



# Dell PowerSwitch SN6000 Ethernet Switch Series

Ethernet purpose-built for AI infrastructure at any scale, across any distance.

## Key Features

### Performance

- 102.4 Tb/s aggregate bandwidth per ASIC
- Built on 200G SerDes
- 800 Gb/s per port
- Optimized for Spectrum-X Ethernet platform
- Adaptive routing
- Congestion control
- Performance isolation
- Fully shared, monolithic packet buffer

### Telemetry and Visibility

- Hardware-accelerated highfrequency telemetry pipeline
- Packet-granular event-level diagnostics for NetQ histogram visibility
- Support for NVUE, switch SDK, SONiC CLI
- Real-time telemetry via open APIs (OTLP, gNMI, gNOI)

The Dell PowerSwitch SN6000 series is the sixth generation of NVIDIA Ethernet switches. Built on the Spectrum-6 ASIC, these systems deliver high throughput, low latency, and advanced data center capabilities for fabrics of any size. Dynamic, flexible shared buffers and wire-speed performance ensure consistent, predictable results for both AI and cloud-native workloads.

SN6000 switches power key NVIDIA platforms—including [Spectrum-X™ Ethernet](#), MGX™, DGX™, HGX™, and RTX PRO™ Server—and integrate seamlessly with software suites such as NVIDIA AI Enterprise and NVIDIA Mission Control.

Together, these innovations define the next generation of the NVIDIA Spectrum-X Ethernet platform, engineered with extreme codesign for Vera Rubin to enable the next wave of massive-scale AI factories and pave the way for future million-GPU environments.

## AI-Optimized Switching Architecture

The Spectrum-6 Ethernet switching ASIC delivers best-in-class performance for AI and cloud-native workloads across core, cloud, and edge environments. Enhanced RoCE features like adaptive routing, performance isolation, and auto-path configuration set a new benchmark for high-bandwidth AI workloads running over Ethernet.

## NVIDIA Spectrum-X Ethernet Photonics

NVIDIA Spectrum-X Ethernet Photonics delivers the latest advances in co-packaged optical (CPO) technology, bringing cutting-edge photonics innovation directly into the Ethernet switching platform. Spectrum-6 CPO-based switches boast 5x higher power efficiency, 10x greater reliability, and 5x longer uptimes for AI applications. Spectrum-X Ethernet Photonics switch systems integrate optical engines directly onto the same package as the switch ASIC, eliminating traditional pluggable transceivers. Internal optical routing brings fiber straight to the package, where silicon-photonics engines convert light to electrical signals adjacent to the ASIC. An external laser source (ELS) delivers continuous light to the integrated optical engines, lowering on-package heat and enhancing reliability at scale.

## Virtualization, Agility, and Security

- Programmable packet processing pipeline
- Deep packet parser/editor supporting up to 512 bytes
- Single-pass VXLAN routing and bridging
- Centralized VXLAN routing
- Hardware acceleration for routing, NAT, and tunnel termination
- Hardware root of trust for secured switching
- Zero-trust security foundation for multi-tenant AI clouds
- Open network operating system (NOS) ecosystem support

## Cloud-Tier Scale

- Programmable Network Control and Policy support for 750,000 entries (shared across routes, media access control (MAC), access control list (ACL))
- Precision Time Protocol (PTP) time synchronization

## Achieving Gigascale AI With NVIDIA Spectrum-XGS Ethernet Technology

As AI workloads grow, data centers face hard limits in power and physical footprint, making it increasingly difficult to scale within a single site. Connecting multiple facilities with off-the-shelf Ethernet networking introduces long-tail latency, jitter, and unstable performance. NVIDIA Spectrum-XGS Ethernet technology solves this by enabling high-performance scale-across networking, allowing multiple geographically separated data centers to operate as one unified AI factory.

