



Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 24.3.1

Network Convergence System 5500 Series Routers	2
What's New in Cisco IOS XR Release 24.3.1	2
Caveats	16
Behavior Changes	16
Release Package	16
Determine Software Version	18
Determine Firmware Support	18
Compatibility Matrix for EPNM and Crosswork with Cisco IOS XR Software	35
Important Notes	35

Revised: September 11, 2024

Network Convergence System 5500 Series Routers

What's New in Cisco IOS XR Release 24.3.1

Cisco IOS XR Release 24.3.1 is a new feature release for Cisco NCS 5500 Series routers.

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

New in Documentation

Feature	Description
Cisco IOS XR Feature Finder	We have launched this interactive tool that assists you in locating features introduced across Cisco IOS XR releases and platforms. This tool empowers you to explore, discover, and utilize the full potential of our platforms. As we continue to enhance the tool, we would love to hear your feedback. You are welcome to drop us a note here .

Software Features Enhanced and Introduced

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

Feature	Description
Programmability	
gNSI Acctz Logging	<p>Introduced in the 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 log and monitor AAA (Authentication, Authorization, and Accounting) accounting of gRPC operations and CLI accounting data through gNSI Acctz for effective management of network for better performance and resource utilization. You can also configure the number of gNSI accounting records that can be streamed.</p> <p>Previously, you could monitor the AAA accounting data through syslog only.</p> <p>The feature introduces these changes:</p> <p>CLI: <code>grpc aaa accounting queue-size</code></p> <p>To view the specification of gNSI Accounting (Acctz) RPCs and messages, see the Github repository.</p>
Routing	
Enhanced EIGRP Integration for BVI with VRF-lite on NC57 Line Cards	<p>Introduced in this release on: NCS 5500 modular routers (NCS 5500 line cards), NCS 5700 line cards [Mode: Native])</p> <p>Now you can achieve efficient routing within a unified IP subnet and secure, segmented network paths without the need for additional physical routers by using EIGRP over BVI with VRF Lite. This integration allows you to connect your legacy management network seamlessly, creating a single broadcast domain across core routers.</p>

Feature	Description
LSP Fast-Flooding on IS-IS Networks	<p>Introduced in this release on: NCS 5500 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Compatibility; Native])</p> <p>You can now accelerate the rate at which Link State Packets (LSPs) are distributed across an IS-IS network. Faster LSP distribution means faster network convergence. This faster convergence ensures that the most accurate topology information is quickly available across all routers on the network, reducing the chances of routing loops or misrouting.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • lsp-fast-flooding • max-lsp-tx • psnp-interval • remote-psnp-delay <p>YANG Data Model:</p> <ul style="list-style-type: none"> • <code>Cisco-IOS-XR-um-router-isis-cfg</code> <p>(see GitHub, YANG Data Models Navigator)</p>
Shorter minimum interval support for BFD over logical bundle	<p>Introduced in this release on: NCS 5500 modular routers (NCS 5700 line cards [Mode: Native])</p> <p>This feature reduces the minimum interval timer from 300 ms to 100 ms, enabling faster failure detection and quicker identification of system issues.</p>
Segment Routing	
BGP Signaling for co-existence of IP routes	<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>SRv6 with BGP supports the coexistence of IP routes with or without SRv6 SID over an SRv6-enabled core network. This support enables integrating SRv6 capabilities into existing network infrastructures without replacing IP routing completely.</p> <p>This feature enables flexibility and scalability, transition to new technologies, and enhanced network efficiency, making it easier to migrate from MPLS to SRV6.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • encapsulation-type srv6 relax-sid

Feature	Description
Delay Measurement Using Software Timestamp	<p>Introduced in this release on: NCS 5500 modular routers; NCS 5500 fixed port routers.</p> <p>You can now identify performance issues caused by the network, disk I/O, processing, or other factors using software timestamping on your router by measuring the delay and loss of each network path, even if the existing hardware lacks timestamp support.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • The timestamp-format NTP keyword is introduced in the performance-measurement delay-profile command.
Delay Measurement for IP Endpoint over SRv6 Network on Cisco NCS 5508 and Cisco NCS 5700 Series Routers	<p>Introduced in this release on: NCS 5500 modular routers, NCS 5700 fixed port routers, NCS 5700 line cards [Mode: Native] .</p> <p>Delay Measurement for IP Endpoint over SRv6 Network is now supported on the NCS 5500 modular routers and NCS 5700 line cards in the Native mode.</p> <p>In Segment Routing over an IPv6 network (SRv6), you can measure packet delay from the source to a specific IP endpoint. You can use this information for troubleshooting, network maintenance, and optimizing network performance.</p> <p>Additionally, you can use flow labels to verify the delay of each subsequent hop path towards the IP endpoint of that path. So that, when network traffic is distributed across multiple available paths towards an IP endpoint, delay measurement tracks the delay of each of these paths towards the IP endpoint.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • The source-address ipv6 keyword is introduced in the performance-measurement endpoint command. • The segment-list name keyword is introduced in the segment-routing traffic-eng explicit command. • The flow-label keyword is introduced in the performance-measurement delay-profile name command. <p>YANG Data Model:</p> <ul style="list-style-type: none"> • Cisco-IOS-XR-um-performance-measurement-cfg • Cisco-IOS-XR-perf-meas-oper.yang <p>(See GitHub, YANG Data Models Navigator)</p>

Feature	Description
Liveness Monitoring for IP Endpoint over SRv6 Network on Cisco NCS 5508 and Cisco NCS 5700 Series Routers	<p>Introduced in this release on: NCS 5500 modular routers, NCS 5700 fixed port routers, NCS 5700 line cards [Mode: Native] .</p> <p>Liveness Monitoring for IP Endpoint over SRv6 Network is now supported on the NCS 5500 modular routers and NCS 5700 line cards in the Native mode.</p> <p>In Segment Routing over an IPv6 network (SRv6), you can keep track of the operational status of both the forward and reverse paths of a particular node or IP endpoint. You can use this information for troubleshooting, network maintenance, and optimizing network performance.</p> <p>Additionally, you can use flow labels to verify the liveness of each subsequent hop path toward the IP endpoint of that path. So that, when network traffic is distributed across multiple available paths towards an IP endpoint, liveness detection tracks the operational status of each of these paths towards the IP endpoint.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • The reverse-path and segment-list name keywords are introduced in the segment-routing traffic-eng explicit command. • The source-address ipv6 is introduced in the performance-measurement endpoint command. <p>YANG Data Model:</p> <ul style="list-style-type: none"> • Cisco-IOS-XR-um-performance-measurement-cfg • Cisco-IOS-XR-perf-meas-oper.yang <p>(see GitHub, YANG Data Models Navigator)</p>
SRv6 Traffic Accounting for NCS 5700	<p>Introduced in this release on: NCS 5700 fixed port routers (NCS 5700 line cards [Mode: Native]).</p> <p>SRv6 Traffic Accounting is now supported on the Cisco NCS 5700 series routers and line cards in Native mode.</p> <p>You can now enable the router to record the number of packets and bytes transmitted on a specific egress interface for IPv6 traffic using the SRv6 locator counter.</p> <p>You can use this data to create deterministic data tools to anticipate and plan for future capacity planning solutions.</p> <p>This feature introduces or modifies the following changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • accounting prefixes ipv6 mode per-prefix per-nexthop srv6-locators <p>YANG Data Models:</p> <ul style="list-style-type: none"> • Cisco-IOS-XR-accounting-cfg • Cisco-IOS-XR-fib-common-oper.yang <p>(see GitHub, YANG Data Models Navigator)</p>
Interface and Hardware Component	

