

ThinkSystem NVIDIA ConnectX-7 NDR200 InfiniBand/200GbE QSFP112 Adapters Product Guide

The ThinkSystem NVIDIA ConnectX-7 NDR200 InfiniBand QSFP112 Adapters offer 200 Gb/s connectivity for both Ethernet and InfiniBand protocols. The adapters are suitable for providing high-performance connectivity when running HPC, cloud, storage and machine learning applications.

The following figure shows the ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter (the standard heat sink has been removed in this photo).

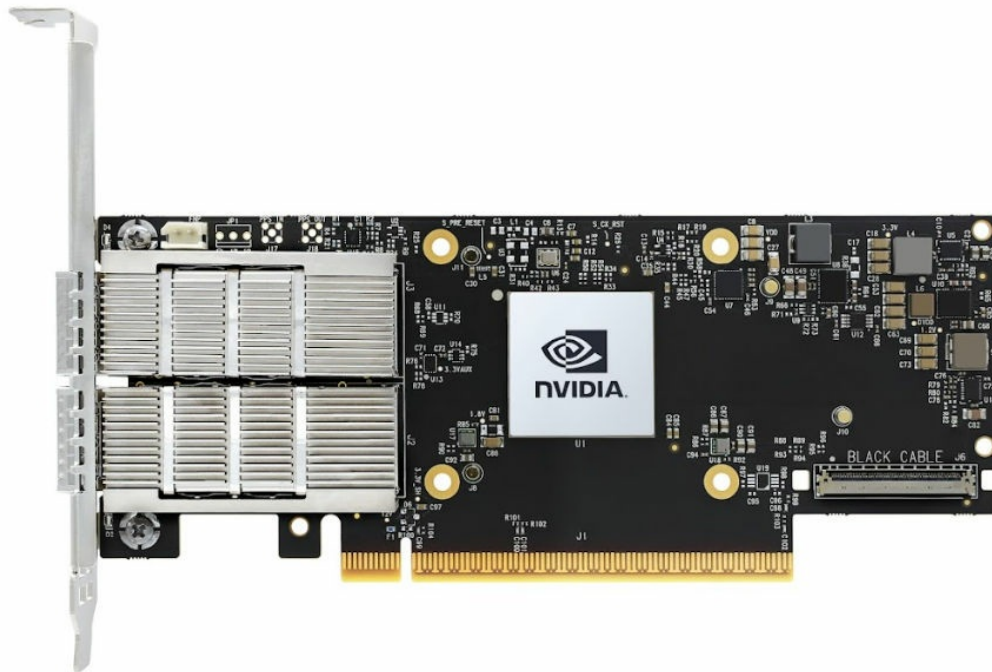


Figure 1. ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter

Did you know?

The ConnectX-7 NDR200 adapters are optimized to deliver accelerated networking for modern cloud, artificial intelligence, and traditional enterprise workloads. ConnectX-7 provides a broad set of software-defined, hardware-accelerated networking, storage, and security capabilities which enable organizations to modernize and secure their IT infrastructures.

Part number information

The following table shows the part numbers for the adapters.

Table 1. Ordering information

Part number	Feature code	NVIDIA equivalent	Description	Protocol support
Air-cooled adapter				
4XC7A81883	BQBN	MCX755106AS-HEAT	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	InfiniBand, Ethernet
Water-cooled adapter				
4XC7A86669	BKSL*	MCX755106AS-HEAT-DWC	ThinkSystem SD650 V3 NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	InfiniBand, Ethernet
4XC7A99370			ThinkSystem SC750 V4 NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	

* In the configurator, the server-specific copper tubing for water cooling is automatically derived and attached in the factory

Non-DWC adapter part numbers includes the following:

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

Supported transceivers and cables

The ConnectX-7 NDR200 adapters have two empty QSFP112 cages for connectivity. The following table lists the supported transceivers.

For the transceiver and cable support for the Mellanox QSA 100G to 25G Cable Adapter (4G17A10853), see the [25G Cable Adapter transceiver and cable support](#) section.

The following table lists the supported transceivers.