Built on the SN6000 series of Ethernet switches and Spectrum-X SuperNIC™s, Spectrum-XGS Ethernet adds a distance-aware congestion control algorithm that efficiently balances traffic across sites. With end-to-end telemetry, precise latency management, and deterministic performance, Spectrum-XGS Ethernet technology enables facilities separated by hundreds of kilometers and more to function as a single, coherent AI environment.

### SN6000 Series Switches

The SN6000 series, based on the 102.4 Tb/s Spectrum-6 ASIC, is available in multiple configurations for high-performance L2/L3 forwarding across leaf, spine, and superspine deployments. The platforms deliver full wire-speed throughput, ultra-low latency, and 160 MB per ASIC of fully shared packet buffer for fair and predictable performance.

### SN6800-LD

SN6800 is the industry's first 4-ASIC co-packaged Ethernet switch for AI scale-out, delivering unmatched radix, optical density, and power efficiency for next-generation AI fabrics. Optimized for Spectrum-X Ethernet, SN6800 is a 5RU switch that features 512 ports of 800 Gb/s connectivity via MMC-12 optical fibers, delivering 409.6 Tb/s of switching capacity, supporting up to 2,048 breakout connections for massive GPU-cluster scale-out.

The SN6800-LD features a 5RU liquid-cooled design with UQD8 v2 connectors and a 48–60 VDC busbar power architecture for efficient rack integration into high-density AI data centers.



SN6600-LD\*



SN6800-LD\*



SN6810-LD\*

\* For illustration only. Actual products may vary.

### SN6810-LD

The SN6810-LD is a Spectrum-6 switch with UQDB v2 connectors, designed to deliver high-performance Ethernet connectivity for AI clusters. Driven by a single Spectrum-6 ASIC, it delivers 102.4 Tb/s of switching capacity leveraging silicon-photonics co-packaged optics (CPO) for efficient, low-latency single-mode fiber connectivity. The SN6810-LD features a 2RU liquid-cooled design with UQD8 v2 connectors and a 48–60 VDC busbar power architecture for efficient rack integration into high density AI data centers.

## SN6600-LD

The SN6600-LD is a fully liquid-cooled switch with UQD8 v2 connectors, featuring 64 OSFP cages supporting 128 ports of up to 800 Gb/s in a compact 2RU form factor. It provides 102.4 Tb/s of total throughput for scalable GPU-cluster connectivity. Leveraging the existing pluggable transceiver ecosystem, it is optimized for NVIDIA Spectrum-X Ethernet and supports AI-optimized leaf/spine architectures in middle-of-row (MoR) and end-of-row (EoR) designs. Its 48–60 VDC busbar power design reduces cabling, improves power efficiency, and simplifies maintenance in high-density data center environments.

## Platform Security

SN6000 series switches offer complete security across all switch layers. Hardware, firmware, and software are authenticated by a built-in root of trust, from the basic input and output system (BIOS) to the network operating system (NOS). Any attempt to run an altered component or image is automatically blocked, ensuring secure operation across data center environments.

## Baseboard Management Controller

The platform uses a Baseboard Management Controller (BMC), an integral part of the security Root-of-Trust, to provide an interface to the Baseboard Management System (BMS). The BMC can be managed via either a serial port or a BMC Ethernet port. It supports remote system power management and reports liquid leak detection events.

## Network Operating Systems

- NVIDIA Cumulus Linux: [NVIDIA Cumulus® Linux](#) is a powerful network operating system (NOS) that enables advanced automation, customization, and scalability using API-first principles hardened in the world's largest data centers. Cumulus Linux is the only NOS that brings operational efficiency to every AI factory.
- Enterprise SONiC Distribution by Dell Technologies: Designed for hyperscalers, service providers, and enterprises, [Dell SONiC](#) delivers a robust, AI-optimized NOS that combines the flexibility of open networking with the performance and reliability of NVIDIA Spectrum-X silicon. Purpose-built for next-generation data centers and AI fabrics, Dell SONiC on Spectrum-X ensures seamless integration, high-performance, and low-latency networking to meet the demands of AI-driven workloads. Its containerized architecture enables unparalleled customization and scalability, empowering customers to optimize their networks for evolving needs. Backed by Dell's enterprise-grade support and NVIDIA's expertise, Dell SONiC provides the confidence and tools needed to accelerate innovation and operational excellence in AI-optimized environments.

