

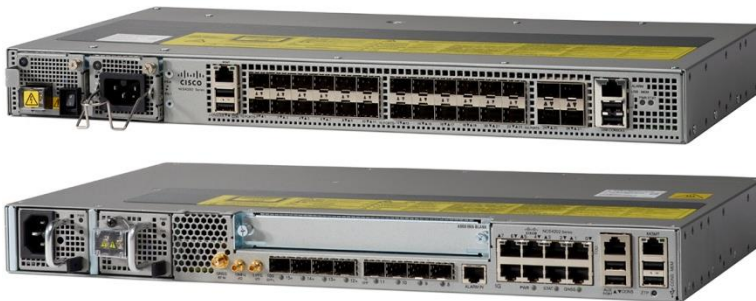
Cisco Network Convergence System 4201/4202 Series

Designed for circuit-switched network migration and business applications, the Cisco® NCS 4201 and NCS4202 Series deliver best-in-class circuit emulation (CEM) and Carrier Ethernet capabilities.

Legacy copper access networks, based on Plesiochronous Digital Hierarchy (PDH), and optical metro networks, based on Synchronous Optical Network (SONET) or Synchronous Digital Hierarchy (SDH) technologies, set the standards for reliability, capacity, and efficiency, 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 4201 and NCS 4202 Series Network Convergence Systems (Figure 1) are full-featured, compact 1RU high converged access platforms designed for the cost-effective delivery of TDM to IP/MPLS migration services. These temperature-hardened, high-throughput, small-form-factor, low-power-consumption systems are optimized for circuit emulation and business applications. NCS 4201 and NCS 4202 systems allow service providers to deliver dense scale in a compact form factor and unmatched CEM and Carrier Ethernet capabilities. They also provide a comprehensive and scalable feature set, supporting both Layer 2 VPN (L2VPN) and Layer 3 VPN (L3VPN) services in a compact package.

Figure 1. NCS 4201 and NCS 4202 Systems



Feature	Benefit
Support for TDM and SONET/SDH migration to modernized packet-based optical metro network	Provides cost-effective delivery of CEM and Carrier Ethernet capabilities over a redundant and protected packet-based network (MPLS/FlexLSP).
Metro Carrier Ethernet aggregation	Enables the service flexibility and delivery of Layer 2, Layer 3, IP, and MPLS transport for advanced L2VPN, L3VPN, and multicast services.
Industry-leading, carrier-class CEM technology	Delivers any-to-any connectivity through a packet-based network (MPLS/Flex LSP) using TDM, PDH, SONET/SDH, and Carrier Ethernet (FE, GE, and 10GE) interfaces.

Feature	Benefit
Next-generation access 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's MPLS FlexLSP guarantees resiliency (sub-50-ms 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 compact platform	Designed with a compact 1RU form factor, the Cisco NCS 4201 and NCS4202 can be deployed in space-constrained locations such as ETSI 300-mm deep cabinets, and the extended temperature range feature supports deployment in locations with minimum environmental control. Ethernet interfaces are available in copper and fiber, with speeds ranging from 10 Mbps to 10 Gbps. Legacy interfaces are available in speeds ranging from nxDS1/E1 and nxDS3/E3, for PDH, to OC-3/STM-1 and OC-12/STM-4 SONET/SDH.

Industry-Leading, Carrier-Class CEM Technology

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 4201 and NCS4202 Series products provide a purpose-built solution that enables service providers to meet their legacy TDM requirements. With a wide variety of TDM, PDH, SONET/SDH, and Carrier Ethernet (FE, GE, and 10GE) interfaces in a very compact 1RU form factor, the NCS 4201 and NCS 4202 Series deliver any-to-any connectivity through a packet-based network (MPLS/Flex LSP), more efficiently than any other packet transport mechanism, and are not bounded by TDM transport inefficiencies. The NCS 4200 Series features include:

- Cisco's industry-leading circuit emulation technology, which provides entry-level dense TDM circuit emulation over a protected Flex LSP core in a compact form factor
- 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 compact design that requires a much smaller central office footprint (some configurations provide more than two times the capacity of multiple DCS/ADM equipment) with significant power and cooling savings compared to legacy products

Fully Distributed and Unique Packet Capabilities for Converged Access Networks

Migrating circuit-switched TDM, PDH, 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 4201 and NCS 4202 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:

- State-of-the-art pseudowire emulation edge-to-edge (PWE3) and hierarchical quality of service (H-QoS). The NCS 4201 and NCS4202 provide advanced per-traffic-class metering and offer bidirectional packet-count and byte-count statistics. The service offering is enhanced with operations, administration, and maintenance (OAM) functions that include Layer 2 connectivity fault management (CFM), IP service-level agreements (SLAs) for Layer 3, and MPLS OAM.
- Synchronous Ethernet (SyncE) and IEEE-1588 timing services required in today's converged access networks. The NCS 4202 model provides a built-in GNSS receiver, which can act as a grandmaster clock for aggregating and backhauling TDM traffic.
- The NCS 4202 model also supports Cisco Universal Power over Ethernet (Cisco UPOE[®]), which can be used to power small equipment. The router can be deployed in small, completely sealed cabinets in outside environments, because of its small form factor and its durability in extended temperature ranges
- The NCS4202 model supports security services such as IP Security (IPSec), Network Address Translation (NAT), and Port Address Translation (PAT) to help protect against vulnerabilities to customer traffic and the network.
- IP/MPLS features capable of delivering the required functionalities for a next-generation copper and optical access network, including MPLS FlexLSP; a predictable, deterministic, transport-centric evolution of MPLS-TP, which guarantees resiliency (sub-50-ms 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 4201 and NCS4202 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 very compact form factor (1RU high) 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, and the extended temperature range supported by the device allow it to be deployed in locations with minimum environmental control. Small footprint and extended temperature range support allow service providers to extend the reach of their access networks to more challenging and remote locations. The interface modules, AC and/or DC redundant power supplies, and fan tray are all field-replaceable, providing high-availability capability to service providers.

In addition, the NCS 4201 and NCS4202 Series are 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 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 traffic proliferation, new business models prompted by over-the-top (OTT) entrants, and packet optical network convergence and migration

Tables 1 through 3 list the product, power, and environmental specifications for the Cisco NCS 4201 and NCS 4202 Series systems. Table 4 provides safety and compliance information.

Table 1. Cisco NCS 4201 and NCS 4202 Series System Specifications

	Cisco NCS4201-SA	Cisco NCS4202-SA
Physical specifications ¹⁾ (H x W x D)	1.72 x 17.5 x 10 in. (43.7 x 444.5 x 255 mm), 1RU	1.73 x 17.5 x 11.28 in. (44 x 444.5 x 286.54 mm), 1RU
Weight	8.5 lb (3.9kg) - empty chassis	9.25 lb (4.2 kg) - empty chassis
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
Air flow	Front-to-back	Front-to-back
Power supplies	2 power supplies (AC or DC)	2 power supplies (AC or DC)
Mean time between failures (MTBF) (hours)	NCS4201-SA: 546,260 ASR-920-FAN-F: 2,581,770 ASR-920-PWR-A: 1,598,000 ASR-920-PWR-D: 1,129,417	NCS4202-SA: 407,230 ASR-920-FAN-TRAY: 2,811,680 A920-PWR400-A: 356,809 A920-PWR400-D: 331,879

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

Table 2. Power Specifications

Description	Cisco NCS4201-SA	Cisco NCS4202-SA
Power consumption	Max 145W, Typical: 110W	Max 150W, Typical: 130W (without PoE)
AC input voltage and frequency	Voltage range: 85V AC to 264V AC, nominal 100V AC to 240V AC Frequency Range: 47 to 63 Hz, nominal 50 to 60 Hz	Voltage range: 85V AC to 264V AC, nominal 100V AC to 240V AC Frequency Range: 47 to 63 Hz, nominal 50 to 60 Hz
DC input voltage	Voltage range: -18 to -32 VDC or -36 to -72 VDC Nominal: -24 VDC/-48 VDC	Voltage range: -18 VDC to -32 VDC or -40 VDC to -72 VDC Nominal -24VDC/-48VDC/-60VDC

Table 3. Environmental Specifications

Description	Cisco NCS 4201 and NCS4202 Series System
Operating environment and altitude ¹⁾	-40 to 70°C, up to 1,000 feet (300m) -40 to 65°C, up to 6,000 feet (1800m) -40 to 55°C, up to 13,000 feet (4000m)
Relative humidity	5 to 95 percent, noncondensing
Acoustic noise ²⁾	Acoustic noise peak operation maximum 55 dBA (59 dBA for NCS4202-SA) sound pressure level, bystander position for rack-mount products at 20°C operation as measured by ISO 7779 NAIS noise measurement test standard. Acoustic noise peak operation compliant to the Network Equipment Building Standards (NEBS) GR-63-Core Issue 3 sound power level of 78 dB at 27°C operation as measured by the ANSI S12.10/ISO 7779 NAIS noise measurement test standard. Actual measurement is less than 63dB.
Storage environment	Temperature: -40 to 70°C altitude: 15,000 feet (4570m)
Seismic	Zone 4

¹⁾ Optics used might limit the temperature range.

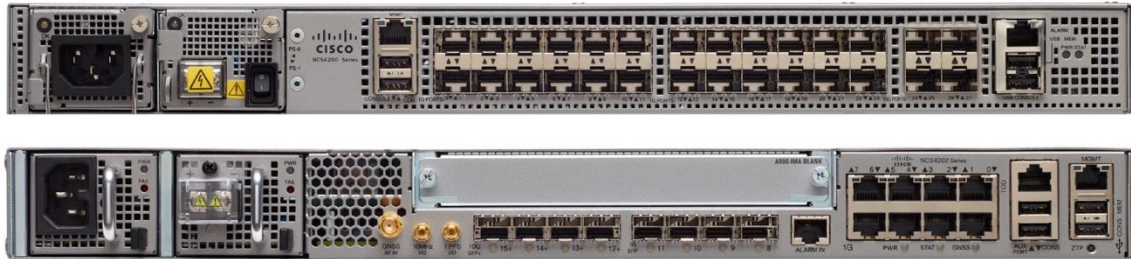
²⁾ The numbers in Table 3 are for normal (nonfailure) operation. When operating with a fan failure, these numbers might be exceeded.

