CORNELIS® CN5000 OMNI-PATH® DIRECTOR CLASS SWITCH

Revolutionizing AI and HPC infrastructure with 400G ultra-dense networking for scalable acceleration.

Network-Led Application Acceleration for AI and HPC

Purpose-Built for Scale and Density

The CN5000 Director Class Switch (DCS) enables exascale compute fabrics by consolidating network connectivity in a single, high-density chassis.

With support for thousands of nodes through fewer switch tiers, this 576-port powerhouse reduces cabling complexity, improves reliability, and drives down latency. This means fewer switches, fewer hops, and fewer points of failure—all while achieving unmatched scale with uncompromised efficiency.

Optimized for AI and HPC at Unprecedented Scale

As AI training sets and HPC simulations continue to scale, network infrastructure must evolve to support exponentially growing data flows without compromise.

The CN5000 DCS delivers consistent ultra-low latency and maximum throughput. Its high port count allows for flatter, more efficient topologies—ideal for GPU-heavy workloads, multi-node AI pipelines, and tightly coupled HPC simulations. This means faster time-to-results and more effective use of compute resources.

Lower TCO Through Intelligent Consolidation

With up to 576-ports per switch, the CN5000 DCS reduces the need for extensive switching infrastructure, lowering capital expenditures, power consumption, and operational complexity. Intelligent traffic flow management and congestion control ensure efficient resource utilization and extend the longevity of your infrastructure investments.

Built-In Reliability, Resilience, and Flexibility

Designed for always-on, mission-critical deployments, the CN5000 DCS offers enterprise-class resilience and operational continuity.
With built-in error correction, redundant hot-swappable power supplies and cooling modules, fault tolerance, and dynamic network function allocation, the CN5000 DCS ensures consistent, high-availability operation. Its adaptability across diverse workloads makes it a strategic backbone for evolving compute demands—whether you are running complex AI models, fluid dynamics simulations, or large-scale genomics pipelines.

Industry-Leading Telemetry for Scalable Intelligence

At massive scale, network visibility is not optional, it is essential. The CN5000 DCS delivers fine-grained telemetry and real-time traffic analytics to detect congestion, rebalance workloads, and optimize performance.

These capabilities scale with infrastructure growth, providing actionable insights and proactive control across thousands of endpoints.

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 DCS HIGHLIGHTS

Benefits

- Performance that scales with your cluster
- Industry-leading price-performance
- Advanced telemetry engines deliver real-time insights for traffic optimization

Performance

- Up to 576 ports of 400G
- Scales up to 230.4T aggregate bandwidth
- Optimization for message rate and latency

Key Features

- Two-tier fat tree internal interconnect topology
- Virtual lanes (VLs): Configurable from one to four VLs plus one management VL
- Innovative traffic categorization to control incast-prone applications
- QSFP112 quad small form factor pluggable cabling
- Low-latency bit error recovery and optional correction
- Backwards compatible with previous generation Omni-Path 100G fabric
- Security (Secure key EEPROM, Secure Boot)
- System design supports full redundancy
- Air-cooled and liquid-cooled options

Advanced Congestion Management

- Fine-Grained Adaptive Routing (FGAR)
- Static Dispersive Routing (SDR)
- Delivers 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
Port Total	576
Cooling Options	Air-cooled & Liquid-Cooled (Fluids: DI, PG, & MEG)
Dimensions (W x H x D)	
Air-Cooled	17.6 x 31.5 x 29 in 44.7 x 80.0 x 73.7 cm
Liquid-Cooled	17.6 x 35.0 x 29 in 44.7 x 88.9 x 73.7 cm
Leaf Modules	12 (max)
Spine Modules	6 (max)
Power Supply Modules	8/9/16
Fan Modules	
Air-Cooled	6
Liquid-Cooled	1
Power Consumption (Typ/Max)	
	Air-Cooled: 21.9/23.6 kW
	Liquid-Cooled : 21.1/22.5 kW
Weight (Fully Configured, N+1 PSUs)	
Air-Cooled	544 lb (247 kg)
Liquid-Cooled	590 lb (268 kg)

Name	Number	Description
CN5000 Air-Cooled Director Class Switches and Components		
980078	CN5SWD12KAB	CN5000 Director Class Switch, 12 Leaf Slots, 240/277 VAC in, Air-Cooled, Base Chassis
980077	CN5SWD12KAC	CN5000 Director Class Switch, 12 Leaf Slots, 240/277 VAC in, Air-Cooled, FRU Chassis
980083	CN5SWDLQ48A	CN5000 Director Class Switch, Leaf QSFP112 Module, 48 Port, Air-Cooled
980085	CN5SWDSP01A	CN5000 Director Class Switch, Spine Module, Air-Cooled
CN5000 Liquid-Cooled Director Class Switches and Components		
980166	CN5SWD12GWB	CN5000 Director Class Switch, 12 Leaf Slots, 240/277 VAC in, Liquid-Cooled, Base Chassis
980165	CN5SWD12KWC	CN5000 Director Class Switch, 12 Leaf Slots, 240/277 VAC in, Liquid-Cooled, FRU Chassis
980179	CN5SWDLQ48W	CN5000 Director Class Switch, Leaf QSFP112 Module, 48 Port, Liquid-Cooled
980180	CN5SWDSP01W	CN5000 Director Class Switch, Spine Module, Liquid-Cooled
CN5000 Director Class Modules and Accessories		
980079	CN5SWDAC01M	CN5000 Director Class Switch, AC Power Cord, SAF-D-GRID 400V Connector
980080	CN5SWDFN01	CN5000 Director Class Switch, Fan Tray Module
980082	CN5SWDKT12	CN5000 Director Class Switch, Installation & Rail Kit, 12 Leaf Slots
980084	CN5SWDLQFP	CN5000 Director Class Switch, Leaf QSFP112 Module, Filler Panel
980087	CN5SWDMM01	CN5000 Director Class Switch, Management Module
980088	CN5SWDPS01	CN5000 Director Class Switch, Power Supply
980089	CN5SWDPSFP	CN5000 Director Class Switch, Power Supply, Filler Panel

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, CB Scheme: IEC 60950

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