



## Release Notes for Cisco NCS 540 Series Routers, Cisco IOS XR Release 7.10.1

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# What's New in Cisco IOS XR Release 7.10.1

Cisco IOS XR Release 7.10.1 is a new feature release for Cisco NCS 540 Series routers. For more details on the Cisco IOS XR release model and associated support, see [Guidelines for Cisco IOS XR Software](#).

## New in Documentation

This release introduces rich and intuitive ways for you to access YANG data models supported in the Cisco IOS XR software.

Product	Description
<a href="#">Cisco IOS XR Error Messages</a>	Search by release number, error strings, or compare release numbers to view a detailed repository of error messages and descriptions.
<a href="#">Cisco IOS XR MIBs</a>	Select the MIB of your choice from a drop-down to explore an extensive repository of MIB information.
<a href="#">YANG Data Models Navigator</a>	<p>We have launched the tool as an easy reference to view the Data Models (Native, Unified, OpenConfig) supported in IOS XR platforms and releases. You can explore the data model definitions, locate a specific model, and view the containers and their respective lists, leaves, leaf lists, Xpaths, and much more.</p> <p>As we continue to enhance the tool, we would love to hear your feedback. You are welcome to drop us a note <a href="#">here</a>.</p>
Use Case-based Documentation at Learning Labs	<p>You can now quickly explore and experiment on use-cases without setting up any hardware resources with the new Interactive documentation for Cisco 8000 routers on DevNet Learning Labs. Powered by Jupyter, the automated code blocks within the documentation enable you to configure the desired functionality on the routers and retrieve real-time output swiftly.</p> <p>Check out the new interactive documentation here:</p> <ul style="list-style-type: none"><li>• <a href="#">End to end 3-stage CLOS Networks for SONiC</a></li><li>• <a href="#">Use cases for QoS and Model-driven Telemetry</a></li></ul>

## 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="#">Reduce Recursions for eBGP Peering on Loopback Address on Bridge-Group Virtual Interface</a>	You can now achieve eBGP peering on Loopback interfaces on Bridge-Group Virtual Interface (BVI) and reduce the recursion level from three to two. This reduction in the recursion level, achieved by removing the need to use the BVI name in the configuration of static routes, allows faster packet forwarding and better utilization of network resources.
<b>Segment Routing</b>	

Feature	Description
<a href="#">IS-IS Partition Detection and Leakage of Specific Route Advertisements</a>	<p>In an open ring topology, a single fiber cut may partition the area or domain into two pieces. With summarization enabled, the area (domain) partition may result in traffic drops. Depending on the configuration in the Area Border Routers (ABRs) or Autonomous System Boundary Routers (ASBRs) that is picked as an entry point to the partitioned area (domain), the traffic is delivered to its destination or dropped as unreachable at ABR or ASBR.</p> <p>IS-IS partition detection and leakage of specific route advertisements features are introduced to retain connectivity for the partitioned area (domain) when summarization is used.</p> <p>The ABRs or ASBRs detect a network partition within an area (domain) and upon detection, ensure that the summary route is replaced with specific route advertisements in IS-IS.</p> <p>The feature introduces these changes:</p> <p><b>New Command:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">partition-detect</a></li> </ul> <p><b>Modified Command:</b></p> <ul style="list-style-type: none"> <li>• The <b>partition-repair</b> keyword is introduced in the <a href="#">summary-prefix</a> command.</li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>• New XPathS for <code>Cisco-IOS-XR-um-router-isis-cfg.yang</code> (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>
<a href="#">SR Policy Liveness Monitoring - Hardware Offloading</a>	<p>You can now hardware offload the liveness monitoring in performance measurement to the router hardware, which is the Network Processing Unit (NPU). This feature helps you optimize and scale the measurement operation, helping you meet delay-bound Service Level Agreements (SLAs). Previously, this feature was software driven.</p> <p>This feature introduces a new keyword <b>npu-offload</b> under the <a href="#">performance-measurement liveness-profile name <i>liveness profile</i></a> command.</p>
<a href="#">Configurable Filters for IS-IS Advertisements to BGP-Link State</a>	<p>This feature allows you to configure a route map to filter IS-IS route advertisements to BGP-Link State (LS). It also provides a per-area configuration knob to disable IS-IS advertisements for external and propagated prefixes. This configuration of filters hence reduces the amount of redundant data for external and interarea prefixes sent to the BGP - LS clients.</p> <p>This feature introduces <b>exclude-external</b>, <b>exclude-interarea</b>, and <b>route-policy name</b> optional keywords in the <a href="#">distribute link-state</a> command:</p>

Feature	Description
<a href="#">Multicast: Cisco Nonstop Forwarding for Tree-SID</a>	<p>Starting from this release, Multicast Nonstop Forwarding supports Tree-SID (Tree Segment Identifier). This ensures that traffic forwarding continues without interruptions whenever the active RSP fails over to the standby RSP.</p> <p>This feature prevents hardware or software failures on the control plane from disrupting the forwarding of existing packet flows through the router for Tree-SID. Thus, ensuring improved network availability, network stability, preventing routing flaps, and no loss of user sessions while the routing protocol information is being restored.</p> <p>The feature modifies the <a href="#">show mrib nsf private</a> command.</p>
<a href="#">Multicast VPN: Dynamic Tree-SID Multicast VPN IPv6</a>	<p>This feature allows Dynamic Tree Segment Identifier (Tree-SID) deployment where IPv6 Multicast payload is used for optimally transporting IP VPN multicast traffic over the provider network, using SR-PCE as a controller. This implementation supports IPv6 only for the Dynamic Tree-SID. Currently, the Static Tree-SID supports IPV4 payloads only, not the IPv6 payloads.</p>
<b>IP Addresses and Services</b>	
<a href="#">Single Pass IPv6 Egress ACL</a>	<p>You can now experience faster packet processing and save NPU cycles by avoiding the recycling of packets within the router. This is made possible by enabling the single-pass egress ACL which avoids multiple round-trips of packets in the ingress-to-egress path, thereby eliminating the need for additional packet processing. Also, because the match criteria requirement for a single-pass egress IPv6 ACL is reduced, the TCAM key size is reduced.</p> <p>This feature introduces the <a href="#">hw-module profile acl ipv6 single-pass-egress-acl</a> command.</p>
<b>L2VPN and Ethernet Services</b>	
<a href="#">EVPN BUM Flood Traffic Optimization</a>	<p>You can save the consumption of network bandwidth by preventing the replication of Broadcast, Unknown unicast and Multicast (BUM) traffic towards EVPN core and attachment circuits (AC). This feature not only prevents the replication of BUM traffic but also ensures that only the designated router receives the BUM traffic.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b> New commands.</p> <ul style="list-style-type: none"> <li>• <a href="#">hw-module l2-replication core-optimized</a></li> <li>• <a href="#">flood mode ac-shg-optimized</a></li> <li>• </li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>• New XPath for <a href="#">Cisco-IOS-XR-um-hw-module-profile-cfg.yang</a> (see <a href="#">GitHub, YANG Data Models Navigator</a>)</li> </ul>

Feature	Description
<a href="#">EVPN Link Bandwidth for Proportional Multipath on VNF</a>	<p>You can now use the EVPN link bandwidth to set proportional multipath on Virtual Network Forwarders (VNFs) connected to Top of Racks (ToRs). You can advertise the link bandwidth extended community attribute for each path in a network. When you enable EVPN link bandwidth on multiple paths, the bandwidth values of these paths are aggregated and the cumulative bandwidth is advertised across the VNFs. The load metrics is installed in Routing Information Base (RIB) and the RIB redistributes nexthop prefixes to the paths to achieve proportional multipath.</p> <p>This allows distribution of traffic proportional to the capacity of the links across all the available Virtual Network Forwarders (VNFs) that facilitates optimal traffic load balancing across the VNFs.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">evpn-link-bandwidth</a></li> <li>• <a href="#">set extcommunity evpn-link-bandwidth</a></li> <li>• <a href="#">delete extcommunity evpn-link-bandwidth</a></li> </ul>
<a href="#">Set EVPN Gateway IP Address in EVPN Route Type 5 NLRI</a>	<p>You can now facilitate optimal traffic load balancing across the Virtual Network Forwarders (VNFs) and minimize control plane updates when the VNFs or virtual machines (VMs) are moved across Top of Racks (ToR) by setting the EVPN gateway IP address in the EVPN route type 5 network layer reachability information (NLRI) that advertises IPv4 and IPv6 addresses. With this functionality, only one IP prefix route is withdrawn ensuring fast traffic switchover and reduced convergence time in the event of failure.</p> <p>Previously, the gateway IP address field in the EVPN route type 5 NLRI was not used. By default, the NLRI advertisement included the EVPN gateway IP address of zero, which was represented as 0.0.0.0 for IPv4 and :: for IPv6. This resulted in the withdrawal of all prefixes one by one in the event of a failure, leading to traffic loss.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">set advertise-evpn-gw-ip</a></li> <li>• <a href="#">advertise gateway-ip-disable</a></li> </ul>
<b>Modular QoS</b>	