Feature	Description
<p>Configurable FDD and FED Alarm Threshold Values</p>	<p>Introduced in this release on: NCS 5700 Fixed Port Routers.</p> <p>We now ensure that you have accurate data to initiate proactive maintenance for non-critical FEC errors or take prompt action to prevent potential optical link data loss in your network. This is made possible because we've enabled the configuration of FEC (Forward Error Correction) Detected Degrade (FDD) alarm threshold values for non-critical FEC errors and FEC Excessive Degrade (FED) alarm threshold values for critical FEC errors. You can configure or clear these values for QDD-400G-ZR, QDD-400G-ZRP, and DP04QSDD-HE0 optical modules.</p> <p>Prior to this release, the router would automatically generate FEC alarms based on default threshold values.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <p>Modified the controller optics command by adding the following keywords:</p> <ul style="list-style-type: none"> • host fec-threshold excess-degrade raise • media fec-threshold excess-degrade raise • host fec-threshold excess-degrade clear • media fec-threshold excess-degrade clear • host fec-threshold detected-degrade raise • media fec-threshold detected-degrade raise • host fec-threshold detected-degrade clear • media fec-threshold detected-degrade clear <p>The fec-thresholds keyword is added to the show controllers optics command.</p> <p>YANG Data Model:</p> <ul style="list-style-type: none"> • New XPaths for <code>Cisco-IOS-XR-controller-optics-oper.yang</code> • <code>Cisco-IOS-XR-um-cont-optics-fec-threshold-cfg.yang</code>

Feature	Description
Media Link-down PreFEC Degrade Enablement	<p>Introduced in this release on: NCS 5700 Fixed Port Routers.</p> <p>The Media Link-down PreFEC Degrade functionality can be used to protect the media side of the optical transceiver during transmission errors.</p> <p>By using this feature, you can proactively switch the traffic to standby path when the BER counter crosses the threshold value. This feature helps to avoid further traffic impact when the optical network reaches more noise or error.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <p>Modified the controller optics command by adding the media link-down prefec-degrade keyword.</p> <p>YANG Data Model:</p> <ul style="list-style-type: none"> • New XPaths for <code>Cisco-IOS-XR-controller-optics-oper.yang</code> • New XPaths for <code>Cisco-IOS-XR-um-cont-optics-fec-threshold-cfg.yang</code> <p>(see GitHub, YANG Data Models Navigator)</p>
SPAN-to-File supports pcap and pcapng File Format for NCS 5700	<p>Introduced in this release on: NCS 5700 fixed port routers and NCS 5700 line cards [Mode: Native].</p> <p>SPAN-to-File extends support to both pcap and pcap Next Generation (pcapng) file format on the Cisco NCS 5700 series routers and line cards in Native mode.</p>
<p>IP Addresses and Services</p>	
Configure Additional IPv4 and IPv6 VRRP Sessions on NCS 5700 and NCS 5500 Line Cards	<p>Introduced in this release on: NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Native])</p> <p>You can now configure additional IPv4 and IPv6 VRRP sessions on the NCS 5700 and NCS 5500 line cards to improve flexibility, scalability, and control over network redundancy and load-balancing mechanisms.</p> <p>Earlier, you could only configure up to 255 IPv4 and 255 IPv6 VRRP sessions. However, you can now configure up to 300 IPv4 and 300 IPv6 VRRP sessions on the NCS 5700 and NCS 5500 line cards.</p> <p>If a physical interface reaches its limit of 255 VRRP IDs, an additional physical interface or sub-interface can accommodate the remaining 45 VRRP IDs.</p>
<p>L2VPN and Ethernet Services</p>	
Layer 2 VPN Bridging and VPWS Services over BGP-LU Underlay on the NCS57 Line Cards	<p>Introduced in this release on: NCS 5500 modular routers(NCS 5700 line cards [Mode: Compatibility])</p> <p>This feature support is now extended to routers that have Cisco NC57 line cards installed and operate in compatibility mode.</p>
Layer 3 Support for ITU-T Y.1564 Service Activation Test	<p>Introduced in this release on: NCS 5500 fixed port routers; NCS 5700 fixed port routers</p> <p>The ITU-T Y.1564 Ethernet Service Activation Test (SAT) is now supported on Layer 3 interfaces, enhancing the capability to conduct thorough testing and performance verification for IP-based network services. This capability ensures that the performance of Ethernet services can be validated with greater accuracy and reliability, guaranteeing that network services meet the required quality standards before deployment.</p>

Feature	Description
Modular QoS	
LAG-level Scheduling in Egress Queuing	<p>Introduced in this release on: NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5700 line cards [Mode: Native])</p> <p>This release enhances traffic management by introducing Link Aggregation Group (LAG) level scheduling improving shaping granularity and scheduler resource efficiency. Unlike the previous per-member scheduling, where policies are replicated and applied to each individual link in a bundle, LAG-level scheduling applies policies to the entire bundle as a single link.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • hw-module profile qos lag-scheduler <p>YANG Data Models:</p> <ul style="list-style-type: none"> • New Xpaths for <code>Cisco-IOS-XR-um-hw-module-profile-cfg.yang</code> <p>(see GitHub, YANG Data Models Navigator)</p>
Low Rate Shaper for Enhanced Granularity	<p>Introduced in this release on: NCS 5700 line cards [Mode: Native]</p> <p>In local Virtual Output Queue (VOQ) switching, you can now achieve precise parent shaper granularity on ETM-enabled interfaces by configuring shared shaper elements in a quad shaper to 0 kbps.</p> <p>This is made possible by enabling a virtual flow using a low-rate connector to the highest-priority queue in the egress pipeline, maintaining the granularity for the four levels of priority and preventing traffic congestion.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • hw-module profile qos etm-low-rate-connector npu-id <i>npu-id</i> reserve-conn-range <i>range</i> • hw-module profile qos etm-low-rate-connector npu-id <i>npu-id</i> reserve-conn-range <i>range</i> location <i>node-location</i> <p>YANG Data Models:</p> <ul style="list-style-type: none"> • New Xpaths for <code>Cisco-IOS-XR-um-hw-module-profile-cfg.yang</code> <p>(see GitHub, YANG Data Models Navigator)</p>
System Management	
Concurrent Configuration Rebase during Commit	<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>The router performs the commit and rebase operations simultaneously, ensuring that the commit operation remains unblocked during the rebase operation.</p> <p>This removes the need to use the cfs check command to increase the commit count and the commit file diff size.</p>

Feature	Description
Configurable Fault Recovery Attempts	<p>Introduced in this release on: NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Compatibility; Native])</p> <p>You can now reduce the risk of traffic loss by controlling fault recovery attempts by a line card, fabric card, shelf controller, or route processor. This feature allows you to specify the number of recovery attempts before the card is shut down, offering greater control and flexibility.</p> <p>This feature is disabled by default.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • hw-module fault-recovery <p>YANG DATA Model:</p> <ul style="list-style-type: none"> • New XPath for Cisco-IOS-XR-hw-module-cfg.yang (see GitHub, YANG Data Models Navigator) <p>This feature is supported on the Cisco NCS 5500 series modular routers and on these line cards:</p> <ul style="list-style-type: none"> • NC57-48Q2D-S • NC57-48Q2D-SE-S • NC57-36H6D-S • NC55-24X100G-SE • NC55-36X100G-A-SE • NC55-MOD-A-S • NC55-MOD-A-SE-S • NC55-36X100G-S • NC55-36X100G

