

Cisco Network Convergence System 1014

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It's a web-scale era, and every second a million minutes of video content crosses the network. The continuous expansion of Internet usage is driven by cloud services, new AI options like ChatGPT and Bard, social networking, video streaming and gaming. To keep up with demand, hyperscalers, communication service providers, and enterprises need to rapidly scale their networks for operational efficiency, security and reliability. The Network Convergence System (NCS) 1014 is a new platform in a compact modular form factor that can be placed in data centers as well as central offices. With complete life-cycle automation and real time visibility, industry leading power efficiency, enhanced resiliency features and state-of-the-art security, the NCS 1014 provides best-in-class performance for metro, long-haul, and submarine applications while being simple to deploy and manage.

Product overview

The Cisco® NCS 1014 (Figure 1) is a compact modular shelf that allows operators to maximize capacity with minimum space and power footprint. At 2RU and 600mm rack support along with four-line card slots, one field replaceable controller card, three redundant fans and two redundant power supplies, the NCS 1014 is mechanically similar to the NCS 1004 shelf. However, a number of new features are introduced with the NCS 1014.

The NCS 1014 has two redundant and field-replaceable AC and DC power supply units that support up to 2.5KW per system and 580W per slot. Three redundant and field-replaceable fans with higher speed and efficiency are introduced for improved front to back air cooling.

The controller card is accessible from the front and field replaceable. The NCS 1014 supports redundancy of IOS-XR software image and system configuration across SSDs on the controller card and the shelf like the NCS 1004. The SSD on the shelf is field replaceable. While NCS 1014 introduces hardware support for precision timing distribution and backplane interconnect for dual-card modes, it remains backward compatible with current shipping NCS 1004 transponder line cards.

The system utilizes Cisco IOS XR7 software that requires less memory and boots faster than prior software. IOS XR carrier-class software delivers several features such as machine-to-machine APIs based on YANG data models, streaming telemetry for real-time, granular device monitoring, and an infrastructure for third-party applications. Security is top concern for operators and hyperscalers, and the NCS 1014 supports comprehensive security features across hardware and software.



Figure 1.
Cisco NCS 1014

Features and benefits

The NCS 1014 offers the following key hardware benefits:

- Supports current and next-gen transponders with 100GE/400GE/800GE clients and high performance or power optimized DCO (Digital Coherent Optics) trunks.
- Supports Open Optical Line System configurations with or without transponders.
- Supports management plane resiliency through redundant SSD disks with disaster recovery support and headless mode of operation that isolates management plane and data-plane.
- Hardware and software security protection and integrity checks are supported to establish trust in hardware, verify trust in OS, maintain trust at run-time and measure trust.
- Precision Timing support for improved accuracy of timestamps associated with critical performance data.
- Dual card modes supported with back-plane interconnects between slots.
- Remote console support, whereby the user can reach the remote node if the console port at the local node is connected.

Management

The Cisco NCS 1014 provides comprehensive management capabilities to support Operations, Administration, Maintenance, and Provisioning (OAM&P) through IOS XR CLI, SNMP, Syslog, and XML. In addition, iPXE for automated software download and Zero-Touch Provisioning (ZTP) for automated configuration download are available for simplified installation. For machine-to-machine configuration and management of the NCS 1014, NETCONF, RESTCONF, and gRPC transport protocols with JSON, XML, and GPB encoding are provided.

OpenConfig protocols for management GNMI and operations GNOI are also supported for efficient manageability and programmability. GNOI based operational commands for system reboot, file transfers, certificate authentication, loopbacks, LLDP and BERT are supported. The NCS 1014 provides a set of native YANG models as well as the ability to map into any industry-standard or customer-defined YANG data models. For monitoring, the NCS 1014 provides a streaming telemetry feature that relies on a push mechanism to disseminate user-selected PM and status information at user-specified frequencies at granular 10-second intervals. This improves monitoring speed and scale compared to traditional pull-based mechanisms such as SNMP. The telemetry infrastructure also allows for events such as alarms, and port-state changes to be notified.

The NCS 1014 can also support third-party application hosting. Such an application can be hosted in a container or docker and can perform provisioning and monitoring on the NCS 1014.

Security

NCS 1014 supports Secure Asset Transfer (SAT) that is an umbrella of many features such as Dual signed secure boot, BIV (Boot Integrity Visibility), Chip guard, IMA (Integrity Measurement Architecture) and RPM Signing. With SUDI (Secure Unique Device Identifier) certificates loaded during manufacturing, the NCS 1014 is protected from tampering in the supply chain and establishes trust in the hardware. All keys and certificates are stored in secure storage referred to as Trust Anchor Module (TAM). Hardware anchored Secure Boot, Unified Extensible Firmware interface (UEFI) Secure Boot and process level signature verification enables verification of trust in the OS software. The NCS 1014 also provides runtime protections that prevent remote exploits and supports trust visualization that enables detection of any compromise.

Headless operation

The headless operation allows for the NCS 1014 data plane to operate error-free during software upgrades and when the controller card is either physically absent or in a failed state. The fault propagation will continue to operate for client and trunk failures without the presence of the controller module. The headless mode is operational in case of SSD absence/failure state too.

