Data sheet
Cisco public

Cisco Network Convergence System 6000 Series 20-Port 100-Gbps Multiservice Line Card with Combo Optics and Cisco AnyPort Technology

The Cisco® Network Convergence System (NCS) 6000 Series Routers offer exceptional network agility and petabit per second system scale. The Cisco NCS 6000 Series also facilitates the build-out of the next-generation core to support elastic capacity at a low TCO and to deliver high-bandwidth mobile, video, and cloud services.

Using the industry-leading Cisco IOS® XR operating system, running in a virtualized environment, the Cisco NCS 6000 Series advances the concept of distributed routing and virtualization. Using virtualized Cisco IOS XR, the Cisco NCS 6000 Series brings new levels of programmability and virtualization to increase application service offerings, accelerate provisioning, and make the network more cost effective.

The Cisco NCS 6000 Series is powered by the Cisco nPower family of Network Processor Units (NPU). Designed to deliver the industry's first Zero-Packet Loss (ZPL) and Zero-Topology Loss (ZTL) software upgrade capability, these state-of-the-art programmable forwarding ASICs are an evolution from the 10-port 100-Gbps Line Cards.

The Cisco NCS 6000 Series is engineered for environmental efficiency by offering an adaptable power-consumption model for its ASICs, and the use of revolutionary CMOS photonics technology. With these technologies together, the Cisco NCS 6000 Series can offer one of the most power-efficient footprints in the service provider routing space.

The Cisco NCS 6000 Series 20-port 100-Gbps Multiservice Line Card is compatible with the existing NCS 6000 chassis and route processors but mandates the use of the Universal Fabric Card (UFC), version 2 Fan Trays & UFC licenses.

Figure 1.   20-port 100-Gbps MS line card with combo optics and Cisco anyport technology

Features and benefits

The Cisco NCS 6000 Series 20-port 100-Gbps Multiservice (MS) line cards are industry-leading solutions that allow service providers to offer two Terabit Per Second (Tbps) of throughput over 20 ports with 100-Gbps interfaces. Optimized for high-speed, high scale IP and Multi-Protocol Label Switching (MPLS) forwarding applications, they provide industry-leading forwarding scale, ultra-fast convergence and Quality of Service (QoS) at wire rate.

Each line card supports a combo of CPAK and QSPF optics:

- 8 CPAK 100-Gbps ports
- 12 QSFP28 100-Gbps ports

Cisco AnyPort technology enables under software control and in conjunction with the CPAK optical modules, various high-speed Ethernet rates. For example, the use of Cisco CPAK-100G-SR10 modular optics enables the following short-reach interface options per CPAK port:

- 1 port of 100 Gigabit Ethernet
- 10 ports of 10 Gigabit Ethernet

Using the Cisco CPAK-100G-SR10 modules and a breakout MMF panel (NCS-PP-100X10-SR; Figure 2), the 20- port 100-Gbps Cisco MS line card with AnyPort technology can support up to 80 x 10 Gigabit Ethernet short- reach MMF interfaces per card, 640 x 10 Gigabit Ethernet Gigabit Ethernet short- reach MMF interfaces per chassis and 10,240 x 10 Gigabit Ethernet short- reach MMF interfaces per system.

Optics on the 20-port 100-Gbps MS line cards with combo optics allow for different optical capabilities at the same rates:

- Short reach using Multimode Fiber (MMF) connectivity with CPAK-100G-SR10 & QSFP-100G-SR4-S modules
- Long reach using Single-Mode Fiber (SMF) connectivity with CPAK-100G-LR4, CPAK-10X10G-LR & QSFP-100G-LR4-S modules
- Extended reach with Single-Mode Fiber (SMF) connectivity using CPAK-10X10G-ERL modules

The Cisco NCS 6000 Series 20-port 100-Gbps Multiservice Line Cards offer significant advantages to service providers:

- 2-Tbps throughput with full IPv4, IPv6, and MPLS forwarding capabilities, optimized for high-throughput, high-scale & ultra-fast convergence Internet peering and core applications
- Industry-leading wire-rate lookup, forwarding, and QoS performance for IP and MPLS flows
- Built-in hardware acceleration for critical network control traffic
- Support across all Cisco NCS 6000 Series single-chassis, back-to-back and multi-chassis configurations for investment protection
- Support for the Cisco AnyPort technology allowing solutions to mix and match different types of interfaces and breakout capabilities
- Efficient environmental design by adapting the power consumption to active Cisco nPower resources only
- In Service Software Upgrade
- Independently programmable and upgradable NPUs with fault protection and isolation
- Enhanced onboard multicore CPU for accelerated and scalable software processing
- Integrated OTU-4 framers for G.709 termination at 100-Gbps speeds
- Up to 2048 licensed enabled queues per 100 Gigabit Ethernet physical interface, with 20,480 licensed enabled queues per card

- Accurate hardware-assisted time-stamping support for OAM and Service-Level Agreement (SLA) monitoring

- Industry-leading environmental efficiency with a low power and weight profile per Gbps

- HW capable of supporting MACSEC on 12 X QSFP28 ports

Figure 2.   Cisco NCS-PP-100X10-SR MMF break-out panel

Product specifications

Table 1 provides a summary of the Cisco 20-port 100-Gbps line card specifications.

Table 1.   Product specifications

Feature	Description
Software compatibility	Virtualized Cisco IOS-XR Software Release 6.2.2 or later
Port density	• 20 ports of 100 Gigabit Ethernet per line card slot • Up to 80 ports of 10 Gigabit Ethernet short-reach optics using Cisco CPAK-100G-SR10 and the break-out panel NCS-PP-100X10-SR • Up to 80 ports of 10 Gigabit Ethernet short-reach optics using Cisco CPAK-100G-LR10 and the break-out panel NCS-PP-100X10-LR
Ethernet	• IEEE 802.3ba compliant • 100 Gigabit Ethernet Physical later (PHY) monitoring • IEEE 802.x flow control
Optical Transport Network (OTN) framing	• Support for OTN framing (OTU-4)
Features and protocols	IP features: • IPv4 unicast services • IPv6 unicast services • IPv4 and IPv6 Equal-Cost Multipath (ECMP) routing • IPv4 and IPv6 load balancing Forwarding features: • Access Control Lists (ACLs and xACLs) • QoS and Class of Service (CoS) using modular QoS Command Line Interface (CLI) • IP packet classification and marking • Queuing (both ingress and egress) • Policing (both ingress and egress) • Diagnostic and network management support IPv4 multicast features: • Protocol-Independent Multicast (PIM) forwarding • IP multicast priority propagation • Multicast Reverse Path Forwarding (RPF) • Multicast Nonstop Forwarding (NSF) • Multicast Forwarding Information Base (MFIB) MPLS features: • MPLS forwarding • MPLS load balancing

Feature	Description
	• Traffic engineering and Point-to-Multipoint (P2MP) traffic engineering
	• Policy-Based Traffic Engineering Selection (PBTS)
	• MPLS OAM
	• User-Network Interface (UNI)
	• MPLS Fast Reroute (FRR)
	• Link Management Protocol (LMP)
	Security features:
	• Access control list
	• Unicast Reverse Path Forwarding (uRPF)
	• Dynamic Control Plane Protection (DCoPP)
	• Management plane protection
	• QoS-based policy propagation through Border Gateway Protocol (BGP)
	Error detection and fast convergence features:
	• Bidirectional Forwarding Detection (BFD)
	• Ethernet OA&M (802.1ag and 802.3ah)
	• IP and MPLS Fast Reroute (FRR)
	• BGP Prefix-Independent Convergence
	Accounting:
	• Cisco NetFlow
	• BGP policy accounting
	• MAC accounting
	Segment Routing
Performance	• Line-rate packet forwarding and service
	• Nonblocking fabric performance for all IPv4, IPv6, and MPLS packet sizes
	• Full bidirectional 2-Tbps throughput
	• Maximum number of line cards per chassis: 8
Reliability and availability	• Line card Online Insertion and Removal (OIR) support without affecting system
	• In-service system upgrade of the switch fabric from single-chassis to multichassis
	• In-Service Software Upgrade
	• Coexistence of Multiservice and Label Switch Router (LSR) cards in the same system
Network management	• Cisco IOS XR Software CLI
	• Netconf & Yang support
	• Simple Network Management Protocol (SNMP)
	• Extensible Markup Language (XML) interface
	• Telemetry
	• Cisco Prime™ Network
	• EPNM
Physical dimensions	• Occupies a full slot in a Cisco NCS 6000 Series chassis
	• Size (H x D x W): 22.5 in. x 15.75 in. x 2.1 in.
	• Weight: 28 lb
Environmental conditions	• Compliant with GR-63-CORE requirements
	• Storage temperature: -40 to 158°F (-40 to 70°C)
	• Operating temperature:
	○ Normal: 41 to 104°F (5 to 40°C)
	○ Short-term: 23 to 122°F (-5 to 50°C)[1]
	• Relative humidity:
	○ Normal: 5 to 85%

