

# Cisco Network Convergence System 4200 Series

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).

## Features and Benefits

Table 1 shows features and benefits.

**Table 1.** Features and Benefits

Feature	Benefit
<b>Support for TDM and SONET/SDH migration to modernized, packet-based optical metro network</b>	Provides cost-effective delivery of CEM and OTN capabilities over a redundant and protected packet-based network (MPLS/FlexLSP).

Feature	Benefit
<b>Metro Carrier Ethernet aggregation</b>	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.
<b>Industry-leading, carrier-class CEM density</b>	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.
<b>Next-generation metro network with fully distributed and unique packet capabilities</b>	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.
<b>Operation efficiency with end-to-end network management</b>	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.
<b>Flexible and modular platform</b>	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 pliesochronous 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.

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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

## 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
<b>Physical specifications<sup>1</sup></b>	Height: 5.22 in. (132.6 mm), 3 RU Width: 17.44 in. (443 mm) Depth: 9.22 in. (234.2 mm) Weight: <ul style="list-style-type: none"> <li>• 34.17 lb. (15.5 kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards</li> <li>• 11.2 lb. (5.1 kg) for an empty chassis</li> <li>• 38 lb. shipment weight</li> </ul>	Height: 12.22 in. (310.38 mm), 7 RU Width: 17.44 in. (443 mm) Depth: 9.22 in. (234.2 mm) Weight: <ul style="list-style-type: none"> <li>• 69.32 lb. (31.4 kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards</li> <li>• 34.9 lb (15.9 kg) for an empty chassis</li> <li>• 58 lb. shipment weight</li> </ul>	Height: 24.50 in. (867.30 mm), 14 RU Width: 21.25 in. (752.25 mm) Depth: 12.10 in. (428.34 mm) Weight: <ul style="list-style-type: none"> <li>• 130 lb. (58.97 kg) with two RSPs, two DC power supplies, and loaded with a typical combination of interface module cards</li> <li>• 96.8 lb (42.90 kg) for an empty chassis</li> <li>• 158.08 lb (70.71 kg) shipment weight</li> </ul>
<b>Rack mounts</b>	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
<b>Interface modules</b>	6 interface module slots	16 interface module slots	16 interface module slots
<b>Route switch processors</b>	2 RSP slots	2 RSP slots	2 RSP slots
<b>Power supplies</b>	2 power supply slots	3 power supply slots <sup>2</sup>	3 power supply slots <sup>2</sup>
<b>Fan tray</b>	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
<b>Airflow</b>	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
<b>Power supplies</b>	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
<b>Chassis MTBF at 40°C operating temperature</b>	900,000 hours	1,585,000 hours	4,894,910 hours
<b>Fan tray MTBF at 40°C operating temperature</b>	600,000 hours	1,329,000 hours	Top/Bottom Fan Tray 1,465,910 hours Power Fan Tray 10,000,000 hours

<sup>1</sup> Measured from the front of the chassis (excluding handles from the power supply, fan tray, and interface modules installed in the chassis).

<sup>2</sup> 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
<b>Power consumption</b>	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 <a href="http://tools.cisco.com/cpc/">http://tools.cisco.com/cpc/</a>
<b>AC input voltage and frequency</b>	Voltage range: 85 to 264 VAC, nominal 115 to 230 VAC Frequency range: 47 to 63 Hz, nominal 50 to 60 Hz
<b>AC power supply MTBF at 40°C operating temperature</b>	300,000 hours
<b>DC input voltage</b>	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
<b>DC power supply MTBF at 40°C operating temperature</b>	300,000 hours
<b>Power supply shipment packaging size (LxWxH)</b>	15.44 in. x 9.44 in. x 4.31 in.
<b>Power supply shipment weight</b>	3.6 lb.