Feature	Description
<a href="#">QoS IP DSCP Preservation for IPv6 SR-TE</a>	<p>This release introduces the functionality to preserve IP DSCP markings for IPv6 SR-TE traffic and covers the following scenarios:</p> <ul style="list-style-type: none"> <li>• <b>For two or less than two topmost or imposition labels:</b> when you set the MPLS experimental bits (EXP) values (also called Traffic Class values), the IP DSCP markings are now preserved by default in the ingress policies when the MPLS labels are pushed into the packet.</li> <li>• <b>For more than three imposition labels:</b> you must enable this functionality to preserve IP DSCP markings.</li> </ul> <p>With preservation, traffic with IPv6 packets with DSCP marking for priority, flows as intended and there's no drop in traffic because of incorrect or missing labels.</p> <p>In previous releases, irrespective of the number of MPLS labels, when the EXP values were copied into the packet header during imposition, even the IP DSCP markings for IPv6 traffic were modified. This modification resulted in traffic drops at the next-hop routers in SR-TE tunnels.</p> <p>This feature introduces a new keyword, <b>v6uc-enable</b>, in the <b>hw-module profile mpls-ext-dscp-preserve</b> command.</p>
<b>MPLS</b>	
<a href="#">Automatic Bandwidth Bundle TE++ for Numbered Tunnels</a>	<p>We have optimized network performance and enabled efficient utilization of resources for numbered tunnels based on real-time traffic by automatically adding or removing tunnels between two endpoints. This is made possible because this release introduces support for auto-bandwidth TE++ for numbered tunnels, expanding upon the previous support for only named tunnels, letting you define explicit paths and allocate the bandwidth to each tunnel.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• The <b>auto-capacity</b> keyword is added to the <b>interface tunnel-te</b> command.</li> </ul> <p><b>YANG Data Model:</b></p> <p>New XPath for Cisco-IOS-XR-mpls-te-cfg.yang (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<b>Multicast</b>	
<a href="#">Draft-Rosen Multicast VPN (Profile 0) in PIM Sparse Mode (SM)</a>	<p>Draft-Rosen Multicast VPN (Profile 0) is now supported in PIM sparse mode (PIM-SM) between the PE routers that are running in VRF mode. PIM SM provides precise control in cases of large multicast traffic when there is less bandwidth available. This control is possible because it uses a temporary Rendezvous Point (RP) router to connect the multicast traffic source to the next hop router.</p> <p>Prior to this release, Profile 0 was supported only in PIM Source Specific Multicast (SSM) mode.</p>
<b>Netflow</b>	

Feature	Description
<a href="#">Simultaneous L2 and L3 Flow Monitoring using IPFIX</a>	<p>This feature introduces support for simultaneous L2 and L3 flow monitoring. Now, you can configure IP Flow Information Export (IPFIX) to actively monitor and record end-to-end L2 and L3 flow information elements from network devices. Previously, only L2 or L3 flow could be monitored at a time.</p> <p>This feature introduces these changes:</p> <p>CLI: The following sub-menus are introduced for these commands:</p> <ul style="list-style-type: none"> <li>• The <b>record ipv4</b> command is modified to support a new optional keyword, <b>I2-I3</b></li> <li>• The <b>record ipv6</b> command is modified to support a new optional keyword, <b>I2-I3</b></li> </ul>
<b>Programmability</b>	
Improved YANG Input Validator and Get Requests	The OpenConfig data models provide a structure for managing networks via YANG protocols. With this release, enhancements to the configuration architecture improve input validations and ensure that the Get requests made through gNMI or NETCONF protocols return only explicitly configured OpenConfig leaves.
<b>Routing</b>	
<a href="#">Autonomous System Boundary Router Isolation and Adjacency Control for LSA Overflows</a>	<p>In a network employing an Autonomous System Boundary Router (ASBR) and other routers, you are now assured of uninterrupted traffic flow even if the ASBR generates LSAs that exceed the limit you configured. This is made possible as you can now isolate ASBRs and also control the duration of adjacency in the EXCHANGE or LOADING phase. By isolating the ASBR from its immediate neighbors, the remaining network topology can continue to function without disruption, effectively preventing any adverse impact on traffic flow. This approach also simplifies the recovery process, as manual intervention is only necessary for the immediate neighbors of the ASBR routers.</p> <p>This feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <b>max-external-lsa</b></li> <li>• <b>exchange-timer</b></li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>• <code>Cisco-IOS-XR-ipv4-ospf-cfg.yang</code></li> <li>• <code>Cisco-IOS-XR-ipv4-ospf-oper.yang</code></li> <li>• <code>Cisco-IOS-XR-um-router-ospf-cfg.yang</code></li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p>
<b>System Management</b>	

Feature	Description
<a href="#">Cisco Smart Licensing on QDD-400G-ZR-S, QDD-400G-ZRP-S, and DP04QSDD-HE0 optics</a>	<p>Cisco Smart Licensing is a cloud-based, flexible, automated software licensing model that enables you to activate and manage Cisco software licenses across your organization. Smart Licensing solution allows you to easily track the status of your license and software usage trends.</p> <p>Smart Licensing is now supported on the following optics:</p> <ul style="list-style-type: none"> <li>• <a href="#">QDD-400G-ZR-S</a></li> <li>• <a href="#">QDD-400G-ZRP-S</a></li> <li>• <a href="#">DP04QSDD-HE0</a></li> </ul>

System Security	
<a href="#">Public Key-Based Authentication of SSH Clients on Cisco IOS XR Routers</a>	<p>Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Compatibility; Native])</p> <p>You can now avail cryptographic strength and automated password-less log in while establishing SSH connections with the server. Along with password and keyboard-interactive authentication, Cisco IOS XR routers configured as SSH clients now support public key-based authentication. In this authentication method, passwords need not be sent over the network and hence, it provides an additional layer of security as well as aids in automation processes. This feature is available only for users locally configured on the router, not those configured on remote servers.</p> <p>Previous releases supported SSH public key-based authentication only for Cisco IOS XR routers configured as SSH servers.</p> <p>The feature introduces these changes:</p> <ul style="list-style-type: none"> <li>• <b>CLI:</b> <ul style="list-style-type: none"> <li>• <a href="#">crypto key generate authentication-ssh rsa</a></li> <li>• <a href="#">crypto key zeroize authentication-ssh rsa</a></li> <li>• <a href="#">show crypto key mypubkey authentication-ssh rsa</a></li> </ul> </li> <li>• <b>Yang Data Models:</b> <p>New Xpaths for:</p> <ul style="list-style-type: none"> <li>• <code>Cisco-IOS-XR-crypto-act.yang</code></li> <li>• <code>Cisco-IOS-XR-crypto-cepki-new-oper.yang</code></li> </ul> <p>(see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</p> </li> </ul>

The following feature is supported on N540-ACC-SYS, N540X-ACC-SYS, and N540-24Z8Q2C-SYS variants.

Feature	Description
<b>Modular QoS</b>	



Feature	Description
<a href="#">Bandwidth Remaining Ratio at Parent Level</a>	<p>You can now provide preference to a specific user assigned to a subinterface. With this feature, the bandwidth remaining ratio (BWRR) is applied at the parent traffic policy level to control the low-priority traffic at the subinterface level.</p> <p>During congestion, the subinterface with the higher BWRR gets more bandwidth allocation that allows traffic to flow.</p> <p>Earlier, the BWRR in H-QoS was supported only at the child policy level.</p> <p>Supported on the following Cisco NCS 540 variants:</p> <ul style="list-style-type: none"> <li>• N540-ACC-SYS</li> <li>• N540X-ACC-SYS</li> <li>• N540-24Z8Q2C-SYS</li> </ul>

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

Feature	Feature
<b>Application Hosting</b>	
<a href="#">Cisco Secure DDOS Edge Protection</a>	<p>Cisco Secure DDoS Edge Protection solution provides protection from Denial-of-Service (DDoS) attacks and helps to mitigate them.</p> <p>DDoS Edge Protection solution helps you to:</p> <ul style="list-style-type: none"> <li>• Reduce the total cost of ownership for the DDoS solution by reducing the overall scrubbing capacity requirement which in turn reduces the overall power consumption, cooling, and other maintenance costs.</li> <li>• Improve customer satisfaction and helps in achieving SLAs due to the reduced attack detection and response time.</li> </ul>
<b>Programmability</b>	
<code>Cisco-IOS-XR-um-ipsec-cfg.yang</code>	This unified data model enables you to encrypt management traffic using IPsec tunnels.
<b>L2VPN and Ethernet Services</b>	

Feature	Feature
<a href="#">EVPN Port-Active Hot Standby on Bundle Interfaces</a>	<p>The EVPN port-active mode configuration is now modified to support hot standby. In a hot standby bundle interface, the main and subinterfaces remain up. This functionality ensures fast convergence of standby to active transition.</p> <p>Previously, the interfaces in a standby node would be down. During the failure and recovery of active node, the standby node transitions through the Out-of-Service (OOS) state to the Up state.</p> <p>If you still want the nodes to transition through the OOS state, use the <b>access-signal out-of-service</b> command to revert to the previous behavior.</p> <p>The feature introduces these changes:</p> <p><b>CLI:</b></p> <ul style="list-style-type: none"> <li>• <a href="#">access-signal out-of-service</a></li> </ul> <p><b>YANG Data Model:</b></p> <ul style="list-style-type: none"> <li>• New XPath for <code>Cisco-IOS-XR-12vpn-cfg.yang</code> (see <a href="#">GitHub</a>, <a href="#">YANG Data Models Navigator</a>)</li> </ul>

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

Feature	Description
<b>Network Synchronization</b>	
<a href="#">PTP over BVI support on Cisco NCS 540 Small Density Routers</a>	<p>This feature allows PTP traffic to flow over a bridged virtual interface.</p> <p>You can now configure PTP over BVI on the following Cisco NCS 540 router variants:</p> <ul style="list-style-type: none"> <li>• N540-6Z14S-SYS-D</li> <li>• N540X-6Z18G-SYS-A/D</li> <li>• N540X-8Z16G-SYS-A/D</li> <li>• N540X-4Z14G2Q-A/D</li> </ul>

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

Feature	Description
<b>Network Synchronization</b>	
PTP support on N540-24Q8L2DD-SYS	<p>Based on the IEEE 1588-2008 standard, Precision Time Protocol (PTP) is a protocol that defines a method to synchronize clocks in a network for networked measurement and control systems.</p> <p>With this release, PTP Class C and class B performance are now supported on 1G, 10G, 25G, 40G and 100G port speeds on the N540-24Q8L2DD-SYS hardware.</p>

