ThinkSystem NVIDIA ConnectX-8 8240 400Gbs QSFP112 2-Port PCIe Gen6 x16 Adapter

Product Guide

The ThinkSystem NVIDIA ConnectX-8 8240 400Gbs QSFP112 2-Port PCIe Gen6 x16 Adapter is a high-performance two-port SuperNIC network adapter with two QSFP112 interfaces. It supports either 400Gb NDR InfiniBand or 400 Gb Ethernet, providing high-speed connectivity for AI computing.

The following figure shows the ThinkSystem NVIDIA ConnectX-8 8240 400Gbs QSFP112 2-Port PCIe Gen6 x16 Adapter (shown with the full-adapter gold case and internal heatsink removed)

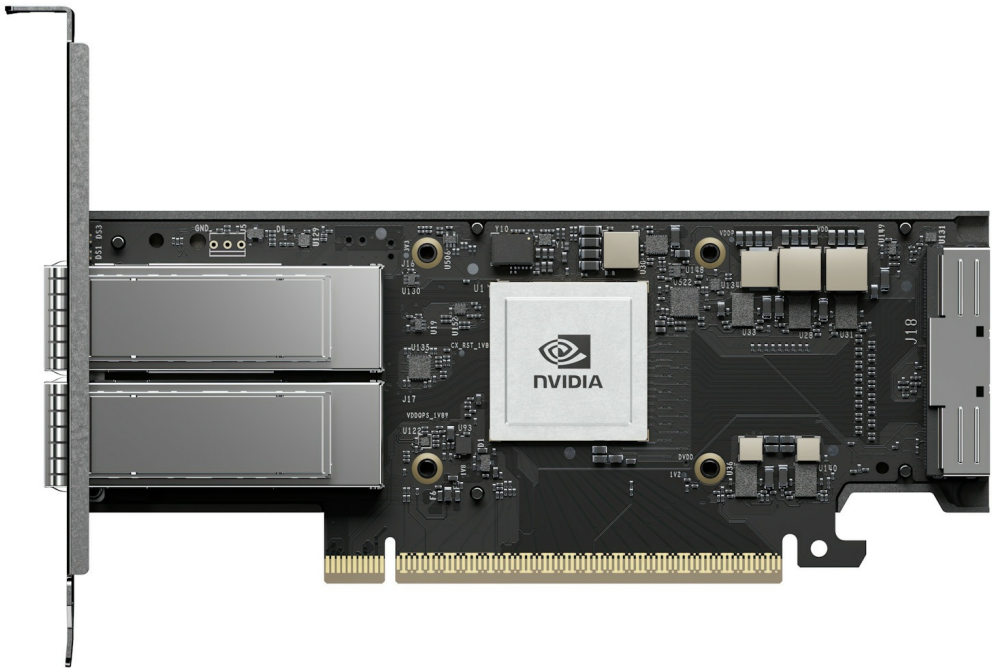

Figure 1. ThinkSystem NVIDIA ConnectX-8 8240 400Gbs QSFP112 2-Port PCIe Gen6 x16 Adapter (full-adapter gold case and heatsink removed)

Did you know?

The ConnectX-8 8240 adapter includes support for NVIDIA In-Network Computing acceleration engines to deliver the performance and robust feature set needed to power trillion-parameter-scale AI factories and scientific computing workloads.

Part number information

The following table shows the ordering information.

Table 1. Ordering information

Part number	Feature code	Description	NVIDIA equivalent
4XC7B03668	C9AQ	ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW), 4XC7B03668	900-9X81Q-00CN-ST0

The option part number includes the following:

- One NVIDIA adapter with full-height (3U) adapter bracket attached
- Low-profile (2U) adapter bracket
- Documentation

In PCIe Gen5 systems, the ConnectX-8 8240 adapter requires the use of an Auxiliary cable which plugs into a second PCIe x16 connection. The combination of the x16 host interface of the adapter plus the x16 connection of the Auxiliary cable results in a PCIe 5.0 x32 connection, needed for 800 Gb networking connectivity. Ordering information for the Auxiliary cable is listed in the following table.

Table 2. Auxiliary cable for ConnectX-8 adapters

Part number	Feature code	Description
4X97B05994	C8WC	ThinkSystem 1U/2U V4 NVIDIA ConnectX-8 Aux Cable Kit

Supported transceivers and cables

The ConnectX-8 8240 adapter has two empty QSFP112 cages for connectivity.