**Table 4.** Environmental Specifications

Description	Cisco NCS 4200 Series System
<b>Operating environment and altitude<sup>1</sup></b>	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)
<b>Outside plant</b>	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.
<b>Relative humidity</b>	5 to 95%, noncondensing
<b>Acoustic noise<sup>3</sup></b>	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.
<b>Storage environment</b>	Temperature: -40 to 70°C; altitude: 15,000 ft. (4570m)
<b>Seismic</b>	Zone 4
<b>Hazardous substances</b>	Reduction of Hazardous Substances (ROHS) 6

<sup>1</sup> 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.

<sup>2</sup> Not more than the following in a one-year period: 96 consecutive hours, or 360 hours total, or 15 occurrences.

<sup>3</sup> 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
<b>Safety</b>	<ul style="list-style-type: none"> <li>• UL 60950-1, 2<sup>nd</sup> edition</li> <li>• CAN/CSA C22.2 No. 60950-1-07, 2<sup>nd</sup> edition</li> <li>• IEC 60950-1, 2<sup>nd</sup> edition</li> <li>• EN 60950-1, 2<sup>nd</sup> edition</li> <li>• AS/NZS 60950.1:2003</li> </ul>
<b>Electromagnetic</b>	<ul style="list-style-type: none"> <li>• FCC CFR47 Part 15 Class A</li> </ul>
<b>Emissions compliance</b>	<ul style="list-style-type: none"> <li>• EN55022, class A</li> <li>• CISPR22, class A</li> <li>• ICES-003, class A</li> <li>• EN 300 386, class A</li> <li>• VCCI, class A</li> <li>• KN22, class A</li> <li>• EN61000-3-2 to EN61000-3-3</li> </ul>
<b>Immunity compliance</b>	<ul style="list-style-type: none"> <li>• EN 300 386</li> <li>• EN 61000-6-1</li> <li>• EN 50082-1</li> <li>• CISPR24</li> <li>• EN 55024</li> <li>• KN 24</li> <li>• EN 50121-4</li> <li>• EN/KN 61000-4-2 to EN/KN 61000-4-6</li> <li>• EN/KN 61000-4-8</li> <li>• EN/KN 61000-4-11</li> </ul>
<b>NEBS<sup>1</sup></b>	<ul style="list-style-type: none"> <li>• GR-63-CORE Issue 4</li> <li>• GR-1089-CORE Issue 6</li> <li>• SR-3580 NEBS Level 3</li> </ul>
<b>ETSI</b>	<ul style="list-style-type: none"> <li>• ETS/EN 300 119 Part 4</li> <li>• ETS/EN 300 019: Storage: Class 1.2, Transportation: Class 2.3, In-Use/Operational: Class 3.2</li> <li>• ETS/EN 300 753</li> </ul>
<b>Network synchronization</b>	<ul style="list-style-type: none"> <li>• ANSI T1.101</li> <li>• GR-1244-CORE</li> <li>• GR-253-CORE</li> <li>• ITU-T G.703 clause 5</li> <li>• ITU-T G.703 clause 9</li> <li>• ITU-T G.781</li> <li>• ITU-T G.813</li> <li>• ITU-T G.823</li> <li>• ITU-T G.824</li> <li>• ITU-T G.8261/Y.1361</li> <li>• ITU-T G.8262</li> <li>• ITU-T G.8264</li> </ul>

<sup>1</sup> Notable exception: All cabling is provided through the front panel.

**Table 6.** Certifications

Description	Cisco NCS 4200 Series System
<b>Common Criteria</b>	Cisco NCS 4206 System and Cisco NCS 4216 System running Cisco IOS® XE Software 3.18
<b>FIPS</b>	FIPS 140 validated cryptographic module, Cisco NCS 4206 System, and Cisco NCS 4216 System running Cisco IOS XE Software 3.18

