

# Release Notes for Cisco NCS 1000 Series, IOS XR Release 24.3.1

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## Network Convergence System 1000 Series



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## What's New in Cisco NCS 1000, IOS XR Release 24.3.1

Cisco is continuously enhancing the product with every release and this section covers a brief description of key features and enhancements. You can also access the links to the detailed documented features.

### NCS 1020 Optical Line System

The Cisco NCS 1020 is a new Wavelength Division Multiplexing (WDM) System. Its salient features are:

- Operates as an integrated optical layer Reconfigurable Optical Add-Drop Multiplexer (ROADM) and Amplifier system to support Point-to-Point (P2P), Ring, and Mesh network architectures, complete with add/drop capabilities
- Offers transmission versatility by supporting multiple coherent sources such as:
  - 400G digital coherent ZR/ZR+ optics (-10dBm output power)
  - DWDM optical pluggable modules such as CFP2 and ZR/ZR+.
  - DWDM Line modules such as 1.2T, 2.4T and 2-QDD-C.
- Offers automation through IOS XR operating system that provides a rich suite of automation features including Zero Touch Provisioning (ZTP), open config YANG model support with NETCONF, and streaming telemetry.
- Allows Network Monitoring through a combination of probes based on OTDR, OSC, OCM, and telemetry data.

- Protects the installed modules and fiber connection with an optional NCS1020-DR= door kit which includes:
  - Replaceable internal air filters (NCS1020-DR-FTF=) for blocking dust and particles.
  - Hex openings for optimal airflow.
  - Fiber management brackets for proper cable routing.
  - Pull hinges for easy attachment.
  - Front door LEDs that mimic SYS and ATT LEDs of the controller for consistent monitoring.

### Supported Field Replaceable Modules

Cisco NCS 1020 is a 10RU chassis that has an in-built External Interface Timing Unit (EITU) and provides slots to accommodate field-replaceable modules as mentioned below.

- One Solid State Drive (SSD)
- Two controllers (active and backup)
- Two Power Supply Units (PSU)
- Eight fans (four NCS1010 fans and four NCS1020 fans)
- Ten line cards (two OLT/ILA and eight CCMD-16 line cards)

### Supported Line Cards

The NCS 1020 chassis supports the following line cards:

- NCS1K-OLT-C—C-band Optical Line Terminal without Raman
- NCS1K-E-OLT-C—C-band Optical Line Terminal without Raman, Enhanced
- NCS1K-ILA-C—In-Line Amplifier - C-band
- NCS1K14-CCMD-16-C—NCS 1000 16-port Colorless Direct attach line card with EDFA, C-band




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**Note** Slot 0 supports only C-band OLT cards. Slots 2, 3, 4, and 5 support CCMD-16-C cards.

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### Software Functionalities

NCS 1020 has a robust software suite, solidifying its position as a leading optical networking platform. These functionalities are strategically organized into following two core categories for enhanced user experience:

#### Data Path

NCS 1020 supports

- OTS, OTS-OCH, OSC, DFB, OCH, and OMS controllers on the NCS 1010 line cards, and OMS and OCH controllers on the CCMD-16-C and CCMD-16-L line cards.
- performance monitoring to gather, store, set thresholds for, and report performance data for early detection of network issues.

### Optical Applications for Automatic Network Turn Up

- **Span Loss** - Measures span loss between two nodes for a given direction and verifies if span loss is within the configured range.
- **Gain Estimator** - Computes power that is transmitted from the upstream node, analyzes incoming span loss, sets the gain mode of the EDFA amplifier, and provides the initial target gain for the amplifier.
- **Link Tuner** - Computes and configures the target PSD (power spectral density) for each span using actual optical measurements like span loss.
- **Automatic Power Control** - Configures amplifier and attenuator setpoints to achieve target PSD across the link.
- **Automatic Network Turn Up** - Allows all the optical applications to work together and bring up the DWDM link.

### OTDR Auto-scan

The OTDR Auto-scan automatically triggers whenever there are events such as span fault, span restore, device power cycle, and line card cold reload occur. It allows quick identification of fiber failure type and fault location.

### Telemetry

Sensor paths are supported in NCS 1020. You can stream telemetry data from NCS 1020 using sensor paths.

### Smart Licensing

NCS 1020 supports Smart Licensing, a cloud-based software license management solution that automates the time-consuming tasks of manual licensing. This solution allows you to efficiently track the status of your licenses and monitor software usage trends.

## Cisco NCS 1014

The following table lists the features added in the NCS 1014 guides:

Feature	Description
<b>Hardware Installation</b>	

Feature	Description
Pluggables Support	<p>This client pluggable is supported on the QXP card:</p> <ul style="list-style-type: none"> <li>• QDD-400G-LR4-S</li> </ul> <p>This trunk pluggable is supported on the QXP card:</p> <ul style="list-style-type: none"> <li>• QDD-400G-ZR-S</li> </ul> <p>These client pluggables are supported on the 2.4TX card:</p> <ul style="list-style-type: none"> <li>• QDD-2X100-CWDM4-S</li> <li>• QDD-2X100-LR4-S</li> </ul> <p>These trunk pluggables are supported on the 2.4TX card:</p> <ul style="list-style-type: none"> <li>• CIM8-CE-K9=</li> <li>• CIM8-LE-K9=</li> </ul>

