

# Cisco NCS 5000 Series

## Cloud Scale for Metro Aggregation Networks

The Cisco® Network Convergence System 5000 Series offers a high-density, small-form-factor MPLS aggregation router for metro aggregation. It is designed to economically scale large enterprise, over-the-top (OTT), and service provider data center networking architectures.

### Product Overview

The Cisco NCS 5000 Series is an extension to Cisco's routing platform portfolio, enabling service providers and MPLS-enabled data center architectures to offer elastic networks with improved business agility and simplified operations to deliver high-bandwidth mobile, video, and cloud services.

It can also operate as an extension shelf of Cisco ASR 9000 Series Aggregation Services Routers using network virtualization (nV) technology, consolidating multiple layers in the network and dramatically reducing operational costs.

The Cisco NCS 5001 and NCS 5002 (Figure 1) are small form-factor dense GE/10GE aggregation systems. Powered by industry leading routing operation system Cisco IOS® XR Software, the system also offers rich functions such as third party application hosting, machine-to-machine interface, telemetry, and flexible package delivery.

**Figure 1.** Cisco NCS 5001 and NCS 5002



## Features and Benefits

Table 1 describes features and benefits.

**Table 1.** Features and Benefits of Cisco NCS 5001 and NCS 5002 (Cisco IOS XR Software 6.0.0 or Beyond)

Feature	Benefit
<b>Integrated interface</b>	40 ports of 1/10 Gigabit Ethernet (GE) and 4 ports of 100 GE (NCS 5001) 80 ports of 1/10 GE and 4 ports of 100 GE (NCS 5002)
<b>Cisco IOS XR Software, a carrier-class operating system</b>	Visibility and telemetry Machine to machine interface Application hosting Flexible platform and packaging Modularity Automation
<b>Performance</b>	Up to 1.2Tbps throughput with 1.4 Bpps

Feature	Benefit
<b>Integrated route processor with 16 GB RAM</b>	Runs Cisco IOS XR Software, a carrier-class operating system with high memory capacity
<b>Network virtualization (nV)</b>	Cisco nV technology dramatically reduces operational costs and simplifies the network through the use of the Cisco ASR 9000 Series distributed control plane
<b>Management ports</b>	Provides easy access to system console
<b>External USB port</b>	Helps simplify image and file management
<b>Embedded USB (eUSB) storage (32GB)</b>	Flash memory devices for software image, configuration, logging, and recovery
<b>Power consumption and form factor</b>	Ultra-low power and footprint
<b>Power supply</b>	Redundant AC or DC power supplies Redundant fan

## Product Specifications

Table 2 gives specifications of Cisco NCS 5001 and NCS 5002, and Table 3 describes software features. Table 4 describes optics support.

**Table 2.** Product Specifications

Category	NCS 5001	NCS 5002
<b>Integrated interfaces</b>	40 ports of GE/10GE and 4 ports of 100 GE	80 ports of GE/10GE and 4 ports of 100 GE
<b>Performance</b>	Up to 800Gbps throughput	Up to 1.2Tbps throughput
<b>Storage</b>	32 GB eUSB	32 GB eUSB
<b>Memory</b>	16 GB DRAM	16 GB DRAM
<b>Buffer</b>	16 MB	16 MB
<b>Physical specifications</b>	Height: 1.72 in (4.3688 cm) Width: 17.44 in (44.2976 cm) Depth: 19.3 in (49.022 cm) Weight of chassis: 20.5 lb (9.29kg)	Height: 3.38 in (8.5852 cm) Width: 17.44 in (44.2976 cm) Depth: 19.3 in (49.022 cm) Weight of chassis: 33lb (14.96kg)
<b>Power inputs</b>	Worldwide ranging AC (90-265V; 50-60 Hz) Worldwide ranging DC (-40V to -72V)	Worldwide ranging AC (90-265V; 50-60 Hz) Worldwide ranging DC (-40V to -72V)
<b>Power consumption</b>	Typical – 200 W Maximum – 275W	Typical – 300W Maximum – 500W
<b>Operating temperature (nominal)</b>	0 – 40C	0 – 40C
<b>Operating temperature (short-term)</b>	0 – 55C	0 – 55C
<b>Operating humidity (nominal) (relative humidity)</b>	5 to 95% noncondensing	5 to 95% noncondensing
<b>Operating humidity (short-term)</b>	5%-93% not to exceed 0.026 kg water/kg of dry air	5%-93% not to exceed 0.026 kg water/kg of dry air
<b>Storage temperature</b>	-40 to 70 degree C	-40 to 70 degree C
<b>Storage (relative humidity)</b>	93% @ 40C Per NEBS GR-63-Core	93% @ 40C Per NEBS GR-63-Core
<b>Operating altitude</b>	0 to 10,000 ft (0 to 3000m)	0 to 10,000 ft (0 to 3000m)
<b>Air flow</b>	Front to Back Back to Front	Front to Back Back to Front
<b>Network Equipment Building Standards (NEBS)</b>	Designed to meet GR-63-CORE and GR-1089-CORE	Designed to meet GR-63-CORE and GR-1089-CORE
<b>ETSI standards</b>	ETS 300 019-2-1, Class 1.2 Storage ETS 300 019-2-2, Class 2.3 Transportation ETS 300 019-2-3, Class 3.2 Stationary Use	ETS 300 019-2-1, Class 1.2 Storage ETS 300 019-2-2, Class 2.3 Transportation ETS 300 019-2-3, Class 3.2 Stationary Use