Table 2. Transceivers

Part number	Feature code	Description
100Gb Transceivers		
4M27A67042	BFH1	Lenovo 100Gb SR4 QSFP28 Ethernet Transceiver
4TC7A86257	BVA4	Lenovo 100GBase-SR4 QSFP28 Transceiver
200/400Gb Transceivers		
4TC7A81831	BQJZ	ThinkSystem NDR/NDR200 QSFP112 IB Multi Mode Solo-Transceiver
Converters/Adapters		
4G17A10853	B306	Mellanox 100G QSFP28 to 25G SFP28 Cable Adapter

The following table lists the supported optical cables.

Table 3. Optical cables

Part number	Feature code	Description
SFP28 25Gb Active Optical Cables		
4X97A94008	AV1F	Lenovo 3m 25G SFP28 Active Optical Cable
4X97A94011	AV1G	Lenovo 5m 25G SFP28 Active Optical Cable
4X97A94012	AV1H	Lenovo 10m 25G SFP28 Active Optical Cable
4X97A94013	AV1J	Lenovo 15m 25G SFP28 Active Optical Cable
4X97A94702	AV1K	Lenovo 20m 25G SFP28 Active Optical Cable
QSFP28 100Gb Ethernet Active Optical Cables		
4X97A94703	B2UZ	Lenovo 1m 100G QSFP28 Active Optical Cable
4X97A94014	AV1L	Lenovo 3m 100G QSFP28 Active Optical Cable
4X97A94015	AV1M	Lenovo 5m 100G QSFP28 Active Optical Cable
4X97A94016	AV1N	Lenovo 10m 100G QSFP28 Active Optical Cable
4X97A94704	AV1P	Lenovo 15m 100G QSFP28 Active Optical Cable
4X97A94705	AV1Q	Lenovo 20m 100G QSFP28 Active Optical Cable
7Z57A03546	C10P	Lenovo 3m 100G SFP28 Active Optical Cable
100G MPO OM4 MMF Cables (these cables require a transceiver)		
7Z57A03567	AV25	Lenovo 5m MPO-MPO OM4 MMF Cable
7Z57A03568	AV26	Lenovo 7m MPO-MPO OM4 MMF Cable
7Z57A03569	AV27	Lenovo 10m MPO-MPO OM4 MMF Cable
7Z57A03570	AV28	Lenovo 15m MPO-MPO OM4 MMF Cable
7Z57A03571	AV29	Lenovo 20m MPO-MPO OM4 MMF Cable
7Z57A03572	AV2A	Lenovo 30m MPO-MPO OM4 MMF Cable
QSFP56 HDR InfiniBand / 200 GbE Optical Cables		
4Z57A14188	B4QW	3m Mellanox HDR IB Active Optical QSFP56 Cable
4Z57A14189	B4QX	5m Mellanox HDR IB Active Optical QSFP56 Cable
4Z57A14190	B4QY	10m Mellanox HDR IB Active Optical QSFP56 Cable
4Z57A14191	B4QZ	15m Mellanox HDR IB Active Optical QSFP56 Cable
4Z57A14192	B4R0	20m Mellanox HDR IB Active Optical QSFP56 Cable
QSFP56 HDR IB to 2x HDR100 Optical Splitter Cables		
4Z57A14196	B4R4	3m Mellanox HDR IB to 2x HDR100 Splitter Optical QSFP56 Cable
4Z57A14197	B4R5	5m Mellanox HDR IB to 2x HDR100 Splitter Optical QSFP56 Cable
4Z57A14198	B4R6	10m Mellanox HDR IB to 2x HDR100 Splitter Optical QSFP56 Cable
4Z57A14199	B4R7	15m Mellanox HDR IB to 2x HDR100 Splitter Optical QSFP56 Cable
4Z57A14214	B4R8	20m Mellanox HDR IB to 2x HDR100 Splitter Optical QSFP56 Cable
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

The following table lists the supported direct-attach copper (DAC) cables.

