



# Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.11.1

First Published: 2023-12-08

## Network Convergence System 540 Series Routers

### What's New in Cisco IOS XR Release 7.11.1

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](#).

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

Feature	Description
<b>BGP</b>	
<a href="#">Peering Between BGP Routers Within the Same Confederation</a>	<p>You can now enable BGP peering between routers in the sub-autonomous system (AS) within a confederation to advertise specific router updates using iBGP. This capability ensures that the mesh of routers between sub-ASes in a confederation maintains consistent routing tables, ensuring proper network reachability. Enabling this feature helps improve preventing performance reduction and traffic management challenges.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"><li>• <code>allowconfedas-in</code></li></ul> <p><b>YANG Data Model</b></p> <ul style="list-style-type: none"><li>• New XPath for <code>Cisco-IOS-XR-ipv4-bgp-cfg.yang</code></li><li>• <code>Cisco-IOS-XR-um-router-bgp-cfg</code></li></ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>

Feature	Description
<a href="#">Virtual Routing Forwarding Next Hop Routing Policy</a>	<p>You can now enable a route policy at the BGP next-hop attach point to limit notifications delivered to BGP for specific prefixes, which equips you with better control over routing decisions, and allows for precise traffic engineering and security compliance for each VRF instance, and helps establish redundant paths specific to each VRF.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <p>Modified Command:</p> <ul style="list-style-type: none"> <li>The <a href="#">nexthop route-policy</a> command is extended to VRF address-family configuration mode.</li> </ul> <p><b>YANG Data Model</b></p> <ul style="list-style-type: none"> <li>New XPath for <ul style="list-style-type: none"> <li><code>Cisco-IOS-XR-ipv4-bgp-cfg.yang</code></li> <li><code>Cisco-IOS-XR-um-router-bgp-cfg</code></li> </ul> </li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<b>Segment Routing</b>	
<a href="#">Microloop Avoidance for IS-IS with Per-Prefix Filtering</a>	<p>Currently, when SR Microloop Avoidance for IS-IS is enabled, it applies to all prefixes.</p> <p>This feature allows you to selectively allow or deny specific IPv4 or IPv6 prefixes or routes that may cause microloops, which allows for efficient use of hardware resources and ensures overall network stability.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>The <a href="#">microloop avoidance segment-routing</a> command is modified with the new <b>route-policy name</b> option for IS-IS.</li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>This feature extends the native <code>Cisco-IOS-XR-um-router-isis-cfg.yang</code> model (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>

Feature	Description
<a href="#">IS-IS Flexible Algorithm with Exclude Maximum Delay Constraint</a>	<p>This feature enables you to configure topologies that exclude links that have delays over a specific threshold. This is especially critical for high-frequency trading applications, in satellite networks, or wherever there are fluctuations in link delays.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>The <b>router isis instance flex-algo algo</b> command is modified with the new <b>maximum-delay value</b> option.</li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>This feature extends the native Cisco-IOS-XR-clns-isis-cfg.yang model (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>
<a href="#">IS-IS Flexible Algorithm with Exclude Minimum Bandwidth Constraint</a>	<p>Traffic engineering in networks can be optimized by avoiding low-bandwidth links that may not be capable of handling high volumes of traffic.</p> <p>This feature allows you to use Flexible Algorithm to create topologies in your network that explicitly exclude high bandwidth traffic from utilizing links below a specified capacity. This constraint is achieved by introducing a new bandwidth-based metric type within the Flexible Algorithm framework. Links that do not satisfy the constraint are ignored when computing the associated Flexible Algorithm topology.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>The <b>router isis instance flex-algo algo</b> command is modified with the new <b>minimum-bandwidth value</b> option.</li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>This feature extends the native Cisco-IOS-XR-clns-isis-cfg.yang model (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>
<a href="#">SRv6 ESI Filtering</a>	<p>Split Horizon Group (SHG) labels and Ethernet Segment Identifier (ESI) filtering functionalities exist on MPLS underlay networks.</p> <p>This feature introduces ESI filtering functionality to SRv6 underlay networks, using the End.DT2M SRv6 endpoint behavior. This behavior uses the "Arg.FE2" argument for SRv6, which is similar to the SHG label for MPLS.</p> <p>This feature allows nodes to identify BUM traffic based on the advertised ESI and prevent a loop by avoiding re-broadcasting the same traffic back towards the access node.</p> <p>This functionality is enabled by default.</p>