Feature	Description
<b>System Setup and Software Installation</b>	
Automatic FPD Upgrade Support for Coherent Interconnect Module 8	<p>The Coherent Interconnect Module 8 (CIM8) FPD is automatically upgraded to the latest qualified version when the line card FPD is upgraded. This ensures that both the line card and CIM8 operate with optimized performance and improved interoperability.</p> <p>Supported line cards are:</p> <ul style="list-style-type: none"> <li>• NCS1K14-2.4T-X-K9</li> <li>• NCS1K4-2.4T-K9</li> </ul>
Automatic FPD Upgrade Support for Power Module	<p>The FPD upgrade for power modules is now integrated with the NCS 1014 automatic FPD upgrade. You have the flexibility to include or exclude the power module FPD in the automatic upgrade according to your operational requirements. This option is disabled by default.</p> <p>Command added:</p> <ul style="list-style-type: none"> <li>• <b>fpd auto-upgrade {include   exclude} pm</b></li> </ul> <p>You can also enable the automatic FPD upgrade for power modules using the OpenConfig data model Cisco-IOS-XR-openconfig-system-fpd-ext.</p>
Smart Licensing for QXP Line Card	<p>Now the NCS1K4-QXP-L-K9 supports the smart licensing feature. It enables you to automate the time-consuming manual licensing tasks and allows you to easily track the status of your license and software usage trends.</p>

Feature	Description
<b>Configuration</b>	

Feature	Description
<a href="#">100GE Channel Support for the 600 and 1000G Trunk rate in NCS1K14-2.4T-X-K9 Muxponder Mode</a>	The NCS1K14-2.4T-X-K9 line card now allows 100G breakout client support for 600G and 1000G trunk rate in muxponder mode. It features 4x100GE breakout channels in shared client ports, enabling seamless integration with existing 100G networks using QDD-4X100G-LR-S, QDD-4X100G-FR-S, and QDD-400G-DR4-S pluggable modules. These channels offer high density and bandwidth efficiency without extra costs.
<a href="#">Additional Muxponder Mode Trunk Rates for the NCS1K14-2.4T-X-K9 Line Card</a>	The NCS1K14-2.4T-X-K9 line card now supports additional trunk rates of 500G and 900G in muxponder mode, enhancing flexibility and optimizing pluggable count alongside the existing 600G and 1000G rates.
<a href="#">Cumulative PRBS on CoherentDSP Controllers</a>	The cumulative PRBS (Pseudo-Random Binary Sequence) on CoherentDSP controllers enhances troubleshooting capabilities between the trunk ports.  The <b>show coherentDSP rack/slot/instance/port prbs-details</b> command output now includes the newly supported fields.

Feature	Description
<b>Data Models</b>	
<a href="#">Extending Cisco Native Models for OpenConfig Support</a>	The OpenConfig model is completely supported on NCS 1014 chassis, by extending the existing Cisco native model configuration. It supports the Q-margin and Enhanced Q-margin parameters as part of the extended OpenConfig model.
<a href="#">OpenConfig Support for FEC Data</a>	OpenConfig model support is added for Forward Error Correction (FEC) data on the NCS 1014 chassis. It helps in avoiding deviations in the <b>pre-fec-ber</b> and <b>post-fec-ber</b> leaves for transceivers.

## NCS 1004

The following table lists the features added in the NCS 1004 guides:

Feature	Description
<b>Hardware Installation</b>	
<a href="#">Pluggables Support</a>	The QDD-4X100G-FR-S pluggable is now supported on the QXP line card.
Feature	Description
<b>Configuration</b>	

Feature	Description
<a href="#">Type 6 Password Support for Keyring Configuration in IKEv2 Encryption</a>	<p>The keyring configuration for IKEv2 encryption now supports the Type 6 password encryption method. This method uses AES256-GCM encryption and a user-configured primary key to encrypt the preshared key and Postquantum Preshared Keys (PPK).</p> <p>This Type 6 encryption enhances security by storing sensitive information, such as the preshared key and PPK, in an encoded format on the device and makes it difficult to decipher.</p> <p>You can enable this feature using the following commands:</p> <ul style="list-style-type: none"> <li>• <b>key config-key password-encryption</b></li> <li>• <b>password6 aes encryption</b></li> </ul> <p>You can verify the status the encryption using the following command:</p> <ul style="list-style-type: none"> <li>• show type6 server</li> </ul>

## Cisco Optical Site Manager

The following table lists the features added in the Cisco Optical Site Manager guide:

Feature	Description
<b>Configuration</b>	
<a href="#">Backup and Restore Database</a>	<p>Cisco Optical Site Manager now supports backup and restore for its database and the databases of the devices it manages.</p> <p>When unexpected failures occur, such as hardware malfunctions or software corruption, your data is securely backed up and easily recoverable.</p>
<a href="#">Cisco Optical Site Manager Smart Licensing</a>	<p>Cisco Optical Site Manager now supports the smart licensing. It enables you to automate the time-consuming manual licensing tasks and allows you to easily track the status of your license and software usage trends.</p> <p>You can choose any of smart licensing mode based on your requirement:</p> <ul style="list-style-type: none"> <li>• Smart Transport</li> <li>• CSLU</li> <li>• Offline</li> </ul>
<a href="#">Additional Card Mode and Trunk Rates for the NCS1K14-2.4T-X-K9 Card</a>	<p>The <b>Select Card Mode</b> page of the <b>Card Configuration Wizard</b> is updated to include the <b>1.2T Splitted</b> configuration on the <b>Trunk 0</b> port on the NCS1K14-2.4T-X-K9 Card.</p> <p>You can also use the wizard to configure these trunk rates on the card in the muxponder mode:</p> <ul style="list-style-type: none"> <li>• 100-GE client traffic for 600-G and 1000-G</li> <li>• 500-G and 900-G</li> </ul>

