Cisco Network Convergence System 4200 Series

Contents

Designed for circuit-switched network migration and metro aggregation applications, the Cisco® Network Convergence System (NCS) 4200 Series delivers best-in-class Circuit Emulation (CEM), Optical Transport Network (OTN), and Carrier Ethernet capabilities.

Product overview

Legacy optical metro networks based on SONET and Synchronous Digital Hierarchy (SDH) technologies set the standards for reliability, capacity, and efficiency in transporting Time-Division Multiplexing (TDM) traffic and carrying voice and data services. Service providers and carriers are nonetheless faced with many challenges and limitations imposed by these legacy networks and need alternatives for migrating their circuit-switched transport networks to future-proof packet-based networks.

The Cisco NCS 4200 Series addresses the legacy network inefficiencies by delivering a cost-effective, modular solution based on a protocol-independent fabric architecture. The Cisco NCS 4200 Series, as part of the Cisco Evolved Programmable Network (EPN) architecture, is capable of delivering unbounded scale and unmatched CEM and OTN capabilities over a redundant and protected packet-based network (Multiprotocol Label Switching [MPLS]/FlexLSP and Segment Routing).

Features and benefits

Table 1 shows features and benefits.

Table 1.   Features and Benefits

Feature	Benefit
Support for TDM and SONET/SDH migration to modernized, packet-based optical metro network	Provides cost-effective delivery of CEM and OTN capabilities over a redundant and protected packet-based network (MPLS/FlexLSP/SR).
Metro Carrier Ethernet aggregation	Enables the service flexibility and delivery of Layer 2, Layer 3, IP, and MPLS transport for advanced Layer 2 VPN, Layer 3 VPN, and multicast services.

Feature	Benefit
Industry-leading, carrier-class CEM density	Delivers any-to-any connectivity via a packet-based network (MPLS/FlexLSP) using very high-density TDM, SONET/SDH, OTN, and Carrier Ethernet (FE, GE, 10GE, 40GE, and 100GE) interfaces.
Next-generation metro network with fully distributed and unique packet capabilities	Supports state-of-the-art pseudowire emulation edge-to-edge (PWE3), hierarchical Quality of Service (H-QoS), and next generation IP/MPLS. Cisco MPLS FlexLSP guarantees resiliency (sub-50ms switchover time), fault propagation, connectivity verification, statistical multiplexing, and scalability, with RSVP-TE extensions as the control plane for bidirectional tunnel (LSP) setup and programmability for SDN functionality support.
Operation efficiency with end-to-end network management	Supported by the Evolved Programmable Network Manager (EPN-M), which enables business agility and operational efficiencies through automated device operations, fast provisioning, and proactive assurance.
Flexible and modular platform	Designed with a compact form factor, the NCS 4200 can be deployed in space-constrained locations such as ETSI 300-mm deep cabinets. A side-to-side airflow design enables two Cisco NCS 4200 Series systems to be easily mounted back to back (in a 600-mm cabinet), and the extended temperature range feature supports deployment in locations with minimum environmental control. Universal air deflectors can also be used for front-to-back air flow. As a modular platform, the NCS 4200 supports multiple distinct Route Switch Processors (RSPs), AC and DC power supplies, fan trays, and a wide range of interface modules. Ethernet interfaces are available in copper and fiber, with speeds ranging from 10 Mbps to 100 Gbps. Legacy interfaces are available in speeds ranging from nxDS0 to OC-192/STM-64 for Plesiochronous Digital Hierarchy (PDH), SDH, and SONET. OTN wrapping functionalities are also supported.

Industry-leading, carrier-class CEM density

Although the legacy TDM infrastructure is aging, expensive to operate, and an inefficient platform for data transport, service providers and carriers are still required to maintain their TDM connectivity. End customers are sometimes reluctant to move to native Ethernet/IP/MPLS handoffs and might switch to a different service provider if forced to transition early.