Feature	Description
<a href="#">Path MTU discovery for SRv6 Packets on Ingress PE</a>	<p>This feature prevents packet losses when one SRv6-enabled router sends an oversized packet to another. The functionality enables a router to send an ICMP error message to the source in such cases, prompting the sender to resend a packet whose size is within the MTU value, thus ensuring the packet moves ahead. The feature is critical for SRv6-enabled routers as these routers don't support packet fragmentation.</p> <p>Previously, a router dropped oversized packets without notifying the source, resulting in packet loss.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>The <b>path-mtu</b> keyword is introduced in the <b>hw-module profile segment-routing srv6 mode</b> command.</li> </ul>
<a href="#">Two-Way Active Measurement Protocol Light Source Address Filtering</a>	<p>You can now restrict unauthorized users from sending packets to the network and prevent compromising the network security and reliability. For a destination UDP port, you can configure the list of IP addresses that can send Two-Way Active Measurement Protocol (TWAMP)-light packets to responder or querier nodes.</p> <p>In earlier releases, the responder or querier node accepted TWAMP-light packets from all IP addresses.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>The <b>querier</b> and <b>responder</b> keywords are introduced in the <b>performance-measurement protocol twamp-light measurement delay</b> command.</li> </ul> <p><b>YANG Data Models:</b></p> <ul style="list-style-type: none"> <li><code>Cisco-IOS-XR-um-performance-measurement-cfg.yang</code></li> <li><code>Cisco-IOS-XR-perf-meas-oper.yang</code></li> </ul> <p>See (<a href="#">GitHub</a>, <a href="#">Yang Data Models Navigator</a>)</p>
<a href="#">SR Policy Liveness Monitoring on Segment Routing over IPv6 (SRv6)</a>	<p>In segment routing over IPv6 (SRv6), you can now verify end-to-end traffic forwarding over an SR policy candidate path by periodically sending probe messages. Performance monitoring on an SRv6 network enables you to track and monitor traffic flows at a granular level.</p> <p>Earlier releases supported SR policy liveness monitoring over an SR policy candidate path on MPLS.</p>

Feature	Description
<a href="#">SRv6 Traffic Accounting</a>	<p>You can now enable the router to record the number of packets and bytes transmitted on a specific egress interface for IPv6 traffic using the SRv6 locator counter.</p> <p>You can use this data to create deterministic data tools to anticipate and plan for future capacity planning solutions.</p> <p>This feature introduces or modifies the following changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <b>accounting prefixes ipv6 mode per-prefix per-nexthop srv6-locators</b></li> </ul> <p><b>YANG Data Models:</b></p> <ul style="list-style-type: none"> <li>• Cisco-IOS-XR-accounting-cfg</li> <li>• Cisco-IOS-XR-fib-common-oper.yang</li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<a href="#">Maximum Paths Per IS-IS Flexible Algorithm Per Prefix</a>	<p>Previously, you could configure a maximum number of Equal-Cost Multi-path (ECMP) to be set for individual Flex Algorithms.</p> <p>This feature provides additional granularity to the IS-IS Maximum Paths Per-Algorithm feature by allowing you to specify a set of prefixes for Flexible Algorithm.</p> <p>Now you can achieve a balance between path diversity and computational and memory requirements by controlling the number of paths for each specific algorithm and destination prefix combination.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <b>maximum-paths route-policy <i>name</i></b></li> </ul> <p><b>YANG Data Models:</b></p> <ul style="list-style-type: none"> <li>• This feature extends the native <code>Cisco-IOS-XR-clns-isis-cfg.yang</code> model</li> </ul> <p>See <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a></p>

Feature	Description
<a href="#">Microloop Avoidance for OSPFv2 Single-Node Cost-in and Single-Node Cost-out Events</a>	<p>Microloops disrupt network connectivity and cause suboptimal routing decisions. This feature avoids microloops by implementing the Greedy walk algorithm, which is similar to TI-LFA computation.</p> <p>This feature extends the microloop avoidance support for additional scenarios in OSPFv2, such as cost-in and cost-out events.</p> <p>This feature introduces these changes:</p> <p><b>YANG Data Models:</b></p> <ul style="list-style-type: none"> <li>• <code>Cisco-IOS-XR-ipv4-ospf-oper.yang</code></li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<b>Modular QoS</b>	
<a href="#">Egress EXP bits Marking Support on Single-Label</a>	<p>With this feature support, you can now mark MPLS EXP bits on single-label scenario.</p> <p>You can now design the QoS for your network based on either single-label or global label. If the directly connected peer router doesn't advertise the explicit-null label, then the router encapsulates the packets with only the global label.</p> <p>Previously, the router was limited to mark MPLS EXP bits with a minimum of two labels. But even with a single EXP marking, you can prioritize certain types of traffic over others based on their importance.</p>
<a href="#">Burst Size for Port-Level Shaper</a>	<p>Introduced in this release on:</p> <p>You can now achieve a predictable and accurate burst size at the link level by configuring port-level shaper burst size, thus ensuring better adherence to traffic SLAs. Also, with the port-level shaper burst size configured in the egress policy maps, the predictability in peak burst ensures that you can configure any next-hop low-capacity device to handle these bursts.</p> <p>Previously, you could configure burst sizes, which impacted traffic flow only at the Virtual Output Queue (VOQ) level but didn't control packet transmission at the link level.</p>

