

# Cisco NCS 2000 Software Release 11.0

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The Cisco<sup>®</sup> Network Convergence System (NCS) Family of products delivers an Evolved Programmable Network (EPN) that lets you simplify network operations, reduce network costs, and make your network more dynamic and profitable. The Cisco Network Convergence System 2000 Series (NCS 2000 Series) delivers agility, programmability, and massive scale across ultra-long-haul, metro, and enterprise optical networks.

Cisco NCS 2000 Software Release 11.0 introduces new transport node controller modules (SKU numbers NCS2K-TNCS-2-K9= and NCS2K-TNCS-2O-K9=). Release 11.0 includes a list of enhancements on software functionality for the NCS 2000 Platform with the following functions:

- 40 GE, 8/10 GFC client protocol support on the 400G Xponder DWDM module
- LLDP support for 10/40/100GE client protocols on the 400G Xponder module
- Support for Locally Significant Certificates on the 400G Xponder module
- Forced regen inclusion functionality support with the control plane for circuit creation
- Support of 40G Bi-Di pluggable on the NCS2K-400G-XP= module
- Support of 100G Bi-Di pluggable on the NCS2K-400G-XP= and NCS2K-MR-MXP-K9= modules
- Support of TNCS-O and TNCS-2O modules in the NCS 2002 chassis
- Improvements in setting the latitude and longitude positions with respect to accuracy
- Improvements on the automatic node setup functionality for NCS 2000
- NCS 1004 support for provisioning and configuration on the NCS 2000 FLOW control plane
- Improvement in connection verification functions on nodes with NCS2K-SMR-20FS-CV= modules
- Support of ONS-SI-100-LX10= and ONS-SE-100-LX10= for MSM functionality on the NCS 2015

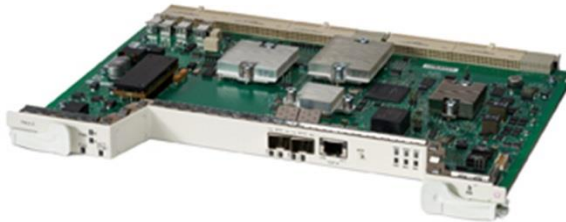
## New features

### New hardware support

The Cisco NCS 2000 transport platform introduces two new controller cards for management of the nodes, with enhanced RAM and Flash, enhancing the node functions in terms of scalability and flexibility.

- **NCS2K-TNCS-2-K9=**

TNCS2 is a new controller card supported in the NCS 2002(M2), NCS 2006(M6), and NCS 2015 Chassis of the NCS 2000 platform. The card supports two SFP ports for OSC operating with Fast Ethernet and Gigabit Ethernet communication between two nodes. The card can be equipped in active/standby mode with TNC, TNC-E, TNCS, and TNCS2 in the NCS 2006(M6) and NCS 2015 Chassis.



- **NCS2K-TNCS-2O-K9=**

TNCS-2O is a new controller card supported in the NCS 2002(M2), NCS 2006(M6), and NCS 2015 chassis of NCS 2000 platform. The card supports two SFP ports and two line ports for OSC operating with Fast Ethernet / Gigabit Ethernet communication between two nodes. The two line ports support OTDR mode of operation in conjunction with OSC. The card can be equipped in active/standby mode with TNC, TNC-E, TNCS, and TNCS2 in the NCS 2006(M6) and NCS 2015 chassis.



Each TNCS-2O line card supports 2x OTDR/OSC embedded ports and 2x OSC ports:

- 1 OTDR per degree, with up to 4 degrees per chassis – dedicated OTDR
- Digital – Bit stream instead of high-power optical pulse
- In-band – Take measurements directly at 1518 nm; no extrapolations
- Bi-directional operation – Tests both fibers and both directions of the fiber with a single device
- 1 x Fast Ethernet 1518 nm OSC per degree, with up to 4 degrees per chassis
- 2x OSC ports for generic OSC mode of operation without OTDR

## New software functions and enhancements on the NCS 2000 Series

The following new software features are available in Release 11.0 on the NCS 2000 Series:

- **40 GE, 8/10G Fibre Channel client protocol support on the 400G DWDM Xponder module**

The Cisco NCS 2000 400G DWDM Xponder line module supports new client payloads of 40 GE with the QSFP-40G-SR4, QSFP-40G-LR4, and QSFP-40-SR-BD pluggables; 8G Fibre Channel payloads with the ONS-QC-16GFC-LW pluggable; and 10G Fibre Channel with the ONS-QSFP-4X10-MLR pluggable. 40 GE is enabled with a new sub opmode, labelled 2x40GE+2x10GE, at slice level for 100G and 200G DWDM transmission. 8G and 10G Fibre Channel are configurable with 10x10G slice opmode.