Feature	Description
<a href="#">Support for NCS 1001 and Cards</a>	<p>Cisco Optical Site Manager now allows you to manage the NCS 1001 node and its cards:</p> <ul style="list-style-type: none"> <li>• NCS1K-PSM</li> <li>• NCS1K-EDFA</li> </ul>
<a href="#">Connection Verification for NCS 1010</a>	<p>You can now verify the connections between OLT-C line cards and passive modules of NCS 1010 devices from the <b>Connection Verification</b> list located in the right-panel of the <b>Node Functional View</b>.</p> <p>You can use Connection Verification to quickly identify and troubleshoot connectivity issues.</p>
<a href="#">Optical Channel Section Enhancements</a>	<p>The <b>Optical Channel</b> section is now updated to allow the configuration of the <b>Target Power</b> and <b>Fixed Ratio</b> parameter values.</p>
<a href="#">Support for NCS 1004 Cards</a>	<p>The <b>Card Configuration Wizard</b> now supports configuring these card modes for the NCS1K4-OTN-XP card:</p> <ul style="list-style-type: none"> <li>• 10G-GREY-MXP</li> <li>• 40x10G-4x100G-MXP</li> </ul> <p>You can also use the wizard to configure card mode for the NCS1K4-2-QDD-C-K9 card.</p>
<a href="#">Add Unmanaged Devices</a>	<p>The <b>Add Device</b> dialog box now includes the <b>unmanaged-network-element</b> device type option, allowing the addition of unmanaged devices.</p> <p>This enhancement makes it easier to add and configure passive devices on the network.</p>

Feature	Description
<b>System Setup and Software Installation</b>	
<a href="#">Cisco Optical Site Manager High Availability</a>	<p>You can now configure Cisco Optical Site Manager with High Availability (HA). In this setup, if the primary device hosting Cisco Optical Site Manager fails, another device configured with HA will take over immediately, minimizing downtime and maintaining operational continuity.</p>

## Important Notes

Downgrade of the NCS 1010 software from release 7.11.1 or higher to any lower release can affect traffic.

## Release Packages

Packages for CISCO NCS 1020

Table 1: Packages for Cisco NCS 1020

Feature Set	Filename	Description
<b>Composite Package</b>		
Cisco IOS XR Core Bundle + Manageability Packages	ncs1010-x64-24.3.1.iso	Contains required core packages, including operating system, Admin, Base, Forwarding, SNMP Agent, FPD, and Alarm Correlation and Netconf-yang, Telemetry, Extensible Markup Language (XML) Parser, HTTP server packages.
<b>Individually Installable Packages</b>		
Cisco IOS XR Telnet Packages	xr-telnet-24.3.1.v1.0.0-1.x86_64.rpm xr-telnet-ncs1020-24.3.1.v1.0.0-1.x86_64.rpm	Install these packages to support Telnet.
Cisco IOS XR Cisco Discovery Protocol (CDP) Packages	xr-cdp-24.3.1.v1.0.0-1.x86_64.rpm xr-cdp-ncs1020-24.3.1.v1.0.0-1.x86_64	Install these packages support CDP.

**Packages for CISCO NCS 1014**

**Note** The NCS 1014 packages include Cisco Optical Site Manager Software.

Table 2: Packages for Cisco NCS 1014

Feature Set	Filename	Description
<b>Composite Package</b>		
Cisco IOS XR Core Bundle + Manageability Packages	ncs1010-x64-24.3.1.iso	Contains required core packages, including operating system, Admin, Base, Forwarding, SNMP Agent, FPD, and Alarm Correlation and Netconf-yang, Telemetry, Extensible Markup Language (XML) Parser, HTTP server packages.
<b>Individually Installable Packages</b>		
Cisco IOS XR Telnet Packages	xr-telnet-24.3.1.v1.0.0-1.x86_64.rpm xr-telnet-ncs1014-24.3.1.v1.0.0-1.x86_64.rpm	Install these packages to support Telnet.
Cisco IOS XR Cisco Discovery Protocol (CDP) Packages	xr-cdp-24.3.1.v1.0.0-1.x86_64.rpm xr-cdp-ncs1014-24.3.1.v1.0.0-1.x86_64.rpm	Install these packages to support CDP.
<b>COSM Packages</b>		



Cisco Optical Site Manager Packages	xr-cosm-24.3.1v1.0.0-1.x86_64.rpm xr-cosm-ncs1014-24.3.1v1.0.0-1.x86_64.rpm xr-cosm-82eb6a4d2fa15d0e-24.3.1v1.0.0-1.x86_64.rpm	Install these packages to enable Cisco Optical Site Manager.
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### Packages for CISCO NCS 1010



**Note** The NCS 1010 packages include Cisco Optical Site Manager Software.

**Table 3: Packages for Cisco NCS 1010**

Feature Set	Filename	Description
<b>Composite Package</b>		
Cisco IOS XR Core Bundle + Manageability Packages	ncs1010-x64-24.3.1.iso	Contains required core packages, including operating system, Admin, Base, Forwarding, SNMP Agent, FPD, and Alarm Correlation and Netconf-yang, Telemetry, Extensible Markup Language (XML) Parser, HTTP server packages.
<b>Individually Installable Packages</b>		
Cisco IOS XR Telnet Packages	xr-telnet-24.3.1v1.0.0-1.x86_64.rpm xr-telnet-ncs1010-24.3.1v1.0.0-1.x86_64.rpm	Install these packages to support Telnet.
Cisco IOS XR Cisco Discovery Protocol (CDP) Packages	xr-cdp-24.3.1v1.0.0-1.x86_64.rpm xr-cdp-ncs1010-24.3.1v1.0.0-1.x86_64.rpm	Install these packages to support CDP.