Feature	Description
<a href="#">View Packet Processing and Traffic Management Resources</a>	<p>You can now view the utilization of some packet processing and traffic management resources, such as policer banks and connectors. Insights into their consumption and availability help you prevent or mitigate an Out of Resource (OOR) situation, thus ensuring optimal QoS operations with minimal impact on network performance.</p> <p>The feature introduces the following changes:</p> <p><b>CLI:</b></p> <p><a href="#">show controllers npu resources qos</a></p> <p><b>YANG:</b></p> <ul style="list-style-type: none"> <li>• Cisco-IOS-XR-fretta-bcm-dpa-qos-resources-oper</li> <li>• Cisco-IOS-XR-5500-qos-oper</li> <li>• Cisco-IOS-XR-fretta-bcm-dpa-qos-rate-profile-resources-oper</li> <li>• Cisco-IOS-XR-fretta-bcm-dpa-qos-egq-resources-oper</li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<b>Multicast</b>	
<a href="#">EVPN All-Active Multi-homed Multicast Source Behind a BVI</a>	<p>We have enhanced multicast routing efficiency, load balancing, and latency in EVPN topology by optimizing redundancy and enabling support for All-Active (AA) multicast multi-homed sources. The multi-homed multicast data sources are located behind a Bridge-Group Virtual Interface (BVI), while multicast receivers can be in either the core or a bridge domain.</p> <p>This feature introduces the following changes:</p> <ul style="list-style-type: none"> <li>• <b>CLI</b> <ul style="list-style-type: none"> <li>• The <b>ole-collapse-disable</b> keyword is introduced in the <a href="#">hw-module multicast evpn</a> command.</li> </ul> </li> <li>• <b>YANG Data Model</b> <ul style="list-style-type: none"> <li>• New leaf <b>evpn-ole-collapse-disable</b> added in <code>Cisco-IOS-XR-fia-hw-profile-cfg.yang</code> (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>).</li> </ul> </li> </ul>

Feature	Description
<a href="#">Statistics for Egress Multicast Traffic Route Rate</a>	<p>With the ability to now view the route rates or rate of data being forwarded or transmitted per interface, you can monitor your network performance at a granular level, effectively troubleshoot network issues, and have greater control over bandwidth management.</p> <p>Previously, you could view the route rates only at the line card level.</p> <p>This feature introduces the following changes:</p> <ul style="list-style-type: none"> <li>• <b>CLI</b> <ul style="list-style-type: none"> <li>• The <b>rate</b> keyword is introduced in the <a href="#">show mrib route</a> command.</li> </ul> </li> <li>• <b>YANG Data Model</b> <ul style="list-style-type: none"> <li>• New XPathS for <code>Cisco-IOS-XR-mfwd-oper.yang</code> (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>).</li> </ul> </li> </ul>
<a href="#">MLD Snooping Synchronization for EVPN Multi-Homing</a>	<p>The Designated Forwarder (DF) PE router in an EVPN multi-homed network can now efficiently forward multicast traffic from the source to the interested receivers, avoiding unnecessary replication and reducing network bandwidth consumption.</p> <p>This is made possible by introducing support for Multicast Listener Discovery, MLDv1, and MLDv2 (IPv6) snooping state synchronization for EVPN multi-homing peers or provider edge (PE) devices, expanding the scope of the previous support for IGMP (IPv4) snooping state synchronization.</p>
<b>System Security</b>	



Feature	Description
<a href="#">Multiple Public Keys per User for Public Key-based Authentication</a>	<p>We provide greater flexibility to access secure routers by allowing four public keys to be used for authentication. With the ability to associate multiple public keys with your user account on the router, we've also simplified the authentication process by eliminating the need to create unique users for each SSH client device.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• The <b>second</b> , <b>third</b> , and <b>fourth</b> keywords are introduced in the <a href="#">crypto key import authentication rsa</a> command.</li> <li>• The <b>second</b>, <b>third</b>, and <b>fourth</b> keywords are introduced in the <a href="#">crypto key zeroize authentication rsa</a> command.</li> <li>• The <b>second</b>, <b>third</b>, and <b>fourth</b> keywords are introduced in the <a href="#">keystring</a> command.</li> </ul> <p><b>YANG Data Models:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">Cisco-IOS-XR-crypto-act</a></li> <li>• <a href="#">Cisco-IOS-XR-um-ssh-cfg</a></li> </ul> <p>(See <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<a href="#">Support for Non-Default SSH Ports on Cisco NCS 540 series routers that run on Cisco IOS XR7</a>	<p>Non-default SSH port is now supported on all variants of Cisco NCS 540 series routers, include the variants that run on Cisco IOS XR7.</p>
<b>Programmability</b>	
<a href="#">Automatic Resynchronization of OpenConfig Configuration</a>	<p>OpenConfig infrastructure can now reapply all the OpenConfig configurations automatically if there are any discrepancies in the running configuration.</p> <p>With this feature, there is no need for manual replacement of the OpenConfig configuration using Netconf or gNMI.</p> <p>The re-sync operation is triggered if the running configurations and the OpenConfig configuration go out of sync after any system event that removes some running configurations from the system. A corresponding system log gets generated to indicate the re-sync status.</p>

Feature	Description
<a href="#">gRPC Network Security Interface</a>	<p>This release implements authorization mechanisms to restrict access to gRPC applications and services based on client permissions. This is made possible by introducing an authorization protocol buffer service for gRPC Network Security Interface (gNSI).</p> <p>Prior to this release, the gRPC services in the gNSI systems could be accessed by unauthorized users.</p> <p>This feature introduces the following change:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">gnsi load service authorization policy</a></li> <li>• <a href="#">show gnsi service authorization policy</a></li> </ul> <p>To view the specification of gNSI, see <a href="#">Github</a> repository.</p>