- **LLDP support on the 400G DWDM Xponder module**

In Release 11.0, Cisco NCS 2000 supports LLDP for 10/40/100GE clients on the 400G DWDM Xponder line module, providing users with the capability to support discovery of endpoints connected to the NCS 2000 400GXP. The information is limited to the MAC address of the endpoints that can be transmitted over the 400GXP.

- **40G and 100G Bi-Di pluggable support on NCS 2000 line modules**

In Release 11.0, Cisco NCS 2000 supports the two Bi-Di pluggables: QSFP-40G-SR-BD and QSFP-40/100-SRBD. The 40G SR-BD pluggable is supported on both the NCS2K-MR-MXP line module and the NCS2K-400G-XP module, while 40/100SR-BD is supported only on the NCS2K-400G-XP= module.

- **ANS-APC enhancements on the NCS 2000 Series**

In Release 11.0, as part of the automatic provisioning of parameters and configurations on the node during upgrades, CTP and CTC enhancements are done in order to enforce changes only for the new additions to the node configuration, without impacting any ANS parameters of existing settings of the node.

- **Regeneration inclusion support with no validation mode for WSON circuit creation**

In Release 11.0, the Cisco NCS 2000 optical-impairment-aware GMPLS WSON control plane is enhanced to support inclusion of a regen node as a constraint for circuit creation, protection, and restoration of service. This enhancement will provide flexibility for customers to choose a node where a regen can be placed for consideration while creating an end-to-end circuit.

- **Locally Significant Certificates support on the 400G DWDM Xponder module for encryption**

In Release 11.0, the NCS 2000 400G Xponder DWDM module supports inclusion of Locally Significant Certificates. This enhances the capabilities of 400G Xponder to support third-party CA-attested certificates to be included in communication for encryption functionality.

Release 11.0 also supports encryption when the 400GXponder is configured in OTN-XC operating mode, which implies a 400G cross-connected ring encrypted with 100/200G trunk interfaces between the nodes.

- **Connection verification improvements on the NCS 2000 node**

In Release 11.0, enhancements are done in order to reduce the connection verification timing for connection-verification-enabled hardware modules in the node. This includes an editable field providing connection-verification timing to be set between 1 and 3600 minutes.

- **Precision setting of latitude and longitude for EPNM**

In Release 11.0, the Cisco NCS 2000 platform enhanced its location tagging integration into the EPNM with the inclusion of seconds for better precision. EPNM users will be able to add seconds into the location and pin the NCS 2000 nodes to a location of interest on the EPNM network map.

- **NCS 1004 support on the NCS 2000 node for provisioning and circuit creation**

The Cisco NCS 2000 supports the introduction of the NCS 1004 platform into the optical network for circuit creation of 200G to 600G wavelengths with an alien mode of operation. The functionality is available with SSON software package that is capable of supporting Media Channel Group with a 200/300/400/500/600G line rate entering from the NCS 1004 into the NCS 2000 Flex spectrum ROADM networks.

- **CTC X-launch from EPNM**

In Release 11.0, EPNM users will be able to X-launch CTC directly from the EPNM network map to perform necessary node-level actions with automatic login based on the login user and the necessary access security credentials.