The NCS 4200 Series products provide a purpose-built solution that enables service providers to meet their legacy TDM requirements. With high-density TDM, SONET/SDH, OTN, and Carrier Ethernet (FE, GE, 10GE, 40GE, and 100GE) interfaces, the NCS 4200 Series delivers any-to-any connectivity via a packet-based network (MPLS/FlexLSP) more efficiently than any other packet transport mechanism and is not bounded by TDM transport inefficiencies. The NCS 4200 Series features include:

- Cisco's high-density circuit emulation technology, which provides boundless scale with high-density TDM circuit emulation over a protected FlexLSP core

- A complete central office modernization option for legacy TDM DCS migration and SONET/SDH ADM ring overlay/migration, as well as facilitating the transition to packet-based networks over time

- A carrier-class design that requires a much smaller central office footprint (some configurations provide more than 2 times the capacity of multiple DCS/ADM equipment) with significant power and cooling savings compared to legacy products

Fully distributed and unique packet capabilities

Migrating circuit-switched TDM and SONET/SDH networks to Ethernet/IP/MPLS-capable switches and routers can be challenging, particularly when service providers need to replicate the functionalities and provisioning capabilities of the legacy infrastructure. Solutions such as pure OTN-capable switching products can address the bandwidth constraints of legacy optical transport networks, but they are based solely on Layer 2, VLANs, and G.8031/8032 protocols, which do not scale properly for a modernized packet-based metro network.

The NCS 4200 Series products enable service providers to easily transition to an MPLS next-generation metro network. To support the technological requirements of a next-generation architecture, the NCS 4200 Series products feature:

- Support for state-of-the-art, PWE3, and H-QoS

- IP/MPLS features capable of delivering the required functionalities for a next-generation optical metro network, including MPLS FlexLSP, a predictable, deterministic, transport-centric evolution of MPLS-TP, which guarantees resiliency (sub-50ms switchover time), fault propagation, connectivity verification, statistical multiplexing, and scalability, with RSVP-TE extensions as the control plane for bidirectional tunnel (LSP) setup, and programmability for SDN functionality support

Operational efficiency and flexible deployment options

Service providers and carriers require capabilities that help them simplify and automate the management of their networks, promoting efficiency gains in the deployment and operation of the networks. They also need to be aware of the tremendous costs associated with housing and operating their infrastructure.

The NCS 4200 products enable service providers to operate more efficiently, not only in the services they deliver, but also in the management of their infrastructure.

Designed with a compact form factor to accommodate deployment in small spaces and available with a range of mounting options, the system can be deployed in space-constrained locations such as ETSI 300-mm deep cabinets. The side-to-side airflow design allows two Cisco NCS 4200 Series systems to be mounted back to back in a 600-mm cabinet, while the extended temperature range supported by the device allows it to be deployed in locations with minimum environmental control. Optional airflow deflectors can also be used for customers requiring front-to-back airflow. Small footprint and extended temperature range support allow service providers to extend the reach of their metro networks to more challenging and remote locations.

In addition, the NCS 4200 Series is supported by the EPN-M application, which provides simplified, converged, end-to-end lifecycle management across an optical and Carrier Ethernet infrastructure. EPN Manager is designed with SDN, NFV, and multilayer management in mind. Based on a model-driven extensible architecture, EPN Manager allows service providers to:

- Increase their agility and operational efficiencies through automated device operations, fast provisioning, and proactive assurance

- Quickly respond to major market transitions, including proliferating traffic growth, new business models prompted by Over-The-Top (OTT) entrants, and packet optical network convergence and migration

The NCS 4200 Series also support native YANG (RFC 7950) data modeling language used for model configuration and operational state data manipulated by NETCONF, RESTCONF, and other network configuration protocols. Current native models cover the most frequently used Cisco IOS XE features and additional features can be modeled and updated in future software releases.

Product specifications

Tables 2 through 4 list the product, power, and environmental specifications for the Cisco NCS 4200 Series systems. Tables 5 and 6 provide safety, compliance, and certification information.