Feature	Description
Performance Monitoring	<p>Introduced in this release on: NCS 5500 fixed port routers</p> <p>You can now get statistical information with Performance Monitoring in PTP networks, such as clock accuracy, synchronization status, and network delays by defining Performance Monitoring Parameters and Port Specific Parameters.</p> <p>This feature empowers operators with comprehensive performance monitoring and precise time-stamp analysis, offering enhanced granularity for time synchronization in telecommunication networks. By providing detailed insights, it enables operators to make well-informed decisions and take proactive actions to ensure optimal network performance.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • performance-monitoring • show ptp platform performance-counters • show ptp dataset performance <p>YANG Data Models:</p> <ul style="list-style-type: none"> • Cisco-IOS-XR-ptp-cfg.yang • Cisco-IOS-XR-ptp-oper.yang • Cisco-IOS-XR-um-ptp-cfg.yang <p>(see GitHub, YANG Data Models Navigator)</p>
PTP and SyncE support on breakout ports of NCS-57C3-MOD, NCS-57C3-MODS-SYS, and NC57-MPA-2D4H-S	<p>Introduced in this release on: NCS 5700 fixed port routers; NCS 5500 modular routers (NCS 5500 line cards; NCS 5700 line cards [Mode: Compatibility; Native])</p> <p>Based on the IEEE 1588-2019 standard, the Precision Time Protocol (PTP) is a network protocol that defines a method for synchronizing clocks in a network for networked measurement and control.</p> <p>This feature extends the support for PTP and SyncE on these hardware:</p> <ul style="list-style-type: none"> • NCS-57C3-MOD and NCS-57C3-MODS-SYS routers on fixed port numbers 24 to 31 and 4x10G and 4x25G breakout ports • NC57-MPA-2D4H-S with 4x25G breakout ports <p>These breakout ports support both Class A and B performances.</p>
System Security	

Feature	Description
MAC Authentication Bypass	<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>Based on the MAC address of the end device or the client connected to the router port, this feature enables port control functionality for your router. This functionality provides controlled access to network services for end devices that do not support other authentication methods such as IEEE 802.1X port-based authentication.</p> <p>The feature introduces these changes:</p> <p>CLI:</p> <ul style="list-style-type: none"> • New mab option for the dot1x profile command • New mab-retry-time option for the authenticator command • clear mab • show mab

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.

Feature	Description
Programmability	
openconfig-keychain.yang Version 0.4.0	<p>Cisco IOS-XR now supports the openconfig-keychain.yang data model, version 0.4.0, offering a standardized method for key management on network devices. This model introduces a keychain container for managing cryptographic keys, each with defined lifetimes and algorithms. Keys with a key-id string containing any characters from [a-fA-F] are considered MACsec keys and keys with a key-id as an integer are treated as NON-MACsec keys.</p> <p>The key-chains container from the previous version has been removed.</p>

Feature	Description
openconfig-macsec.yang Version 1.0.0	<p>Cisco IOS-XR now supports the openconfig-keychain.yang data model, version 0.4.0. This model provides a standardized approach to key management on network devices by introducing a keychain container for managing cryptographic keys, each with specified lifetimes and algorithms.</p> <p>Key Identification - Keys are identified based on the key-id string:</p> <ul style="list-style-type: none"> • MACsec Keys: Keys with a key-id string containing any characters from [a-fA-F]. • NON-MACsec Keys: Keys with a key-id as an integer. <p>MACsec Key Requirements - For MACsec keys, the secret-key/key-string must adhere to the following requirements:</p> <ul style="list-style-type: none"> • 32 Hex Characters: Automatically maps to the AES-128-CMAC cryptographic algorithm in the native model. • 64 Hex Characters: Automatically maps to the AES-256-CMAC cryptographic algorithm. <p>This mapping is assumed because the openconfig-keychain model does not include AES-128-CMAC and AES-256-CMAC crypto-type enums.</p>
Cisco-IOS-XR-ptp-cfg.yang	<p>The Cisco-IOS-XR-ptp-cfg.yang data model has been updated to version 3.2.0 for Interfaces.</p> <p>The new virtual port gm-threshold-breach leaf allows you to configure the value at which a bi-state alarm is triggered when the virtual port Time of Day (ToD) offset from the TimeTransmitter exceeds the threshold in nanoseconds.</p>
Cisco-IOS-XR-um-ptp-cfg.yang	<p>The Cisco-IOS-XR-um-ptp-cfg.yang data model has been updated to version 2.0.0 for Interfaces. The model now supports container performance-monitoring that allows you to enable performance-monitoring globally.</p>
Cisco-IOS-XR-ptp-oper.yang	<p>The Cisco-IOS-XR-ptp-oper.yang data model has been updated to version 2.3.0.</p> <p>The container performance-monitoring-dses and container performance-monitoring-port-dses, allows you to collect PTP performance monitor statistics for the full dataset and this is the only way to access records for ports.</p>

Feature	Description
openconfig-system.yang Version 0.17.1	<p>The OpenConfig data model is revised from version 0.16.1 to 0.17.1, introducing two new leaves in the NTP container:</p> <ul style="list-style-type: none"> • network-instance: The network instance used to locate this server. • source-address: The source address to use on outgoing NTP packets. <p>In the current OpenConfig system hierarchy, the NTP server or peer's IP address is the container, with the network instance as its leaf. Therefore, this feature comes with the following restrictions:</p> <ul style="list-style-type: none"> • The open-config model does not support multiple VRFs on the same NTP server or peer IP address. • The address and network-instance tags are mandatory for creating, updating, merging, or replacing an NTP server or peer with a non-default VRF. Replacing the NTP server or peer for a non-default network instance is not supported. • Users must clear NTP configurations with non-default VRFs before downgrading to another XR SW release due to the inverted OC hierarchy. <p>Due to these limitations, we recommend using the corresponding CLI commands for the NTP functionalities.</p>
Cisco-IOS-XR-um-hw-module-profile-cfg.yang	<p>This YANG data model is enhanced with new containers:</p> <ul style="list-style-type: none"> • etm-low-rate-connector - reserve low-rate connector range for enabling virtual flow to support 0 Kbps shaper rate for shared shapers in a quad shaper on ETM-enabled interfaces. • lag-scheduler: enable Link Aggregation Group (LAG) level scheduling for improved resource efficiency and traffic fairness.
Cisco-IOS-XR-um-cont-optics-fec-threshold-cfg.yang	<p>This Unified Yang data model is enhanced for existing <i>Media</i> container with the addition of new containers <i>link-down</i> and <i>prefec-degrade</i> for enabling Media linkdown preFEC degrade.</p>
Cisco-IOS-XR-controller-optics-oper.yang	<p>The Cisco-IOS-XR-controller-optics-oper yang data model is enhanced with <i>media-linkdown-prefec-degrade</i> leaf to identify if the Media linkdown preFEC degrade has been enabled or not.</p>

Hardware Introduced

Hardware	Description
Optics	<p>This release launches the following new optics on selective hardware within the product portfolio. For details, refer to the Transceiver Module Group (TMG) Compatibility Matrix.</p> <p>Cisco 10GBASE Small Form-Factor Pluggable (SFP+)</p> <ul style="list-style-type: none"> • S10G-LR-PM-D-I • S10G-SR-PM-D-I • S10G-ER-PM-D-I

Features Supported on Cisco NC5700 Line Cards and NCS 5700 Fixed Port Routers

The following table lists the features supported on Cisco NC5700 line cards in compatibility mode (NC5700 line cards with previous generation NCS 5500 line cards in the same NCS 5500 modular routers) and native mode (NCS 5500 modular routers with only NCS 5700 line cards and NCS 5700 fixed port routers).

To enable the native mode on Cisco NCS 5500 series modular routers having Cisco NCS 5700 line cards, use the **hw-module profile npu native-mode-enable** command in the configuration mode. Ensure that you reload the router after configuring the native mode.

Features supported in the native mode are also available on Cisco NCS 5700 fixed port routers.