Category	NCS 5001	NCS 5002
<b>EMC standards</b>	47CFR Part 15 (CFR 47) Class A AS/NZS CISPR22 Class A CISPR22 Class A EN55022 Class A ICES003 Class A VCCI Class A EN61000-3-2 EN61000-3-3 KN22 Class A CNS13438 Class A	47CFR Part 15 (CFR 47) Class A AS/NZS CISPR22 Class A CISPR22 Class A EN55022 Class A ICES003 Class A VCCI Class A EN61000-3-2 EN61000-3-3 KN22 Class A CNS13438 Class A
<b>Immunity</b>	EN55024 CISPR24 EN300386 KN24	EN55024 CISPR24 EN300386 KN24
<b>Safety</b>	UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1 Second Edition EN 60950-1 Second Edition IEC 60950-1 Second Edition AS/NZS 60950-1 GB4943 2001	UL 60950-1 Second Edition CAN/CSA-C22.2 No. 60950-1 Second Edition EN 60950-1 Second Edition IEC 60950-1 Second Edition AS/NZS 60950-1 GB4943 2001

**Table 3.** Software Features Support on NCS 5001 and NCS 5002 in Cisco IOS XR Software 6.0.0 Release or Beyond

Description	Specification
<b>Layer 2</b>	<ul style="list-style-type: none"> <li>• Layer 2 switch ports and VLAN trunks</li> <li>• IEEE 802.1Q VLAN encapsulation/Q-in-Q Encapsulation</li> <li>• IEEE 802.1ad</li> <li>• Cisco Bundle Ethernet technology (up to 32 ports per Ethernet Bundle)</li> <li>• Link Aggregation Control Protocol (LACP): IEEE 802.3ad</li> <li>• Jumbo frames on all ports (up to 9216 bytes)</li> <li>• L2 Ingress access control list (ACL)</li> <li>• L2 AC-AC cross-connect</li> <li>• Integrated Routing and Bridging (IRB)</li> </ul>
<b>Layer 3</b>	<ul style="list-style-type: none"> <li>• Layer 3 interfaces: Physical and Subinterfaces</li> <li>• Routing protocols: Static, Open Shortest Path First (OSPFv2), OSPFv3, Intermediate System to Intermediate System (ISIS), ISISv6 and Border Gateway Protocol (BGP)</li> <li>• 32-way equal-cost multi-path (ECMP)</li> <li>• L3 Ingress IPv4 ACL and IPv6 ACL</li> <li>• Bidirectional Forwarding Detection (BFD)</li> <li>• IPv6 unicast</li> <li>• Cisco Bundle Ethernet technology (up to 32 ports per Ethernet Bundle)</li> <li>• Link Aggregation Control Protocol (LACP): IEEE 802.3ad</li> <li>• Jumbo frame support (up to 9216 bytes)</li> <li>• Hot Standby Router Protocol (HSRP)/Virtual Router Redundancy Protocol (VRRP)</li> <li>• Layer 3 Virtual Private Network</li> </ul>
<b>Multicast</b>	<ul style="list-style-type: none"> <li>• Protocol Independent Multicast Sparse Mode (PIM-SM), PIM Source-Specific Multicast (PIM-SSM)</li> <li>• Internet Group Management Protocol (IGMP) Versions 2 and 3</li> </ul>
<b>MPLS</b>	<ul style="list-style-type: none"> <li>• Label switching</li> <li>• LDP</li> <li>• Ethernet over MPLS (EoMPLS)</li> </ul>

Description	Specification
<b>Segment Routing</b>	<ul style="list-style-type: none"> <li>• Segment routing based transport</li> <li>• ISIS extensions to segment routing</li> <li>• OSPF extensions to segment routing</li> <li>• BGP egress peering engineering</li> <li>• Segment Routing Traffic Engineering (SR-TE)</li> </ul>
<b>Quality of service (QoS)</b>	<ul style="list-style-type: none"> <li>• Classification can be based on: Class of Service (L2), IP Differentiated Service Code Point (L3), IP ACL (L3/L4), IP Precedence (type of service)(L3), IP Real-Time Transport Protocol (L4 User Data Protocol Ports)</li> <li>• DSCP Marking</li> <li>• 8 number of queues for user traffic</li> <li>• Support for priority queuing</li> </ul>
<b>Automation</b>	<ul style="list-style-type: none"> <li>• Zero-touch provisioning (ZTP), iPXE</li> <li>• Configuration Management</li> <li>• Network Configuration Protocol (NETCONG/YANG)</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Provides comprehensive network security features, including ACLs; control-plane protection; management plane protection; routing authentications; authentication, authorization, and accounting (AAA) and Terminal Access Controller Access-Control System Plus (TACACS+); Secure Shell (SSH) Protocol; SNMPv3; and RPL support</li> <li>• Layer 2 Ingress ACLs</li> <li>• Layer 3 Ingress ACLs</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>• MIB, XML, JSON, GPB, and SNMP</li> <li>• MPLS OAM (label switched path [LSP]) ping, LSP traceroute</li> <li>• Ethernet OAM</li> </ul>