The following table lists the supported transceivers.

Table 3. Transceivers

Part number	Feature code	Description
200/400Gb Transceivers		
4TC7A81831	BQJZ	ThinkSystem NDR/NDR200 QSFP112 IB Multi Mode Solo-Transceiver

The following table lists the supported optical cables.

Table 4. Optical cables

Part number	Feature code	Description
NVIDIA NDR Multi Mode Fibre Optical Cables		
4X97A81748	BQJN	Lenovo 3m NVIDIA NDR Multi Mode Optical Cable
4X97A81749	BQJP	Lenovo 5m NVIDIA NDR Multi Mode Optical Cable
4X97A81750	BQJQ	Lenovo 7m NVIDIA NDR Multi Mode MPO12 APC Optical Cable
4X97A81751	BQJR	Lenovo 10m NVIDIA NDR Multi Mode Optical Cable
4X97A81752	BQJS	Lenovo 20m NVIDIA NDR Multi Mode Optical Cable
4X97A85349	BSN6	Lenovo 30m NVIDIA NDR Multi Mode MPO12 APC Optical Cable

Technical specifications

The adapter has the following technical specifications:

Implementation tip: By default, the ConnectX-8 C8240 adapter will attempt to establish a link using Ethernet. If an InfiniBand connection is required, the protocol must be changed on the adapter.

- Two QSFP112 cages
- InfiniBand Network Interface
  - Supports 200/100/50G PAM4
  - Speeds: 2 ports each of 400Gb, 200Gb, 100Gb
  - Supports InfiniBand NDR/HDR/HDR100/EDR
  - IBTA v1.7-compliant
  - 16 million I/O channels
  - 256 to 4,000 byte MTU, 2GB messages
- Ethernet Network Interface
  - Supports 100/50G PAM4 and 25/10G NRZ
  - Speeds: 2 ports each of 400Gb, 200Gb, 100Gb, 50Gb, 25Gb
  - Supports up to 8 split ports
  - Max bandwidth: 800Gb/s
- Protocol support
  - InfiniBand: IBTA v1.7; Auto-Negotiation: XDR (4 lanes x 200Gb/s per) port, NDR (4 lanes x 100Gb/s per lane) port, NDR200 (2 lanes x 100Gb/s per lane) port, HDR (50Gb/s per lane) port, HDR100 (2 lane x 50Gb/s per lane) port, EDR (25Gb/s per lane) port, FDR (14.0625Gb/s per lane), 1X/2X/4X SDR (2.5Gb/s per lane).
  - Ethernet: 400GAUI-4 C2M, 400GBASE-CR4, 200GAUI-2 C2M, 200GAUI-4 C2M, 200GBASE-CR4, 100GAUI-2 C2M, 100GAUI-1 C2M, 100GBASE-CR4, 100GBASE-CR2, 100GBASE-CR1, 50GAUI-2 C2M, 50GAUI-1 C2M, 50GBASE-CR, 50GBASE-R2 , 40GBASE-CR4, 40GBASE-R2, 25GBASE-R, 10GBASE-R, 10GBASE-CX4, 1000BASE-CX, CAUI-4 C2M, 25GAUI C2M, XLAUI C2M , XLPPI, SFI
- Host Interface
  - PCIe Gen6 x16 host interface via edge connector
  - Additional x16 interface via an MCIO connector on the adapter (requires Auxiliary cable)
  - NVIDIA Multi-Host (up to 4 hosts)
  - MSI/MSI-X
- Optimized Cloud Networking
  - Stateless TCP offloads: IP / TCP / UDP checksum, LSO, LRO, GRO, TSS, RSS
  - SR-IOV
  - Ethernet Accelerated Switching & Packet Processing (ASAP2) for SDN and VNF
  - OVS acceleration
  - Overlay network accelerations: VXLAN, GENEVE, NVGRE
  - Connection tracking (L4 firewall) and NAT
  - Hierarchical QoS, Header rewrite, Flow mirroring, Flow-based statistics, Flow aging
- Advanced AI / HPC Networking
  - RDMA and RoCEv2 accelerations
  - Advanced, programmable congestion control
  - NVIDIA GPUDirect RDMA
  - GPUDirect Storage
  - In-network computing
  - High-speed packet reordering
- MPI Accelerations
  - Burst-buffer offloads
  - Collective operations offloads