Feature	Description
SyncE support on N540-24Q8L2DD-SYS	<p>SyncE provides synchronization signals transmitted over the Ethernet physical layer to downstream devices, while the Synchronization Status Message (SSM) indicates the quality level of the transmitting clock to the neighboring nodes, informing the nodes about the level of the network's reliability. Ethernet Synchronization Message Channel (ESMC) is the logical channel that uses an Ethernet PDU (protocol data unit) to exchange SSM information over the SyncE link.</p> <p>SyncE is now supported on the N540-24Q8L2DD-SYS hardware.</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>	
Cisco-IOS-XR-crypto-act.yang	<p>The following new leaves are added to this Cisco native data model to enable public key-based authentication of users on Cisco IOS XR routers that are configured as SSH clients:</p> <ul style="list-style-type: none"> <li>key-generate-authentication-ssh-rsa-keys</li> <li>key-zeroize-authentication-ssh-rsa</li> </ul>
Cisco-IOS-XR-crypto-cepki-new-oper.yang	<p>A new container, <code>auth-ssh-keys</code>, is added to this Cisco native data model to display the details of SSH RSA cryptographic keys that are used for public key-based authentication of users on Cisco IOS XR routers that are configured as SSH clients.</p>
Cisco-IOS-XR-l2vpn-cfg.yang	<p>This Cisco native data model is enhanced to support EVPN port-active with hot standby on bundle interfaces.</p>
Cisco-IOS-XR-um-hw-module-profile-cfg.yang	<p>This Cisco unified data model is enhanced to support optimization of EVPN BUM flood traffic.</p>

Feature	Description
<p>openconfig-bgp-neighbor.yang Version 9.1.0</p>	<p>With this release, the OpenConfig data model introduces the following changes:</p> <ul style="list-style-type: none"> <li>• The datatype of the timer related leaves in the OpenConfig data model, such as <code>ashold-time</code>, <code>keep-alive-interval</code>, <code>minimum-advertisement-interval</code>, <code>stale-routes-time</code>, <code>negotiated-hold-time</code> are changed. It is changed from <code>decimal64</code> to <code>uint16</code>.</li> <li>• The new leaf <code>restart-time</code> under <code>Neighbor</code> and <code>Peer-group</code> reflects the time interval (in sec) after which the BGP session is re-established.</li> <li>• Introduces the enable or disable capability of <code>graceful-restart</code> under <code>Neighbor</code> and <code>Peer-group</code>.</li> <li>• Supports independent configuration of the two leaves: <code>keepalive</code> and <code>hold-time</code>.</li> <li>• The new leaf <code>allow-multiple-as</code> under <code>global/use-multiple-paths/ebgp/config/</code>, enables the BGP to choose a path from different neighboring as multipath. The hop count of the AS-path must match the hop count of the bestpath. You can now program routes with different AS-paths into the forwarding table as equal cost multipath routes. Earlier, for ECMP paths to be eligible, their AS-paths must exactly match the bestpath.</li> <li>• The new leaf <code>treat-as-withdraw</code> avoids the session reset when a BGP session encounters errors during parsing of received update message. The leaf discards the incoming update message as a withdraw message and ensures that the subsequent actions are done.</li> </ul> <p>Event-driven telemetry and Model-driven telemetry are supported.</p>

Feature	Description
openconfig-isis.yang	<p>The OpenConfig data model defines the configuration and state information related to ISIS protocol configuration running on a router. With this release, you can configure the following XPaths:</p> <p><code>openconfig-network-instance/network-instances/network-instance/protocols/protocol/isis/interfaces/interface/</code></p> <ul style="list-style-type: none"> <li>• <code>config/hello-padding</code>: controls the padding type for IS-IS Hello PDUs.</li> <li>• <code>mpls/igp-ldp-sync/config/enabled</code>: synchronization between the LDP and IS-IS.</li> <li>• <code>levels/level/hello-authentication/config/keychain</code>: refers to a keychain that should be used for hello authentication.</li> <li>• <code>enable-bfd/config/enabled</code>: when this leaf is set to true, BFD is used to detect the liveness of the remote peer or next-hop.</li> <li>• <code>levels/level/config/enabled</code>: when set to true, the functionality within which this leaf is defined is enabled and when set to false it is explicitly disabled.</li> </ul> <p><code>openconfig-network-instance/network-instances/network-instance/protocols/protocol/isis/</code></p> <ul style="list-style-type: none"> <li>• <code>global/mpls/igp-ldp-sync/config/enabled</code>: synchronization between the LDP and IS-IS.</li> <li>• <code>global/config/maximum-area-addresses</code>: supports maximum area.</li> <li>• <code>globalconfig/Iid-tlv</code>: (ISIS Instance Identifier TLV) when set to true, the IID-TLV identifies the unique instance as well as the topology/topologies to which the PDU applies.</li> <li>• <code>levels/level/authentication/config/keychain</code>: refers to the keychain that should be used for authenticating IS-IS packets.</li> </ul> <p>Event-driven and Model-driven telemetry is supported.</p>
openconfig-system-grpc.yang Version 1.0.0	<p>The OpenConfig data model is revised from version 0.1.1 to 1.0.0. This version enables the gRPC server to listen on any IP address bound to an interface and port of the system or listen for any specific list of IP addresses. The maximum number of supported IP addresses are 32, which may be IPv4 or IPv6, or both.</p> <p>Earlier, the gRPC server had the listen functionality for any IP address on the gRPC port but not to a specific list of listen addresses.</p> <p>Event-driven telemetry and Model-driven telemetry are supported.</p>

Feature	Description
Cisco-IOS-XR-infra-xtc-agent-cfg.yang	This Cisco native data model is used for gathering statistics on reporting of SR-Traffic Engineering (TE) policies using BGP-Link State (LS).
Cisco-IOS-XR-um-router-isis-cfg.yang	The latest update to the Cisco-IOS-XR-um-router-isis-cfg.yang unified data model includes the addition of the partition-detect and partition-repair containers. These new containers indicate the configuration of the partition-detect and partition-repair nodes.

## Hardware Introduced




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**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](#).

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

Hardware	Description
Alarm reporting change on ZR and ZR+ Optics	Unlike in previous releases where the loss of payload signal on ZR and ZR+ optics triggered both Loss of Signal - Payload (LOS-P) and Loss of Link (LOL) alarms, from this release onwards, only the Loss of Signal - Payload (LOS-P) is raised.

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

Hardware	Description
Optics	<p>This release launches 400G Digital Coherent QSFP-DD transceiver optics on selective hardware within the product portfolio. For details and other new supported transceivers, refer to the <a href="#">Transceiver Module Group (TMG) Compatibility Matrix</a>.</p> <ul style="list-style-type: none"> <li>Cisco Quad Small Form-Factor Pluggable Double Density (QSFP-DD) <ul style="list-style-type: none"> <li><a href="#">DP04QSDD-HE0</a></li> </ul> </li> </ul>

## 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.
- Remove the speed settings on the 1G Copper optics when 10M/100M is configured and replaced with 1G SFP optics.
- The **hw-module profile mfib statistics** command is not supported.

## Caveats

**Table 1: Cisco IOS XR NCS 540 Routers Specific Bugs**

Bug ID	Headline
<a href="#">CSCwf89722</a>	EVPN VPWS down post migrating from Multi-homing to Single-Homing

Bug ID	Headline
<a href="#">CSCwf81475</a>	Netflow IPv6: The record-ipv6 under monitor-map reports incorrect output and input interface with outbundlemember or outphysint options.

## 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 7.10.1 Software

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

- The first table lists the supported software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS variants.
- The second table lists the supported software for N540-24Q8L2DD-SYS, N540X-16Z4G8Q2C-A/D, N540-28Z4C-SYS-A/D, N540X-12Z16G-SYS-A/D, N540-12Z20G-SYS-A/D, N540-FH-CSR-SYS, N540X-16Z8Q2C-D and N540-FH-AGG-SYS variants.
- The third table lists the supported software for N540X-4Z14G2Q-A/D, N540X-8Z16G-SYS-A/D, N540-6Z14S-SYS-D, N540-6Z18G-SYS-A/D, and N540X-6Z18G-SYS-A/D variants.

Visit the [Cisco Software Download page](#) to download the Cisco IOS XR software images.

**Table 2: Release 7.10.1 Software for N540-24Z8Q2C-SYS, N540-ACC-SYS, and N540X-ACC-SYS**

Base Image	Filename	Description
IOS XR Base Image	ncs540-mini-x-7.10.1.iso	IOS XR mandatory base image.
USB Boot Package	ncs540-usb_boot-7.10.1.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-r7101.x86_64.rpm	Supports Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server



IOS XR MPLS	ncs540-mpls-1.0.0.0-r7101.x86_64.rpm ncs540-mpls-te-rsvp-1.0.0.0-r7101.x86_64.rpm	Supports MPLS and MPLS Traffic Engineering (MPLS-TE)
IOS XR Security	ncs540-k9sec-1.0.0.0-r7101.x86_64.rpm	Supports MACsec and 802.1X
IOS XR ISIS	ncs540-isis-1.0.0.0-r7101.x86_64.rpm	Supports ISIS
IOS XR OSPF	ncs540-ospf-1.0.0.0-r7101.x86_64.rpm	Supports OSPF
IOS XR Lawful Intercept	ncs540-li-1.0.0.0-r7101.x86_64.rpm	Supports Lawful Intercept (LI)
IOS XR Multicast	ncs540-mcast-1.0.0.0-r7101.x86_64.rpm	Supports Multicast
IOS XR EIGRP	ncs540-eigrp-1.0.0.0-r7101.x86_64.rpm	Supports EIGRP
IOS XR LI-CTRL	ncs540-lictrl-1.0.0.0-r7101.x86_64.rpm	Supports LI-CTRL

**Table 3: Release 7.10.1 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-x64-7.10.1.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-7.10.1.tar.</p>
USB Boot Package	ncs540l-usb_boot-7.10.1.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-iosxr-7.10.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540l-iosxr-7.10.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540l-iosxr-7.10.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540l-k9sec-rpms.7.10.1.tar	Supports 802.1X

IOS XR RIP (xr-rip)	NCS540l-iosxr-7.10.1.tar	Supports RIP
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**Table 4: Release 7.10.1 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-aarch64-7.10.1.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-7.10.1.tar.</p>
USB Boot Package	ncs540l-aarch64-usb_boot-7.10.1.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>		