Table 1: Features Supported on Cisco NC5700 Line Cards

Feature	Compatible Mode	Native Mode
gRPC Acctz Logging	✓	✓
Enhanced EIGRP Integration for BVI with VRF-lite on NC57 Line Cards	×	✓
LSP Fast Flooding on IS-IS networks	✓	✓
BGP Signaling for co-existence of IP routes	✓	✓
Delay Measurement for IP Endpoint over SRv6 Network on Cisco NCS 5508 and Cisco NCS 5700 Series Routers	×	✓
Liveness Monitoring for IP Endpoint over SRv6 Network on Cisco NCS 5508 and Cisco NCS 5700 Series Routers	✓	✓
SRv6 Traffic Accounting for NCS 5700	×	✓
SPAN-to-File - pcapng File Format for NCS 5700	×	✓
Configure Additional IPv4 and IPv6 VRRP Sessions on NCS 5700 and NCS 5500 Line Cards	×	✓
Layer 2 VPN Bridging and VPWS Services over BGP-LU Underlay on the NCS57 Line Cards	✓	×
LAG-level Scheduling in Egress Queuing	×	✓

Feature	Compatible Mode	Native Mode
Low-rate Shaper Granularity Enhancements	×	✓
Concurrent Configuration Rebase during Commit	✓	✓
Configurable Fault Recovery Attempts	✓	✓
PTP and SyncE support on breakout ports of NCS-57C3-MOD, NCS-57C3-MODS-SYS, and NC57-MPA-2D4H-S	✓	✓
MAC Authentication Bypass	✓	✓
Shorter minimum interval support for BFD over logical bundle	×	✓

For the complete list of features supported on Cisco NC57 line cards until Cisco IOS XR Release 24.3.1. see:

- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 24.2.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 24.1.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.11.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.10.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.9.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.9.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.8.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.8.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.7.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.7.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.6.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.6.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.5.3](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.5.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.5.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.4.2](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.4.1](#)
- [Release Notes for Cisco NCS 5500 Series Routers, IOS XR Release 7.3.1](#)

Caveats

Table 2: Cisco NCS 5500 Series Router Specific Bugs

Bug ID	Headline
CSCwm14431	Upgrade from 7.10.2 to 24.3.1 with base and VRF config makes the SDR console inaccessible
CSCwk03429	After reload location all, line card goes to SW_INACTIVE or is taking time to come UP
CSCwk73534	OC terminal-device target-output-power units/definition interpretation is wrong
CSCwk80634	Layer3 interfaces does not support multiple MAC address as SAT destination

Behavior Changes

- Two new MPLS OAM commands, **address-family ipv4 reply** and **address-family ipv6 reply**, are implemented in Cisco IOS XR Release 24.3.1. Use the keyword **ip-header-source** in either of these commands if an explicit source IP is required in the MPLS OAM reply packets when route policies block packets with non-routed source addresses. By default, the MPLS OAM packets use the local interface address as the source.
- From this release, we introduce support for virtual flows using low-rate connectors to achieve precise shaper granularity at 0 kbps for shared shaper elements in a quad shaper for ETM-enabled interfaces.
Prior to this release, the maximum shaper rate supported for shared shaper elements in a quad shaper for ETM was 3.9 Mbps.
- Starting from Cisco IOS XR Release 24.3.1, the **reverse** keyword in **show reboot** command is deprecated and will not be supported in future releases. Hence the **show reboot history reverse location** command is also not supported.

Release Package

This table lists the Cisco IOS XR Software feature set matrix (packages) with associated filenames.

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

Table 3: Release 24.3.1 Packages for Cisco NCS 5500 Series Router

Composite Package		
Feature Set	Filename	Description

Cisco IOS XR IP Unicast Routing Core Bundle	ncs5500-mini-x.iso	Contains base image contents that includes: <ul style="list-style-type: none"> • Host operating system • System Admin boot image • IOS XR boot image • BGP packages
Individually-Installable Optional Packages		
Feature Set	Filename	Description
Cisco IOS XR Manageability Package	ncs5500-mgbl-3.0.0.0-r2431.x86_64.rpm	Extensible Markup Language (XML) Parser, Telemetry, Netconf, gRPC and HTTP server packages.
Cisco IOS XR MPLS Package	ncs5500-mpls-2.1.0.0-r2431.x86_64.rpm ncs5500-mpls-te-rsvp-2.2.0.0-r2431.x86_64.rpm	MPLS and MPLS Traffic Engineering (MPLS-TE) RPM.
Cisco IOS XR Security Package	ncs5500-k9sec-3.1.0.0-r2431.x86_64.rpm	Support for Encryption, Decryption, Secure Shell (SSH), Secure Socket Layer (SSL), and Public-key infrastructure (PKI)
Cisco IOS XR ISIS package	ncs5500-isis-1.2.0.0-r2431.x86_64.rpm	Support ISIS
Cisco IOS XR OSPF package	ncs5500-ospf-2.0.0.0-r2431.x86_64.rpm	Support OSPF
Lawful Intercept (LI) Package	ncs5500-li-1.0.0.0-r2431.x86_64.rpm	Includes LI software images
Multicast Package	ncs5500-mcast-1.0.0.0-r2431.x86_64rpm	Support Multicast
EIGRP	ncs5500-eigrp-1.0.0.0-r2431.x86_64.rpm	Supports Enhanced Interior Gateway Routing Protocol
Lawful Intercept Control	ncs5500-lictrl-1.0.0.0-r2431x86_64.rpm	Supports Lawful Intercept Control
Healthcheck	ncs5500-healthcheck-1.0.0.0-r2431.x86_64.rpm	Supports System Health Check

Table 4: Release 24.3.1 TAR files for Cisco NCS 5500 Series Router

Feature Set	Filename
NCS 5500 IOS XR Software 3DES	NCS5500-iosxr-k9-24.3.1.tar
NCS 5500 IOS XR Software	NCS5500-iosxr-24.3.1.tar
NCS 5500 IOS XR Software	NCS5500-docs-24.3.1.tar

Table 5: Release 24.3.1 Packages for Cisco NCS 5700 Series Router

Feature Set	Filename
-------------	----------

NCS 5700 IOS XR Software	ncs5700-x64-24.3.1.iso
NCS 5700 IOS XR Software (only k9 RPMs)	ncs5700-k9sec-rpms.24.3.1.tar
NCS 5700 IOS XR Software Optional Package	NCS5700-optional-rpms.24.3.1.tar This TAR file contains the following RPMS: <ul style="list-style-type: none"> • optional-rpms/cdp/* • optional-rpms/eigrp/* • optional-rpms/telnet/*

Determine Software Version

To verify the software version running on the router, use **show version** command in the EXEC mode.

```
Router# show version
Cisco IOS XR Software, Version 24.3.1
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
Built By      : swtools
Built On     : Sun Sep 1 00:51:25 PDT 2024
Built Host   : iox-ucs-077
Workspace    : /auto/srcarchive11/prod/24.3.1/ncs5500/ws
Version      : 24.3.1
Location     : /opt/cisco/XR/packages/
Label       : 24.3.1-iso

cisco NCS-5500 () processor
System uptime is 13 minutes
```

Determine Firmware Support

Use the **show hw-module fpd** command in EXEC and Admin 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.

You can also use the **show fpd package** command in Admin mode to check the fpd versions.