    - Rendezvous protocol offloads
    - Enhanced atomic operations
- AI / HPC Software
    - NCCL HPC-X
    - DOCA UCC / UCX
    - OpenMPI
    - MVAPICH-2
- Platform security
    - Secure boot with hardware root of trust (RoT)
    - Secure firmware update
    - Flash encryption
    - Device attestation (SPDM 1.2)
- Cryptography
    - Inline crypto accelerations: IPsec, TLS, MACsec, PSP
- Management and Control
    - Network Control Sideband Interface (NC-SI)
    - MCTP over SMBus and PCIe 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
    - Joint Test Action Group (JTAG) IEEE 1149.1 and IEEE 1149.6
- Network Boot
    - InfiniBand or Ethernet
    - PXE boot
    - iSCSI boot
    - UEFI

NVIDIA Unified Fabric Manager

NVIDIA Unified Fabric Manager (UFM) is InfiniBand networking management software that combines enhanced, real-time network telemetry with fabric visibility and control to support scale-out InfiniBand data centers.

The two offerings available from Lenovo are as follows:

- **UFM Telemetry** for Real-Time Monitoring
  The UFM Telemetry platform provides network validation tools to monitor network performance and conditions, capturing and streaming rich real-time network telemetry information, application workload usage, and system configuration to an on-premises or cloud-based database for further analysis.
- **UFM Enterprise** for Fabric Visibility and Control
  The UFM Enterprise platform combines the benefits of UFM Telemetry with enhanced network monitoring and management. It performs automated network discovery and provisioning, traffic monitoring, and congestion discovery. It also enables job schedule provisioning and integrates with industry-leading job schedulers and cloud and cluster managers, including Slurm and Platform Load Sharing Facility (LSF).

The following table lists the subscription licenses available from Lenovo.

Table 5. NVIDIA Unified Fabric Manager subscriptions

Part number	Feature code (7S09CTO6WW)	NVIDIA part number	Description
UFM Telemetry			
7S090011WW	S921	797-YUFTMA+P3CMI12	NVIDIA UFM Telemetry 1-year License and 24/7 Support for Lenovo clusters
7S090012WW	S922	797-YUFTMA+P3CMI36	NVIDIA UFM Telemetry 3-year License and 24/7 Support for Lenovo clusters
7S090013WW	S923	797-YUFTMA+P3CMI60	NVIDIA UFM Telemetry 5-year License and 24/7 Support for Lenovo clusters
UFM Enterprise			
7S09000XWW	S91Y	797-YUFETA+P3CMI12	NVIDIA UFM Enterprise 1-year License and 24/7 Support for Lenovo clusters
7S09000YWW	S91Z	797-YUFETA+P3CMI36	NVIDIA UFM Enterprise 3-year License and 24/7 Support for Lenovo clusters
7S09000ZWW	S920	797-YUFETA+P3CMI60	NVIDIA UFM Enterprise 5-year License and 24/7 Support for Lenovo clusters

For more information, see the following web page:
https://www.nvidia.com/en-us/networking/infiniband/ufm/

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 6. Server support (Part 1 of 4)

Part Number	Description	AMD V3				2S Intel V3/V4						4S 8S Intel V3			Multi Node V3/V4			1S V3			
		SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	ST650 V3 (7D7B / 7D7A)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR630 V4 (7DG8 / 7DG9)	SR650 V4 (7DGC / 7DGD)	SR650a V4 (7DGC / 7DGD)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SR950 V3 (7DC5 / 7DC4)	SD535 V3 (7DD8 / 7DD1)	SD530 V3 (7DDA / 7DD3)	SD550 V3 (7DD9 / 7DD2)	ST45 V3 (7DH4 / 7DH5)	ST50 V3 (7DF4 / 7DF3)	ST250 V3 (7DCF / 7DCE)	SR250 V3 (7DCM / 7DCL)
4XC7B03668	ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW)	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N

Table 7. Server support (Part 2 of 4)

Part Number	Description	GPU Rich					Edge						Super Computing						
		SR670 V2 (7Z22 / 7Z23)	SR675 V3 (7D9Q / 7D9R)	SR680a V3 (7DHE)	SR685a V3 (7DHC)	SR780a V3 (7DJ5)	SE100 (7DGR)	SE350 (7Z46 / 7D1X)	SE350 V2 (7DA9)	SE360 V2 (7DAM)	SE450 (7D8T)	SE455 V3 (7DBY)	SC750 V4 (7DDJ)	SC777 V4 (7DKA)	SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	SD650-N V3 (7D7N)
4XC7B03668	ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 8. Server support (Part 3 of 4)