### Packages for Cisco NCS 1004

**Table 4: Packages for Cisco NCS 1004**

Feature Set	Filename	Description
<b>Composite Package</b>		
Cisco IOS XR Core Bundle + Manageability Package	NCS1004-iosxr-px-k9-24.3.1.tar	Contains required core packages, including operating system, Admin, Base, Forwarding, SNMP Agent, FPD, and Alarm Correlation and Netconf-yang, Telemetry, Extensible Markup Language (XML) Parser, HTTP server packages.
<b>Individually Installable Packages</b>		

Cisco IOS XR Security Package	ncs1004-k9sec-1.0.0.0-r2431.x86_64.rpm	Support for Encryption, Decryption, IP Security (IPsec), Secure Socket Layer (SSL), and Public-key infrastructure (PKI).
Cisco IOS XR OTN-XP DP Package	ncs1004-sysadmin-otn-xp-dp-24.3.1-r2411.x86_64.rpm (part of ncs1004-iosxr-px-k9-24.3.1.tar)	Install this data path FPD packages on the OTN-XP card. This package is mandatory for datapath bring up.

## Caveats

### Open Caveats

#### NCS 1020

There are no open caveats for NCS 1020.

#### NCS 1014

The following table lists the open caveats for NCS 1014:

Bug ID	Headline
<a href="#">CSCwk64963</a>	NCS1014-"Failed to connect to LC software" alarm reported for LC warm reboot
<a href="#">CSCwk65757</a>	Continuous ssh authentication XR syslogs while COSM managing it
<a href="#">CSCwk73534</a>	OC terminal-device target-output-power units/definition interpretation is wrong
<a href="#">CSCwk74541</a>	config went to pre-config state after LC Warm followed by power cycle

#### NCS 1010

The following table lists the open caveats for NCS 1010:

Bug ID	Headline
<a href="#">CSCwk65757</a>	Continuous ssh authentication XR syslogs while COSM managing it
<a href="#">CSCwk83924</a>	NCS1010:Line Card is struck in 'platform init' state upon software upgrade

#### NCS 1004

The following table lists the open caveats for NCS 1004:

Bug ID	Headline
<a href="#">CSCwk80675</a>	2431-NCS1004-OTN-XP Card PSM switching for OTU2 client time exceeds the standard
<a href="#">CSCwk73534</a>	OC terminal-device target-output-power units/definition interpretation is wrong

#### Cisco Optical Site Manager

The following table lists the open caveats for Cisco Optical Site Manager.

Bug ID	Headline
<a href="#">CSCwk35425</a>	[COSM]: Unable to do software upgrade only on COSM HA devices, have to do upgrade on all devices
<a href="#">CSCwm29656</a>	[COSM]: SU Activation procedure should be denied when XR is waiting for commit
<a href="#">CSCwk35582</a>	[COSM]: Revert of software upgrade with scope "All-Parallel" should revert subtended device first
<a href="#">CSCwj87619</a>	[COSM]: After successful restore on aggregator, we don't have component status on show backuprestore
<a href="#">CSCwk12288</a>	[COSM]: restore on device A with stop-on-mismatch as true fails when added device B after backup
<a href="#">CSCwm05065</a>	[COSM]: log messages in netconf ncs_events for DB backup and restore is not coming correctly
<a href="#">CSCwm27010</a>	COSM FLT: Eqpt state not updated/Improper removal alarm not cleared sometimes post reload
<a href="#">CSCwm12431</a>	[COSM]: Unable to perform Software upgrade from UI, when having unmanaged device on HA
<a href="#">CSCwk60955</a>	COSM] upgrade 7.11.2 to 24.3.1, device with degree unmanage by COSM due to config inconsistency in XR
<a href="#">CSCwm06822</a>	[COSM-webui] - 'OCM' is not working for EDFA+FLD_OSC in ILA node type
<a href="#">CSCwk02526</a>	[COSM-ncs1kned] - "Attention LED" is not working for NCS1K_1001 Chassis

## Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.

## Using Bug Search Tool

You can use the Cisco Bug Search Tool to search for a specific bug or to search for all bugs in a release.

### Procedure

- 
- Step 1** Go to the <http://tools.cisco.com/bugsearch>.
- Step 2** Log in using your registered Cisco.com username and password.  
The Bug Search page opens.
- Step 3** Use any of these options to search for bugs, and then press Enter (Return) to initiate the search:
- To search for a specific bug, enter the bug ID in the Search For field.
  - To search for bugs based on specific criteria, enter search criteria, such as a problem description, a feature, or a product name, in the Search For field.

- To search for bugs based on products, enter or select a product from the Product list. For example, if you enter “WAE,” you get several options from which to choose.
- To search for bugs based on releases, in the Releases list select whether to search for bugs affecting a specific release, bugs that were fixed in a specific release, or both. Then enter one or more release numbers in the Releases field.

**Step 4** When the search results are displayed, use the filter tools to narrow the results. You can filter the bugs by status, severity, and so on.

To export the results to a spreadsheet, click **Export Results to Excel**.