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

Feature	Description
<b>Network Synchronization</b>	
<a href="#">Enhanced SyncE and extended ESMC</a>	<p>ITU-T G.8262.1 recommendation defines the requirements for timing devices used in synchronizing network equipment. For example, bandwidth, frequency accuracy, holdover, and noise generation.</p> <p>With Enhanced SyncE (eSyncE) and Extended Ethernet Synchronization Message Channel (eESMC) support, the NCS 540 Series Routers are capable of handling the following SyncE clocks on the network:</p> <ul style="list-style-type: none"> <li>• Enhanced primary reference clock (ePRC)</li> <li>• Enhanced primary reference timing clock (ePRTC)</li> </ul> <p>In this release, eSyncE and eESMC are supported on the following Cisco NCS 540 router variants:</p> <ul style="list-style-type: none"> <li>• N540-6Z14S-SYS-D</li> <li>• N540-6Z18G-SYS-A/D</li> <li>• N540X-4Z14G2Q-A/D</li> <li>• N540X-8Z16G-SYS-A/D</li> <li>• N540X-6Z18G-SYS-A/D</li> <li>• N540X-16Z4G8Q2C-A/D</li> <li>• N540-24Q8L2DD-SYS</li> </ul>

Feature	Description
<a href="#">PTP and SyncE support on breakout ports for N540-24Q8L2DD-SYS and N540X-16Z4G8Q2C-A/D Routers</a>	<p>With this release, timing support for PTP and SyncE is extended to 4x10G and 4x25G breakout ports of N540-24Q8L2DD-SYS and N540X-16Z4G8Q2C-A/D Routers.</p> <p>Class B and Class C performances are supported on 4x10G and 4x25G breakout ports in N540-24Q8L2DD-SYS and N540X-16Z4G8Q2C-A/D Routers.</p>

The following feature is supported on N540-ACC-SYS variant.

Feature	Description
<b>Network Synchronization</b>	
<a href="#">TSoP Smart SFP for SDH and SONET Encapsulation</a>	<p>This release introduces support for the Clear Channel Synchronous Transport Module Level-1 (STM1) Smart SFP (SFP-TS-OC3STM1-I) for the Transparent SONET or SDH over Packet (TSoP) protocol. This allows you to leverage your existing packet-switched network to transport traditional time-division multiplexing (TDM) traffic. TSoP Smart SFPs offer the following advantages:</p> <ul style="list-style-type: none"> <li>• Encapsulation of SDH or SONET bit streams into packet-switched network format</li> <li>• Improved suitability for pseudowire transport over an Ethernet network</li> </ul>

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

Feature	Description
<b>Interface and Hardware Component</b>	
<a href="#">Partial 4x100G and 2x100G Breakout Port Support</a>	<p>A breakout interface allows to split the high-density port into multiple lower-density ports.</p> <p>You can now configure 4x100G, 3x100G, 2x100G, and 1x100G for 400G breakout ports, and 2x100G, and 1x100G, for 200G breakout ports.</p> <p>Breakout port is supported on the following Cisco NCS 540 router variant:</p> <ul style="list-style-type: none"> <li>• N540-24Q8L2DD</li> </ul> <p>With breakout interfaces, you can eliminate the need for more network devices or modules.</p>
<a href="#">Optimized Bandwidth Allocation for 3x100G Breakout</a>	<p>Improved bandwidth allocation for 3x100G breakout by utilizing 300G bandwidth. Previously, 400G bandwidth was allocated for configuring 3x100G breakouts, resulting in 100G of unused bandwidth. This enhancement reduces unused bandwidth and optimizes overall bandwidth allocation.</p>

Feature	Description
<a href="#">Disable Auto-Squelch on Coherent Optics</a>	<p>This release introduces the support to disable auto-squelch on coherent optics. By disabling auto-squelch, you can detect weak signals embedded within the laser source noise and simultaneously reduce processing overhead in systems with stable laser sources and minimal noise. When laser squelch is enabled, the system shuts down the laser in case of an Optical Transport Network (OTN) failure.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">host auto-squelch disable</a></li> </ul> <p><b>YANG DATA models:</b></p> <ul style="list-style-type: none"> <li>• New XPathS for <code>Cisco-IOS-XR-controller-optics-cfg</code> (see <a href="#">Github</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>
Feature	Feature
<b>Application Hosting</b>	
<a href="#">Cisco Secure DDoS Edge Protection</a>	<p>We have now moved DDoS protection to the network edge, ensuring you can mitigate any DDoS attacks at the ingress points and minimize the impact of such attacks on your network and applications running on it. This solution deploys a centralized controller that manages a distributed network of edge detectors that analyze and mitigate threats across networks.</p>