NCS 5500 Fixed Port Routers

```
Router# show fpd package
=====
                Field Programmable Device Package
                =====
Card Type          FPD Description          Req   SW   Min Req  Min Req
=====          =====          Reload Ver   SW Ver  Board Ver
=====          =====          =====
NC55-12X100G-SE-PR  Bootloader (A)                YES    1.20    1.20    0.0
                   IOFPGA (A)                  YES    0.12    0.12    0.0
                   MIFPGA                   YES    0.03    0.03    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	1241.00	1241.00	0.0

NC55-12X100GE-PROT	Bootloader (A)	YES	1.22	1.22	0.0
	IOFPGA (A)	YES	0.15	0.15	0.0
	MIFPGA	YES	0.09	0.09	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	1241.00	1241.00	0.0

NC55-18H18F	Bootloader (A)	YES	1.20	1.20	0.0
	IOFPGA (A)	YES	0.22	0.22	0.0
	MIFPGA	YES	0.03	0.03	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	1241.00	1241.00	0.0

NC55-24H12F-SE	Bootloader (A)	YES	1.20	1.20	0.0
	IOFPGA (A)	YES	0.09	0.09	0.0
	MIFPGA	YES	0.03	0.03	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	1241.00	1241.00	0.0

NC55-24X100G-SE	Bootloader (A)	YES	1.20	1.20	0.0
	IOFPGA (A)	YES	0.13	0.13	0.0
	MIFPGA	YES	0.03	0.03	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	1241.00	1241.00	0.0

NC55-32T16Q4H-A	Bootloader (A)	YES	0.05	0.05	0.0

	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.93	0.93	0.0
	MIFPGA	YES	0.60	0.60	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC55-32T16Q4H-AT	Bootloader (A)	YES	0.05	0.05	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.93	0.93	0.0
	MIFPGA	YES	0.60	0.60	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC55-36X100G	Bootloader (A)	YES	1.22	1.22	0.0
	IOFPGA (A)	YES	0.15	0.15	0.0
	MIFPGA	YES	0.09	0.09	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	1241.00	1241.00	0.0

NC55-36X100G-A-SE	Bootloader (A)	YES	0.15	0.15	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.26	0.26	0.0
	MIFPGA	YES	0.03	0.03	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	1241.00	1241.00	0.0

NC55-36X100G-S	Bootloader (A)	YES	1.20	1.20	0.0
	IOFPGA (A)	YES	0.12	0.12	0.0

	MIFPGA	YES	0.07	0.07	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	1241.00	1241.00	0.0

NC55-5504-FC	Bootloader (A)	YES	1.75	1.75	0.0
	IOFPGA (A)	YES	0.10	0.10	0.0

NC55-5504-FC2	Bootloader (A)	YES	1.13	1.13	0.0
	IOFPGA (A)	YES	0.47	0.47	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	1241.00	1241.00	0.0

NC55-5508-FC	Bootloader (A)	YES	1.74	1.74	0.0
	IOFPGA (A)	YES	0.17	0.17	0.0

NC55-5508-FC2	Bootloader (A)	YES	1.80	1.80	0.0
	IOFPGA (A)	YES	0.20	0.20	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	1241.00	1241.00	0.0

NC55-5516-FC	Bootloader (A)	YES	1.75	1.75	0.0
	IOFPGA (A)	YES	0.26	0.26	0.0

NC55-5516-FC2	Bootloader (A)	YES	1.80	1.80	0.0
	IOFPGA (A)	YES	0.24	0.24	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	1241.00	1241.00	0.0

NC55-6X100GE-PROT	Bootloader (A)	YES	1.22	1.22	0.0
	IOFPGA (A)	YES	0.15	0.15	0.0
	MIFPGA	YES	0.09	0.09	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	1241.00	1241.00	0.0

NC55-6X200-DWDM-S	Bootloader (A)	YES	1.20	1.20	0.0
	CFP2_PORT_0	NO	5.56	5.56	2.1
	CFP2_PORT_1	NO	5.56	5.56	2.1
	CFP2_PORT_2	NO	5.56	5.56	2.1
	CFP2_PORT_3	NO	5.56	5.56	2.1
	CFP2_PORT_4	NO	5.56	5.56	2.1
	CFP2_PORT_5	NO	5.56	5.56	2.1
	DENALI0	NO	13.48	13.48	0.0
	DENALI1	NO	13.48	13.48	0.0
	DENALI2	NO	13.48	13.48	0.0
	IOFPGA (A)	YES	0.14	0.14	0.0
	MORGOETH	YES	5.26	5.26	0.0
	MSFPGA0	YES	2.22	2.22	0.0
	MSFPGA1	YES	2.22	2.22	0.0
	MSFPGA2	YES	2.22	2.22	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	1241.00	1241.00	0.0

NC55-MOD-A-S	Bootloader (A)	YES	1.03	1.03	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.14	0.14	0.0
	MIFPGA	YES	0.16	0.16	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	1241.00	1241.00	0.0

NC55-MOD-A-SE-S	Bootloader (A)	YES	1.03	1.03	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.14	0.14	0.0
	MIFPGA	YES	0.16	0.16	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	1241.00	1241.00	0.0
NC55-MPA-12T-S	MPAFPGA	YES	0.28	0.28	0.0
NC55-MPA-1TH2H-S	CFP2-D-DCO_2	NO	38.27397	38.27397	0.1
	CFP2-D10-DCO_2	NO	67.30726	67.30726	0.1
	CFP2-D15-DCO_2	NO	67.30726	67.30726	0.1
	CFP2-DE-DCO_2	NO	38.27397	38.27397	0.1
	CFP2-DETS-DCO_2	NO	38.27397	38.27397	0.1
	CFP2-DS-DCO_2	NO	38.27397	38.27397	0.1
	CFP2-DS100-DCO_2	NO	38.27397	38.27397	0.1
	MPAFPGA	YES	0.54	0.54	0.0
NC55-MPA-2TH-HX-S	CFP2-D-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-D-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-D10-DCO_0	NO	67.30726	67.30726	0.1
	CFP2-D10-DCO_1	NO	67.30726	67.30726	0.1
	CFP2-D15-DCO_0	NO	67.30726	67.30726	0.1
	CFP2-D15-DCO_1	NO	67.30726	67.30726	0.1
	CFP2-DE-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DE-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DETS-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DETS-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DS-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DS-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DS100-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DS100-DCO_1	NO	38.27397	38.27397	0.1
	MPAFPGA	YES	0.54	0.54	0.0
NC55-MPA-2TH-S	CFP2-D-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-D-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-D10-DCO_0	NO	67.30726	67.30726	0.1
	CFP2-D10-DCO_1	NO	67.30726	67.30726	0.1
	CFP2-D15-DCO_0	NO	67.30726	67.30726	0.1
	CFP2-D15-DCO_1	NO	67.30726	67.30726	0.1
	CFP2-DE-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DE-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DETS-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DETS-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DS-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DS-DCO_1	NO	38.27397	38.27397	0.1
	CFP2-DS100-DCO_0	NO	38.27397	38.27397	0.1
	CFP2-DS100-DCO_1	NO	38.27397	38.27397	0.1
	MPAFPGA	YES	0.54	0.54	0.0
NC55-MPA-4H-HD-S	MPAFPGA	YES	0.55	0.55	0.0
NC55-MPA-4H-HX-S	MPAFPGA	YES	0.54	0.54	0.0
NC55-MPA-4H-S	MPAFPGA	YES	0.54	0.54	0.0
NC55-OIP-2	CPLD-MPAFPGA	YES	2.00	2.00	0.0
	MPAFPGA	YES	4.11	4.11	0.0
NC55-OIP-4	MPAFPGA	YES	0.10	0.10	0.0
NC55-PWR-3KW-2HV	DT-LogicMCU (A)	NO	3.01	3.01	0.2
	DT-PrimMCU (A)	NO	3.00	3.00	0.2
	DT-SecMCU (A)	NO	3.01	3.01	0.2
NC55-PWR-3KW-DC	DT-SecMCU (A)	NO	4.12	4.12	0.1
NC55-PWR-4.4KW-DC	QCS-LogicMCU (A)	NO	3.00	3.00	0.1
	QCS-PrimMCU (A)	NO	3.00	3.00	0.1

	QCS-SecMCU (A)	NO	3.00	3.00	0.1

NC55-RP	Bootloader (A)	YES	9.31	9.31	0.0
	IOFPGA (A)	YES	0.09	0.09	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	1241.00	1241.00	0.0

NC55-RP-E	Bootloader (A)	YES	1.24	1.24	0.0
	IOFPGA (A)	YES	0.23	0.23	0.0
	OMGFPGA (A)	YES	0.61	0.61	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	1241.00	1241.00	0.0

NC55-RP-PROTO	Bootloader (A)	YES	9.31	9.31	0.0
	IOFPGA (A)	YES	0.06	0.06	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	1241.00	1241.00	0.0

NC55-RP2-E	Bootloader (A)	YES	0.09	0.09	0.0
	IOFPGA (A)	YES	0.50	0.50	0.0
	OMGFPGA (A)	YES	0.52	0.52	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B-0	YES	7.216	7.216	0.0
	TimingIC-B-1	YES	7.216	7.216	0.0

NC55-SC	Bootloader (A)	YES	1.74	1.74	0.0
	IOFPGA (A)	YES	0.11	0.11	0.0

NC57-1600W-ACFW	PrimMCU-ACFW (A)	NO	1.02	1.02	0.0
	SecMCU-ACFW (A)	NO	1.07	1.07	0.0

NC57-1600W-DCFW	PriMCU-DCFW (A)	NO	1.07	1.00	0.0
NC57-18DD-SE	Bootloader (A)	YES	1.03	1.03	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.22	0.22	0.0
	MIFPGA	YES	0.11	0.11	0.0
	QDD_BRT_FW_CO_P00	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P01	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P02	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P03	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P04	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P05	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P06	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P07	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P08	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P09	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P10	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P11	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P12	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P13	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P14	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P15	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P16	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P17	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P18	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P19	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P20	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P21	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P22	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P23	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P24	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P25	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P26	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P27	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P28	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P29	YES	70.130	70.130	0.0