## Determine Software Version

### NCS1020

Log into NCS 1020 node and enter the **show version** command.

```
RP/0/RP0/CPU0:ios#show version
Fri Aug 30 07:14:16.476 UTC
Cisco IOS XR Software, Version 24.3.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
  Built By       : cisco
  Built On       : Thu Aug 29 17:07:57 UTC 2024
  Build Host     : iox-ucs-069
  Workspace      : /auto/srcarchive11/prod/24.3.1/ncs1010/ws/
  Version        : 24.3.1
  Label          : 24.3.1

cisco NCS1010 (C3758R @ 2.40GHz)
cisco NCS1020-SA (C3758R @ 2.40GHz) processor with 32GB of memory
ios uptime is 42 minutes
NCS 1020 Chassis
```

### NCS 1014

Log into NCS 1014 node and enter the **show version** command.

```
RP/0/RP0/CPU0:ios#show version
Fri Aug 30 11:03:57.578 IST
Cisco IOS XR Software, Version 24.3.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
  Built By       : cisco
  Built On       : Thu Aug 29 17:07:57 UTC 2024
  Build Host     : iox-ucs-069
  Workspace      : /auto/srcarchive11/prod/24.3.1/ncs1010/ws/
  Version        : 24.3.1
  Label          : 24.3.1

cisco NCS1010 (C3758R @ 2.40GHz)
cisco NCS1014 (C3758R @ 2.40GHz) processor with 32GB of memory
ios uptime is 42 minutes
NCS 1014 - Chassis
```

## NCS 1010

Log into NCS 1010 node and enter the **show version** command.

```
RP/0/RP0/CPU0:ios#show version
Fri Aug 30 15:03:18.271 IST
Cisco IOS XR Software, Version 24.3.1 LNT
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
  Built By      : cisco
  Built On     : Thu Aug 29 17:07:57 UTC 2024
  Build Host   : iox-ucs-069
  Workspace    : /auto/srcarchive11/prod/24.3.1/ncs1010/ws/
  Version     : 24.3.1
  Label       : 24.3.1

cisco NCS1010 (C3758 @ 2.20GHz)
cisco NCS1010-SA (C3758 @ 2.20GHz) processor with 32GB of memory
ios uptime is 11 minutes
NCS 1010 - Chassis
```

## NCS 1004

Log into the NCS 1004 node and enter the **show version** command.

```
RP/0/RP0/CPU0:ios#show version
Fri Aug 30 12:46:55.697 UTC
Cisco IOS XR Software, Version 24.3.1
Copyright (c) 2013-2024 by Cisco Systems, Inc.

Build Information:
  Built By      : swtools
  Built On     : Thu Aug 29 11:58:32 PDT 2024
  Build Host   : iox-lnx-039
  Workspace    : /auto/srcarchive11/prod/24.3.1/ncs1004/ws
  Version     : 24.3.1
  Location    : /opt/cisco/XR/packages/
  Label       : 24.3.1

cisco NCS-1004 () processor
System uptime is 2 minutes

RP/0/RP0/CPU0:ios#
```

# Determine Firmware Version

Use the **show hw-module fpd** command in EXEC mode to view the hardware components with their current FPD version and status. The status of the hardware must be CURRENT; The Running and Programed version must be the same.

## NCS 1020

Log into the node and enter the **show hw-module fpd** command.

```
RP/0/RP0/CPU0:ios#show hw-module fpd
Thu Aug 29 07:54:47.160 UTC

Auto-upgrade:Enabled,PM excluded
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
```

FPD Versions

## Determine Firmware Version

```

=====
Location   Card type           HWver FPD device      ATR Status  Running Programd
Reload Loc
-----
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  ADMCONFIG           CURRENT     1.00     1.00
NOT REQ
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  BIOS                 S CURRENT     5.20     5.20
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  BIOS-Golden         BS CURRENT           1.90
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  CpuFpga             S CURRENT     1.10     1.10
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  CpuFpgaGolden       BS CURRENT           1.02
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  SsdMicron5300       S CURRENT     0.01     0.01
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  TamFw                S CURRENT     9.07     9.07
0/RP0
0/RP0/CPU0 NCS1010-CTR2-B-K9  0.1  TamFwGolden         BS CURRENT           9.07
0/RP0
0/PM0      NCS1K4-AC-PSU-2    1.0  PO-PrimMCU          CURRENT     1.03     1.03
NOT REQ
0/PM0      NCS1K4-AC-PSU-2    1.0  PO-SecMCU           CURRENT     1.05     1.05
NOT REQ
0/PM1      NCS1K4-AC-PSU-2    1.0  PO-PrimMCU          CURRENT     1.03     1.03
NOT REQ
0/PM1      NCS1K4-AC-PSU-2    1.0  PO-SecMCU           CURRENT     1.05     1.05
NOT REQ
0/0/NXR0   NCS1K-E-OLT-R-C    1.0  OLT                  S CURRENT     3.16     3.16
NOT REQ
0/0/NXR0   NCS1K-E-OLT-R-C    1.0  Raman-1             S CURRENT     3.16     3.16
NOT REQ
0/2/NXR0   NCS1K14-CCMD-16-C  0.2  CpuModFw            S CURRENT     243.10   243.10
NOT REQ
0/2/NXR0   NCS1K14-CCMD-16-C  0.2  OptModFw            S CURRENT     20.02    20.02
NOT REQ
0/3/NXR0   NCS1K14-CCMD-16-C  0.2  CpuModFw            S CURRENT     243.10   243.10
NOT REQ
0/3/NXR0   NCS1K14-CCMD-16-C  0.2  OptModFw            S CURRENT     20.02    20.02
NOT REQ
0/Rack     NCS1020-SA         0.1  ADMCONFIG           CURRENT     1.00     1.00
NOT REQ
0/Rack     NCS1020-SA         0.1  IoFpgaLow           S CURRENT     1.12     1.12
NOT REQ
0/Rack     NCS1020-SA         0.1  IoFpgaLowGolden     BS CURRENT           0.07
NOT REQ
0/Rack     NCS1020-SA         0.1  IoFpgaUp            S CURRENT     1.10     1.10
NOT REQ
0/Rack     NCS1020-SA         0.1  IoFpgaUpGolden      BS CURRENT           0.06
NOT REQ
0/Rack     NCS1020-SA         0.1  SsdIntelSC2KB       S CURRENT     1.20     1.20
0/Rack
RP/0/RP0/CPU0:ios#

```

**NCS 1014**

Log into the node and enter the **show hw-module fpd** command.