## 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
<b>Programmability</b>	
openconfig-system.yang Version 0.13.1	This OpenConfig data model is revised from version 0.6.0 to 0.13.1. There are no functional changes between these two versions.
openconfig-vlan.yang Version 3.2.2	This OpenConfig data model is revised from version 3.2.0 to 3.2.2. There are no functional changes between these two versions.
openconfig-mpls-static.yang Version 3.3.0	The OpenConfig data model is revised from version 3.2.2 to 3.3.0. There are no functional changes between these two versions.
openconfig-lldp.yang	<p>This OpenConfig data model supports streaming model-driven telemetry (MDT) data for the leaves deviated in the previous releases.</p> <p>You can stream cadence-driven telemetry data for the following nodes:</p> <ul style="list-style-type: none"> <li>• Retrieve the counters cleared and the number number of valid TLVs received using last-clear and tlv-accepted leaves</li> <li>• Gather data about LLDP interface counters using frame-in, frame-out, frame-error-in, frame-discard, tlv-discard, tlv-unknown, last-clear, and frame-error-out leaves</li> <li>• Stream operational state data for LLDP neighbors using age and last-update leaves</li> </ul> <p>You can stream event-driven telemetry (EDT) data for system-name, system-description, chassis-id, and chassis-id-type leaves.</p>

Feature	Description
openconfig-spanning-tree.yang Version 0.3.1	<p>This release introduces support for this OpenConfig data model to define the configuration and operational state data for Spanning Tree Protocol (STP). The protocol creates a spanning tree that can span all routers in the network, it then disables the links that are not part of the spanning tree, leaving a single active path between any two network nodes. Using this data model, you can configure STP for a loop free topology within Ethernet networks, allowing redundancy within the network to deal with link failures.</p> <p><b>Note</b> The following limitations apply when using this data model:</p> <ul style="list-style-type: none"> <li>• Rapid Spanning Tree Protocol (RSTP), which is an evolution of the original STP that provides faster convergence after a topology change, is not supported in IOS XR and is not configurable using the data model</li> <li>• Streaming telemetry data for the operational state of nodes is not supported</li> <li>• Instances of Multiple Spanning Tree Protocol (MSTP), which creates multiple spanning tree instances for each VLAN is configured using <b>mst-id</b> node. Configuring this node with value 0 is not supported</li> </ul>
openconfig-spanning-tree-types.yang Version 0.4.1	<p>This release introduces support for this OpenConfig data model to define the types related to the <b>openconfig-spanning-tree.yang</b> model. This data model provides a way to consistently manage STP on the devices to increase network reliability and performance by preventing network loops.</p>
Cisco-IOS-XR-um-performance-measurement-cfg.yang	<p>This unified data model is enhanced as follows:</p> <ul style="list-style-type: none"> <li>• New containers <i>allow-querier</i> and <i>allow-responder</i>, to configure the list of IP addresses that can send TWAMP-light packets to responder or querier nodes.</li> <li>• A new container, <i>flow-label</i>, to monitor the liveness of multiple paths for a given segment list.</li> </ul>

Feature	Description
Cisco-IOS-XR-perf-meas-oper.yang	<p>This native data model is enhanced as follows:</p> <ul style="list-style-type: none"> <li>• New containers, <i>allowed-responder-summary</i> and <i>allowed-querier-summary</i>, to configure the list of IP addresses that can send TWAMP-light packets to responder or querier nodes.</li> <li>• New container, <i>usid-info</i>, and new leaves such as <i>sid-value</i>, <i>usid-length</i>, <i>sid-format</i>, and <i>sid-behavior</i> in the <i>PM-USID-INFO</i> grouping, to monitor the liveness of a SRv6 candidate path.</li> </ul>
Cisco-IOS-XR-infra-xtc-agent-cfg.yang	<p>This native data model is enhanced with a new leaf, <i>minimum-active-segment-lists</i>, to configure the minimum number of active segment lists associated with the candidate path.</p>
Cisco-IOS-XR-crypto-act.yang	<p>This native data model is enhanced with a new leaf, <i>key-num</i>, under the following containers:</p> <p><i>key-import-authentication-rsa</i>: To import SSH public keys to the router for the currently logged-in user</p> <p><i>key-import-authentication-rsa-username</i>: To import SSH public keys to the router for a specific user</p> <p><i>key-zeroize-authentication-rsa</i>: To delete SSH public keys in the router for the currently logged-in user</p> <p><i>key-zeroize-authentication-rsa-username</i>: To delete SSH public keys in the router for a specific user</p> <p>The data model supports the following values for the <i>key-num</i> leaf:</p> <ul style="list-style-type: none"> <li>• 2: second key</li> <li>• 4: third key</li> <li>• 8: fourth key</li> </ul>

Feature	Description
Cisco-IOS-XR-um-ssh-cfg.yang	<p>This unified data model is enhanced with the following new leaves under the <code>ssh server username</code> container to add up to 4 multiple public keys per user for public key-based authentication.</p> <p><code>keystring-second</code>: Adds a second SSH public key for a user in the router.</p> <p><code>keystring-third</code>: Adds a third SSH public key for a user in the router.</p> <p><code>keystring-fourth</code>: Adds a fourth SSH public key for a user in the router.</p>

## 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](#).

There are no new hardware features introduced in this release.

## Behavior Changes

- 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 indexaddress ipv4 address` command.