## Platform Software Options

- NVIDIA Air: [NVIDIA Air](#) simplifies deployments by enabling digital twins of the entire network to design, test, and validate network provisioning, automation, and security policies. NVIDIA Air allows day-zero operations before hardware is deployed by simulating and automating changes ahead of production, and accelerates deployment of networking infrastructure, reducing time to first token while ensuring cloud-scale efficiency and reliability.
- NVIDIA NetQ: With end-to-end network visibility powered by [NVIDIA NetQ™](#), operators gain flow-level insight across switches, GPUs, SuperNICs, and switch ports, including detailed per-hop behavior on RoCE queues. This integrated telemetry enables precise performance monitoring, rapid troubleshooting, and deterministic optimization of multi-tenant AI workloads running across the fabric.

Technical Specifications			
Switch Model	SN6800-LD	SN6810-LD	SN6600-LD
Optical form factor	512 MMC-12 800 Gb/s co-packaged optics	512 MMC-12 800 Gb/s co-packaged optics	64 OSFP 800GbE
800 Gb/s ports	-	128	128
400 Gb/s ports	-	256	256
200 Gb/s ports	2,048	512	512
100 Gb/s ports	2,048+8	512+2	512+2
External laser source (ELS)	64	16	-
Switching capacity (Tb/s)	409.6 Tb/s [4x 102.4 Tb/s]	102.4 Tb/s	102.4 Tb/s
Lanes per port x max. speed per lane	8x 200G PAM4	8x 200G PAM4	8x 200G PAM4
CPU	16-core x86, AMD	8-core x86, AMD	8-core x86, AMD
System memory	64GB DDR5	64GB DDR5	64GB DDR5
SSD memory	160 GB NVMe	160 GB NVMe	160 GB NVMe
Packet buffer	4x 160 MB	160 MB	160 MB
100/1000 Mb/s management ports	2	2	1
Serial ports	1 RJ45	1 RJ45	1 RJ45
USB ports	USB-A v2	USB-A v2	USB-A v2
BMC ports	1 RJ45	1 RJ45	1 RJ45
Cooling specifications	Liquid connector: 10x UQD8 v2 LFR: 12.27 LPM Coolant temp: 17–45°C	Liquid connector: 4x UQD8 v2 LFR: 3.27 LPM Coolant temp: 17–45°C	Liquid connector: 2x UQD8 v2 LFR: 5.7 LPM Coolant temp: 17–45°C
System power	48 VDC/54 VDC [Busbar] Permissible range: 40–60 VDC	48 VDC/54 VDC [Busbar] Permissible range: 40–60 VDC	48 VDC/54 VDC [Busbar] Permissible range: 40–60 VDC
Size (H x W x D)	H: 8.75" (220 mm), 5RU W: 17.24" (438 mm) D: 30.55" (780 mm)	H: 3.43" (87 mm), 2RU W: 17.24" (438 mm) D: 30.55" (776 mm)	H: 3.43" (88 mm), 2RU W: 17.2" (438 mm) D: 30.7 (780 mm)

\*This document describes hardware features and capabilities. For information on feature availability, refer to the switch software release notes.

Compliance	
Standards Compliance	
Safety	CB, CE, cTUVus, CU
EMC	CE, ICES, FCC, RCM, VCCI
Non-operating conditions	-40–70°C
Relative humidity	5%–85%
Operating altitude	0–3,050 m
RoHS	RoHS compliant

# IT Lifecycle Services for Networking

## Experts, insights and ease

Our highly trained experts, with innovative tools and proven processes, help you transform your IT investments into strategic advantages.



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