Package	Filename	Description
IOS XR Telnet (xr-telnet)	NCS540L-aarch64-iosxr-optional-rpms-7.10.1.tar	Supports Telnet
IOS XR EIGRP (xr-eigrp)	NCS540L-aarch64-iosxr-optional-rpms-7.10.1.tar	Supports EIGRP
IOS XR CDP (xr-cdp)	NCS540L-aarch64-iosxr-optional-rpms-7.10.1.tar	Supports CDP
IOS XR k9sec (xr-k9sec)	NCS540L-aarch64-k9sec-rpms.7.10.1.tar	Supports 802.1X
IOS XR RIP (xr-rip)	NCS540L-aarch64-iosxr-optional-rpms-7.10.1.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 7.10.1
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

```
Build Information:
  Built By      : deenayak
  Built On      : Wed Aug 16 21:43:50 PDT 2023
  Built Host    : iox-ucs-033
  Workspace     : /auto/srcarchive16/prod/7.10.1/ncs540/ws
  Version       : 7.10.1
  Location      : /opt/cisco/XR/packages/
  Label        : 7.10.1
```

```
cisco NCS-540 () processor
System uptime is 1 hour 12 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 7.10.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

```
Build Information:
  Built By      : deenayak
  Built On      : Wed Aug 16 23:51:31 UTC 2023
  Build Host    : iox-ucs-035
  Workspace     : /auto/srcarchive16/prod/7.10.1/ncs540l/ws/
  Version       : 7.10.1
  Label        : 7.10.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-28Z4C-SYS-A (C3708 @ 1.70GHz) processor with 8GB of memory
ROUTER uptime is 1 hour, 33 minutes
Cisco NCS 540 Series Fixed Router 28x1/10G, 4x100G, 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 7.10.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : deenayak
Built On     : Wed Aug 16 23:51:31 UTC 2023
Build Host   : iox-lnx-024
Workspace    : /auto/srcarchive16/prod/7.10.1/ncs5401-aarch64/ws/
Version      : 7.10.1
Label       : 7.10.1
```

```
cisco NCS540L
cisco N540X-4Z14G2Q-A processor with 8GB of memory
Router uptime is 6 minutes
Cisco NCS 540 Series Fixed Router 12x1G, 4xCu, 2x10G, 2x25G, AC
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.10.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : deenayak
Built On     : Wed Aug 16 23:51:31 UTC 2023
Build Host   : iox-ucs-035
Workspace    : /auto/srcarchive16/prod/7.10.1/ncs5401/ws/
Version      : 7.10.1
Label       : 7.10.1
```

```
cisco NCS540L (D1519 @ 1.50GHz)
cisco N540-24Q8L2DD-SYS (D1519 @ 1.50GHz) processor with 16GB of memory
Router uptime is 1 hour, 37 minutes
Cisco NCS540 Series, Fixed Router 2x400G, 8x50G, 24x25G Chassis
```

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

```
RP/0/RP0/CPU0:Router#show version
Cisco IOS XR Software, Version 7.10.1 LNT
Copyright (c) 2013-2023 by Cisco Systems, Inc.
```

Build Information:

```
Built By      : deenayak
Built On     : Wed Aug 16 23:51:31 UTC 2023
Build Host   : iox-ucs-035
Workspace    : /auto/srcarchive16/prod/7.10.1/ncs5401/ws/
Version      : 7.10.1
Label       : 7.10.1
```

```
cisco NCS540L (C3708 @ 1.70GHz)
cisco N540-FH-AGG-SYS (C3708 @ 1.70GHz) processor with 8GB of memory
Router uptime is 1 hour, 2 minutes
Cisco NCS 540 FH System with 24xCPRI/25G/10G/TSN+4x100G
```

## Determine Firmware Support

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

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



**Note** If the **Req Reload** field is mentioned as **Yes** in the output, then it indicates the need for a router reboot for the FPD's latest version to take effect.

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