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

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

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

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



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

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

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

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

## Restrictions and Limitations on the Cisco NCS 540 Series Router

- 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 for 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 7.11.1 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 7.11.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS**

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.11.1.iso	IOS XR mandatory base image.
USB Boot Package	ncs540-usb_boot-7.11.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
<b>Optional Packages not included in the base image</b>		
Package	Filename	Description
IOS XR Manageability	ncs540-mgbl-1.0.0.0-r7111.x86_64.rpm	Supports Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server
IOS XR MPLS	ncs540-mpls-1.0.0.0-r7111.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r7111.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE)
IOS XR Security	ncs540-k9sec-1.0.0.0-r7111.x86_64.rpm	Supports MACsec and 802.1X
IOS XR ISIS	ncs540-isis-1.0.0.0-r7111.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r7111.x86_64.rpm	Supports OSPF

IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r7111.x86_64.rpm	Supports Lawful Intercept (LI)
IOS XR Multicast	ncs540-mcast-1.0.0.0-r7111.x86_64.rpm	Supports Multicast
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r7111.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r7111.x86_64.rpm	Supports LI-CTRL

**Table 2: Release 7.11.1 Software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, N540X-16Z8Q2C-D and N540-FH-AGG-SYS**

Base Image	Filename	Description
IOS XR Base Image	ncs540l-x64-7.11.1.iso	<p>IOS XR base image with mandatory packages.</p> <p>The base ISO image also includes the following optional packages:</p> <ul style="list-style-type: none"> <li>• xr-bgp</li> <li>• xr-cdp</li> <li>• xr-eigrp</li> <li>• xr-ipsla</li> <li>• xr-is-is</li> <li>• xr-k9sec</li> <li>• xr-lictrl</li> <li>• xr-lldp</li> <li>• xr-mcast</li> <li>• xr-mpls-oam</li> <li>• xr-netflow</li> <li>• xr-ospf</li> <li>• xr-perf-meas</li> <li>• xr-perfmgmt</li> <li>• xr-rip</li> <li>• xr-telnet</li> <li>• xr-track</li> </ul> <p>These optional packages are also included in NCS540l-iosxr-7.11.1.tar.</p>

USB Boot Package	ncs540l-usb_boot-7.11.1.zip	Package required to perform USB Boot. Includes the same packages as the base image.
<b>Optional Packages not included in the base image</b>		
<b>Package</b>	<b>Filename</b>	<b>Description</b>
IOS XR Telnet (xr-telnet)	NCS540l-iosxr-7.11.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.11.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.11.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.11.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540l-iosxr-7.11.1.tar	Supports RIP

**Table 3: Release 7.11.1 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-aarch64-7.11.1.iso	<p>IOS XR base image with mandatory packages.</p> <p>The ISO image also includes the following optional packages:</p> <ul style="list-style-type: none"> <li>• xr-bgp</li> <li>• xr-cdp</li> <li>• xr-eigrp</li> <li>• xr-ipsla</li> <li>• xr-is-is</li> <li>• xr-k9sec</li> <li>• xr-lictrl</li> <li>• xr-lldp</li> <li>• xr-mcast</li> <li>• xr-mpls-oam</li> <li>• xr-ncs540l-mcast</li> <li>• xr-ncs540l-netflow</li> <li>• xr-netflow</li> <li>• xr-ospf</li> <li>• xr-perf-meas</li> <li>• xr-perfmgmt</li> <li>• xr-rip</li> <li>• xr-telnet</li> <li>• xr-track</li> </ul> <p>These optional packages are also included in NCS540l aarch64 iosxr optional rpms-7.11.1.tar.</p>
USB Boot Package	ncs540l-aarch64-usb_boot-7.11.1.zip	<p>Package required to perform USB Boot.</p> <p>Includes the same packages as the base image.</p>
<b>Optional Packages not included in the base image</b>		
<b>Package</b>	<b>Filename</b>	<b>Description</b>
IOS XR Telnet (xr-telnet)	NCS540l-aarch64-iosxr-optional-rpms-7.11.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-aarch64-iosxr-optional-rpms-7.11.1.tar	Supports EIGRP

IOS XR CDP (xr-cdp)	NCS5401-aarch64-iosxr-optional-rpms-7.11.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS5401-aarch64-k9sec-rpms.7.11.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS5401-aarch64-iosxr-optional-rpms-7.11.1.tar	Supports RIP

## Determine Software Version

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.11.1
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
  Built By      : deenayak
  Built On      : Sun Dec  3 14:56:03 PST 2023
  Built Host    : iox-ucs-037
  Workspace     : /auto/srcarchive14/prod/7.11.1/ncs540/ws
  Version       : 7.11.1
  Location      : /opt/cisco/XR/packages/
  Label        : 7.11.1

cisco NCS-540 () processor
System uptime is 57 minutes
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.11.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
  Built By      : deenayak
  Built On      : Sun Dec 03 03:52:54 UTC 2023
  Built Host    : iox-lnx-157
  Workspace     : /auto/srcarchive14/prod/7.11.1/ncs5401/ws/
  Version       : 7.11.1
  Label        : 7.11.1

cisco NCS540L (C3708 @ 1.70GHz)
cisco N540X-16Z4G8Q2C-A (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 2 days, 20 hours, 10 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 N540X-4Z14G2Q-A/D, N540-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, and N540X-6Z18G-SYS-A/D variants:

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.11.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
  Built By      : deenayak
  Built On      : Sun Dec 03 03:52:54 UTC 2023
  Built Host    : iox-lnx-157
  Workspace     : /auto/srcarchive14/prod/7.11.1/ncs5401-aarch64/ws/
  Version       : 7.11.1
```

