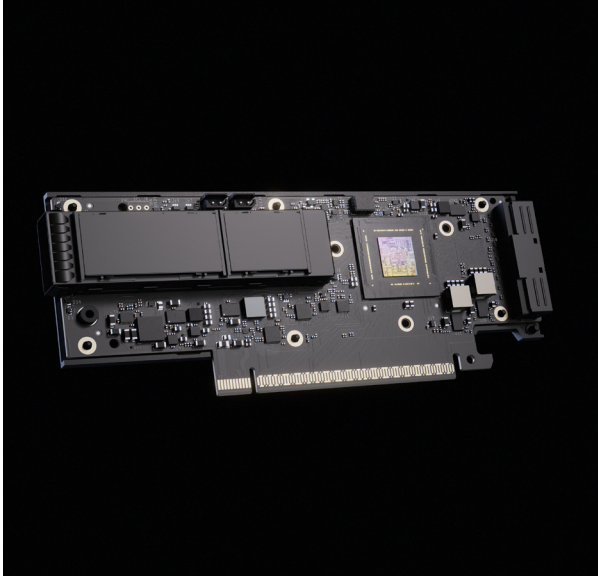
Datasheet

ConnectX-9 SuperNIC

Highest-performance networking designed for gigascale AI factories.



The NVIDIA® ConnectX®-9 SuperNIC™ supercharges gigascale AI computing workloads with support for per-port speeds of 800 gigabits per second (Gb/s) over InfiniBand and Ethernet. It delivers extremely fast, efficient network connectivity that significantly enhances system performance for AI factories and cloud platforms.

Powerful Networking for AI

ConnectX-9 SuperNICs fuel the next wave of innovation in accelerated, gigascale AI compute fabrics. Seamlessly integrated with next-generation NVIDIA Spectrum-X™ Ethernet and NVIDIA Quantum-X800 networking platforms, ConnectX-9 SuperNICs deliver up to 1.6 terabits per second (Tb/s) of throughput to NVIDIA Rubin GPUs. These platforms offer the robustness, feature sets, and scalability required for trillion-parameter GPU computing, disaggregated serving architectures, and agentic AI applications. With enhanced power efficiency, ConnectX-9 SuperNICs support the creation of sustainable AI data centers operating hundreds of thousands of GPUs, ensuring a future-ready infrastructure for AI advancements.

ConnectX-9 SuperNICs provide enhanced programmable input/output (IO) and telemetry-based congestion control, achieving industry-leading network performance and peak AI workload efficiency. Additionally, ConnectX-9 InfiniBand SuperNICs extend the capabilities of NVIDIA Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)™ to boost NVIDIA In-Network Computing in high-performance computing environments—further enhancing overall efficiency and performance for scientific computing workloads, large-scale training, and inference.

Product Specifications

Supported Network Protocols

- Ethernet
- InfiniBand

Total Bandwidth

- 800 Gb/s

Ethernet Port Speeds

- 800/400/200/100/50/25 Gb/s

InfiniBand Port Speeds

- 800/400/200/100 Gb/s

Host Interface

- PCIe Gen6: up to 48 lanes

Portfolio

- PCIe HHHL form factor, 1P x OSFP224 and 2P x QSFP112
- OCP3 TSFF 1P x OSFP224 and 2P x QSFP112
- Quad ConnectX-9 IO card for NVIDIA Vera Rubin NVL144 systems

Key Features	
Network Interface	> Max. bandwidth: 800 Gb/s > 200/100/50 Gb/s of PAM4 and 25/10 Gb/s NRZ > Port configuration: • One port supporting up to 800 Gb/s • Two ports supporting up to 400 Gb/s each • Supports up to eight split ports
Host Interface	> PCIe Gen6 (up to 48 lanes) > NVIDIA Multi-Host™ (up to 4 hosts) > PCIe switch downstream port containment (DPC) > Message-signaled interrupts (MSI) and MSI-X
AI Networking	> Remote direct-memory access (RDMA) and RDMA over Converged Ethernet v2 (RoCEv2) accelerations > NVIDIA Spectrum-X Ethernet: • Spectrum-X multi-plane • Spectrum-X net plug-in > Programmable RDMA transport > Advanced, programmable congestion control > NVIDIA Collective Communications Library (NCCL) > NVIDIA Inference Transfer Library (NIXL) > NVIDIA GPUDirect® RDMA > GPUDirect Storage > In-Network Computing > Advanced timing and synchronization > Message Passing Interface (MPI) accelerations
Cloud Networking	> Stateless Transmission Control Protocol (TCP) offloads > Single-root IO virtualization (SR-IOV) > NVIDIA Accelerated Switching and Packet Processing™ (ASAP2) Ethernet for software-defined networking (SDN) and virtual network functions (VNF): • Open vSwitch (OVS) acceleration • Overlay network accelerations • Connection tracking (L4 firewall) and network address translation (NAT)
Security	> AES-GCM 128/256-bit key data-in-motion accelerations: Internet Protocol Security (IPsec), Transport Layer Security (TLS), Protocol for Secure Packet (PSP) > AES-XTS 256/512-bit key data-at-rest acceleration > Platform security: • Secure boot with hardware root of trust • Secure firmware update • Flash encryption • Device attestation (SPDM 1.1 and SPDM 1.2) • Commercial National Security Algorithm Suite (CNSA) 2.0 post-quantum cryptography (PQC) Secure Boot and Update support

Key Features	
Management and Control	> Network Control Sideband Interface (NC-SI) > Management Component Transport Protocol (MCTP) over System Management Bus (SMBus) and PCIe Platform Level Data Model (PLDM) for: • Monitor and Control DSP0248 • Firmware Update DSP0267 • Redfish Device Enablement DSP0218 • Field-Replaceable Unit (FRU) DSP0257 > Security Protocols and Data Models (SPDM) DSP0274 > Serial Peripheral Interface (SPI) to flash
Network Boot	> InfiniBand or Ethernet > Preboot eXecution Environment (PXE) boot > Unified Extensible Firmware Interface (UEFI)

*This document describes hardware features and capabilities. For feature availability, refer to the firmware release notes and NVIDIA DOCA™ release notes.

Ready to Get Started?

To learn more, contact an NVIDIA sales representative:
nvidia.com/networking-contact-sales