## Upgrade path

Cisco NCS 2000 Series Software Release 11.0 upgrade paths include:

- Release 9.6.13 -> 11.0 (MSTP -> NCS, MSTP -> MSTP)
- Release 10.6.2 -> 11.0 (MSTP -> NCS, MSTP -> MSTP, NCS -> NCS, NCS Flex -> NCS Flex)
- Release 10.7->11.0 (MSTP -> NCS, MSTP -> MSTP, NCS -> NCS, NCS Flex -> NCS Flex)
- Release 10.8->11.0 (MSTP -> NCS, MSTP -> MSTP, NCS -> NCS, NCS Flex -> NCS Flex)
- Release 10.9->11.0 (MSTP -> NCS, MSTP -> MSTP, NCS -> NCS, NCS Flex -> NCS Flex)

## Ordering information

Table 1 contains the product identifiers and their respective descriptions for the hardware modules introduced in Release 11.0. Table 2 lists the product identifiers and their respective descriptions for the software packages.

**Table 1.** NCS 2000 controller modules IDs and descriptions

Product name	Description
<b>NCS2K-TNCS-2-K9=</b>	NCS 2000 Transport Node Controller, version 2
<b>NCS2K-TNCS-2O-K9=</b>	NCS2000 Transport Node Controller w/2x OTDR/OSC, version 2

**Table 2.** NCS 2000 Software Release 11.0 product IDs and descriptions

Product name	Description
<b>SF15454M-R11.0K9</b>	MSTP R11.0 Preloaded SW, TCC3,TNCE,TSCE,TNCS/O - NO WSON
<b>SF15454MC-R11.0K9</b>	MSTP R11.0 Preloaded SW, TCC3,TNCE,TSCE,TNCS/O - WSON CP
<b>SF-NCS2K-R11.0K9</b>	NCS 2K/MSTP - R11.0 SW, TNCE, TSCE, TNCS/O - WSON CP
<b>SF-NCS2K-R11.0FSK9</b>	NCS 2K/MSTP - R11.0 SW, TNCE, TSCE, TNCS/O - FlexSpectrum
<b>SF-NCS2K-R11.0SSK9</b>	NCS 2K/MSTP - R11.0 SW, TNCE, TSCE, TNCS/O - SSON
<b>Software Right-To-Use (RTU) License</b>	
<b>NCS2K-L-R11.0FSK9</b>	NCS 2K/MSTP - R11.0 SW, Upgrade SW RTU - FlexSpectrum
<b>NCS2K-L-R11.0SSK9</b>	NCS 2K/MSTP - R11.0 SW, Upgrade SW RTU - SSON
<b>NCS2K-L-R11.0K9</b>	NCS 2K/MSTP - R11.0 SW, Upgrade SW RTU - WSON CP
<b>15454M-LIC-11.0K9</b>	MSTP - ANSI & ETSI, R11.0 - Upgrade License RTU - NO WSON
<b>Software DVDs</b>	
<b>NCS2K-M-R11.0FSK9=</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - FlexSpectrum
<b>NCS2K-M-R11.0FSK9</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - FlexSpectrum
<b>NCS2K-M-R11.0SSK9=</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - SSON

Product name	Description
<b>NCS2K-M-R11.0SSK9</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - SSON
<b>NCS2K-M-R11.0K9=</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - WSON CP
<b>NCS2K-M-R11.0K9</b>	NCS 2K/MSTP - R11.0 SW, Media (DVD) SW RTU - WSON CP
<b>15454M-R11.0SWK9=</b>	MSTP - ANSI & ETSI, R11.0 - RTU LIC DVD, NO WSON
<b>15454M-R11.0SWK9</b>	MSTP - ANSI & ETSI, R11.0 - RTU LIC DVD, NO WSON
<b>E-delivery</b>	
<b>E-NCS2K-R11.0FSK9=</b>	NCS 2K/MSTP - R11.0 E-Del-OS SW, SW RTU - FlexSpectrum
<b>E-NCS2K-R11.0SSK9=</b>	NCS 2K/MSTP - R11.0 E-Del-OS SW, SW RTU - SSON
<b>E-NCS2K-M-R11.0K9=</b>	NCS 2K/MSTP - R11.0 E-Del-OS SW RTU - WSON CP
<b>E-15454-R11.0SWK9=</b>	MSTP - ANSI & ETSI, R11.0 - E-Del-OS SW RTU LIC, NO WSON

## Cisco services

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## For more information

For more information about the Cisco NCS 2000 Series, visit: <https://www.cisco.com/c/en/us/products/optical-networking/network-convergence-system-2000-series/index.html>.



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