**2.4T and 2.4T-X Cards**

```
RP/0/RP0/CPU0:ios#show hw-module fpd
Fri Aug 30 11:04:02.782 IST
```

```
Auto-upgrade:Enabled,PM excluded
```

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

Location Reload Loc	Card type	HWver	FPD device	ATR	Status	FPD Versions	
						Running	Programd
0/RP0/CPU0 NOT REQ	NCS1K14-CNTLR-K9	0.2	ADM-DB		CURRENT	2.10	2.10
0/RP0/CPU0 NOT REQ	NCS1K14-CNTLR-K9	0.2	ADM-MB		CURRENT	2.30	2.30
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	BIOS	S	CURRENT	4.80	4.80
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	BIOS-Golden	BS	CURRENT		4.50
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	CpuFpga	S	CURRENT	1.17	1.17
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	CpuFpgaGolden	BS	CURRENT		1.03
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	SsdIntelS4510	S	CURRENT	11.51	11.51
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	TamFw	S	CURRENT	9.04	9.04
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	TamFwGolden	BS	CURRENT		9.04
0/PM1 NOT REQ	NCS1K4-AC-PSU	0.1	PO-PrimMCU		CURRENT	2.04	2.04
0/PM1 NOT REQ	NCS1K4-AC-PSU	0.1	PO-SecMCU		CURRENT	2.06	2.06
0/0/NXR0 NOT REQ	NCS1K14-2.4T-K9	0.1	CpuModFw	S	CURRENT	243.10	243.10
0/2/NXR0 NOT REQ	NCS1K14-2.4T-K9	0.1	CpuModFw	S	CURRENT	243.10	243.10
0/3/NXR0 NOT REQ	NCS1K14-2.4T-X-K9	1.0	CpuModFw	S	CURRENT	243.10	243.10
0/Rack NOT REQ	NCS1014	0.1	ADM-CHASSIS		CURRENT	0.21	0.21
0/Rack NOT REQ	NCS1014	0.1	IoFpga	S	CURRENT	1.19	1.19
0/Rack NOT REQ	NCS1014	0.1	IoFpgaGolden	BS	CURRENT		1.05
0/Rack 0/Rack	NCS1014	0.1	SsdIntelSC2KB	S	CURRENT	1.20	1.20

**QXP Card**

RP/0/RP0/CPU0:ios#show hw-module fpd  
Fri Aug 30 09:24:55.766 UTC

Auto-upgrade:Enabled,PM excluded

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

Location Reload Loc	Card type	HWver	FPD device	ATR	Status	FPD Versions	
						Running	Programd
0/RP0/CPU0 NOT REQ	NCS1K14-CNTLR-K9	0.2	ADM-DB		CURRENT	2.10	2.10
0/RP0/CPU0 NOT REQ	NCS1K14-CNTLR-K9	0.2	ADM-MB		CURRENT	2.30	2.30
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	BIOS	S	CURRENT	4.80	4.80
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	BIOS-Golden	BS	CURRENT		1.72
0/RP0/CPU0 0/RP0	NCS1K14-CNTLR-K9	0.2	CpuFpga	S	CURRENT	1.17	1.17

## Determine Firmware Version

```

0/RP0/CPU0 NCS1K14-CNTLR-K9      0.2  CpuFpgaGolden  BS  CURRENT          0.27
0/RP0
0/RP0/CPU0 NCS1K14-CNTLR-K9      0.2  SsdMicron5300  S   CURRENT    0.01  0.01
0/RP0
0/RP0/CPU0 NCS1K14-CNTLR-K9      0.2  TamFw          S   CURRENT    9.04  9.04
0/RP0
0/RP0/CPU0 NCS1K14-CNTLR-K9      0.2  TamFwGolden   BS  CURRENT          9.04
0/RP0
0/PM1      NCS1K4-AC-PSU    0.1  PO-PriMCU     CURRENT    2.04  2.04
NOT REQ
0/PM1      NCS1K4-AC-PSU    0.1  PO-SecMCU     CURRENT    2.06  2.06
NOT REQ
0/0/NXR0   NCS1K4-QXP-K9    0.2  CpuModFw      S   CURRENT    243.10 243.10
NOT REQ
0/1/NXR0   NCS1K4-QXP-L-K9  0.2  CpuModFw      S   CURRENT    243.10 243.10
NOT REQ
0/Rack     NCS1014          0.1  ADM-CHASSIS   CURRENT    0.21  0.21
NOT REQ
0/Rack     NCS1014          0.1  IoFpga        S   CURRENT    1.19  1.19
NOT REQ
0/Rack     NCS1014          0.1  IoFpgaGolden  BS  CURRENT          1.05
NOT REQ
0/Rack     NCS1014          0.1  SsdIntelSC2KB S   CURRENT    1.20  1.20
0/Rack