## Ordering Information

**Table 7.** Ordering Information

Part Number	Description
<b>NCS 4206 System Components</b>	
<b>NCS4206-SA</b>	NCS 4206 shelf assembly (6 slots, 3 RU)
<b>NCS4206-SA=</b>	NCS 4206 shelf assembly (6 slots, 3 RU), spare
<b>NCS4206-DOOR</b>	NCS 4206 door and ancillary
<b>A903-FAN-H</b>	High-performance fan tray
<b>A903-F2B-AIR</b>	Front-to-back airflow deflector
<b>NCS 4216 System Components</b>	
<b>NCS4216-SA</b>	NCS 4216 shelf assembly (16 slots, 7 RU)
<b>NCS4216-SA=</b>	NCS 4216 shelf assembly (16 slots, 7 RU), spare
<b>NCS4216-DOOR</b>	NCS 4216 door and ancillary
<b>A907-FAN-E</b>	Fan tray with filter slot
<b>A907-F2B-AIR</b>	Front-to-back airflow deflector
<b>NCS 4216 F2B System Components</b>	
<b>NCS4216-F2B-SA</b>	NCS 4216 F2B Shelf Assembly (16 slots - 14 RU)
<b>NCS4216-F2B-SA=</b>	NCS 4216 F2B Shelf Assembly (16 slots - 14 RU), Spare
<b>NCS4216-F2B-DOOR</b>	NCS 4216 F2B Door and Ancillary
<b>NCS4216-F2B-FAN</b>	NCS 4216 F2B Top/Bottom Fan Tray Kit
<b>NCS4216-PWR-FAN</b>	NCS 4216 F2B Power Supply Fan Tray
<b>NCS 4200 Common Equipment</b>	
<b>A900-PWR1200-A</b>	ASR 900 1200W AC power supply
<b>A900-PWR1200-A=</b>	ASR 900 1200W AC power supply, spare
<b>A900-PWR1200-D</b>	ASR 900 1200W DC power supply
<b>A900-PWR1200-D=</b>	ASR 900 1200W DC power supply, spare
<b>A900-PWR900-D2</b>	ASR 900 900W DC power supply with dual feed
<b>A900-PWR900-D2=</b>	ASR 900 900W DC power supply with dual feed, spare
<b>A900-PWR-BLANK</b>	ASR 900 power supply blank cover
<b>A900-RSPA-BLANK=</b>	ASR 900 route switch processor type A blank cover, spare
<b>A900-IMA-BLANK=</b>	ASR 900 interface module type A blank cover, spare
<b>A900-IMA-FILLER=</b>	ASR 900 Interface Module Filler Cover, Spare
<b>A900-OPT-GUIDE-H=</b>	ASR 900 optical guide for horizontal fiber routing support
<b>A900-ROPT-GUIDE-H=</b>	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
<b>Cisco Total Implementation Solutions (TIS), available directly from Cisco</b> <b>Cisco Packaged TIS, available through resellers</b>	<ul style="list-style-type: none"><li>• Project management</li><li>• Site survey, configuration, and deployment</li><li>• Installation, test, and cutover</li><li>• Training</li><li>• Major moves, adds, and changes</li><li>• Design review and product staging</li></ul>	<ul style="list-style-type: none"><li>• Supplement existing staff</li><li>• Help ensure functions meet needs</li><li>• Mitigate risk</li></ul>
<b>Cisco SP Base Support and Service Provider–Based Onsite Support, available directly from Cisco</b> <b>Cisco Packaged Service Provider–Based Support, available through resellers</b>	<ul style="list-style-type: none"><li>• 24-hour access to software updates</li><li>• Web access to technical repositories</li><li>• Telephone support through the Cisco Technical Assistance Center (TAC)</li><li>• Advance replacement of hardware parts</li></ul>	<ul style="list-style-type: none"><li>• Facilitate proactive or expedited problem resolution</li><li>• Lower total cost of ownership by taking advantage of Cisco expertise and knowledge</li><li>• Reduce network downtime</li></ul>

## Cisco Capital

### Financing to Help You Achieve Your Objectives

Cisco Capital<sup>®</sup> financing can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx, accelerate your growth, and optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. [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.






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**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

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