Product specifications

Table 1. Product specifications

Feature summary	Description
Software compatibility	IOS XR 7.11.1 or later
Physical dimensions (NCS 1014)	Occupies 2RU and fits into 2- or 4- post 19-inch, 600-mm ETSI, 23-inch racks. Weight: 16.77 kg
Maximum power consumption	600W (empty chassis)
Typical power consumption	250W (empty chassis)
MTBF for chassis and commons	7,25,770 hours
Common units	2+1 FRU FANs 2.5KW Electrical rating 100-240Vac 2.5KW Electrical rating 48 - 60Vdc FRU Controller ports (2x SFP Timing ports, 2x Electrical 1GE MGNT ports, 2x USB ports, 1x RS232 console port and 1 Coax cable for GNSS input)
Dimensions	NCS1014 17.4" wide x 19" deep x 3.5" tall NCS1K4-DC-PSU-2 2.9" wide x 7.4" deep x 3.1" tall NCS1K4-AC-PSU-2 2.9" wide x 7.4" deep x 3.1" tall NCS1K14-FAN 3.3" wide x 6.9" deep x 3.2" tall NCS1K14-CNTRLR-K9 6.4" wide x 11" deep x 1.1" tall NCS1K14-SSD = 0.485 in. wide x 4.0 in. deep x 3.44 in. tall
Weight	NCS 1014 9.73 kg (empty chassis) NCS1K4-DC-PSU 1.45 kg NCS1K4-AC-PSU 1.45 kg NCS1K14-FAN 0.8 kg NCS1K14-CNTRLR-K9 1.08 kg
LED	
Attention LED	Blue
Client and DWDM port LEDs	Green
<ul style="list-style-type: none"> No alarms Minor alarms 	Amber
Critical and major alarms Fan LED	Red
<ul style="list-style-type: none"> All 3 FANs are present and running 	Green
One or more FANs are absent or failed PSU LED	Red
<ul style="list-style-type: none"> 2 PSUs present and operational 2 PSUs are not fully operational 	Green
	Red

Regulatory compliance

Table 2 lists regulatory compliance information for the chassis. Please check with your Cisco sales representative for any countries that are not listed below.

Table 2. Regulatory compliance

ANSI system	ETSI system
Countries and regions supported	
<ul style="list-style-type: none"> • Canada • United States • Korea • Japan • European Union 	<ul style="list-style-type: none"> • European Union • Africa • CSI • Australia • New Zealand • China • Korea • India • Saudi Arabia • South America
Safety	
<ul style="list-style-type: none"> • CSA C22.2 #60950-1 – Edition 7, March 2007 • BS/IEC/EN 62368-1 • CAN 22.2 No. 62368-1 • UL 62368-1 	<ul style="list-style-type: none"> • IEC 60950-1 Information technology equipment Safety Part 1: General requirements - Edition 2, 2005 + Amendment 1 2009 + Amendment 2 2013. • EN 60950-1: Edition 2 (2006) Information technology equipment - Safety - Part 1: General requirements + A11:2009 + A1:2010 + A12:2011 + A2:2013. • CE Low Voltage Directive (LVD): 2014/35/EC. • A/NZS 62368.1.
Laser	
<ul style="list-style-type: none"> • 21CFR1040 (2008/04) (Accession Letter and CDRH Report) Guidance for Industry and FDA Staff (Laser Notice No. 56), May 2019 	<ul style="list-style-type: none"> • IEC 60825-1: 2014-05 Ed. 3.0 Safety of laser products Part 1: Equipment classification, requirements and users guide. • IEC60825-2 Ed.3.2 (2010) Safety of laser products Part 2: Safety of optical fiber communication systems.
Optical	
<ul style="list-style-type: none"> • ITU-T G.691 	<ul style="list-style-type: none"> • ITU-T G.975.
Quality	
<ul style="list-style-type: none"> • TR-NWT-000332, Issue 4, Method 1 calculation for 20-year Mean Time Between Failure (MTBF). 	

Ordering information

Table 3. Ordering Caption

Part number	Description
NCS1K14-SYS	NCS 1014 Assemble to order
NCS1014	Network Convergence System 1014 chassis with timing support
NCS1K14-FAN	Network Convergence System 1014 FAN Module
NCS1K14-CNTRLR-K9	Network Convergence System 1014 Controller
NCS1K14-SSD	Network Convergence System 1014 SSD
NCS1K14-BLANK	Network Convergence System 1014 Blank card
NCS1K4-AC-PSU-2	Network Convergence System 1004 AC Power Supply Unit 2.5KW
NCS1K4-DC-PSU-2	Network Convergence System 1004 DC Power Supply Unit 2.5KW

Warranty

The following is the warranty:

- Hardware warranty duration: 5 years.
- Software warranty duration: 1 year.
- Hardware replacement, repair, or refund procedure: Cisco or our service center will use commercially reasonable efforts to ship a replacement part for delivery within 15 working days after receipt of the defective product at Cisco's site. Actual delivery times of replacement products may vary depending on customer location.

Your formal warranty statement appears in the Cisco Information Packet that accompanies your Cisco product.

Product warranty terms and other information applicable to Cisco products are available at:

www.cisco.com/go/warranty.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environment Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

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Document history

New or revised topic	Described in	Date
Updated Pictures of Chassis	Fig 1	August 4, 2023

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