```

## 1.2T Card

```

RP/0/RP0/CPU0:ios#sh hw-module fpd
Auto-upgrade:Enabled,PM excluded
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	NCS1K14-CNTLR-K9	0.2	ADM-DB		CURRENT	2.10	2.10
NOT REQ							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	ADM-MB		CURRENT	2.30	2.30
NOT REQ							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	BIOS	S	CURRENT	4.80	4.80
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	BIOS-Golden	BS	CURRENT		4.70
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	CpuFpga	S	CURRENT	1.17	1.17
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	CpuFpgaGolden	BS	CURRENT		1.09
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	SsdMicron5300	S	CURRENT	0.01	0.01
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	TamFw	S	CURRENT	9.04	9.04
0/RP0							
0/RP0/CPU0	NCS1K14-CNTLR-K9	0.2	TamFwGolden	BS	CURRENT		9.04
0/RP0							
0/PM0	NCS1K4-AC-PSU	0.1	PO-PriMCU		CURRENT	2.04	2.04
NOT REQ							
0/PM0	NCS1K4-AC-PSU	0.1	PO-SecMCU		CURRENT	2.06	2.06
NOT REQ							
0/1/NXR0	NCS1K14-2.4T-K9	0.1	CpuModFw	S	CURRENT	24.32	24.32
NOT REQ							
0/2/NXR0	NCS1K4-1.2T-L-K9	0.1	CpuModFw	S	CURRENT	24.32	24.32
NOT REQ							
0/2/NXR0	NCS1K4-1.2T-L-K9	0.1	OptModFw	S	CURRENT	1.38	1.38
NOT REQ							
0/3/NXR0	NCS1K4-1.2T-L-K9	0.1	CpuModFw	S	CURRENT	24.32	24.32
NOT REQ							
0/3/NXR0	NCS1K4-1.2T-L-K9	0.1	OptModFw	S	CURRENT	1.38	1.38



```

NOT REQ
0/Rack NCS1014 0.1 ADM-CHASSIS CURRENT 0.21 0.21
NOT REQ
0/Rack NCS1014 0.1 IoFpga S CURRENT 1.19 1.19
NOT REQ
0/Rack NCS1014 0.1 IoFpgaGolden BS CURRENT 1.05
NOT REQ
0/Rack NCS1014 0.1 SsdIntelSC2KB S CURRENT 1.20 1.20
0/Rack
RP/0/RP0/CPU0:ios#
    
```

**NCS 1010**

Log into the node and enter the **show hw-module fpd** command.

```

RP/0/RP0/CPU0:ios#show hw-module fpd
Fri Aug 30 05:59:44.248 IST
    
```

```

Auto-upgrade:Enabled,PM excluded
Attribute codes: B golden, P protect, S secure, A Anti Theft aware
    
```

Location Reload Loc	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	ADMConfig	CURRENT	3.40	3.40
NOT REQ						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	BIOS	S CURRENT	4.80	4.80
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	BIOS-Golden	BS CURRENT		4.10
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	CpuFpga	S CURRENT	1.13	1.13
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	CpuFpgaGolden	BS CURRENT		1.01
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	SsdMicron5300	S CURRENT	0.01	0.01
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	TamFw	S CURRENT	6.13	6.13
0/RP0						
0/RP0/CPU0	NCS1010-CNTRLR-K9	1.11	TamFwGolden	BS CURRENT		6.11
0/RP0						
0/PM0	NCS1010-AC-PSU	1.0	AP-PrimMCU	CURRENT	1.03	1.03
NOT REQ						
0/PM0	NCS1010-AC-PSU	1.0	AP-SecMCU	CURRENT	2.01	2.01
NOT REQ						
0/PM1	NCS1010-AC-PSU	1.0	AP-PrimMCU	CURRENT	1.03	1.03
NOT REQ						
0/PM1	NCS1010-AC-PSU	1.0	AP-SecMCU	CURRENT	2.01	2.01
NOT REQ						
0/0/NXR0	NCS1K-E-OLT-R-C	1.0	OLT	S CURRENT	3.16	3.16
NOT REQ						
0/0/NXR0	NCS1K-E-OLT-R-C	1.0	Raman-1	S CURRENT	3.16	3.16
NOT REQ						
0/Rack	NCS1010-SA	2.1	EITU-ADMConfig	CURRENT	2.10	2.10
NOT REQ						
0/Rack	NCS1010-SA	2.1	IoFpga	S CURRENT	1.19	1.19
NOT REQ						
0/Rack	NCS1010-SA	2.1	IoFpgaGolden	BS CURRENT		1.01
NOT REQ						
0/Rack	NCS1010-SA	2.1	SsdMicron5300	S CURRENT	0.01	0.01
0/Rack						

**NCS 1004**

Log into the node and enter the **show hw-module fpd** command.

**QXP Card**

```
RP/0/RP0/CPU0:ios#show hw-module fpd
Fri Aug 30 12:47:31.279 UTC
```

Auto-upgrade:Enabled

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/0	NCS1K4-QXP-K9	1.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/0	NCS1K4-QXP-K9	3.0	LC_QSFPDD_PORT_0	CURRENT	70.13011	70.13011
0/0	NCS1K4-QXP-K9	2.0	LC_QSFPDD_PORT_10	CURRENT	61.2332	61.2332
0/0	NCS1K4-QXP-K9	3.0	LC_QSFPDD_PORT_14	CURRENT	70.13011	70.13011
0/0	NCS1K4-QXP-K9	3.0	LC_QSFPDD_PORT_2	CURRENT	70.13011	70.13011
0/0	NCS1K4-QXP-K9	3.0	LC_QSFPDD_PORT_4	CURRENT	70.13011	70.13011
0/0	NCS1K4-QXP-K9	2.0	LC_QSFPDD_PORT_8	CURRENT	61.2332	61.2332
0/RP0	NCS1K4-CNTLR-K9	8.0	CSB_IMG	S CURRENT	0.200	0.200
0/RP0	NCS1K4-CNTLR-K9	8.0	TAM_FW	CURRENT	36.08	36.08
0/RP0	NCS1K4-CNTLR-K9	1.14	BIOS	S CURRENT	6.40	6.40
0/RP0	NCS1K4-CNTLR-K9	5.4	BP_SSD	CURRENT	75.00	75.00
0/RP0	NCS1K4-CNTLR-K9	8.0	CPU_FPGA	CURRENT	1.14	1.14
0/RP0	NCS1K4-CNTLR-K9	5.5	CPU_SSD	CURRENT	1.00	1.00
0/RP0	NCS1K4-CNTLR-K9	3.18	POWMAN_CFG	CURRENT	3.40	3.40
0/PM1	NCS1K4-AC-PSU	0.1	PO-PrimCU	CURRENT	2.70	2.70
0/SC0	NCS1004	2.0	BP_FPGA	CURRENT	1.25	1.25
0/SC0	NCS1004	2.0	XGE_FLASH	CURRENT	18.04	18.04

**OTN-XP Card**