```
Label          : 7.11.1
```

```
cisco NCS540L
cisco N540X-6Z18G-SYS-A processor with 8GB of memory
ROUTER uptime is 2 days, 11 hours, 36 minutes
Cisco NCS 540 Series Fixed Router 18x1G, 6x1/10G, AC
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.11.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
Built By      : deenayak
Built On     : Sun Dec 03 03:52:54 UTC 2023
Build Host   : iox-lnx-157
Workspace    : /auto/srcarchive14/prod/7.11.1/ncs5401/ws/
Version     : 7.11.1
Label       : 7.11.1
```

```
cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
ROUTER uptime is 2 days, 22 hours
Cisco NCS540 Series, Fixed Router 2x400G, 8x50G, 24x25G Chassis
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.11.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.

Build Information:
Built By      : deenayak
Built On     : Sun Dec 03 03:52:54 UTC 2023
Build Host   : iox-lnx-157
Workspace    : /auto/srcarchive14/prod/7.11.1/ncs5401/ws/
Version     : 7.11.1
Label       : 7.11.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-CSR-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 21 hours, 44 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
```

## Determine Firmware Support

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-24Z8Q2C-M	Bootloader (A)	YES	1.16	1.16	0.0
	CPU-IOPFGA (A)	YES	0.10	0.10	0.0
	MB-IOPFGA (A)	YES	0.27	0.27	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	1427.00	1427.00	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

## Determine Firmware Support

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	1.16	1.16	0.0
	CPU-IOFPGA (A)	YES	0.10	0.10	0.0
	MB-IOFPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.08	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	1427.00	1427.00	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

## Determine Firmware Support

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
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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
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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
-----					
N540-X-24Z8Q2C-M	Bootloader (A)	YES	1.16	1.16	0.0
	CPU-IOFPGA (A)	YES	0.10	0.10	0.0
	MB-IOFPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.08	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	1427.00	1427.00	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

## Determine Firmware Support

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	1.16	1.16	0.0
	CPU-IOFPGA (A)	YES	0.10	0.10	0.0
	MB-IOFPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.08	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	1427.00	1427.00	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

## Determine Firmware Support

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

## Determine Firmware Support

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
```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0	N540-24Z8Q2C-M	0.4	MB-MIFPGA	CURRENT	0.08	0.08
0/RP0	N540-24Z8Q2C-M	0.4	Bootloader	CURRENT	1.16	1.16
0/RP0	N540-24Z8Q2C-M	0.4	CPU-IOFPGA	CURRENT	0.10	0.10
0/RP0	N540-24Z8Q2C-M	0.4	MB-IOFPGA	CURRENT	0.27	0.27
0/RP0	N540-24Z8Q2C-M	0.4	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, N540X-16Z8Q2C-D, and N540X-16Z4G8Q2C-A/D variants:

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

```
=====
```

Field Programmable Device Package						
Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver	
-----						
N540-12Z20G-SYS-A	ADM_FW	YES	14.03	14.03	0.0	
	ADMConfig	NO	1.05	1.05	0.0	
	IoFpga	YES	3.08	3.08	0.0	
	IoFpgaGolden	YES	2.07	2.03	0.0	
	Primary-BIOS	YES	1.48	1.48	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	1.48	1.48	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
	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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

## Determine Firmware Support

	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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      1.48      1.48      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

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-16Z4G8Q2C-A  1.0  ADM_FW          CURRENT      14.03      14.03
NOT REQ
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  ADMConfig       CURRENT      1.05       1.05
NOT REQ
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  IoFpga          CURRENT      3.08       3.08
0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  IoFpgaGolden    B CURRENT      1.31
0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  Primary-BIOS    SA CURRENT      1.48       1.48
0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  StdbyFpga       S CURRENT      0.50       0.50
0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  StdbyFpgaGolden BS CURRENT      0.37
0/RP0
0/RP0/CPU0 N540X-16Z4G8Q2C-A  1.0  TamFw           S CURRENT      4.13       4.13
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 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

```

=====
Field Programmable Device Package
=====
Card Type           FPD Description      Req   SW   Min Req  Min Req
                    Reinstall 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

```

## Determine Firmware Support

	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	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
	StdbypFpga	YES	2.05	2.05	0.0
	StdbypFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-8Z16G-SYS-D	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0

IoFpga	YES	0.17	0.17	0.0
IoFpgaGolden	YES	0.15	0.15	0.0
Prim-BootLoader	YES	20.08	20.08	0.0
StdbyFpga	YES	2.05	2.05	0.0
StdbyFpgaGolden	YES	0.33	0.33	0.0
TamFw	YES	6.05	6.05	0.0
TamFwGolden	YES	6.05	6.05	0.0