```
=====
                          Field Programmable Device Package
                          =====
Card Type                FPD Description                Req   SW   Min Req   Min Req
                          Reload  Ver   SW Ver   Board Ver
=====
N540-24Z8Q2C-M          Bootloader (A)                YES   1.16   1.16     0.0
                          CPU-IOFPGA (A)                YES   0.10   0.10     0.0
                          MB-IOFPGA (A)                YES   0.27   0.27     0.0
                          MB-MIFPGA                    YES   0.05   0.05     0.0
                          SATA-INTEL_240G (A)          NO    1132.00 1132.00  0.0
                          SATA-INTEL_480G (A)          NO    1132.00 1132.00  0.0
                          SATA-M500IT-MC (A)          NO     3.00    3.00    0.0
                          SATA-M500IT-MU-A (A)        NO     5.00    5.00    0.0
                          SATA-M500IT-MU-B (A)        NO     4.00    4.00    0.0
                          SATA-M5100 (A)            NO    75.00   75.00   0.0
                          SATA-M600-MCT (A)          NO     5.00    5.00    0.0
                          SATA-M600-MU (A)           NO     6.00    6.00    0.0
                          SATA-Micron (A)           NO     1.00    1.00    0.0
                          SATA-SMART-128G (A)       NO   1427.00 1427.00  0.0
                          SSFP_E1F_0                NO    13.01   13.01   0.0
                          SSFP_E1F_1                NO    13.01   13.01   0.0
                          SSFP_E1F_10               NO    13.01   13.01   0.0
                          SSFP_E1F_11               NO    13.01   13.01   0.0
                          SSFP_E1F_12               NO    13.01   13.01   0.0
                          SSFP_E1F_13               NO    13.01   13.01   0.0
                          SSFP_E1F_14               NO    13.01   13.01   0.0
                          SSFP_E1F_15               NO    13.01   13.01   0.0
                          SSFP_E1F_16               NO    13.01   13.01   0.0
                          SSFP_E1F_17               NO    13.01   13.01   0.0
                          SSFP_E1F_18               NO    13.01   13.01   0.0
                          SSFP_E1F_19               NO    13.01   13.01   0.0
                          SSFP_E1F_2                NO    13.01   13.01   0.0
                          SSFP_E1F_20               NO    13.01   13.01   0.0
                          SSFP_E1F_21               NO    13.01   13.01   0.0
                          SSFP_E1F_22               NO    13.01   13.01   0.0
                          SSFP_E1F_23               NO    13.01   13.01   0.0
                          SSFP_E1F_24               NO    13.01   13.01   0.0
                          SSFP_E1F_25               NO    13.01   13.01   0.0
                          SSFP_E1F_26               NO    13.01   13.01   0.0
                          SSFP_E1F_27               NO    13.01   13.01   0.0
                          SSFP_E1F_28               NO    13.01   13.01   0.0
                          SSFP_E1F_29               NO    13.01   13.01   0.0
                          SSFP_E1F_3                NO    13.01   13.01   0.0
                          SSFP_E1F_30               NO    13.01   13.01   0.0
                          SSFP_E1F_31               NO    13.01   13.01   0.0
                          SSFP_E1F_32               NO    13.01   13.01   0.0
                          SSFP_E1F_33               NO    13.01   13.01   0.0
                          SSFP_E1F_34               NO    13.01   13.01   0.0
                          SSFP_E1F_35               NO    13.01   13.01   0.0
                          SSFP_E1F_36               NO    13.01   13.01   0.0
                          SSFP_E1F_37               NO    13.01   13.01   0.0
                          SSFP_E1F_38               NO    13.01   13.01   0.0
                          SSFP_E1F_39               NO    13.01   13.01   0.0
                          SSFP_E1F_4                NO    13.01   13.01   0.0
                          SSFP_E1F_40               NO    13.01   13.01   0.0
=====
```

SSFP_E1F_41	NO	13.01	13.01	0.0
SSFP_E1F_42	NO	13.01	13.01	0.0
SSFP_E1F_43	NO	13.01	13.01	0.0
SSFP_E1F_44	NO	13.01	13.01	0.0
SSFP_E1F_45	NO	13.01	13.01	0.0
SSFP_E1F_46	NO	13.01	13.01	0.0
SSFP_E1F_47	NO	13.01	13.01	0.0
SSFP_E1F_5	NO	13.01	13.01	0.0
SSFP_E1F_6	NO	13.01	13.01	0.0
SSFP_E1F_7	NO	13.01	13.01	0.0
SSFP_E1F_8	NO	13.01	13.01	0.0
SSFP_E1F_9	NO	13.01	13.01	0.0
SSFP_OC3_STM1_0	NO	12.01	12.01	0.0
SSFP_OC3_STM1_1	NO	12.01	12.01	0.0
SSFP_OC3_STM1_10	NO	12.01	12.01	0.0
SSFP_OC3_STM1_11	NO	12.01	12.01	0.0
SSFP_OC3_STM1_12	NO	12.01	12.01	0.0
SSFP_OC3_STM1_13	NO	12.01	12.01	0.0
SSFP_OC3_STM1_14	NO	12.01	12.01	0.0
SSFP_OC3_STM1_15	NO	12.01	12.01	0.0
SSFP_OC3_STM1_16	NO	12.01	12.01	0.0
SSFP_OC3_STM1_17	NO	12.01	12.01	0.0
SSFP_OC3_STM1_18	NO	12.01	12.01	0.0
SSFP_OC3_STM1_19	NO	12.01	12.01	0.0
SSFP_OC3_STM1_2	NO	12.01	12.01	0.0
SSFP_OC3_STM1_20	NO	12.01	12.01	0.0
SSFP_OC3_STM1_21	NO	12.01	12.01	0.0
SSFP_OC3_STM1_22	NO	12.01	12.01	0.0
SSFP_OC3_STM1_23	NO	12.01	12.01	0.0
SSFP_OC3_STM1_24	NO	12.01	12.01	0.0
SSFP_OC3_STM1_25	NO	12.01	12.01	0.0
SSFP_OC3_STM1_26	NO	12.01	12.01	0.0
SSFP_OC3_STM1_27	NO	12.01	12.01	0.0
SSFP_OC3_STM1_28	NO	12.01	12.01	0.0
SSFP_OC3_STM1_29	NO	12.01	12.01	0.0
SSFP_OC3_STM1_3	NO	12.01	12.01	0.0
SSFP_OC3_STM1_30	NO	12.01	12.01	0.0
SSFP_OC3_STM1_31	NO	12.01	12.01	0.0
SSFP_OC3_STM1_32	NO	12.01	12.01	0.0
SSFP_OC3_STM1_33	NO	12.01	12.01	0.0
SSFP_OC3_STM1_34	NO	12.01	12.01	0.0
SSFP_OC3_STM1_35	NO	12.01	12.01	0.0
SSFP_OC3_STM1_36	NO	12.01	12.01	0.0
SSFP_OC3_STM1_37	NO	12.01	12.01	0.0
SSFP_OC3_STM1_38	NO	12.01	12.01	0.0
SSFP_OC3_STM1_39	NO	12.01	12.01	0.0
SSFP_OC3_STM1_4	NO	12.01	12.01	0.0
SSFP_OC3_STM1_40	NO	12.01	12.01	0.0
SSFP_OC3_STM1_41	NO	12.01	12.01	0.0
SSFP_OC3_STM1_42	NO	12.01	12.01	0.0
SSFP_OC3_STM1_43	NO	12.01	12.01	0.0
SSFP_OC3_STM1_44	NO	12.01	12.01	0.0
SSFP_OC3_STM1_45	NO	12.01	12.01	0.0
SSFP_OC3_STM1_46	NO	12.01	12.01	0.0
SSFP_OC3_STM1_47	NO	12.01	12.01	0.0
SSFP_OC3_STM1_5	NO	12.01	12.01	0.0
SSFP_OC3_STM1_6	NO	12.01	12.01	0.0
SSFP_OC3_STM1_7	NO	12.01	12.01	0.0
SSFP_OC3_STM1_8	NO	12.01	12.01	0.0
SSFP_OC3_STM1_9	NO	12.01	12.01	0.0
SSFP_STM1_TSOP_0	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_1	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_10	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_11	NO	13.00	13.00	0.0

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

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N540-ACC-SYS	Bootloader (A)	YES	1.16	1.16	0.0
	CPU-IOFPGA (A)	YES	0.10	0.10	0.0
	MB-IOFPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.05	0.05	0.0
	SATA-INTEL_240G (A)	NO	1132.00	1132.00	0.0
	SATA-INTEL_480G (A)	NO	1132.00	1132.00	0.0
	SATA-M500IT-MC (A)	NO	3.00	3.00	0.0
	SATA-M500IT-MU-A (A)	NO	5.00	5.00	0.0
	SATA-M500IT-MU-B (A)	NO	4.00	4.00	0.0
	SATA-M5100 (A)	NO	75.00	75.00	0.0
	SATA-M600-MCT (A)	NO	5.00	5.00	0.0
	SATA-M600-MU (A)	NO	6.00	6.00	0.0
	SATA-Micron (A)	NO	1.00	1.00	0.0
	SATA-SMART-128G (A)	NO	1427.00	1427.00	0.0
	SSFP_E1F_0	NO	13.01	13.01	0.0
	SSFP_E1F_1	NO	13.01	13.01	0.0
	SSFP_E1F_10	NO	13.01	13.01	0.0
	SSFP_E1F_11	NO	13.01	13.01	0.0
	SSFP_E1F_12	NO	13.01	13.01	0.0



SSFP_E1F_13	NO	13.01	13.01	0.0
SSFP_E1F_14	NO	13.01	13.01	0.0
SSFP_E1F_15	NO	13.01	13.01	0.0
SSFP_E1F_16	NO	13.01	13.01	0.0
SSFP_E1F_17	NO	13.01	13.01	0.0
SSFP_E1F_18	NO	13.01	13.01	0.0
SSFP_E1F_19	NO	13.01	13.01	0.0
SSFP_E1F_2	NO	13.01	13.01	0.0
SSFP_E1F_20	NO	13.01	13.01	0.0
SSFP_E1F_21	NO	13.01	13.01	0.0
SSFP_E1F_22	NO	13.01	13.01	0.0
SSFP_E1F_23	NO	13.01	13.01	0.0
SSFP_E1F_24	NO	13.01	13.01	0.0
SSFP_E1F_25	NO	13.01	13.01	0.0
SSFP_E1F_26	NO	13.01	13.01	0.0
SSFP_E1F_27	NO	13.01	13.01	0.0
SSFP_E1F_28	NO	13.01	13.01	0.0
SSFP_E1F_29	NO	13.01	13.01	0.0
SSFP_E1F_3	NO	13.01	13.01	0.0
SSFP_E1F_30	NO	13.01	13.01	0.0
SSFP_E1F_31	NO	13.01	13.01	0.0
SSFP_E1F_32	NO	13.01	13.01	0.0
SSFP_E1F_33	NO	13.01	13.01	0.0
SSFP_E1F_34	NO	13.01	13.01	0.0
SSFP_E1F_35	NO	13.01	13.01	0.0
SSFP_E1F_36	NO	13.01	13.01	0.0
SSFP_E1F_37	NO	13.01	13.01	0.0
SSFP_E1F_38	NO	13.01	13.01	0.0
SSFP_E1F_39	NO	13.01	13.01	0.0
SSFP_E1F_4	NO	13.01	13.01	0.0
SSFP_E1F_40	NO	13.01	13.01	0.0
SSFP_E1F_41	NO	13.01	13.01	0.0
SSFP_E1F_42	NO	13.01	13.01	0.0
SSFP_E1F_43	NO	13.01	13.01	0.0
SSFP_E1F_44	NO	13.01	13.01	0.0
SSFP_E1F_45	NO	13.01	13.01	0.0
SSFP_E1F_46	NO	13.01	13.01	0.0
SSFP_E1F_47	NO	13.01	13.01	0.0
SSFP_E1F_5	NO	13.01	13.01	0.0
SSFP_E1F_6	NO	13.01	13.01	0.0
SSFP_E1F_7	NO	13.01	13.01	0.0
SSFP_E1F_8	NO	13.01	13.01	0.0
SSFP_E1F_9	NO	13.01	13.01	0.0
SSFP_OC3_STM1_0	NO	12.01	12.01	0.0
SSFP_OC3_STM1_1	NO	12.01	12.01	0.0
SSFP_OC3_STM1_10	NO	12.01	12.01	0.0
SSFP_OC3_STM1_11	NO	12.01	12.01	0.0
SSFP_OC3_STM1_12	NO	12.01	12.01	0.0
SSFP_OC3_STM1_13	NO	12.01	12.01	0.0
SSFP_OC3_STM1_14	NO	12.01	12.01	0.0
SSFP_OC3_STM1_15	NO	12.01	12.01	0.0
SSFP_OC3_STM1_16	NO	12.01	12.01	0.0
SSFP_OC3_STM1_17	NO	12.01	12.01	0.0
SSFP_OC3_STM1_18	NO	12.01	12.01	0.0
SSFP_OC3_STM1_19	NO	12.01	12.01	0.0
SSFP_OC3_STM1_2	NO	12.01	12.01	0.0
SSFP_OC3_STM1_20	NO	12.01	12.01	0.0
SSFP_OC3_STM1_21	NO	12.01	12.01	0.0
SSFP_OC3_STM1_22	NO	12.01	12.01	0.0
SSFP_OC3_STM1_23	NO	12.01	12.01	0.0
SSFP_OC3_STM1_24	NO	12.01	12.01	0.0
SSFP_OC3_STM1_25	NO	12.01	12.01	0.0
SSFP_OC3_STM1_26	NO	12.01	12.01	0.0
SSFP_OC3_STM1_27	NO	12.01	12.01	0.0

SSFP_OC3_STM1_28	NO	12.01	12.01	0.0
SSFP_OC3_STM1_29	NO	12.01	12.01	0.0
SSFP_OC3_STM1_3	NO	12.01	12.01	0.0
SSFP_OC3_STM1_30	NO	12.01	12.01	0.0
SSFP_OC3_STM1_31	NO	12.01	12.01	0.0
SSFP_OC3_STM1_32	NO	12.01	12.01	0.0
SSFP_OC3_STM1_33	NO	12.01	12.01	0.0
SSFP_OC3_STM1_34	NO	12.01	12.01	0.0
SSFP_OC3_STM1_35	NO	12.01	12.01	0.0
SSFP_OC3_STM1_36	NO	12.01	12.01	0.0
SSFP_OC3_STM1_37	NO	12.01	12.01	0.0
SSFP_OC3_STM1_38	NO	12.01	12.01	0.0
SSFP_OC3_STM1_39	NO	12.01	12.01	0.0
SSFP_OC3_STM1_4	NO	12.01	12.01	0.0
SSFP_OC3_STM1_40	NO	12.01	12.01	0.0
SSFP_OC3_STM1_41	NO	12.01	12.01	0.0
SSFP_OC3_STM1_42	NO	12.01	12.01	0.0
SSFP_OC3_STM1_43	NO	12.01	12.01	0.0
SSFP_OC3_STM1_44	NO	12.01	12.01	0.0
SSFP_OC3_STM1_45	NO	12.01	12.01	0.0
SSFP_OC3_STM1_46	NO	12.01	12.01	0.0
SSFP_OC3_STM1_47	NO	12.01	12.01	0.0
SSFP_OC3_STM1_5	NO	12.01	12.01	0.0
SSFP_OC3_STM1_6	NO	12.01	12.01	0.0
SSFP_OC3_STM1_7	NO	12.01	12.01	0.0
SSFP_OC3_STM1_8	NO	12.01	12.01	0.0
SSFP_OC3_STM1_9	NO	12.01	12.01	0.0
SSFP_STM1_TSOP_0	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_1	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_10	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_11	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_12	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_13	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_14	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_15	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_16	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_17	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_18	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_19	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_2	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_20	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_21	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_22	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_23	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_24	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_25	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_26	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_27	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_28	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_29	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_3	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_30	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_31	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_32	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_33	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_34	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_35	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_36	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_37	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_38	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_39	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_4	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_40	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_41	NO	13.00	13.00	0.0

	SSFP_STM1_TSOP_42	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_43	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_44	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_45	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_46	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_47	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_5	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_6	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_7	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_8	NO	13.00	13.00	0.0
	SSFP_STM1_TSOP_9	NO	13.00	13.00	0.0
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N540-PWR400-A	LIT-PrimCU-ACFW (A)	NO	0.04	0.04	0.0
	LIT-SecMCU-ACFW (A)	NO	0.07	0.07	0.0
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N540-PWR400-D	LIT-PrimCU-DCFW (A)	NO	0.04	0.04	0.0
	LIT-SecMCU-DCFW (A)	NO	0.06	0.06	0.0
	SDG-PrimCU-DCFW (A)	NO	1.03	1.03	0.0
	SDG-SecMCU-DCFW (A)	NO	1.03	1.03	0.0
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N540-X-24Z8Q2C-M	Bootloader (A)	YES	1.16	1.16	0.0
	CPU-IOFPGA (A)	YES	0.10	0.10	0.0
	MB-IOFPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.05	0.05	0.0
	SATA-INTEL_240G (A)	NO	1132.00	1132.00	0.0
	SATA-INTEL_480G (A)	NO	1132.00	1132.00	0.0
	SATA-M500IT-MC (A)	NO	3.00	3.00	0.0
	SATA-M500IT-MU-A (A)	NO	5.00	5.00	0.0
	SATA-M500IT-MU-B (A)	NO	4.00	4.00	0.0
	SATA-M5100 (A)	NO	75.00	75.00	0.0
	SATA-M600-MCT (A)	NO	5.00	5.00	0.0
	SATA-M600-MU (A)	NO	6.00	6.00	0.0
	SATA-Micron (A)	NO	1.00	1.00	0.0
	SATA-SMART-128G (A)	NO	1427.00	1427.00	0.0
	SSFP_E1F_0	NO	13.01	13.01	0.0
	SSFP_E1F_1	NO	13.01	13.01	0.0
	SSFP_E1F_10	NO	13.01	13.01	0.0
	SSFP_E1F_11	NO	13.01	13.01	0.0
	SSFP_E1F_12	NO	13.01	13.01	0.0
	SSFP_E1F_13	NO	13.01	13.01	0.0
	SSFP_E1F_14	NO	13.01	13.01	0.0
	SSFP_E1F_15	NO	13.01	13.01	0.0
	SSFP_E1F_16	NO	13.01	13.01	0.0
	SSFP_E1F_17	NO	13.01	13.01	0.0
	SSFP_E1F_18	NO	13.01	13.01	0.0
	SSFP_E1F_19	NO	13.01	13.01	0.0
	SSFP_E1F_2	NO	13.01	13.01	0.0
	SSFP_E1F_20	NO	13.01	13.01	0.0
	SSFP_E1F_21	NO	13.01	13.01	0.0
	SSFP_E1F_22	NO	13.01	13.01	0.0
	SSFP_E1F_23	NO	13.01	13.01	0.0
	SSFP_E1F_24	NO	13.01	13.01	0.0
	SSFP_E1F_25	NO	13.01	13.01	0.0
	SSFP_E1F_26	NO	13.01	13.01	0.0
	SSFP_E1F_27	NO	13.01	13.01	0.0