Table 4. Copper cables

Part number	Feature code	Description
QSFP28 100Gb Ethernet Passive DAC Cables		
7Z57A03561	AV1Z	Lenovo 1m Passive 100G QSFP28 DAC Cable
7Z57A03562	AV20	Lenovo 3m Passive 100G QSFP28 DAC Cable
7Z57A03563	AV21	Lenovo 5m Passive 100G QSFP28 DAC Cable
QSFP56 HDR InfiniBand / 200 GbE Passive DAC Cables		
4Z57A14182	B4QQ	0.5m Mellanox HDR IB Passive Copper QSFP56 Cable
4Z57A14183	B4QR	1m Mellanox HDR IB Passive Copper QSFP56 Cable
4Z57A14184	B4QS	1.5m Mellanox HDR IB Passive Copper QSFP56 Cable
4Z57A14185	B4QT	2m Mellanox HDR IB Passive Copper QSFP56 Cable
QSFP56 HDR InfiniBand to 2x HDR100 Passive DAC Splitter Cables		
4Z57A14193	B4R1	1m Mellanox HDR IB to 2x HDR100 Splitter Passive Copper QSFP56 Cable
4Z57A14194	B4R2	1.5m Mellanox HDR IB to 2x HDR100 Splitter Passive Copper QSFP56 Cable
4Z57A11477	B68L	2m Mellanox HDR IB to 2x HDR100 Splitter Passive Copper QSFP56 Cable
NVIDIA NDRx2 OSFP800 to 4x NDR200 QSFP112 Splitter Copper Cables		
4X97A81832	BQK0	Lenovo 1m NVIDIA NDRx2 OSFP800 to 4x NDR200 QSFP112 Passive Copper Splitter Cable
4X97A81833	BQK1	Lenovo 1.5m NVIDIA NDRx2 OSFP800 to 4x NDR200 QSFP112 Passive Copper Splitter Cable
4X97A81834	BQK2	Lenovo 2m NVIDIA NDRx2 OSFP800 to 4x NDR200 QSFP112 Passive Copper Splitter Cable
4X97A81835	BQK3	Lenovo 3m NVIDIA NDRx2 OSFP800 to 4x NDR200 QSFP112 Passive Copper Splitter Cable

25G Cable Adapter transceiver and cable support

The Mellanox QSA 100G to 25G Cable Adapter (4G17A10853) supports the transceivers listed in the following table.

Table 5. Transceivers for Mellanox QSA 100G to 25G Cable Adapter (4G17A10853)

Part number	Feature code	Description
1Gb transceivers		
00FE333	A5DL	SFP 1000Base-T (RJ-45) Transceiver
10Gb transceivers		
46C3447	5053	SFP+ SR Transceiver
7G17A03130	AVV1	Lenovo 10GBaseT SFP+ Transceiver
4TC7A78615	BNDR	ThinkSystem Accelink 10G SR SFP+ Ethernet transceiver

The Mellanox QSA 100G to 25G Cable Adapter (4G17A10853) supports the fiber optic cables and Active Optical Cables listed in the following table.

Table 6. Optical cables for Mellanox QSA 100G to 25G Cable Adapter (4G17A10853)

Part number	Feature code	Description
LC-LC OM3 Fiber Optic Cables (these cables require a 10 GbE SFP+ SR or 25 GbE SFP28 SR transceiver)		
00MN499	ASR5	Lenovo 0.5m LC-LC OM3 MMF Cable
00MN502	ASR6	Lenovo 1m LC-LC OM3 MMF Cable
00MN505	ASR7	Lenovo 3m LC-LC OM3 MMF Cable
00MN508	ASR8	Lenovo 5m LC-LC OM3 MMF Cable
00MN511	ASR9	Lenovo 10m LC-LC OM3 MMF Cable
00MN514	ASRA	Lenovo 15m LC-LC OM3 MMF Cable
00MN517	ASRB	Lenovo 25m LC-LC OM3 MMF Cable
00MN520	ASRC	Lenovo 30m LC-LC OM3 MMF Cable
MTP-4xLC OM3 MMF Breakout Cables (these cables require a transceiver)		
00FM412	A5UA	Lenovo 1m MPO-4xLC OM3 MMF Breakout Cable
00FM414	A5UC	Lenovo 5m MPO-4xLC OM3 MMF Breakout Cable
SFP+ 10Gb Active Optical Cables		
00YL634	ATYX	Lenovo 1M SFP+ to SFP+ Active Optical Cable
00YL637	ATYY	Lenovo 3M SFP+ to SFP+ Active Optical Cable
00YL640	ATYZ	Lenovo 5M SFP+ to SFP+ Active Optical Cable
00YL643	ATZ0	Lenovo 7M SFP+ to SFP+ Active Optical Cable
00YL646	ATZ1	Lenovo 15M SFP+ to SFP+ Active Optical Cable
00YL649	ATZ2	Lenovo 20M SFP+ to SFP+ Active Optical Cable
OM4 LC to LC Cables (these cables require a transceiver)		
4Z57A10845	B2P9	Lenovo 0.5m LC-LC OM4 MMF Cable
4Z57A10846	B2PA	Lenovo 1m LC-LC OM4 MMF Cable
4Z57A10847	B2PB	Lenovo 3m LC-LC OM4 MMF Cable
4Z57A10848	B2PC	Lenovo 5m LC-LC OM4 MMF Cable
4Z57A10849	B2PD	Lenovo 10m LC-LC OM4 MMF Cable
4Z57A10850	B2PE	Lenovo 15m LC-LC OM4 MMF Cable
4Z57A10851	B2PF	Lenovo 25m LC-LC OM4 MMF Cable
4Z57A10852	B2PG	Lenovo 30m LC-LC OM4 MMF Cable