	QDD_FW_CO_P00	YES	61.23	61.23	0.0
	QDD_FW_CO_P01	YES	61.23	61.23	0.0
	QDD_FW_CO_P02	YES	61.23	61.23	0.0
	QDD_FW_CO_P03	YES	61.23	61.23	0.0
	QDD_FW_CO_P04	YES	61.23	61.23	0.0
	QDD_FW_CO_P05	YES	61.23	61.23	0.0
	QDD_FW_CO_P06	YES	61.23	61.23	0.0
	QDD_FW_CO_P07	YES	61.23	61.23	0.0
	QDD_FW_CO_P08	YES	61.23	61.23	0.0
	QDD_FW_CO_P09	YES	61.23	61.23	0.0
	QDD_FW_CO_P10	YES	61.23	61.23	0.0
	QDD_FW_CO_P11	YES	61.23	61.23	0.0
	QDD_FW_CO_P12	YES	61.23	61.23	0.0
	QDD_FW_CO_P13	YES	61.23	61.23	0.0
	QDD_FW_CO_P14	YES	61.23	61.23	0.0
	QDD_FW_CO_P15	YES	61.23	61.23	0.0
	QDD_FW_CO_P16	YES	61.23	61.23	0.0
	QDD_FW_CO_P17	YES	61.23	61.23	0.0
	QDD_FW_CO_P18	YES	61.23	61.23	0.0
	QDD_FW_CO_P19	YES	61.23	61.23	0.0
	QDD_FW_CO_P20	YES	61.23	61.23	0.0
	QDD_FW_CO_P21	YES	61.23	61.23	0.0
	QDD_FW_CO_P22	YES	61.23	61.23	0.0
	QDD_FW_CO_P23	YES	61.23	61.23	0.0
	QDD_FW_CO_P24	YES	61.23	61.23	0.0
	QDD_FW_CO_P25	YES	61.23	61.23	0.0
	QDD_FW_CO_P26	YES	61.23	61.23	0.0

QDD_FW_CO_P27	YES	61.23	61.23	0.0
QDD_FW_CO_P28	YES	61.23	61.23	0.0
QDD_FW_CO_P29	YES	61.23	61.23	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	1241.00	1241.00	0.0

NC57-24DD

Bootloader(A)	YES	1.03	1.03	0.0
DBFPGA(A)	YES	0.14	0.14	0.0
IOFPGA(A)	YES	0.23	0.23	0.0
MIFPGA	YES	0.11	0.11	0.0
QDD_BRT_FW_CO_P00	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P01	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P02	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P03	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P04	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P05	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P06	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P07	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P08	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P09	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P10	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P11	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P12	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P13	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P14	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P15	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P16	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P17	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P18	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P19	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P20	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P21	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P22	YES	70.130	70.130	0.0
QDD_BRT_FW_CO_P23	YES	70.130	70.130	0.0
QDD_FW_CO_P00	YES	61.23	61.23	0.0
QDD_FW_CO_P01	YES	61.23	61.23	0.0
QDD_FW_CO_P02	YES	61.23	61.23	0.0
QDD_FW_CO_P03	YES	61.23	61.23	0.0
QDD_FW_CO_P04	YES	61.23	61.23	0.0
QDD_FW_CO_P05	YES	61.23	61.23	0.0
QDD_FW_CO_P06	YES	61.23	61.23	0.0
QDD_FW_CO_P07	YES	61.23	61.23	0.0
QDD_FW_CO_P08	YES	61.23	61.23	0.0
QDD_FW_CO_P09	YES	61.23	61.23	0.0
QDD_FW_CO_P10	YES	61.23	61.23	0.0
QDD_FW_CO_P11	YES	61.23	61.23	0.0
QDD_FW_CO_P12	YES	61.23	61.23	0.0
QDD_FW_CO_P13	YES	61.23	61.23	0.0
QDD_FW_CO_P14	YES	61.23	61.23	0.0
QDD_FW_CO_P15	YES	61.23	61.23	0.0
QDD_FW_CO_P16	YES	61.23	61.23	0.0
QDD_FW_CO_P17	YES	61.23	61.23	0.0
QDD_FW_CO_P18	YES	61.23	61.23	0.0
QDD_FW_CO_P19	YES	61.23	61.23	0.0
QDD_FW_CO_P20	YES	61.23	61.23	0.0
QDD_FW_CO_P21	YES	61.23	61.23	0.0

	QDD_FW_CO_P22	YES	61.23	61.23	0.0
	QDD_FW_CO_P23	YES	61.23	61.23	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	1241.00	1241.00	0.0

NC57-36H-SE	Bootloader (A)	YES	1.03	1.03	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.05	0.05	0.0
	MIFPGA	YES	0.03	0.03	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	1241.00	1241.00	0.0

NC57-36H6D-S	Bootloader (A)	YES	0.02	0.02	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.52	0.52	0.0
	MIFPGA	YES	0.40	0.40	0.0
	QDD_BRT_FW_CO_P24	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P25	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P26	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P27	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P28	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P29	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P30	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P31	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P32	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P33	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P34	YES	70.130	70.130	0.0
	QDD_BRT_FW_CO_P35	YES	70.130	70.130	0.0
	QDD_FW_CO_P24	YES	61.23	61.23	0.0
	QDD_FW_CO_P25	YES	61.23	61.23	0.0
	QDD_FW_CO_P26	YES	61.23	61.23	0.0
	QDD_FW_CO_P27	YES	61.23	61.23	0.0
	QDD_FW_CO_P28	YES	61.23	61.23	0.0
	QDD_FW_CO_P29	YES	61.23	61.23	0.0
	QDD_FW_CO_P30	YES	61.23	61.23	0.0
	QDD_FW_CO_P31	YES	61.23	61.23	0.0
	QDD_FW_CO_P32	YES	61.23	61.23	0.0
	QDD_FW_CO_P33	YES	61.23	61.23	0.0
	QDD_FW_CO_P34	YES	61.23	61.23	0.0
	QDD_FW_CO_P35	YES	61.23	61.23	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC57-48Q2D-S	ALDRINFPGA (A)	YES	1.06	1.06	0.0
	Bootloader (A)	YES	1.00	1.00	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.105	0.105	0.0
	MIFPGA	YES	0.21	0.21	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC57-48Q2D-SE-S	ALDRINFPGA (A)	YES	1.06	1.06	0.0
	Bootloader (A)	YES	1.00	1.00	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.105	0.105	0.0
	MIFPGA	YES	0.21	0.21	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC57-MOD-RP2-E	Bootloader (A)	YES	0.14	0.14	0.0
	IOFPGA	YES	0.51	0.51	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	1241.00	1241.00	0.0

NC57-MOD-S	Bootloader (A)	YES	2.03	2.03	0.0
	DBFPGA (A)	YES	0.14	0.14	0.0
	IOFPGA (A)	YES	0.42	0.42	0.0
	MIFPGA	YES	0.18	0.18	0.0
	QDD_BRT_FW_C0_P08	YES	70.130	70.130	0.0
	QDD_BRT_FW_C0_P09	YES	70.130	70.130	0.0
	QDD_FW_C0_P08	YES	61.23	61.23	0.0
	QDD_FW_C0_P09	YES	61.23	61.23	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	1241.00	1241.00	0.0
	TimingIC-A	YES	7.216	7.216	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NC57-MPA-12L-S	MPAFPGA	YES	0.28	0.28	0.0

NC57-MPA-1FH1D-S	CFP2-M25-DCO_1	NO	67.30726	67.30726	0.1
	MPAFPGA	YES	0.80	0.80	0.0
	QDD_BRT_FW_C1_P00	YES	70.130	70.130	0.0
	QDD_BRT_FW_C2_P00	YES	70.130	70.130	0.0
	QDD_BRT_FW_C3_P00	YES	70.130	70.130	0.0
	QDD_FW_C1_P00	YES	61.23	61.23	0.0
	QDD_FW_C2_P00	YES	61.23	61.23	0.0
	QDD_FW_C3_P00	YES	61.23	61.23	0.0

NC57-MPA-2D4H-S	MPAFPGA	YES	0.07	0.07	0.0
	QDD_FW_C1_P00	YES	61.23	61.23	0.0
	QDD_FW_C1_P01	YES	61.23	61.23	0.0
	QDD_FW_C1_P02	YES	61.23	61.23	0.0
	QDD_FW_C1_P03	YES	61.23	61.23	0.0
	QDD_FW_C2_P00	YES	61.23	61.23	0.0
	QDD_FW_C2_P01	YES	61.23	61.23	0.0
	QDD_FW_C2_P02	YES	61.23	61.23	0.0
	QDD_FW_C2_P03	YES	61.23	61.23	0.0
	QDD_FW_C3_P00	YES	61.23	61.23	0.0
	QDD_FW_C3_P01	YES	61.23	61.23	0.0
	QDD_FW_C3_P02	YES	61.23	61.23	0.0
	QDD_FW_C3_P03	YES	61.23	61.23	0.0

NCS-57C3-MOD-SYS	ALDRINFPGA (A)	YES	1.04	1.04	0.0
	Bootloader (A)	YES	0.16	0.16	0.0
	DBFPGA (A)	YES	0.56	0.56	0.0
	IOFPGA	YES	0.101	0.101	0.0
	MIFPGA	YES	0.19	0.19	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	1241.00	1241.00	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
	TimingIC-A	YES	23.112	23.112	0.0
	TimingIC-B	YES	7.216	7.216	0.0

NCS-57C3-MODS-SYS	ALDRINFPGA (A)	YES	1.04	1.04	0.0
	Bootloader (A)	YES	0.16	0.16	0.0
	DBFPGA (A)	YES	0.56	0.56	0.0
	IOFPGA	YES	0.101	0.101	0.0
	MIFPGA	YES	0.19	0.19	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	1241.00	1241.00	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
TimingIC-A	YES	23.112	23.112	0.0
TimingIC-B	YES	7.216	7.216	0.0

NCS 5700 Fixed Port Routers

Router# show fpd package