	SSFP_E1F_28	NO	13.01	13.01	0.0
	SSFP_E1F_29	NO	13.01	13.01	0.0
	SSFP_E1F_3	NO	13.01	13.01	0.0
	SSFP_E1F_30	NO	13.01	13.01	0.0
	SSFP_E1F_31	NO	13.01	13.01	0.0
	SSFP_E1F_32	NO	13.01	13.01	0.0
	SSFP_E1F_33	NO	13.01	13.01	0.0
	SSFP_E1F_34	NO	13.01	13.01	0.0
	SSFP_E1F_35	NO	13.01	13.01	0.0

SSFP_E1F_36	NO	13.01	13.01	0.0
SSFP_E1F_37	NO	13.01	13.01	0.0
SSFP_E1F_38	NO	13.01	13.01	0.0
SSFP_E1F_39	NO	13.01	13.01	0.0
SSFP_E1F_4	NO	13.01	13.01	0.0
SSFP_E1F_40	NO	13.01	13.01	0.0
SSFP_E1F_41	NO	13.01	13.01	0.0
SSFP_E1F_42	NO	13.01	13.01	0.0
SSFP_E1F_43	NO	13.01	13.01	0.0
SSFP_E1F_44	NO	13.01	13.01	0.0
SSFP_E1F_45	NO	13.01	13.01	0.0
SSFP_E1F_46	NO	13.01	13.01	0.0
SSFP_E1F_47	NO	13.01	13.01	0.0
SSFP_E1F_5	NO	13.01	13.01	0.0
SSFP_E1F_6	NO	13.01	13.01	0.0
SSFP_E1F_7	NO	13.01	13.01	0.0
SSFP_E1F_8	NO	13.01	13.01	0.0
SSFP_E1F_9	NO	13.01	13.01	0.0
SSFP_OC3_STM1_0	NO	12.01	12.01	0.0
SSFP_OC3_STM1_1	NO	12.01	12.01	0.0
SSFP_OC3_STM1_10	NO	12.01	12.01	0.0
SSFP_OC3_STM1_11	NO	12.01	12.01	0.0
SSFP_OC3_STM1_12	NO	12.01	12.01	0.0
SSFP_OC3_STM1_13	NO	12.01	12.01	0.0
SSFP_OC3_STM1_14	NO	12.01	12.01	0.0
SSFP_OC3_STM1_15	NO	12.01	12.01	0.0
SSFP_OC3_STM1_16	NO	12.01	12.01	0.0
SSFP_OC3_STM1_17	NO	12.01	12.01	0.0
SSFP_OC3_STM1_18	NO	12.01	12.01	0.0
SSFP_OC3_STM1_19	NO	12.01	12.01	0.0
SSFP_OC3_STM1_2	NO	12.01	12.01	0.0
SSFP_OC3_STM1_20	NO	12.01	12.01	0.0
SSFP_OC3_STM1_21	NO	12.01	12.01	0.0
SSFP_OC3_STM1_22	NO	12.01	12.01	0.0
SSFP_OC3_STM1_23	NO	12.01	12.01	0.0
SSFP_OC3_STM1_24	NO	12.01	12.01	0.0
SSFP_OC3_STM1_25	NO	12.01	12.01	0.0
SSFP_OC3_STM1_26	NO	12.01	12.01	0.0
SSFP_OC3_STM1_27	NO	12.01	12.01	0.0
SSFP_OC3_STM1_28	NO	12.01	12.01	0.0
SSFP_OC3_STM1_29	NO	12.01	12.01	0.0
SSFP_OC3_STM1_3	NO	12.01	12.01	0.0
SSFP_OC3_STM1_30	NO	12.01	12.01	0.0
SSFP_OC3_STM1_31	NO	12.01	12.01	0.0
SSFP_OC3_STM1_32	NO	12.01	12.01	0.0
SSFP_OC3_STM1_33	NO	12.01	12.01	0.0
SSFP_OC3_STM1_34	NO	12.01	12.01	0.0
SSFP_OC3_STM1_35	NO	12.01	12.01	0.0
SSFP_OC3_STM1_36	NO	12.01	12.01	0.0
SSFP_OC3_STM1_37	NO	12.01	12.01	0.0
SSFP_OC3_STM1_38	NO	12.01	12.01	0.0
SSFP_OC3_STM1_39	NO	12.01	12.01	0.0
SSFP_OC3_STM1_4	NO	12.01	12.01	0.0
SSFP_OC3_STM1_40	NO	12.01	12.01	0.0
SSFP_OC3_STM1_41	NO	12.01	12.01	0.0
SSFP_OC3_STM1_42	NO	12.01	12.01	0.0
SSFP_OC3_STM1_43	NO	12.01	12.01	0.0
SSFP_OC3_STM1_44	NO	12.01	12.01	0.0
SSFP_OC3_STM1_45	NO	12.01	12.01	0.0
SSFP_OC3_STM1_46	NO	12.01	12.01	0.0
SSFP_OC3_STM1_47	NO	12.01	12.01	0.0
SSFP_OC3_STM1_5	NO	12.01	12.01	0.0
SSFP_OC3_STM1_6	NO	12.01	12.01	0.0
SSFP_OC3_STM1_7	NO	12.01	12.01	0.0

SSFP_OC3_STM1_8	NO	12.01	12.01	0.0	
SSFP_OC3_STM1_9	NO	12.01	12.01	0.0	
SSFP_STM1_TSOP_0	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_1	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_10	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_11	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_12	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_13	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_14	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_15	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_16	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_17	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_18	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_19	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_2	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_20	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_21	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_22	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_23	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_24	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_25	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_26	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_27	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_28	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_29	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_3	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_30	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_31	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_32	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_33	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_34	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_35	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_36	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_37	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_38	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_39	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_4	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_40	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_41	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_42	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_43	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_44	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_45	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_46	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_47	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_5	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_6	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_7	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_8	NO	13.00	13.00	0.0	
SSFP_STM1_TSOP_9	NO	13.00	13.00	0.0	
-----					
N540X-ACC-SYS	Bootloader (A)	YES	1.16	1.16	0.0
	CPU-IOPPGA (A)	YES	0.10	0.10	0.0
	MB-IOPPGA (A)	YES	0.27	0.27	0.0
	MB-MIFPGA	YES	0.05	0.05	0.0
	SATA-INTEL_240G (A)	NO	1132.00	1132.00	0.0
	SATA-INTEL_480G (A)	NO	1132.00	1132.00	0.0
	SATA-M500IT-MC (A)	NO	3.00	3.00	0.0
	SATA-M500IT-MU-A (A)	NO	5.00	5.00	0.0
	SATA-M500IT-MU-B (A)	NO	4.00	4.00	0.0
	SATA-M5100 (A)	NO	75.00	75.00	0.0
	SATA-M600-MCT (A)	NO	5.00	5.00	0.0
	SATA-M600-MU (A)	NO	6.00	6.00	0.0
	SATA-Micron (A)	NO	1.00	1.00	0.0

SATA-SMART-128G (A)	NO	1427.00	1427.00	0.0
SSFP_E1F_0	NO	13.01	13.01	0.0
SSFP_E1F_1	NO	13.01	13.01	0.0
SSFP_E1F_10	NO	13.01	13.01	0.0
SSFP_E1F_11	NO	13.01	13.01	0.0
SSFP_E1F_12	NO	13.01	13.01	0.0
SSFP_E1F_13	NO	13.01	13.01	0.0
SSFP_E1F_14	NO	13.01	13.01	0.0
SSFP_E1F_15	NO	13.01	13.01	0.0
SSFP_E1F_16	NO	13.01	13.01	0.0
SSFP_E1F_17	NO	13.01	13.01	0.0
SSFP_E1F_18	NO	13.01	13.01	0.0
SSFP_E1F_19	NO	13.01	13.01	0.0
SSFP_E1F_2	NO	13.01	13.01	0.0
SSFP_E1F_20	NO	13.01	13.01	0.0
SSFP_E1F_21	NO	13.01	13.01	0.0
SSFP_E1F_22	NO	13.01	13.01	0.0
SSFP_E1F_23	NO	13.01	13.01	0.0
SSFP_E1F_24	NO	13.01	13.01	0.0
SSFP_E1F_25	NO	13.01	13.01	0.0
SSFP_E1F_26	NO	13.01	13.01	0.0
SSFP_E1F_27	NO	13.01	13.01	0.0
SSFP_E1F_28	NO	13.01	13.01	0.0
SSFP_E1F_29	NO	13.01	13.01	0.0
SSFP_E1F_3	NO	13.01	13.01	0.0
SSFP_E1F_30	NO	13.01	13.01	0.0
SSFP_E1F_31	NO	13.01	13.01	0.0
SSFP_E1F_32	NO	13.01	13.01	0.0
SSFP_E1F_33	NO	13.01	13.01	0.0
SSFP_E1F_34	NO	13.01	13.01	0.0
SSFP_E1F_35	NO	13.01	13.01	0.0
SSFP_E1F_36	NO	13.01	13.01	0.0
SSFP_E1F_37	NO	13.01	13.01	0.0
SSFP_E1F_38	NO	13.01	13.01	0.0
SSFP_E1F_39	NO	13.01	13.01	0.0
SSFP_E1F_4	NO	13.01	13.01	0.0
SSFP_E1F_40	NO	13.01	13.01	0.0
SSFP_E1F_41	NO	13.01	13.01	0.0
SSFP_E1F_42	NO	13.01	13.01	0.0
SSFP_E1F_43	NO	13.01	13.01	0.0
SSFP_E1F_44	NO	13.01	13.01	0.0
SSFP_E1F_45	NO	13.01	13.01	0.0
SSFP_E1F_46	NO	13.01	13.01	0.0
SSFP_E1F_47	NO	13.01	13.01	0.0
SSFP_E1F_5	NO	13.01	13.01	0.0
SSFP_E1F_6	NO	13.01	13.01	0.0
SSFP_E1F_7	NO	13.01	13.01	0.0
SSFP_E1F_8	NO	13.01	13.01	0.0
SSFP_E1F_9	NO	13.01	13.01	0.0
SSFP_OC3_STM1_0	NO	12.01	12.01	0.0
SSFP_OC3_STM1_1	NO	12.01	12.01	0.0
SSFP_OC3_STM1_10	NO	12.01	12.01	0.0
SSFP_OC3_STM1_11	NO	12.01	12.01	0.0
SSFP_OC3_STM1_12	NO	12.01	12.01	0.0
SSFP_OC3_STM1_13	NO	12.01	12.01	0.0
SSFP_OC3_STM1_14	NO	12.01	12.01	0.0
SSFP_OC3_STM1_15	NO	12.01	12.01	0.0
SSFP_OC3_STM1_16	NO	12.01	12.01	0.0
SSFP_OC3_STM1_17	NO	12.01	12.01	0.0
SSFP_OC3_STM1_18	NO	12.01	12.01	0.0
SSFP_OC3_STM1_19	NO	12.01	12.01	0.0
SSFP_OC3_STM1_2	NO	12.01	12.01	0.0
SSFP_OC3_STM1_20	NO	12.01	12.01	0.0
SSFP_OC3_STM1_21	NO	12.01	12.01	0.0

SSFP_OC3_STM1_22	NO	12.01	12.01	0.0
SSFP_OC3_STM1_23	NO	12.01	12.01	0.0
SSFP_OC3_STM1_24	NO	12.01	12.01	0.0
SSFP_OC3_STM1_25	NO	12.01	12.01	0.0
SSFP_OC3_STM1_26	NO	12.01	12.01	0.0
SSFP_OC3_STM1_27	NO	12.01	12.01	0.0
SSFP_OC3_STM1_28	NO	12.01	12.01	0.0
SSFP_OC3_STM1_29	NO	12.01	12.01	0.0
SSFP_OC3_STM1_3	NO	12.01	12.01	0.0
SSFP_OC3_STM1_30	NO	12.01	12.01	0.0
SSFP_OC3_STM1_31	NO	12.01	12.01	0.0
SSFP_OC3_STM1_32	NO	12.01	12.01	0.0
SSFP_OC3_STM1_33	NO	12.01	12.01	0.0
SSFP_OC3_STM1_34	NO	12.01	12.01	0.0
SSFP_OC3_STM1_35	NO	12.01	12.01	0.0
SSFP_OC3_STM1_36	NO	12.01	12.01	0.0
SSFP_OC3_STM1_37	NO	12.01	12.01	0.0
SSFP_OC3_STM1_38	NO	12.01	12.01	0.0
SSFP_OC3_STM1_39	NO	12.01	12.01	0.0
SSFP_OC3_STM1_4	NO	12.01	12.01	0.0
SSFP_OC3_STM1_40	NO	12.01	12.01	0.0
SSFP_OC3_STM1_41	NO	12.01	12.01	0.0
SSFP_OC3_STM1_42	NO	12.01	12.01	0.0
SSFP_OC3_STM1_43	NO	12.01	12.01	0.0
SSFP_OC3_STM1_44	NO	12.01	12.01	0.0
SSFP_OC3_STM1_45	NO	12.01	12.01	0.0
SSFP_OC3_STM1_46	NO	12.01	12.01	0.0
SSFP_OC3_STM1_47	NO	12.01	12.01	0.0
SSFP_OC3_STM1_5	NO	12.01	12.01	0.0
SSFP_OC3_STM1_6	NO	12.01	12.01	0.0
SSFP_OC3_STM1_7	NO	12.01	12.01	0.0
SSFP_OC3_STM1_8	NO	12.01	12.01	0.0
SSFP_OC3_STM1_9	NO	12.01	12.01	0.0
SSFP_STM1_TSOP_0	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_1	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_10	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_11	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_12	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_13	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_14	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_15	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_16	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_17	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_18	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_19	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_2	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_20	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_21	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_22	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_23	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_24	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_25	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_26	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_27	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_28	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_29	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_3	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_30	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_31	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_32	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_33	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_34	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_35	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_36	NO	13.00	13.00	0.0

SSFP_STM1_TSOP_37	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_38	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_39	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_4	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_40	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_41	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_42	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_43	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_44	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_45	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_46	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_47	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_5	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_6	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_7	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_8	NO	13.00	13.00	0.0
SSFP_STM1_TSOP_9	NO	13.00	13.00	0.0

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

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Program
0/RP0	N540-24Z8Q2C-M	1.0	MB-MIFPGA	CURRENT	0.07	0.07
0/RP0	N540-24Z8Q2C-M	1.0	Bootloader	CURRENT	1.16	1.16
0/RP0	N540-24Z8Q2C-M	1.0	CPU-IOFPGA	CURRENT	0.10	0.10
0/RP0	N540-24Z8Q2C-M	1.0	MB-IOFPGA	CURRENT	0.27	0.27
0/RP0	N540-24Z8Q2C-M	1.0	SATA-M500IT-MU-B	CURRENT	4.00	4.00
0/PM0	N540-PWR400-A	1.0	SDG-PrimMCU-ACFW	CURRENT	0.00	0.00
0/PM0	N540-PWR400-A	1.0	SDG-SecMCU-ACFW	CURRENT	0.00	0.00
0/PM1	N540-PWR400-A	1.0	SDG-PrimMCU-ACFW	CURRENT	0.00	0.00
0/PM1	N540-PWR400-A	1.0	SDG-SecMCU-ACFW	CURRENT	0.00	0.00

Log in to the router and enter the **show fpd package** and **show hw-module fpd** commands on the Cisco N540-28Z4C-SYS-A/D, N540-12Z20G-SYS-A/D, N540X-12Z16G-SYS-A/D, N540X-16Z8Q2C-D, and N540X-16Z4G8Q2C-A/D variants:

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

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=====
                          Field Programmable Device Package
=====
Card Type                FPD Description          Req  SW   Min Req  Min Req
                          Reload  Ver   SW Ver   Board Ver
=====  =====  =====  =====  =====  =====
N540-12Z20G-SYS-A      ADM_FW                   YES  14.03  14.03    0.0
ADMConfig              NO   1.05   1.05    0.0
IoFpga                 YES  3.08   3.08    0.0
IoFpgaGolden           YES  2.07   2.03    0.0
Primary-BIOS           YES  1.48   1.48    0.0
StdbbyFpga             YES  0.40   0.40    0.0
StdbbyFpgaGolden       YES  0.40   0.40    0.0
TamFw                  YES  4.11   4.11    0.0
TamFwGolden            YES  4.11   4.11    0.0
-----
N540-12Z20G-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
StdbbyFpga             YES  0.40   0.40    0.0
StdbbyFpgaGolden       YES  0.40   0.40    0.0
TamFw                  YES  4.11   4.11    0.0
TamFwGolden            YES  4.11   4.11    0.0
=====

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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
	Primary-BIOS	YES	1.48	1.48	0.0
	StdbyFpga	YES	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540-28Z4C-SYS-D	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540-FH-AGG-SYS	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	1.46	1.46	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	1.46	1.46	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
	StdbypFpga	YES	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
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	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
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	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
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	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
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	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
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
	StdbypFpga	YES	0.40	0.40	0.0
	StdbypFpgaGolden	YES	0.40	0.40	0.0