The Mellanox QSA 100G to 25G Cable Adapter (4G17A10853) supports the direct-attach copper (DAC) cables listed in the following table.

Table 7. Copper cables for Mellanox QSA 100G to 25G Cable Adapter (4G17A10853)

Part number	Feature code	Description
SFP+ 10Gb Passive DAC Cables		
00D6288	A3RG	0.5m Passive DAC SFP+ Cable
90Y9427	A1PH	1m Passive DAC SFP+ Cable
00AY764	A51N	1.5m Passive DAC SFP+ Cable
00AY765	A51P	2m Passive DAC SFP+ Cable
90Y9430	A1PJ	3m Passive DAC SFP+ Cable
90Y9433	A1PK	5m Passive DAC SFP+ Cable
00D6151	A3RH	7m Passive DAC SFP+ Cable
SFP+ 10Gb Active DAC Cables		
00VX111	AT2R	Lenovo 1m Active DAC SFP+ Cables
00VX114	AT2S	Lenovo 3m Active DAC SFP+ Cables
00VX117	AT2T	Lenovo 5m Active DAC SFP+ Cables
SFP28 25Gb Passive DAC Cables		
7Z57A03557	AV1W	Lenovo 1m Passive 25G SFP28 DAC Cable
7Z57A03558	AV1X	Lenovo 3m Passive 25G SFP28 DAC Cable
7Z57A03559	AV1Y	Lenovo 5m Passive 25G SFP28 DAC Cable
QSFP28 100G-to-4x25G Ethernet Breakout Cables		
7Z57A03564	AV22	Lenovo 1m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable
4Z57A85043	BS32	Lenovo 1.5m 100G to 4x25G Breakout SFP28 Breakout DAC Cable
4Z57A85044	BS33	Lenovo 2m 100G to 4x25G Breakout SFP28 Breakout DAC Cable
7Z57A03565	AV23	Lenovo 3m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable
7Z57A03566	AV24	Lenovo 5m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable

Features

The adapters have the following features:

- **Accelerated Networking and Security**

ConnectX-7 provides a broad set of software-defined, hardware-accelerated networking, storage, and security capabilities which enable organizations to modernize and secure their IT infrastructures. Moreover, ConnectX-7 empowers agile and high-performance solutions from edge to core data centers to clouds, all while enhancing network security and reducing the total cost of ownership.

- **Accelerate Data-Driven Scientific Computing**

ConnectX-7 provides ultra-low latency, extreme throughput, and innovative NVIDIA In-Network Computing engines to deliver the acceleration, scalability, and feature-rich technology needed for today's modern scientific computing workloads.

- **Accelerate Software-Defined Networking**

NVIDIA ASAP² technology accelerates software-defined networking, delivering line-rate performance with no CPU penalty.

- **Enhance Storage Performance**

ConnectX-7 enables high-performance and efficient data storage by leveraging RDMA/RoCE, GPUDirect Storage, and hardware-based NVMe-oF offload engines.