Table 2.   Cisco NCS 4200 Series System Specifications

Description	Cisco NCS 4206 System	Cisco NCS 4216 System	Cisco NCS 4216 F2B System
Physical specifications[1]	Height: 5.22 in. (132.6 mm), 3 RU Width: 17.44 in. (443 mm) Depth: 9.22 in. (234.2 mm) Weight: • 34.17 lb. (15.5 kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards • 11.2 lb. (5.1 kg) for an empty chassis • 38 lb. shipment weight	Height: 12.22 in. (310.38 mm), 7 RU Width: 17.44 in. (443 mm) Depth: 9.22 in. (234.2 mm) Weight: • 69.32 lb. (31.4 kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards • 34.9 lb (15.9 kg) for an empty chassis • 58 lb. shipment weight	Height: 24.50 in. (867.30 mm), 14 RU Width: 21.25 in. (752.25mm) Depth: 12.10 in. (428.34 mm) Weight: • 130lb. (58.97kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards • 96.8lb (42.90kg) for an empty chassis • 158.08 lb (70.71 kg) shipment weight
Rack mounts	ETSI rack mount kit 19 in. rack mount kit 23 in. rack mount kit	ETSI rack mount kit 19 in. rack mount kit 23 in. rack mount kit	23 in. rack mount kit
Interface modules	6 interface module slots	16 interface module slots	16 interface module slots
Route switch processors	2 RSP slots	2 RSP slots	2 RSP slots
Power supplies	2 power supply slots	3 power supply slots[2]	3 power supply slots[2]
Fan tray	1 fan tray with fan redundancy 4 dry contact input alarms on the fan tray	1 fan tray with fan redundancy 4 dry contact input alarms on the fan tray	2 high performance fan trays (top/bottom) 1 power supply fan tray 4 dry contact input alarms on the fan tray
Airflow	Side-to-side airflow; inlet on the right side, outlet on the left side when looking from the front Front-to-back airflow (requires optional airflow deflectors installed)	Side-to-side airflow; inlet on the right side, outlet on the left side when looking from the front Front-to-back airflow (requires optional airflow deflectors installed)	Front-to-back airflow

Description	Cisco NCS 4206 System	Cisco NCS 4216 System	Cisco NCS 4216 F2B System
Power supplies	Up to 2 power supplies (AC or DC) Modules operate in load-share mode System can operate on a single power supply and supports mixing of one AC and one DC power supplies in a single chassis	Up to 3 power supplies (AC or DC) Modules operate in load-share mode System can operate on a single power supply and supports mixing of AC and DC power supplies in a single chassis	Up to 3 power supplies (DC only) and 2 additional DC power inputs for fan trays Modules operate in load-share mode System can operate on a single power supply.
Chassis MTBF at 40°C operating temperature	10,769,390hours	6,620,840hours	5,306,940hours
Fan tray MTBF at 40°C operating temperature	358,780hours	284,880hours	Top/Bottom Fan Tray 1,216,910hours Power Fan Tray 377,920hours

[1] Measured from the front of the chassis (excluding handles from the power supply, fan tray, and interface modules installed in the chassis).

[2]More than 2 power supply modules only supported for certain power supplies and software releases. Consult your account team for more details.

Table 3. Power specifications

Description	Cisco NCS 4200 Series System
Power consumption	Maximum input power for NCS4206/NCS4216 is 1350W (including loss). This is equivalent to 4600 BTU per hr. Maximum input power for NCS4216/NCS4216-F2B is 2044W (including loss). NCS4216-F2B chassis also has 750W maximum input power for fan trays Typical input power depends on the actual configuration and can be checked using the Cisco power calculator tool at https://tools.cisco.com/cpc/
AC input voltage and frequency	Voltage range: 85 to 264 VAC, nominal 115 to 230 VAC Frequency range: 47 to 63 Hz, nominal 50 to 60 Hz
AC power supply MTBF at 40°C operating temperature	300,000 hours
DC input voltage	For 900W DC power supply, voltage range: –40V to –72V DC, nominal –48V/–60V DC For 1200W DC power supply, voltage range: –40V to –72V DC, nominal –48V/–60V DC NCS4216-F2B fan tray power supply voltage range: –40V to –72V DC, nominal –48V/–60V DC
DC power supply MTBF at 40°C operating temperature	A900-PWR900-D2: 2,133,420hours A900-PWR1200-D: 1,462,100 hours
Power supply shipment packaging size (LxWxH)	15.44 in. x 9.44 in. x 4.31 in.

Description	Cisco NCS 4200 Series System
Power supply shipment weight	3.6 lb.

