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
Integrated interface	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)
Cisco IOS XR Software, a carrier-class operating system	Visibility and telemetry Machine to machine interface Application hosting Flexible platform and packaging Modularity Automation
Performance	Up to 1.2Tbps throughput with 1.4 Bpps

Feature	Benefit
Integrated route processor with 16 GB RAM	Runs Cisco IOS XR Software, a carrier-class operating system with high memory capacity
Network virtualization (nV)	Cisco nV technology dramatically reduces operational costs and simplifies the network through the use of the Cisco ASR 9000 Series distributed control plane
Management ports	Provides easy access to system console
External USB port	Helps simplify image and file management
Embedded USB (eUSB) storage (32GB)	Flash memory devices for software image, configuration, logging, and recovery
Power consumption and form factor	Ultra-low power and footprint
Power supply	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
Integrated interfaces	40 ports of GE/10GE and 4 ports of 100 GE	80 ports of GE/10GE and 4 ports of 100 GE
Performance	Up to 800Gbps throughput	Up to 1.2Tbps throughput
Storage	32 GB eUSB	32 GB eUSB
Memory	16 GB DRAM	16 GB DRAM
Buffer	16 MB	16 MB
Physical specifications	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)
Power inputs	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)
Power consumption	Typical – 200 W Maximum – 275W	Typical – 300W Maximum – 500W
Operating temperature (nominal)	0 – 40C	0 – 40C
Operating temperature (short-term)	0 – 55C	0 – 55C
Operating humidity (nominal) (relative humidity)	5 to 95% noncondensing	5 to 95% noncondensing
Operating humidity (short-term)	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
Storage temperature	-40 to 70 degree C	-40 to 70 degree C
Storage (relative humidity)	93% @ 40C Per NEBS GR-63-Core	93% @ 40C Per NEBS GR-63-Core
Operating altitude	0 to 10,000 ft (0 to 3000m)	0 to 10,000 ft (0 to 3000m)
Air flow	Front to Back Back to Front	Front to Back Back to Front
Network Equipment Building Standards (NEBS)	Designed to meet GR-63-CORE and GR-1089-CORE	Designed to meet GR-63-CORE and GR-1089-CORE
ETSI standards	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
EMC standards	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
Immunity	EN55024 CISPR24 EN300386 KN24	EN55024 CISPR24 EN300386 KN24
Safety	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
Layer 2	• Layer 2 switch ports and VLAN trunks • IEEE 802.1Q VLAN encapsulation/Q-in-Q Encapsulation • IEEE 802.1ad • Cisco Bundle Ethernet technology (up to 32 ports per Ethernet Bundle) • Link Aggregation Control Protocol (LACP): IEEE 802.3ad • Jumbo frames on all ports (up to 9216 bytes) • L2 Ingress access control list (ACL) • L2 AC-AC cross-connect • Integrated Routing and Bridging (IRB)
Layer 3	• Layer 3 interfaces: Physical and Subinterfaces • Routing protocols: Static, Open Shortest Path First (OSPFv2), OSPFv3, Intermediate System to Intermediate System (ISIS), ISISv6 and Border Gateway Protocol (BGP) • 32-way equal-cost multi-path (ECMP) • L3 Ingress IPv4 ACL and IPv6 ACL • Bidirectional Forwarding Detection (BFD) • IPv6 unicast • Cisco Bundle Ethernet technology (up to 32 ports per Ethernet Bundle) • Link Aggregation Control Protocol (LACP): IEEE 802.3ad • Jumbo frame support (up to 9216 bytes) • Hot Standby Router Protocol (HSRP)/Virtual Router Redundancy Protocol (VRRP) • Layer 3 Virtual Private Network
Multicast	• Protocol Independent Multicast Sparse Mode (PIM-SM), PIM Source-Specific Multicast (PIM-SSM) • Internet Group Management Protocol (IGMP) Versions 2 and 3
MPLS	• Label switching • LDP • Ethernet over MPLS (EoMPLS)

Description	Specification
Segment Routing	• Segment routing based transport • ISIS extensions to segment routing • OSPF extensions to segment routing • BGP egress peering engineering • Segment Routing Traffic Engineering (SR-TE)
Quality of service (QoS)	• 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) • DSCP Marking • 8 number of queues for user traffic • Support for priority queuing
Automation	• Zero-touch provisioning (ZTP), iPXE • Configuration Management • Network Configuration Protocol (NETCONG/YANG)
Security	• 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 • Layer 2 Ingress ACLs • Layer 3 Ingress ACLs
Management	• MIB, XML, JSON, GPB, and SNMP • MPLS OAM (label switched path [LSP]) ping, LSP traceroute • Ethernet OAM

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

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

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

Ordering Information

Table 5 provides ordering information.

Table 5. Ordering Information

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

Service and Support

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Printed in USA C78-736153-02 01/17