Part Number	Description	1S Intel V2			2S Intel V2			AMD V1					Dense V2				4S V2		8S
		ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR635 (7Y98 / 7Y99)	SR655 (7Y00 / 7Z01)	SR655 Client OS	SR645 (7D2Y / 7D2X)	SR665 (7D2W / 7D2V)	SD630 V2 (7D1K)	SD650 V2 (7D1M)	SD650-N V2 (7D1N)	SN550 V2 (7Z69)	SR850 V2 (7D31 / 7D32)	SR860 V2 (7Z59 / 7Z60)	SR950 (7X11 / 7X12)
4XC7B03668	ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 9. Server support (Part 4 of 4)

Part Number	Description	4S V1			1S Intel V1				2S Intel V1								Dense V1			
		SR850 (7X18 / 7X19)	SR850P (7D2F / 2D2G)	SR860 (7X69 / 7X70)	ST50 (7Y48 / 7Y50)	ST250 (7Y45 / 7Y46)	SR150 (7Y54)	SR250 (7Y52 / 7Y51)	ST550 (7X09 / 7X10)	SR530 (7X07 / 7X08)	SR550 (7X03 / 7X04)	SR570 (7Y02 / 7Y03)	SR590 (7X98 / 7X99)	SR630 (7X01 / 7X02)	SR650 (7X05 / 7X06)	SR670 (7Y36 / 7Y37)	SD530 (7X21)	SD650 (7X58)	SN550 (7X16)	SN850 (7X15)
4XC7B03668	ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW)	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Support of adapters with generic firmware

One or more of the adapters described in this product guide uses standard vendor firmware (look for "Generic FW" or "Generic" in the adapter names). These adapters are supported in Lenovo servers however there are currently limitations on the use of Lenovo management tools.

Support in Lenovo XClarity management tools for adapters with generic firmware is per the following table.

Tip: Always use firmware that is obtained from Lenovo sources to ensure the firmware is fully tested by Lenovo and is supported. You should not use firmware that is obtained from the vendor web site, unless directed to do so by Lenovo support.

Table 10. Lenovo XClarity management tools support for adapters with generic firmware

Function	Lenovo XClarity Provisioning Manager	Lenovo XClarity OneCLI (out-of-band)	Lenovo XClarity OneCLI (in-band)	Lenovo XClarity Administrator
Adapter configuration	Supported (in-band via UEFI)	Planned for support 3Q/2025	Planned for support 3Q/2025	Planned for support 3Q/2025

Operating system support

The adapter supports the operating systems listed in the following table.

Tip: These tables are automatically generated based on data from Lenovo ServerProven.

Table 11. Operating system support for ThinkSystem NVIDIA ConnectX-8 8240 400GbE / 400Gb/s IB QSFP112 2-port PCIe Gen6 x16 (Generic FW), 4XC7B03668

Operating systems	SR630 V4	SR650 V4/SR650a V4
Microsoft Windows Server 2022	Y	Y
Microsoft Windows Server 2025	Y	Y
Red Hat Enterprise Linux 9.4	Y	Y
Red Hat Enterprise Linux 9.5	Y	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y
Ubuntu 24.04 LTS	Y	Y

Regulatory approvals

The adapter has the following regulatory approvals:

- Safety: CB / cTUVus / CE
- EMC: CE / FCC / VCCI / ICES / RCM / KC
- RoHS: RoHS Compliant

Operating environment

The adapter has the following operating characteristics:

- Maximum power available through OSFP port: 17W
- Temperature
  - Operational: 0°C to 55°C
  - Non-operational: -40°C to 70°C
- Humidity: 90% relative humidity

Warranty

One year limited warranty. When installed in a Lenovo server, the adapter assumes the server's base warranty and any warranty upgrades.

Related publications

For more information, refer to these documents:

- ThinkSystem Ethernet and InfiniBand Adapter Reference
  https://lenovopress.lenovo.com/lp1594-thinksystem-ethernet-infiniband-adapter-reference
- Lenovo ServerProven compatibility information
  http://serverproven.lenovo.com
- NVIDIA InfiniBand product page:
  https://www.nvidia.com/en-us/networking/infiniband-adapters/
- ConnectX-8 SuperNIC user manual:
  https://docs.nvidia.com/networking/display/connectx8supernic

Related product families

Product families related to this document are the following:

- InfiniBand & Omni-Path Adapters

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