Table 4. Safety and Compliance

Type	Standards
Safety	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • FCC CFR47 Part 15 Class A
Emissions compliance	<ul style="list-style-type: none"> • EN55022, class A • CISPR22, class A • ICES-003, class A • EN 300 386, class A • VCCI, class A • KN32, class A • EN61000-3-2 to EN61000-3-3
Immunity compliance	<ul style="list-style-type: none"> • EN 300 386 • EN 61000-6-1 • EN 50082-1 • CISPR24 • EN 55024 • KN 35 • EN/KN 61000-4-2 to EN/KN 61000-4-6 • EN/KN 61000-4-8 • EN/KN 61000-4-11
NEBS	<ul style="list-style-type: none"> • GR-63-CORE Issue 4 • GR-1089-CORE Issue 6 • SR-3580 NEBS Issue 4
ETSI	<ul style="list-style-type: none"> • ETS/EN 300 119 Part 4 • ETS/EN 300 019 - Storage: Class 1.2, Transportation: Class 2.3, In-Use/Operational: Class 3.2 (NCS4201 only) • ETS/EN 300 753
Network synchronization	<ul style="list-style-type: none"> • 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 • IEEE1588-2008

Table 5 lists the primary system components for the Cisco NCS 4201 and NCS 4202 Series systems.

Figure 2. Ordering Information (NCS 4201 and NCS 4202)



Part Number	Description
NCS 4201 System Components	
NCS4201-SA	NCS 4201 Shelf Assembly - 4x10GE + 24x GE/FE (1 RU)
NCS4200-1RU-DOOR	NCS 4200 1 RU Door and Ancillary
ASR-920-PWR-A	ASR 920 AC Power Supply
ASR-920-PWR-D	ASR 920 DC Power Supply
SNCS4201NK9318SP	Cisco NCS 4201 IOS XE UNIVERSAL
ASR-920-FAN-F	ASR 920 Fan for Fixed Chassis
A920-RCKMT-19	EIA 19in Rack mount Option for the Cisco ASR 920
A920-RCKMT-ETSI	ETSI Rack mount Option for the Cisco ASR 920
A920-RCKMT-23	EIA 23in Rack mount Option for the Cisco ASR 920
NCS 4202 System Components	
NCS4202-SA	NCS 4202 Shelf Assembly - 4x10GE + 12x GE/FE + 1 IM slot (1 RU)
NCS4200-1RU-DOOR	NCS 4200 1 RU Door and Ancillary
A920-PWR400-A	Cisco ASR 920 400W AC PSU
A920-PWR400-D	Cisco ASR 920 400W DC PSU
SNCS4202NK9318SP	Cisco NCS 4202 IOS XE UNIVERSAL
ASR-920-FAN-TRAY	Cisco ASR 920 Fan Tray
A920-RCKMT-19	EIA 19in Rack mount Option for the Cisco ASR 920
A920-RCKMT-ETSI	ETSI Rack mount Option for the Cisco ASR 920
A920-RCKMT-23	EIA 23in Rack mount Option for the Cisco ASR 920

Interface Modules

Interface modules supported on the NCS 4202 systems are listed in Table 6.

Table 5. Interface Modules Supported on Cisco NCS 4202 Systems

Part Number	Description	Supported as of Cisco IOS XE Release
NCS4200-8E1T1-CE	NCS 4200 8x T1/E1 CEM Line Card - RJ48C	3.18.0SP

Cisco NCS 4202 Series 8-Port T1/E1 Module

This interface module delivers 8 ports of T1 or E1 connectivity on NCS 4202 systems. The module can be software-configured as either T1 mode or E1 mode per interface module. This interface module provides physical connectivity using 8 onboard individual physical RJ-48C port connectors. When using this interface module with the NCS 4202 model, ports 20-23 of the chassis are not usable.

The module is software-configurable for 8 T1 or 8 E1 ports with CEM. Mixing T1 and E1 ports on the same interface module is not supported. The module can be clocked from a line or from an internal clock source. The protocols supported on the module are software-configurable per interface, allowing for flexible deployment and efficient use of the hardware.

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 7 are available as part of the Cisco Carrier Ethernet Switching Service and Support solution and are available directly from Cisco and through resellers.

Table 6. Service and Support

Advanced Services	Features	Benefits
Cisco Total Implementation Solutions (TIS), available directly from Cisco Cisco Packaged TIS, available through resellers	<ul style="list-style-type: none">• Project management• Site survey, configuration, and deployment• Installation, test, and cutover• Training• Major moves, adds, and changes• Design review and product staging	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Facilitate proactive or expedited problem resolution• Lower total cost of ownership by taking advantage of Cisco expertise and knowledge• Reduce network downtime

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