```
RP/0/RP0/CPU0:ios#sh hw-module fpd
Fri Aug 30 12:50:28.483 UTC
```

Auto-upgrade:Enabled

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/0	NCS1K4-OTN-XP	3.0	LC_CFP2_PORT_0	CURRENT	1.46	1.46
0/0	NCS1K4-OTN-XP	3.0	LC_CFP2_PORT_1	CURRENT	1.46	1.46
0/0	NCS1K4-OTN-XP	3.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10

0/0	NCS1K4-OTN-XP	7.0	LC_DP_MOD_FW	CURRENT	3.10	3.10
0/0	NCS1K4-OTN-XP	2.0	LC_QSFPPD_PORT_9	CURRENT	61.2332	61.2332
0/1	NCS1K4-OTN-XP	3.0	LC_CFP2_PORT_0	CURRENT	1.46	1.46
0/1	NCS1K4-OTN-XP	2.0	LC_CFP2_PORT_1	CURRENT	1.80	1.80
0/1	NCS1K4-OTN-XP	3.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/1	NCS1K4-OTN-XP	3.0	LC_DP_MOD_FW	CURRENT	15.10	15.10
0/RP0	NCS1K4-CNTLR-K9	7.0	CSB_IMG	S CURRENT	0.200	0.200
0/RP0	NCS1K4-CNTLR-K9	7.0	TAM_FW	CURRENT	36.08	36.08
0/RP0	NCS1K4-CNTLR-K9	1.14	BIOS	S CURRENT	6.40	6.40
0/RP0	NCS1K4-CNTLR-K9	5.4	BP_SSD	CURRENT	75.00	75.00
0/RP0	NCS1K4-CNTLR-K9	7.0	CPU_FPGA	CURRENT	1.14	1.14
0/RP0	NCS1K4-CNTLR-K9	5.4	CPU_SSD	CURRENT	75.00	75.00
0/RP0	NCS1K4-CNTLR-K9	3.18	POWMAN_CFG	CURRENT	3.40	3.40
0/PM1	NCS1K4-AC-PSU	0.1	PO-PrimCU	CURRENT	2.70	2.70
0/SC0	NCS1004	2.0	BP_FPGA	CURRENT	1.25	1.25
0/SC0	NCS1004	2.0	XGE_FLASH	CURRENT	18.04	18.04

### 1.2T, 1.2T-L, 2-QDD-C, and 2-QDD-L Cards

```
RP/0/RP0/CPU0:ios#sh hw-module fpd
Mon Sep 2 16:09:28.656 UTC
```

```
Auto-upgrade:Enabled
```

Location	Card type	HWver	FPD device	ATR Status	FPD Versions	
					Running	Programd
0/0	NCS1K4-2-QDD-C-K9	0.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/0	NCS1K4-2-QDD-C-K9	1.0	LC_OPT_MOD_FW	CURRENT	1.38	1.38
0/1	NCS1K4-1.2T-K9	2.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/1	NCS1K4-1.2T-K9	1.0	LC_OPT_MOD_FW	CURRENT	1.38	1.38
0/2	NCS1K4-1.2TL-K9	3.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/2	NCS1K4-1.2TL-K9	1.0	LC_OPT_MOD_FW	CURRENT	1.38	1.38
0/3	NCS1K4-2-QDD-CK9L	1.0	LC_CPU_MOD_FW	CURRENT	243.10	243.10
0/3	NCS1K4-2-QDD-CK9L	1.0	LC_OPT_MOD_FW	CURRENT	1.38	1.38
0/RP0	NCS1K4-CNTLR-K9	8.0	CSB_IMG	S CURRENT	0.200	0.200
0/RP0	NCS1K4-CNTLR-K9	8.0	TAM_FW	CURRENT	36.08	36.08
0/RP0	NCS1K4-CNTLR-K9	1.14	BIOS	S CURRENT	6.40	6.40

## Supported MIBs

0/RP0	NCS1K4-CNTRLR-K9	5.4	BP_SSD	CURRENT	75.00	75.00
0/RP0	NCS1K4-CNTRLR-K9	8.0	CPU_FPGA	CURRENT	1.14	1.14
0/RP0	NCS1K4-CNTRLR-K9	5.4	CPU_SSD	CURRENT	75.00	75.00
0/RP0	NCS1K4-CNTRLR-K9	3.18	POWMAN_CFG	CURRENT	3.40	3.40
0/PM1	NCS1K4-AC-PSU	0.1	PO-PrimCU	CURRENT	2.70	2.70
0/SC0	NCS1004	2.0	BP_FPGA	CURRENT	1.25	1.25
0/SC0	NCS1004	2.0	XGE_FLASH	CURRENT	18.04	18.04

## Supported MIBs

The [MIB Locator](#) tool on Cisco Feature Navigator (CFN) provides access to the supported MIBs.