Table 4. Environmental specifications

Description	Cisco NCS 4200 Series System
Operating environment and altitude[1]	NCS4206/NCS4216: –40 to 65°C operating temperature (DC operation, with the 900W or 1200W power supplies)
	NCS4206/NCS4216: –40 to 65°C operating temperature (AC operation, with the 900W or 1200W power supplies)
	NCS4216-F2B: –5 to 55°C operating temperature range (DC operation, with the 900W or 1200W power supplies)
	–60 to 1800m operating altitude (for full operating temperature range)
	Up to 4000m operating altitude (at up to 40°C temperature)
Outside plant	For an outside plant installation, it is required that the system be protected against airborne contaminants, dust, moisture, insects, pests, corrosive gases, polluted air, or other reactive elements present in the outside air. To achieve this level of protection, it is recommended that the unit be installed in a fully sealed enclosure. Examples of such cabinets include IP65 cabinets with heat exchanger complying with Telecordia GR487.
Relative humidity	5 to 95%, noncondensing
Acoustic noise[3]	Acoustic noise peak operation complies with Network Equipment Building Standards (NEBS) GR–63-Core Issue 4 sound power level of 78 dB at 27°C operation as measured by the ANSI S12.10/ISO 7779 NAIS noise measurement test standard.
Storage environment	Temperature: –40 to 70°C; altitude: 15,000 ft. (4570m)
Seismic	Zone 4
Hazardous substances	Reduction Of Hazardous Substances (ROHS) 6

[1] Minimum temperature range of chassis, fan tray, RSP engine, power supply, optics, and interface modules will dictate the supported operating temperature range. Maximum cooling fan tray module is assumed.

[2] Not more than the following in a one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences.

[3] The above are for normal (nonfailure) operation. When operating with a fan failure, the above may be exceeded.

Table 5. Safety and compliance

Type	Standards
Safety	• UL 60950-1, 2nd edition • CAN/CSA C22.2 No. 60950-1-07, 2nd edition • IEC 60950-1, 2nd edition • EN 60950-1, 2nd edition • AS/NZS 60950.1:2003
Electromagnetic	• FCC CFR47 Part 15 Class A

Type	Standards
Emissions compliance	• EN55022, class A • CISPR22, class A • ICES-003, class A • EN 300 386, class A • VCCI, class A • KN22, class A • EN61000-3-2 to EN61000-3-3
Immunity compliance	• EN 300 386 • EN 61000-6-1 • EN 50082-1 • CISPR24 • EN 55024 • KN 24 • EN 50121-4 • EN/KN 61000-4-2 to EN/KN 61000-4-6 • EN/KN 61000-4-8 • EN/KN 61000-4-11
NEBS[1]	• GR-63-CORE Issue 4 • GR-1089-CORE Issue 6 • SR-3580 NEBS Level 3
ETSI	• ETS/EN 300 119 Part 4 • ETS/EN 300 019: Storage: Class 1.2, Transportation: Class 2.3, In-Use/Operational: Class 3.2
Network synchronization	• ANSI T1.101 • GR-1244-CORE • GR-253-CORE • ITU-T G.703 clause 5 • ITU-T G.703 clause 9 • ITU-T G.781 • ITU-T G.813 • ITU-T G.823 • ITU-T G.824 • ITU-T G.8261/Y.1361 • ITU-T G.8262 • ITU-T G.8264 • ITU-T G.8265.1 • ITU-T G.8275.1 • ITU-T G.8275.2 • IEEE1588-2008

[1] Notable exception: All cabling is provided through the front panel.

Table 6.   Certifications

Description	Cisco NCS 4200 Series System
Common Criteria	Cisco NCS 4206 System and Cisco NCS 4216 System running Cisco IOS® XE Software 3.18
FIPS	FIPS 140 validated cryptographic module, Cisco NCS 4206 System, and Cisco NCS 4216 System running Cisco IOS XE Software 3.18
IEEE 1588-2008[1]	1588™ SLAVE (IEEE CONFORMITY ASSESSMENT PROGRAM) ● IEEE 1588TM Conformity Test Suite for Frequency Synchronization in Telecommunications Networks-Packet Slave Clock ● IEEE Std 1588TM-2008 and Recommendation ITU-T G.8265.1 (10/2010) with Amendments 1 (04/2011) and 2 (10/2012)
MEF[1]	Carrier Ethernet CE 2.0
TAA	Cisco NCS 4206 System and Cisco NCS 4216 / 4216-F2B Systems running Cisco IOS® XE Software 16.10.1

[1] Applicable to RSP3 configurations.