- **SharedIO (4XC7A86669 only)**

SharedIO (Shared I/O) is an implementation of Sockets Direct that is offered in Lenovo direct water-cooled (DWC) servers such as the SD650 V3, where there are two server nodes per DWC tray. In this implementation, the ConnectX-7 adapter is installed in a PCIe slot in one node and the adapter is connected via a cable to a PCIe connector on the second node. The result is that the two nodes share the network connection of the adapter with significant savings both in the cost of the adapters but also the cost of switch ports.

Technical specifications

The ConnectX-7 NDR200 adapters have the following technical specifications:

- Networking interfaces
 - Two QSFP112 cages for 200 Gb/s connectivity
 - 400Gb/s total bandwidth
- InfiniBand connectivity
 - Support for InfiniBand NDR200 or HDR with speeds up to 200 Gb/s
 - InfiniBand Trade Association Spec 1.5 compliant
 - RDMA, send/receive semantics
 - 16 million input/output (IO) channels
 - 256 to 4Kbyte maximum transmission unit (MTU), 2Gbyte messages
- Enhanced InfiniBand Networking
 - Hardware-based reliable transport
 - Extended Reliable Connected (XRC)
 - Dynamically Connected Transport (DCT)
 - GPUDirect RDMA
 - GPUDirect Storage
 - Adaptive routing support
 - Enhanced atomic operations
 - Advanced memory mapping, allowing user mode registration (UMR)
 - On-demand paging (ODP), including registration-free RDMA memory access
 - Enhanced congestion control

- Burst buffer offload
 - Single root IO virtualization (SR-IOV)
 - Optimized for HPC software libraries including: NVIDIA HPC-X, UCX, UCC, NCCL, OpenMPI, MVAPICH, MPICH, OpenSHMEM, PGAS
 - Collective operations offloads
 - Support for NVIDIA Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)
 - Rendezvous protocol offload
 - In-network on-board memory
- Ethernet connectivity
 - Supports speeds up to 200 GbE
 - Supports NRZ (10G, 25G) and PAM4 (50G, 100G)
 - RDMA over Converged Ethernet (RoCE)
- Enhanced Ethernet Networking
 - Zero-Touch RoCE
 - ASAP² Accelerated Switch and Packet Processing for SDN and VNF acceleration
 - Single Root I/O Virtualization (SR-IOV)
 - VirtIO acceleration
 - Overlay network acceleration: VXLAN, GENEVE, NVGRE
 - Programmable flexible parser
 - Connection tracking (L4 firewall)
 - Flow mirroring, sampling and statistics
 - Header rewrite
 - Hierarchical QoS
 - Stateless TCP offloads
- Storage Accelerations
 - Block-level encryption: XTS-AES 256/512-bit key
 - NVMe over Fabrics (NVMe-oF)
 - NVMe over TCP (NVMe/TCP)
 - T10 Data Integrity Field (T10-DIF) signature handover
 - SRP, iSER, NFS over RDMA, SMB Direct
- Management and Control
 - NC-SI, MCTP over SMBus, and MCTP over PCIe
 - PLDM for Monitor and Control DSP0248
 - PLDM for Firmware Update DSP0267
 - PLDM for Redfish Device Enablement DSP0218
 - PLDM for FRU DSP0257
 - SPDMM DSP0274
 - Serial Peripheral Interface (SPI) to flash
 - JTAG IEEE 1149.1 and IEEE 1149.6
- Remote Boot
 - Remote boot over InfiniBand
 - Remote boot over iSCSI
 - UEFI
 - PXE over InfiniBand and Ethernet
- Cybersecurity
 - Platform security: secure boot with hardware root-of-trust, secure firmware update, flash encryption, and device attestation
- PCI Express Interface
 - PCIe Gen 5.0 x16 host interface
 - Support for PCIe bifurcation
 - SharedIO (NVIDIA Multi-Host) supports connection of up to two hosts (on supported water-cooled nodes only)
 - Transaction layer packet (TLP) processing hints (TPH)

- o PCIe switch Downstream Port Containment (DPC)
- o Support for MSI/MSI-X mechanisms
- o Advanced error reporting (AER)
- o Access Control Service (ACS) for peer-to-peer secure communication
- o Process Address Space ID (PASID)
- o Address translation services (ATS)
- o Support for SR-IOV