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

Auto-upgrade:Enabled

Attribute codes: B golden, P protect, S secure, A Anti Theft aware

Location Reload Loc	Card type	HWver	FPD device	ATR	Status	FPD Versions	
						Running	Programd
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	ADMConfig		CURRENT	5.00	5.00
NOT REQ							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	IoFpga		CURRENT	0.17	0.17
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	IoFpgaGolden	B	CURRENT		0.15
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	Prim-BootLoader	A	CURRENT	20.08	20.08
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	StdbyFpga	S	CURRENT	2.05	2.05
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	StdbyFpgaGolden	BS	CURRENT		0.32
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	TamFw	S	CURRENT	6.05	6.05
0/RP0							
0/RP0/CPU0	N540X-6Z18G-SYS-A	1.0	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
=====

```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-12Z20G-SYS-A	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	3.08	3.08	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.48	1.48	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	1.48	1.48	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

## Determine Firmware Support

	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
	StdbypFpga	YES	2.59	2.59	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.50	0.50	0.0
	StdbypFpgaGolden	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	1.48	1.48	0.0
	StdbypFpga	YES	0.46	0.46	0.0
	StdbypFpgaGolden	YES	0.46	0.46	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540-FH-CSR-SYS	ADM1_Config	NO	0.09	0.09	0.0
	ADM1_Config	NO	1.01	1.01	2.0
	ADM2_Config	NO	0.09	0.09	0.0
	ADM2_Config	NO	1.01	1.01	2.0
	DpFpga	YES	0.23	0.23	0.0
	IoFpga	YES	1.30	1.30	0.0
	IoFpgaGolden	YES	1.30	1.30	0.0
	Primary-BIOS	YES	1.48	1.48	0.0
	StdbypFpga	YES	0.46	0.46	0.0
	StdbypFpgaGolden	YES	0.46	0.46	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0



-----					
N540-PWR400-A	LI-PrimMCU	NO	0.04	0.04	0.0
	LI-SecMCU	NO	0.06	0.06	0.0
	PrimMCU	NO	1.02	1.02	0.0
	SecMCU	NO	1.03	1.03	0.0
-----					
N540-PWR400-D	LI-PrimMCU	NO	0.04	0.04	0.0
	LI-SecMCU	NO	0.06	0.06	0.0
	PrimMCU	NO	1.03	1.03	0.0
	SecMCU	NO	1.03	1.03	0.0
-----					
N540-PWR750-A	EM-PrimMCU	NO	1.02	1.02	0.0
	EM-SecMCU	NO	1.03	1.03	0.0
-----					
N540-PWR750-D	EM-PrimMCU	NO	1.03	1.03	0.0
	EM-SecMCU	NO	3.01	3.01	0.0
-----					
N540X-12Z16G-SYS-A	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	3.08	3.08	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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

## Determine Firmware Support

Location	Card type	HWver	FPD device	ATR	Status	Running Programd	FPD Versions
			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	1.48	1.48	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

Attribute codes: B golden, P protect, S secure, A Anti Theft aware

Location	Card type	HWver	FPD device	ATR	Status	Running Programd	FPD Versions
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	ADM-DBConfig		CURRENT	1.51	1.51
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	ADM-MBConfig		CURRENT	2.02	2.02
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	IoFpga		CURRENT	2.12	2.12
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	IoFpgaGolden	B	CURRENT		2.10
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	Primary-BIOS	S	CURRENT	4.07	4.07
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	SsdSAMSA64G3	S	CURRENT	12.41	12.41
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	StdbyFpga	S	CURRENT	2.59	2.59
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	StdbyFpgaGolden	BS	CURRENT		0.00
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	TamFw	S	CURRENT	6.05	6.05
0/RP0/CPU0	N540-24Q8L2DD-SYS	2.0	TamFwGolden	BS	CURRENT		0.00
0/PM0	N540-PWR400-A	1.0	PrimMCU		CURRENT	1.02	1.02
0/PM0	N540-PWR400-A	1.0	SecMCU		CURRENT	1.03	1.03

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

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-12Z20G-SYS-A	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	3.08	3.08	0.0
	IoFpgaGolden	YES	2.07	2.03	0.0
	Primary-BIOS	YES	1.48	1.48	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	1.48	1.48	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
	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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

## Determine Firmware Support

	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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	1.48	1.48	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:Disabled

Attribute codes: B golden, P protect, S secure, A Anti Theft aware

Location	Card type	HWver	FPD device	ATR	Status	FPD Versions	
						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	CURRENT		1.30
0/RP0							
0/RP0/CPU0	N540-FH-CSR-SYS	1.0	Primary-BIOS	SA	CURRENT	1.48	1.48
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	CURRENT		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	1.0	PrimMCU		CURRENT	1.02	1.02
NOT REQ							
0/PM0	N540-PWR400-A	1.0	SecMCU		CURRENT	1.03	1.03
NOT REQ							

## Important Notes

### Supported Transceiver Modules

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

## Upgrading Cisco IOS XR Software



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**Note** For software installation and upgrades, refer to the respective upgrade/downgrade docs *.tar* files based on your [540 router variant](#).

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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-7.11.1.tar* file.

The upgrade document for N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-16Z4G8Q2C-A/D, N540-24Q8L2DD-SYS, N540-FH-AGG-SYS, N540X-16Z8Q2C-D, and N540-FH-CSR-SYS variants is available along with the software image in *NCS540l-docs-7.11.1.tar* file.

The upgrade document for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-6Z18G-SYS-A/D variants is available along with the software image in *NCS540l-aarch64-docs-7.11.1.tar* file.



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**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.

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## 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>

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