```
=====
```

Field Programmable Device Package

```
=====
```

Card Type	FPD Description	Req Reload	SW Ver	Min Req SW Ver	Min Req Board Ver

NCS-57B1-5DSE-SYS	ADM1_Config	NO	0.50	0.50	0.0
	ADM2_Config	NO	0.50	0.50	0.0
	ADM3_Config	NO	0.50	0.50	0.0
	IoFpga	YES	0.09	0.09	0.0
	IoFpgaGolden	YES	0.09	0.08	0.0
	Primary-BIOS	YES	1.11	1.11	0.0
	SsdIntelS4510	YES	11.20	11.20	0.0
	ssdIntelS4520	YES	1.11	1.11	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	StdbyFpga	YES	0.24	0.24	0.0
	StdbyFpgaGolden	YES	0.24	0.24	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0

NCS-57B1-6D24-SYS	ADM1_Config	NO	0.94	0.94	0.0
	ADM2_Config	NO	0.94	0.94	0.0
	ADM3_Config	NO	0.94	0.94	0.0
	IoFpga	YES	0.09	0.09	0.0
	IoFpgaGolden	YES	0.09	0.08	0.0
	Primary-BIOS	YES	1.11	1.11	0.0
	SsdIntelS4510	YES	11.20	11.20	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	StdbyFpga	YES	0.24	0.24	0.0
	StdbyFpgaGolden	YES	0.24	0.24	0.0
	TamFw	YES	6.05	6.05	0.0
	TamFwGolden	YES	6.05	6.05	0.0

NCS-57C1-48Q6-SYS	ADM1_Config	YES	0.07	0.07	0.0
	ADM2_Config	YES	0.07	0.07	0.0
	IoFpga	YES	0.47	0.47	0.0
	IoFpgaGolden	YES	0.47	0.47	0.0
	Primary-BIOS	YES	3.07	3.07	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	StdbyFpga	YES	0.31	0.31	0.0
	StdbyFpgaGolden	YES	0.31	0.31	0.0
	TamFw	YES	7.10	7.10	0.0
	TamFwGolden	YES	7.10	7.10	0.0

NCS-57D2-18DD-SYS	ADM1-DBConfig	YES	1.92	1.92	0.0
	ADM2-DBConfig	YES	1.92	1.92	0.0
	ADM3-DBConfig	YES	1.92	1.92	0.0
	ADM4-MBConfig	YES	1.92	1.92	0.0
	ADM5-MBConfig	YES	1.92	1.92	0.0
	ADM6-MBConfig	YES	1.92	1.92	0.0
	FtFpga	NO	0.20	0.20	0.0

	FtFpgaGolden	NO	0.20	0.00	0.0
	IoFpga	YES	0.06	0.06	0.0
	IoFpgaDB	YES	0.07	0.07	0.0
	IoFpgaGolden	YES	0.05	0.05	0.0
	IoFpgaGoldenDB	YES	0.05	0.05	0.0
	Primary-BIOS	YES	4.10	4.10	0.0
	SsdIntelS4510	YES	11.32	11.32	0.0
	SsdMicron5300	YES	0.01	0.01	0.0
	StdbyFpga	YES	0.96	0.96	0.0
	StdbyFpgaGolden	YES	0.83	0.83	0.0
	TamFw	YES	7.09	7.09	0.0
	TamFwGolden	YES	7.09	7.09	0.0

PSU1100W-ACPI	EM-PrimMCU	NO	1.01	1.01	0.0
	EM-SecMCU	NO	1.05	1.05	0.0

PSU2KW-ACPE	PO-PrimMCU	NO	17.56	17.56	0.0

PSU2KW-ACPI	PO-PrimMCU	NO	1.03	1.03	0.0
	PO-SecMCU	NO	1.13	1.13	0.0

PSU2KW-DCPE	PO-PrimMCU	NO	17.56	17.56	0.0

PSU2KW-DCPI	PO-PrimMCU	NO	1.07	1.07	0.0

PSU950W-DCPI	EM-PrimMCU	NO	1.00	1.00	0.0

This sample output is for **show hw-module fpd** command from the Admin mode:

```
sysadmin-vm:0_RP0# show hw-module fpd
Auto-upgrade:Enabled
```

FPD Versions

Location	Card type	HWver	FPD device	ATR Status	Running	Programd
0/0	NC55-36X100G-S	1.1	MIFPGA	CURRENT	0.07	0.07
0/0	NC55-36X100G-S	1.1	Bootloader	CURRENT	1.20	1.20
0/0	NC55-36X100G-S	1.1	IOFPGA	CURRENT	0.12	0.12
0/0	NC55-36X100G-S	1.1	SATA-M600-MCT	CURRENT	5.00	5.00
0/2	NC57-36H6D-S	0.202	MIFPGA	CURRENT	0.40	0.40
0/2	NC57-36H6D-S	1.0	TimingIC-A	CURRENT	7.216	7.216
0/2	NC57-36H6D-S	1.0	TimingIC-B	CURRENT	7.216	7.216
0/2	NC57-36H6D-S	0.202	Bootloader	CURRENT	0.02	0.02
0/2	NC57-36H6D-S	0.202	DBFPGA	CURRENT	0.14	0.14
0/2	NC57-36H6D-S	0.202	IOFPGA	CURRENT	0.52	0.52
0/2	NC57-36H6D-S	0.202	SATA-Micron	CURRENT	1.00	1.00
0/3	NC55-24H12F-SE	1.0	MIFPGA	CURRENT	0.03	0.03
0/3	NC55-24H12F-SE	1.0	Bootloader	CURRENT	1.20	1.20
0/3	NC55-24H12F-SE	1.0	IOFPGA	CURRENT	0.09	0.09
0/3	NC55-24H12F-SE	1.0	SATA-M600-MCT	CURRENT	5.00	5.00
0/5	NC57-24DD	0.501	MIFPGA	CURRENT	0.11	0.11
0/5	NC57-24DD	0.501	Bootloader	CURRENT	1.03	1.03
0/5	NC57-24DD	0.501	DBFPGA	CURRENT	0.14	0.14
0/5	NC57-24DD	0.501	IOFPGA	CURRENT	0.23	0.23
0/5	NC57-24DD	0.501	SATA-M5100	CURRENT	75.00	75.00
0/6/1	NC55-MPA-1TH2H-S	0.2	MPAFPGA	CURRENT	0.54	0.54
0/6/2	NC55-MPA-1TH2H-S	0.2	MPAFPGA	CURRENT	0.54	0.54
0/6	NC55-MOD-A-S	0.302	MIFPGA	CURRENT	0.16	0.16
0/6	NC55-MOD-A-S	0.302	Bootloader	CURRENT	1.03	1.03
0/6	NC55-MOD-A-S	0.302	DBFPGA	CURRENT	0.14	0.14
0/6	NC55-MOD-A-S	0.302	IOFPGA	CURRENT	0.14	0.14
0/6	NC55-MOD-A-S	0.302	SATA-M600-MCT	CURRENT	5.00	5.00
0/RP0	NC55-RP	2.1	Bootloader	CURRENT	9.31	9.31
0/RP0	NC55-RP	2.1	IOFPGA	CURRENT	0.09	0.09

0/RP0	NC55-RP	2.1	SATA-M600-MU	CURRENT	6.00	6.00
0/RP1	NC55-RP	1.0	Bootloader	CURRENT	9.31	9.31
0/RP1	NC55-RP	1.0	IOFPGA	CURRENT	0.09	0.09
0/RP1	NC55-RP	1.0	SATA-M600-MU	CURRENT	6.00	6.00
0/FC3	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC3	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.20	0.20
0/FC3	NC55-5508-FC2	1.0	SATA-M5100	CURRENT	75.00	75.00
0/FC5	NC55-5508-FC2	1.0	Bootloader	CURRENT	1.80	1.80
0/FC5	NC55-5508-FC2	1.0	IOFPGA	CURRENT	0.20	0.20
0/FC5	NC55-5508-FC2	1.0	SATA-M5100	CURRENT	75.00	75.00
0/SC0	NC55-SC	1.6	Bootloader	CURRENT	1.74	1.74
0/SC0	NC55-SC	1.6	IOFPGA	CURRENT	0.11	0.11
0/SC1	NC55-SC	1.6	Bootloader	CURRENT	1.74	1.74
0/SC1	NC55-SC	1.6	IOFPGA	CURRENT	0.11	0.11

Compatibility Matrix for EPNM and Crosswork with Cisco IOS XR Software

The compatibility matrix lists the version of EPNM and Crosswork that are supported with Cisco IOS XR Release in this release.

Table 6: Compatibility Matrix

Cisco IOS XR	Crosswork	EPNM
Release 24.3.1	Crosswork Optimization Engine 6.0	Evolved Programmable Network Manager 7.1.1

Important Notes

- The total number of bridge-domains (2*BDs) and GRE tunnels put together should not exceed 1518. Here the number 1518 represents the multi-dimensional scale value.
- The offline diagnostics functionality is not supported in NCS 5500 platform. Therefore, the **hw-module service offline location** command will not work. However, you can use the **(sysadmin)# hw-module shutdown location** command to bring down the LC.

Licensing

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

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

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



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

Supported Transceiver Modules

To determine the transceivers that Cisco hardware device supports, refer to the [Transceiver Module Group \(TMG\) Compatibility Matrix](#) tool.

Upgrading Cisco IOS XR Software

Cisco IOS XR Software is installed and activated from modular packages, allowing specific features or software patches to be installed, upgraded, or downgraded without affecting unrelated processes. Software packages can be upgraded or downgraded on all supported card types, or on a single card (node).

Before starting the software upgrade, use the **show install health** command in the admin mode. This command validates if the statuses of all relevant parameters of the system are ready for the software upgrade without interrupting the system.



Note

- If you use a TAR package to upgrade from a Cisco IOS XR release prior to 7.x, the output of the **show install health** command in admin mode displays the following error messages:

```
sysadmin-vm:0_RSP0# show install health
. . .
ERROR /install_repo/gl/xr -rw-r--r--. 1 8413 floppy 3230320 Mar 14 05:45 <platform>-isis-2.2.0.0-r702.x86_64
ERROR /install_repo/gl/xr -rwxr-x---. 1 8413 165 1485781 Mar 14 06:02 <platform>-k9sec-3.1.0.0-r702.x86_64
ERROR /install_repo/gl/xr -rw-r--r--. 1 8413 floppy 345144 Mar 14 05:45 <platform>-li-1.0.0.0-r702.x86_64
```

You can ignore these messages and proceed with the installation operation.

- Quad configurations will be lost when you perform a software downgrade on a NCS-55A1-48Q6H device from IOS XR Release 7.5.1 onwards to a release prior to IOS XR Release 7.5.1 due to non-backward compatibility change. The lost configuration can be applied manually after the downgrade.



Note

A quad is a group of four ports with common speeds, 1G/10G or 25G. You can configure the ports speed for a quad by using the **hw-module quad** command.

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 5500 router documentation is located at the following URL:

<https://www.cisco.com/c/en/us/td/docs/iosxr/ios-xr.html>



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA 95134-1706
USA

Asia Pacific Headquarters
CiscoSystems(USA)Pte.Ltd.
Singapore

Europe Headquarters
CiscoSystemsInternationalBV
Amsterdam,TheNetherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.