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 8. 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 9. 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)
4XC7A81883	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N
BKSL	ThinkSystem NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 10. 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 (7D9F)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-1 V3 (7D7L)	SD650-N V3 (7D7N)
4XC7A81883	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	Y	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N
BKSL	ThinkSystem NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y	Y	Y	

Table 11. 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)
4XC7A81883	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N	N	Y	N	N
BKSL	ThinkSystem NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 12. 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)	ST150 (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)
4XC7A81883	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
BKSL	ThinkSystem NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Operating system support

The following table indicates which operating systems can be preloaded in the Lenovo factory for CTO server orders where this adapter is included in the server configuration.

Table 13. OS preload support

Operating system	Preload support
Windows Server 2016	No support as a preload
Windows Server 2019	Supported as a preload for factory orders
Windows Server 2022	Supported as a preload for factory orders
Windows Server 2025	Supported as a preload for factory orders
VMware ESXi 6.5 U3	No support as a preload
VMware ESXi 6.7 U3	No support as a preload
VMware ESXi 7.0	No support as a preload
VMware ESXi 7.0 U1	No support as a preload
VMware ESXi 7.0 U2	No support as a preload
VMware ESXi 7.0 U3	Supported as a preload for factory orders
VMware ESXi 8.0	No support as a preload
VMware ESXi 8.0 U1	No support as a preload
VMware ESXi 8.0 U2	No support as a preload
VMware ESXi 8.0 U3	Supported as a preload for factory orders

Tip: If an OS is listed as "No support" above, but it is listed in one of the support tables below, that means the OS is supported by the adapter, just not available to be preloaded in the Lenovo factory in CTO orders.

The adapters support the operating systems listed in the following tables.

- [ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter, 4XC7A81883](#)
- [ThinkSystem SD650 V3 NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter \(SharedIO\) DWC, 4XC7A86669](#)

Tip: These tables are automatically generated based on data from [Lenovo ServerProven](#).

Table 14. Operating system support for ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter, 4XC7A81883 (Part 1 of 2)

Operating systems	SE455 V3	SR630 V4	SR650 V4/SR650a V4	SD530 V3	SD535 V3	SD550 V3	SR630 V3 (4th Gen Xeon)	SR630 V3 (5th Gen Xeon)	SR635 V3	SR645 V3	SR650 V3 (4th Gen Xeon)	SR650 V3 (5th Gen Xeon)	SR655 V3	SR665 V3	SR675 V3	SR685a V3	SR850 V3	SR860 V3	SR950 V3
Microsoft Windows Server 2019	Y	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N
Microsoft Windows Server 2022	Y	Y	Y ²	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y

Operating systems	SE455 V3	SR630 V4	SR650 V4/SR650a V4	SD530 V3	SD535 V3	SD550 V3	SR630 V3 (4th Gen Xeon)	SR630 V3 (5th Gen Xeon)	SR635 V3	SR645 V3	SR650 V3 (4th Gen Xeon)	SR650 V3 (5th Gen Xeon)	SR655 V3	SR665 V3	SR675 V3	SR685a V3	SR850 V3	SR860 V3	SR950 V3
Microsoft Windows Server 2025	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 8.6	Y	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 8.7	N	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 8.8	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 8.9	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 8.10	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 9.0	Y	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 9.1	N	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 9.2	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 9.3	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 9.4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y ⁴	Y	Y	Y
Red Hat Enterprise Linux 9.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Red Hat Enterprise Linux 10	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
SUSE Linux Enterprise Server 15 SP4	Y	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y	Y
SUSE Linux Enterprise Server 15 SP5	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
Ubuntu 22.04.2 LTS	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Ubuntu 22.04.3 LTS	N	N	N	Y	Y	Y	N	Y	N	N	N	Y	N	N	N	N	N	N	N
Ubuntu 22.04.5 LTS	N	Y	Y	N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N
Ubuntu 22.04 LTS	N	N	N	N	N	N	Y	N	Y	Y	Y	N	Y	Y	Y	Y ⁴	Y	Y	N
Ubuntu 24.04 LTS	Y ¹	Y	Y	Y ¹	Y	Y ¹	Y ¹	Y ¹	Y ¹	Y ³	Y ³	Y ³	Y ¹	Y ¹	Y ¹	Y ⁴	Y ¹	Y ¹	Y
VMware vSphere Hypervisor (ESXi) 7.0 U3	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N
VMware vSphere Hypervisor (ESXi) 8.0 U2	Y	N	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 8.0 U3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.0	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

