	Package requi Includes the s
Optional Packages not included in the base image		
Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.3.2.tar	Supports Teln
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.3.2.tar	Supports EIG
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.3.2.tar	Supports CDF
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.3.2.tar	Supports 802.

Table 3: Release 7.3.2 Software for N540X-8Z16G-SYS-A/D and N540X-6Z18G-SYS-A/D

Base Image	Filename	Description
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IOS XR Base Image	ncs540l-aarch64-7.3.2.iso	IOS XR base ima The ISO image al <ul style="list-style-type: none"> • 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-7.3.2.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-7.3.2.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.3.2.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-aarch64-iosxr-optional-rpms-7.3.2.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-aarch64-k9sec-rpms.7.3.2.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
Fri Oct 15 13:32:26.069 IST
Cisco IOS XR Software, Version 7.3.2
Copyright (c) 2013-2021 by Cisco Systems, Inc.
```

```
Build Information:
  Built By      : ingunawa
  Built On     : Wed Oct 13 20:17:42 PDT 2021
```

```
Built Host   : iox-ucs-021
Workspace    : /auto/srcarchive17/prod/7.3.2/ncs540/ws
Version      : 7.3.2
Location     : /opt/cisco/XR/packages/
Label        : 7.3.2
```

```
cisco NCS-540 () processor
System uptime is 15 hours 53 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
Fri Oct 15 13:38:01.967 IST
Cisco IOS XR Software, Version 7.3.2 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Thu Oct 14 08:19:43 UTC 2021
Build Host    : iox-ucs-022
Workspace     : /auto/srcarchive17/prod/7.3.2/ncs5401/ws
Version       : 7.3.2
Label         : 7.3.2
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-28Z4C-SYS-A (C3708 @ 1.70GHz) processor with 8GB of memory
CL-PE1 uptime is 14 hours, 47 minutes
Cisco NCS 540 Series Fixed Router 28x10G, 4x100G
```

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

```
RP/0/RP0/CPU0:R15_PE7_GP#show version
Fri Oct 15 13:44:43.868 IST
Cisco IOS XR Software, Version 7.3.2 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Thu Oct 14 07:55:33 UTC 2021
Build Host    : iox-lnx-072
Workspace     : /auto/srcarchive17/prod/7.3.2/ncs5401-aarch64/ws
Version       : 7.3.2
Label         : 7.3.2
```

```
cisco NCS540L
cisco N540X-6Z18G-SYS-A processor with 8GB of memory
Darwin-PE6 uptime is 14 hours, 57 minutes
Cisco NCS 540 Series Fixed Router 18x1G, 6x1/10G, AC
```

Log in to the router and enter the **show version** command on the N540-FH-CSR-SYS and N540-FH-AGG-SYS variants:

```
RP/0/RP0/CPU0:R16_PE9_GP#show version
Cisco IOS XR Software, Version 7.3.2 LNT
Copyright (c) 2013-2021 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : ingunawa
Built On      : Thu Oct 14 08:19:43 UTC 2021
Build Host    : iox-ucs-022
Workspace     : /auto/srcarchive17/prod/7.3.2/ncs5401/ws
Version       : 7.3.2
Label         : 7.3.2
```

Determine Firmware Support

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
APE11 uptime is 12 hours, 8 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.

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
Fri Oct 15 13:32:32.823 IST
```

```
=====
```

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

N540-24Z8Q2C-M	Bootloader (A)	YES	1.14	1.14	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-M5100 (A)	NO	71.00	71.00	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	1.14	1.14	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-M5100 (A)	NO	71.00	71.00	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-A	LIT-PrimMCU-ACFW (A)	NO	0.04	0.04	0.0
	LIT-SecMCU-ACFW (A)	NO	0.07	0.07	0.0

N540-PWR400-D	LIT-PrimMCU-DCFW (A)	NO	0.04	0.04	0.0
	LIT-SecMCU-DCFW (A)	NO	0.06	0.06	0.0
	SDG-PrimMCU-DCFW (A)	NO	1.03	1.03	0.0
	SDG-SecMCU-DCFW (A)	NO	1.03	1.03	0.0

N540X-ACC-SYS	Bootloader (A)	YES	1.14	1.14	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-M5100 (A)	NO	71.00	71.00	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_PE2#show hw-module location all fpd
Fri Oct 15 13:32:46.184 IST
```

Auto-upgrade:Enabled

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0	N540-24Z8Q2C-M	1.0	MB-MIFPGA	CURRENT	0.05	0.05
0/RP0	N540-24Z8Q2C-M	1.0	Bootloader	CURRENT	1.14	1.14
0/RP0	N540-24Z8Q2C-M	1.0	CPU-IOFPGA	CURRENT	0.07	0.07
0/RP0	N540-24Z8Q2C-M	1.0	MB-IOFPGA	CURRENT	0.23	0.23
0/RP0	N540-24Z8Q2C-M	1.0	SATA-M500IT-MU-B	CURRENT	4.00	4.00
0/PM0	N540-PWR400-A		SDG-PrimCU-ACFW	NOT READY		
0/PM0	N540-PWR400-A		SDG-SecMCU-ACFW	NOT READY		
0/PM1	N540-PWR400-A	1.0	SDG-PrimCU-ACFW	CURRENT	0.00	0.00
0/PM1	N540-PWR400-A	1.0	SDG-SecMCU-ACFW	CURRENT	0.00	0.00

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-FH-CSR-SYS and N540-FH-AGG-SYS variants:

```
RP/0/RP0/CPU0:R11_PE5_EG#show fpd package
Fri Oct 15 13:38:08.673 IST
```

```
=====
```

Field Programmable Device Package

```
=====
```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-12Z20G-SYS-A	ADMConfig	YES	1.04	1.04	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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
N540-12Z20G-SYS-D	ADMConfig	YES	1.04	1.04	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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
N540-24Q28LDD-SYS	IoFpga	YES	2.01	0.00	0.0
	IoFpgaGolden	YES	2.01	0.00	0.0
	Primary-BIOS	YES	1.07	1.07	0.0
	StdbyFpga	YES	2.18	0.00	0.0
	StdbyFpgaGolden	YES	2.14	0.00	0.0
	TamFw	YES	2.06	0.00	0.0
	TamFwGolden	YES	2.06	0.00	0.0
N540-28Z4C-SYS-A	ADMConfig	YES	1.04	1.04	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	0.0

Determine Firmware Support

	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	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0

N540-FH-AGG-SYS	DpFpgaCpri	YES	0.20	0.20	0.0
	DpFpgaEth	YES	1.18	1.18	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.21	1.21	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	DpFpga	YES	0.19	0.19	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.21	1.21	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

N540X-12Z16G-SYS-A	ADMConfig	YES	1.04	1.04	0.0
	IoFpga	YES	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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	2.07	2.07	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.20	1.20	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

PWR-400W-ACPI	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

PWR-400W-DCPI	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

PWR-750W-ACPI	EM-PrimMCU	NO	1.02	1.02	0.0
	EM-SecMCU	NO	1.03	1.03	0.0

PWR-750W-DCPI	EM-PrimMCU	NO	1.03	1.03	0.0
	EM-SecMCU	NO	3.01	3.01	0.0

RP/0/RP0/CPU0:R11_PE5#show hw-module location all fpd
 Fri Oct 15 13:38:17.566 IST

Auto-upgrade:Enabled
 Attribute codes: B golden, P protect, S secure

Location Reload Loc	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	ADMConfig	CURRENT	1.04	1.04
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	IoFpga	CURRENT	2.07	2.07
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	IoFpgaGolden	B NEED UPGD		1.29
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	Primary-BIOS	S CURRENT	1.20	1.20
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	StdbyFpga	S CURRENT	0.40	0.40
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	StdbyFpgaGolden	BS NEED UPGD		0.00
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	TamFw	S CURRENT	4.11	4.11
0/RP0/CPU0 0/RP0	N540-28Z4C-SYS-A	2.0	TamFwGolden	BS NEED UPGD		2.04

RP/0/RP0/CPU0:PE1#show hw-module fpd

Auto-upgrade:Enabled
 Attribute codes: B golden, P protect, S secure

Location Reload Loc	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0/CPU0 0/RP0	N540-FH-AGG-SYS	1.0	DpFpgaCpri	CURRENT	0.20	0.20
0/RP0/CPU0 0/RP0	N540-FH-AGG-SYS	1.0	DpFpgaEth	CURRENT	1.18	1.18
0/RP0/CPU0 0/RP0	N540-FH-AGG-SYS	1.0	IoFpga	CURRENT	1.30	1.30
0/RP0/CPU0 0/RP0	N540-FH-AGG-SYS	1.0	IoFPgaGolden	B NEED UPGD		1.20

Determine Firmware Support

0/RP0/CPU0	N540-FH-AGG-SYS	1.0	Primary-BIOS	S	CURRENT	1.21	1.21
0/RP0							
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	StdbyFpga	S	CURRENT	0.46	0.46
0/RP0							
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	StdbyFpgaGolden	BS	NEED UPGD		0.00
0/RP0							
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	TamFw	S	CURRENT	6.05	6.05
0/RP0							
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	TamFwGolden	BS	NEED UPGD		6.04
0/RP0							
0/PM0	N540-PWR750-A	0.0	EM-PrimMCU		CURRENT	1.02	1.02
NOT REQ							
0/PM0	N540-PWR750-A	0.0	EM-SecMCU		CURRENT	1.03	1.03
NOT REQ							
0/PM1	N540-PWR750-A	0.0	EM-PrimMCU		CURRENT	1.02	1.02
NOT REQ							
0/PM1	N540-PWR750-A	0.0	EM-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 N540X-6Z18G-SYS-A/D, and N540X-8Z16G-SYS-A/D variants:

```
RP/0/RP0/CPU0:APE11#show fpd package
Fri Oct 15 13:44:49.252 IST
```

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

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req 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
N540X-6Z18G-SYS-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-6Z18G-SYS-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

N540X-8Z16G-SYS-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-8Z16G-SYS-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:R16_PE9_GP#show hw-module location all fpd
Fri Oct 15 13:44:59.449 IST
```

```
Auto-upgrade:Enabled
Attribute codes: B golden, P protect, S secure
```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
Reload Loc						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	IoFpga	CURRENT	0.15	0.15
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	IoFpgaGolden	B NEED UPGD		0.00
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	Prim-BootLoader	CURRENT	20.04	20.04
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	StdbyFpga	S CURRENT	0.33	0.33
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	StdbyFpgaGolden	BS NEED UPGD		0.00
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-A	0.2	TamFw	S CURRENT	6.05	6.05
0/RP0						
0/RP0/CPU0	N540X-6Z18G-SYS-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-7.3.2.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-7.3.2.tar* file.

The upgrade document for N540X-6Z18G-SYS-A/D and N540X-8Z16G-SYS-D variants is available along with the software image in *NCS540l-aarch64-docs-7.3.2.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";
  } elseif 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](#).



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