---

[1] Short-term refers to a period of not more than 96 consecutive hours and a total of not more than 15 days in 1 year. (This number refers to a total of 360 hours in any given year, but no more than 15 occurrences during that 1-year period.)

The Cisco NCS 6000 Series 20-port 100-Gbps Multiservice Line Cards can be ordered in various optics configurations. All optics are fully compliant with IEEE standards 802.3ba PHY specifications and will interoperate with the far side according to IEEE specifications, regardless of the remote module type. Optics specifications are listed in Table 2.

Table 2.   Additional specifications

100 Gigabit Ethernet CPAK Optics for 20-Port 100-Gbps MS line card with combo optics	Maximum Distance
Support for Cisco CPAK-100G-LR4 (100 Gigabit Ethernet long-reach over 4 Wavelength-Division Multiplexing (WDM) lanes (LR4) using single-mode fiber)	6.2 mi (10 km) over standard SMF fiber
Support for Cisco CPAK-100G-SR10 for short-reach solutions over ribbon-cable Multimode Fiber (MMF)	100m over OM3 ribbon cable or 150m over OM4 ribbon cable
Support for Cisco CPAK-10X10G-LR for connectivity to ten 10GBASE-LR optical interfaces	6.2 mi (10 km) links over 24-fiber ribbon cables terminated with MPO/MTP connectors
Support for Cisco CPAK-10X10G-ERL for connectivity to ten 10GBASE-ER optical interfaces	15.53 mi (25 km) links over 24-fiber ribbon cables terminated with MPO/MTP connectors
100 Gigabit Ethernet QSFP Optics for 20-Port 100-Gbps MS line card with combo optics	Maximum Distance
Support for Cisco QSFP-100G-LR4-S for connectivity over four wavelengths	6.2 mi (10 km) over a standard SMF fiber
Support for Cisco QSFP-100G-SR4-S for connectivity over 12-fiber parallel fiber terminated with MPO multifiber connectors	70m over OM3 & 100m over OM4 MMF fiber
Pluggable optics support for Cisco 100GBASE and 100G-OTU4 framing	
Support for future optics versions	

Ordering information

To place an order, visit the Cisco Ordering homepage. Table 3 provides ordering information for the products listed in this datasheet.

Table 3.   Ordering information

Product Part Number	Product Name
NC6-20X100GE-M-C=	Cisco NCS 6000 20 Port 100 Gigabit Ethernet MS Line Card with combo optics
NCS-PP-100X10-SR=	NCS 100x10GE Break-out Panel Short Reach
NCS-PP-100X10-LR=	NCS 100x10GE Break-out Panel Long Reach
NC6-FC2-U=	NCS 6000 2T (2nd Gen) Universal Fabric
NC6-FANTRAY-2=	NCS 6008 Fan Tray v2 (2nd Gen support)
NC6-2T-UPGR	NCS 6008 to 6208 upgrade kit - 2T upgrade kit. Includes all items needed for upgrade to 2T
NCS-6208-SYS-S	NCS 6208 system (2RPs, 6 UFCs, Fans and Power - for 2T)
NC6-UFC-2T-SC-LIC=	2T UFC S/C License for all 6 UFCs

Cisco services for migrating converged IP plus optical solutions

Services from Cisco and our partners help you get the most value from your investments in Cisco's converged IP plus optical solution, quickly and cost effectively. We can help you design, implement, and validate your solution to speed migration and cutover. We can also help coordinate every step, strengthen your team, and make the most of tomorrow's opportunities. Learn more at https://www.cisco.com/go/spservices.

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. 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 6000 Series Routers, contact your local Cisco representative or visit: https://www.cisco.com/go/ncs6000.

Printed in USAs

C78-739387-01 08/17