**Table 4.** Optics Support (Cisco IOS XR Software 6.0.0 or Beyond)

Part Number	Product Description	Product Datasheet	
<b>QSFP-100G-SR4-S</b>	100GBASE SR4 QSFP Transceiver, MPO, 100m, Enterprise Class	<a href="#">Click here</a>	
<b>QSFP-100G-LR4-S</b>	100GBASE LR4 QSFP Transceiver, LC, 10km, Enterprise Class		
<b>QSFP-100G-CWDM4-S</b>	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF		
<b>QSFP-100G-CUxM</b>	QSFP Passive Copper Cable (Length x - 1M to 5M)		
<b>QSFP-100G-AOCxM</b>	QSFP active optical breakout cables (Length x - 1M to 30M)		
<b>SFP-10G-SR</b>	10GBASE-SR 850 nm MMF		<a href="#">Click here</a>
<b>SFP-10G-LR</b>	10GBASE-LR 1310 nm SMF		
<b>SFP-10G-SR-X</b>	10GBASE-SR 850 nm MMF		
<b>SFP-10G-LR-X</b>	10GBASE-LR 1310 nm SMF		
<b>SFP-10G-ER</b>	10GBASE-ER 1550 nm SMF 40km		
<b>SFP-10G-ZR</b>	10GBASE-ZR SFP+, SMF 80km (On specific ports)		
<b>DWDM-SFP10G-xxxx</b>	10GBASE-DWDM (On specific ports)		
<b>CWDM-SFP10G-xxxx</b>	CWDM SFP+ 10 Gigabit Ethernet Transceiver		
<b>SFP-10G-AOC</b>	SFP active optical breakout cables (Length - 1M to 10M)		
<b>SFP-H10GB-CU</b>	10G SFP+ Twinax cable assembly, passive (Length - 1M to 5M)		
<b>SFP-H10GB-ACU</b>	10G SFP+ Twinax cable assembly, active (Length - 7M, 10M)		

Part Number	Product Description	Product Datasheet
<b>GLC-SX-MMD</b>	1000BASE-SX SFP transceiver module for MMF, 850-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector	<a href="#">Click Here</a>
<b>GLC-LH-SMD</b>	1000BASE-LX/LH SFP transceiver module for MMF and SMF, 1300-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector	
<b>GLC-EX-SMD</b>	1000BASE-EX SFP transceiver module for SMF, 1310-nm wavelength, extended operating temperature range and DOM support, dual LC/PC connector	
<b>GLC-ZX-SMD</b>	1000BASE-ZX SFP transceiver module for SMF, 1550-nm wavelength, dual LC/PC connector	
<b>GLC-T</b>	1000BASE-T SFP transceiver module for Category 5 copper wire, RJ-45 connector	
<b>CWDM-SFP-xxxx</b>	Cisco CWDM SFP	
<b>DWDM-SFP-xxxx</b>	Cisco DWDM SFP	

## Ordering Information

Table 5 provides ordering information.

**Table 5.** Ordering Information

Product Name	Part Number
<b>Chassis</b>	
<b>NCS-5001=</b>	Cisco NCS 5001 Routing System
<b>NCS-5002=</b>	Cisco NCS 5002 Routing System
<b>Software</b>	
<b>XR-NC50-P-06.00</b> <b>XR-NC50-PK9-06.00</b>	Cisco NCS 5001 and 5002 Routing System Cisco IOS XR Software (6.0.0)
<b>Software Licenses</b>	
<b>NC5001-L2VPN-LIC=</b> <b>NC5002-L2VPN-LIC=</b>	NCS 5001 Basic L2VPN System License NCS 5002 Basic L2VPN System License
<b>NC5001-L3VPN-LIC=</b> <b>NC5002-L3VPN-LIC=</b>	NCS 5001 Basic L3VPN System License NCS 5002 Basic L3VPN System License
<b>NC5001-MBL-LIC=</b> <b>NC5002-MBL-LIC=</b>	NCS 5001 Basic Mobile System License NCS 5002 Basic Mobile System License
<b>NC5001-SAT-LIC=</b> <b>NC5002-SAT-LIC=</b>	NCS 5001 Basic Satellite Enablement License NCS 5002 Basic Satellite Enablement License

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in 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 Capital

### Financing to Help You Achieve Your Objectives

Cisco Capital® 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 the Cisco NCS 5000 portfolio, visit <http://www.cisco.com/go/ncs> or contact your local Cisco account representative.



---

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

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)