CORNELIS® CN5000 OMNI-PATH® SWITCH

The world's highest-performance scale-out network for AI and HPC, the CN5000 Switch is ideally suited to meet the demands of the modern data center.

Network-Led Application Acceleration for AI and HPC

Built for Scale and Efficiency

The CN5000 Switch delivers lossless, congestion-free networking at scale, supporting up to 500,000 endpoints through key architectural features: credit-based flow control, link-level retransmissions, fabric-level congestion management, and multipath routing without in-order delivery constraints. These innovations ensure low tail latency, eliminate packet loss, and drive higher compute utilization and lower TCO.

Optimized for AI and HPC Workloads

The CN5000 Switch delivers 400G of bandwidth per port and is purpose-built for AI training, inference, and large-scale HPC performance demands.

It provides ultra-low latency and congestion-free throughput, accelerating time-to-results for generative and agentic AI workloads. With exceptional efficiency and architectural robustness, CN5000 switches are the ideal fabric for parallelized compute environments and mission-critical HPC applications.

Reliability, Adaptability, and Efficiency

Consistent, reliable network performance is critical for AI and HPC applications. The CN5000 Switch enhances system-wide efficiency with advanced error correction and dynamic workload-aware traffic management, ensuring adaptability to changing communication patterns and sustained performance under load.

Advanced Telemetry for Intelligent Network Management

Equipped with cutting-edge telemetry capabilities, the CN5000 Switch provides real-time network insights and fine-grained visibility to optimize workload performance.

By continuously analyzing traffic patterns, identifying congestion points, and dynamically adjusting network flows, it ensures smooth, high-efficiency operation—even in the most complex compute environments. With industry-leading precision network intelligence, CN5000 Switches enable greater control, efficiency, and performance across any scale.
In contrast to RoCEv2 and legacy InfiniBand implementations, the CN5000 switch delivers lossless, congestion-free networking that scales with the demands of AI and HPC clusters.

Omni-Path Architecture

CN5000 Architecture delivers lossless and congestion-free data transmission with credit-based flow control and dynamic fine-grained adaptive routing. It is designed for maximum performance, reliability, scalability, and data integrity with dynamic lane scaling and optimized link protection.

CN5000 SWITCH HIGHLIGHTS

Benefits

- Performance that scales with your cluster
- Real-time network visibility and control
- Supports >100K node clusters

Performance

- 48 ports of 400G
- 38.4T full duplex bandwidth
- > 800 million packets/s
- < 1 us MPI latency

Key Features

- Optimization for message rate and latency
- Virtual lanes (VLs): Configurable from one to four VLs plus one management VL
- QSFP112 Quad Small Form Factor Pluggable cabling
- Low-Latency bit error recovery and optional correction
- Security (Secure key EEPROM, Secure Boot)
- Air and liquid cooling options
- Hot swap, field replaceable (FRUs): fan & power supply

Advanced Congestion Management

- Fine-Grained Adaptive Routing (FGAR)
- Static Dispersive Routing (SDR)
- Lossless, congestion-free networking through fabric-wide adaptive routing and incast-aware flow control

Management Features

- Integrated OpenBMC-based management
- Redfish protocol and data model/schema support
- In-band and out-of-band management options
  Command line interface through 10/100/1000 BASE-T Ethernet

Specifications

Bandwidth	400G
Fabric Ports	48 x 400G QFSP112 Ports
Chassis	1.7H x 17.2W x 26.1D in.
Dimensions	4.3H x 43.7W x 66.3D cm
Input Range	200-240, 277 VAC, 50/60 Hz
Cooling Options	Air- and Liquid-Cooled (Fluids: DI, PG, & MEG)

Weight

Air-Cooled	AC Power: 30.80 lb. (13.97 kg)
	DC Power: 30.40 lb. (13.79 kg)
Liquid-Cooled	AC Power: 34.80 lb. (15.79 kg)
	DC Power: 34.40 lb. (15.60 kg)

Power Consumption (Typ/Max)*

DAC	Air-Cooled: 710/865 W
	Liquid-Cooled: 440/475 W
AOC	Air-Cooled: 1,115/1,285 W
	Liquid-Cooled: 840/895 W

*All DACs or AOCs

The CN5000 Switch requires the use of CN5000 SuperNICs to fully enable its congestion-free, lossless operation at scale. This solution is supported by Cornelis' open-source host software and integrates with standard HPC and AI environments with minimal modification.

Name	Number	Description
980173	CN5SWE48G2WP	48-Port, 240/277 VAC in, Dual Power Supply, Liquid-Cooled, Port-to-Fan
980172	CN5SWE48G2WF	48-Port, 240/277 VAC in, Dual Power Supply, Liquid-Cooled, Fan-to-Port
980188	CN5SWE48G2AP	48-Port, 240/277 VAC in, Dual Power Supply, Air-Cooled, Port-to-Fan
980076	CN5SWE48G2AF	48-Port, 240/277 VAC in, Dual Power Supply, Air-Cooled, Fan-to-Port
980201	CN5SWE48D2WP	48-Port, 48 VDC in, Dual Power Supply, Liquid-Cooled, Port-to-Fan
980200	CN5SWE48D2AP	48-Port, 48 VDC in, Dual Power Supply, Air-Cooled, Port-to-Fan

Operating Conditions

Temperature

Operating:	10 to 35 °C
	(derated 1 °C/175 m above 900 m)
Storage:	-40 to 70 °C

Humidity

Operating:	5% to 85% non-condensing
Storage:	5% to 95% non-condensing

Altitude

Operating:	0 to 3,000 m
Storage:	0 to 12,000 m

Emissions/Immunity

US	FCC Part 15, Subpart B, Class A,
Canada	CAN ICES-3(A)/NMB-3(A) Issue 7
Europe	EN55032 (CISPR32)
	EN55035 (CISPR35)
	EN61000-3-2
	EN61000-3-3
Japan	VCCI, Class A
AS/NZ	CISPR 32, Class A
Korea	
Emissions	KS C 9832 Class A
Immunity	KS C 9835
Taiwan	BSMI (CNS 15936) Class A

Safety

US/Canada	NRTL 62368-1,
	CSA 22.2.No. 62368-1
Europe	EN62368-1
International	CB Scheme: IEC 62368-1

Environmental

RoHS	RoHS Directive 2011/65/EU2,
	RoHS Directive 2015/863
REACH	REACH Regulation (EC) No 1907/2006

The Cornelis CN5000 Omni-Path product family includes the Switch, Director Class Switch, and SuperNIC; cables; and open-source Host and Management OPX Software all offering flexible, high-performance networking solutions for diverse infrastructure needs.

Learn more about industry leading AI and HPC scale-out network at www.cornelisnetworks.com

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