```
TamFw                YES      4.11      4.11      0.0
TamFwGolden          YES      4.11      4.11      0.0
```

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	FPD Versions		Reload Loc
						Running	Programd	
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	ADM_FW		CURRENT	14.03	14.03	NOT REQ
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	ADMConfig		CURRENT	1.05	1.05	NOT REQ
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	IoFpga		CURRENT	3.08	3.08	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	IoFpgaGolden	B	CURRENT		2.07	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	Primary-BIOS	SA	CURRENT	1.48	1.48	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	StdbyFpga	S	CURRENT	0.40	0.40	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	StdbyFpgaGolden	BS	CURRENT		0.40	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	TamFw	S	CURRENT	4.11	4.11	0/RP0
0/RP0/CPU0	N540-28Z4C-SYS-A	4.0	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 Reload	SW Ver	Min Req SW Ver	Min Req Board Ver
N540-6Z14S-SYS-D	ADMConfig	NO	5.03	5.03	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	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	0.05	0.05	0.0
	IoFpgaGolden	YES	0.03	0.03	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
TamFwGolden	YES	6.05	6.05	0.0	
N540-6Z18G-SYS-D	ADMConfig	NO	5.03	5.03	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.05	0.05	0.0
	IoFpgaGolden	YES	0.03	0.03	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
TamFwGolden	YES	6.05	6.05	0.0	
N540X-4Z14G2Q-A	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0

	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-4Z14G2Q-D	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-6Z18G-SYS-A	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-6Z18G-SYS-D	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-8Z16G-SYS-A	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0
-----					
N540X-8Z16G-SYS-D	ADMConfig	NO	5.00	5.00	0.0
	BckUp-BootLoader	YES	20.08	20.08	0.0
	IoFpga	YES	0.17	0.17	0.0
	IoFpgaGolden	YES	0.15	0.15	0.0
	Prim-BootLoader	YES	20.08	20.08	0.0
	StdbyFpga	YES	2.05	2.05	0.0
	StdbyFpgaGolden	YES	0.33	0.33	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0

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

Auto-upgrade:Enabled

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

Location	Card type	HWver	FPD device	ATR Status	FPD Versions		Reload Loc
					Running Programd	Reload Loc	
0/RP0/CPU0	N540X-8Z16G-SYS-A	1.0	ADMConfig	CURRENT	5.00	5.00	NOT REQ
0/RP0/CPU0	N540X-8Z16G-SYS-A	1.0	IoFpga	CURRENT	0.17	0.17	0/RP0