¹ The iboot hard drive can't be identified)

² For limitation, please refer [Support Tip TT2791](#)

³ The iboot hard drive can't be identified

⁴ For limitation, please refer [Support Tip TT2258](#)

Table 15. Operating system support for ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter, 4XC7A81883 (Part 2 of 2)

	SR630 V2	SR650 V2	SR670 V2	SR850 V2	SR645	SR665
Operating systems						
Microsoft Windows Server 2019	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2022	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2025	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.6	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.7	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.8	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.9	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.10	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.0	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.1	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.2	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.3	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.4	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.5	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 10	Y	Y	Y	N	Y	Y
SUSE Linux Enterprise Server 12 SP5	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP4	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP5	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y	Y	Y	Y	Y
Ubuntu 22.04.2 LTS	N	N	N	N	N	N
Ubuntu 22.04.3 LTS	N	N	N	N	N	N
Ubuntu 22.04.5 LTS	N	N	N	N	N	N
Ubuntu 22.04 LTS	Y	Y	Y	Y	Y	Y
Ubuntu 24.04 LTS	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹	Y ¹
VMware vSphere Hypervisor (ESXi) 7.0 U3	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 8.0 U2	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 8.0 U3	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.0	N	N	N	N	N	N

¹ The iboot hard drive can't be identified)

Table 16. Operating system support for ThinkSystem SD650 V3 NVIDIA ConnectX-7 NDR200/HDR/200GbE QSFP112 2-Port PCIe Gen5 x16 Adapter (SharedIO) DWC, 4XC7A86669

Operating systems	SD650 V3	SD650 V3 (5th Gen Xeon)	SD650-I V3 (4th Gen Xeon)	SD650-N V3 (4th Gen Xeon)	SD650-N V3 (5th Gen Xeon)	SD650-I V3 (5th Gen Xeon)
Red Hat Enterprise Linux 8.6	Y	N	Y	N	N	N
Red Hat Enterprise Linux 8.8	Y	Y	Y	N	N	Y
Red Hat Enterprise Linux 8.10	Y	Y	N	N	N	N
Red Hat Enterprise Linux 9.0	Y	N	N	N	N	N
Red Hat Enterprise Linux 9.2	Y	Y	Y	N	N	Y
Red Hat Enterprise Linux 9.4	Y	Y	N	N	N	N
Red Hat Enterprise Linux 10	Y	Y	N	Y	Y	N
SUSE Linux Enterprise Server 15 SP4	Y	N	Y	N	N	N
SUSE Linux Enterprise Server 15 SP5	Y	Y	Y	N	N	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y	N	N	N	N
Ubuntu 22.04.3 LTS	N	Y	N	Y	Y	N
Ubuntu 22.04 LTS	Y	N	N	N	N	N
Ubuntu 24.04 LTS	Y ¹	Y ¹	N	N	N	N

¹ The iboot hard drive can't be identified)

Regulatory approvals

The adapters have the following regulatory approvals:

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

Operating environment

The adapters have the following operating characteristics:

- Typical power consumption (passive cables): 19.3W
- Maximum power available through QSFP56 port: 5W
- 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:

- ConnectX-7 user manual:
<https://docs.nvidia.com/networking/display/ConnectX7VPI/Specifications>
- NVIDIA InfiniBand product page:
<https://www.nvidia.com/en-us/networking/infiniband-adapters/>
- DCSC configurator
<https://dcsc.lenovo.com>
- Networking Options for ThinkSystem Servers:
<https://lenovopress.com/lp0765-networking-options-for-thinksystem-servers>
- ServerProven compatibility:
<https://serverproven.lenovo.com>

Related product families

Product families related to this document are the following:

- [Ethernet Adapters](#)
- [InfiniBand & Omni-Path Adapters](#)

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