Ordering information

Table 7.   Ordering information

Part Number	Description
NCS 4206 System Components	
NCS4206-SA	NCS 4206 shelf assembly (6 slots, 3 RU)
NCS4206-SA=	NCS 4206 shelf assembly (6 slots, 3 RU), spare
NCS4206-DOOR	NCS 4206 door and ancillary
A903-FAN-H	High-performance fan tray
A903-F2B-AIR	Front-to-back airflow deflector
NCS 4216 System Components	
NCS4216-SA	NCS 4216 shelf assembly (16 slots, 7 RU)
NCS4216-SA=	NCS 4216 shelf assembly (16 slots, 7 RU), spare
NCS4216-DOOR	NCS 4216 door and ancillary
A907-FAN-E	Fan tray with filter slot
A907-F2B-AIR	Front-to-back airflow deflector

Part Number	Description
NCS 4216 F2B System Components	
NCS4216-F2B-SA	NCS 4216 F2B Shelf Assembly (16 slots-14 RU)
NCS4216-F2B-SA=	NCS 4216 F2B Shelf Assembly (16 slots-14 RU), Spare
NCS4216-F2B-DOOR	NCS 4216 F2B Door and Ancillary
NCS4216-F2B-FAN	NCS 4216 F2B Top/Bottom Fan Tray Kit
NCS4216-PWR-FAN	NCS 4216 F2B Power Supply Fan Tray
NCS 4200 Common Equipment	
A900-PWR1200-A	ASR 900 1200W AC power supply
A900-PWR1200-A=	ASR 900 1200W AC power supply, spare
A900-PWR1200-D	ASR 900 1200W DC power supply
A900-PWR1200-D=	ASR 900 1200W DC power supply, spare
A900-PWR900-D2	ASR 900 900W DC power supply with dual feed
A900-PWR900-D2=	ASR 900 900W DC power supply with dual feed, spare
A900-PWR-BLANK	ASR 900 power supply blank cover
A900-RSPA-BLANK=	ASR 900 route switch processor type A blank cover, spare
A900-IMA-BLANK=	ASR 900 interface module type A blank cover, spare
A900-IMA-FILLER=	ASR 900 Interface Module Filler Cover, Spare
A900-OPT-GUIDE-H=	ASR 900 optical guide for horizontal fiber routing support
A900-ROPT-GUIDE-H=	ASR 900 RSP optical guide for horizontal fiber routing support

Warranty information

Warranty information is available on Cisco.com at the [Product Warranties](#) page.

Service and support

Cisco offers a wide range of services programs to help accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, promoting high levels of customer satisfaction. Cisco Services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services.

Cisco is committed to reducing your total cost of ownership. Cisco offers a portfolio of technical support services to help ensure that Cisco products operate efficiently, remain highly available, and benefit from the most up-to-date system software. The services and support programs described in Table 8 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 8. Service and Support

Advanced Services	Features	Benefits
Cisco Total Implementation Solutions (TIS), available directly from Cisco **Cisco Packaged TIS, available through resellers**	• Project management • Site survey, configuration, and deployment • Installation, text, and cutover • Training • Major moves, adds, and changes • Design review and product staging	• Supplement existing staff • Help ensure functions meet needs • Mitigate risk
Cisco SP Base Support and Service Provider–Based Onsite Support, available directly from Cisco **Cisco Packaged Service Provider–Based Support, available through resellers**	• 24-hour access to software updates • Web access to technical repositories • Telephone support through the Cisco Technical Assistance Center (TAC) • Advance replacement of hardware parts	• Facilitate proactive or expedited problem resolution • Lower total cost of ownership by taking advantage of Cisco expertise and knowledge • Reduce network downtime

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

Reference links to **product-specific environmental sustainability information** that is mentioned in relevant sections of this data sheet are provided in the following table:

Sustainability Topic	Reference
General	
Product Compliance	Table 5 – Safety and Compliance
Power	
Power Supply	Table 3 – Power Specifications
Material	
Unit Weight	Table 2 – Cisco NCS 4200 Series System Specifications
Dimensions and Mean Time between Failures Metrics	Table 2 – Cisco NCS 4200 Series System Specifications

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.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. Learn more.

For more information

For more information about how the NCS 4200 series and Cisco's best-in-class Circuit Emulation (CEM) technology can enable your organization to meet legacy TDM requirements via a packet-based network, contact your local Cisco account representative.