```

0/RP0/CPU0 N540X-8Z16G-SYS-A 1.0 IoFpgaGolden B CURRENT 0.15 0/RP0
0/RP0/CPU0 N540X-8Z16G-SYS-A 1.0 Prim-BootLoader A CURRENT 20.08 20.08 0/RP0
0/RP0/CPU0 N540X-8Z16G-SYS-A 1.0 StdbyFpga S CURRENT 2.05 2.05 0/RP0
0/RP0/CPU0 N540X-8Z16G-SYS-A 1.0 StdbyFpgaGolden BS CURRENT 0.33 0/RP0
0/RP0/CPU0 N540X-8Z16G-SYS-A 1.0 TamFw S CURRENT 6.05 6.05 0/RP0
0/RP0/CPU0 N540X-8Z16G-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   SW   Min Req  Min Req
=====  =====  =====  =====  =====  =====
                        Reload  Ver    SW Ver  Board Ver
-----
N540-12Z20G-SYS-A  ADM_FW                   YES   14.03  14.03    0.0
                        ADMConfig                NO    1.05    1.05    0.0
                        IoFpga                   YES   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   0.40    0.40    0.0
                        StdbyFpgaGolden          YES   0.40    0.40    0.0
                        TamFw                    YES   4.11    4.11    0.0
                        TamFwGolden              YES   4.11    4.11    0.0
-----
N540-12Z20G-SYS-D  ADM_FW                   YES   14.03  14.03    0.0
                        ADMConfig                NO    1.05    1.05    0.0
                        IoFpga                   YES   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   0.40    0.40    0.0
                        StdbyFpgaGolden          YES   0.40    0.40    0.0
                        TamFw                    YES   4.11    4.11    0.0
                        TamFwGolden              YES   4.11    4.11    0.0
-----
N540-24Q8L2DD-SYS ADM-DBConfig             NO    2.05    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
                        Primary-BIOS             YES   1.48    1.48    0.0
                        StdbyFpga                YES   0.40    0.40    0.0
                        StdbyFpgaGolden          YES   0.40    0.40    0.0
                        TamFw                    YES   4.11    4.11    0.0
                        TamFwGolden              YES   4.11    4.11    0.0
-----
N540-28Z4C-SYS-D  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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540-FH-AGG-SYS	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	1.46	1.46	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	1.46	1.46	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-12Z16G-SYS-D	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0

	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z4G8Q2C-A	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z4G8Q2C-D	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z8Q2C-A	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z8Q2C-D	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0

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

Auto-upgrade:Enabled

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

				FPD Versions		=====	
Location	Card type	HWver	FPD device	ATR Status	Running	Programd	Reload Loc
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	ADM-DBConfig	CURRENT	2.05	2.05	NOT REQ
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	ADM-MBConfig	CURRENT	2.05	2.05	NOT REQ
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	IoFpga	CURRENT	2.12	2.12	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	IoFpgaGolden	B CURRENT		2.12	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	Primary-BIOS	S CURRENT	4.07	4.07	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	SsdSAMS64G3	S CURRENT	12.41	12.41	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	StdbyFpga	S CURRENT	2.59	2.59	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	StdbyFpgaGolden	BS CURRENT		2.59	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	TamFw	S CURRENT	6.05	6.05	0/RP0
0/RP0/CPU0	N540-24Q8L2DD-SYS	4.0	TamFwGolden	BS CURRENT		6.05	0/RP0
0/PM0	N540-PWR400-A	0.0	PrimMCU	CURRENT	1.02	1.02	NOT REQ
0/PM0	N540-PWR400-A	0.0	SecMCU	CURRENT	1.03	1.03	NOT REQ
0/PM1	N540-PWR400-A	0.0	PrimMCU	CURRENT	1.02	1.02	NOT REQ
0/PM1	N540-PWR400-A	0.0	SecMCU	CURRENT	1.03	1.03	NOT REQ

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

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

```

=====
                                Field Programmable Device Package
=====
Card Type          FPD Description          Req   SW   Min Req   Min Req
                    Reload   Ver   SW Ver   Board Ver
=====
N540-12Z20G-SYS-A  ADM_FW                   YES   14.03  14.03    0.0
                   ADMConfig                NO    1.05   1.05    0.0
                   IoFpga                   YES   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   0.40   0.40    0.0
                   StdbyFpgaGolden         YES   0.40   0.40    0.0
                   TamFw                    YES   4.11   4.11    0.0
                   TamFwGolden           YES   4.11   4.11    0.0
-----
N540-12Z20G-SYS-D  ADM_FW                   YES   14.03  14.03    0.0
                   ADMConfig                NO    1.05   1.05    0.0
                   IoFpga                   YES   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   0.40   0.40    0.0
                   StdbyFpgaGolden         YES   0.40   0.40    0.0
                   TamFw                    YES   4.11   4.11    0.0
                   TamFwGolden           YES   4.11   4.11    0.0
-----
N540-24Q8L2DD-SYS ADM-DBConfig             NO    2.05   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
                   SsdSAMS64G3            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
                   Primary-BIOS             YES   1.48   1.48    0.0
                   StdbyFpga                YES   0.40   0.40    0.0
                   StdbyFpgaGolden         YES   0.40   0.40    0.0
                   TamFw                    YES   4.11   4.11    0.0
                   TamFwGolden           YES   4.11   4.11    0.0
-----
N540-28Z4C-SYS-D  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   0.40   0.40    0.0
                   StdbyFpgaGolden         YES   0.40   0.40    0.0
                   TamFw                    YES   4.11   4.11    0.0
                   TamFwGolden           YES   4.11   4.11    0.0
-----
N540-FH-AGG-SYS   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	1.46	1.46	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	1.46	1.46	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-12Z16G-SYS-D	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z4G8Q2C-A	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0

	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z4G8Q2C-D	ADM_FW	YES	14.03	14.03	0.0
	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z8Q2C-A	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0
-----					
N540X-16Z8Q2C-D	ADMConfig	NO	1.05	1.05	0.0
	IoFpga	YES	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	0.40	0.40	0.0
	StdbyFpgaGolden	YES	0.40	0.40	0.0
	TamFw	YES	4.11	4.11	0.0
	TamFwGolden	YES	4.11	4.11	0.0

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

Auto-upgrade:Enabled

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

Location	Card type	HWver	FPD device	ATR	Status	FPD Versions		Reload Loc
						Running	Programd	
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	ADM1_Config	CURRENT	1.02	1.02		NOT REQ
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	ADM2_Config	CURRENT	1.02	1.02		NOT REQ
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	DpFpgaCpri	CURRENT	0.24		0.24	
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	DpFpgaEth	CURRENT	1.22	1.22		0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	IoFpga	CURRENT	1.30	1.30		0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	IoFpgaGolden	B	CURRENT		1.30	0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	Primary-BIOS	SA	CURRENT	1.46	1.46	0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	StdbyFpga	S	CURRENT	0.46	0.46	0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	StdbyFpgaGolden	BS	CURRENT		0.46	0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	TamFw	S	CURRENT	6.05	6.05	0/RP0
0/RP0/CPU0	N540-FH-AGG-SYS	1.0	TamFwGolden	BS	CURRENT		6.05	0/RP0
0/PM1	N540-PWR750-A	0.0	PrimMCU	CURRENT	1.02	1.02		NOT REQ
0/PM1	N540-PWR750-A	0.0	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-7.10.1.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 are available along with the software image in [NCS540I-docs-7.10.1.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 are available along with the software image in [NCS540I-aarch64-docs-7.10.1.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 before 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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