



# Networking Options for ThinkSystem Servers Reference Information

# **Ethernet Network Adapters**

ThinkSystem Ethernet adapters provide industry latest networking solutions to address Ethernet, Converged and Virtualized data center networking requirements.

- 100 Gb Ethernet Adapters
- 50 Gb Ethernet Adapters
- 40 Gb Ethernet Adapters
- 25 Gb Ethernet Adapters
- 10 Gb Ethernet RJ45 Adapters
- 10 Gb Ethernet SFP+ Adapters
- Gigabit Ethernet Adapters

### **100 Gb Ethernet Adapters**

100 Gb Ethernet connections for the ultimate in network I/O performance.

### Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter

The ThinkSystem Broadcom 57508 100GbE QSFP56 2-port adapter is a high-performance 100/50/40/25/10Gb Ethernet adapter with a PCIe 4.0 host interface that offers TruFlow intelligent flow processing and supports advanced networking technologies such as VXLAN, NVGRE, Geneve, RoCE, SDN and NFV, to facilitate the management of data networks and to enable service provider solutions.

Form factors: PCIe

Learn more:



### Mellanox ConnectX-6 Dx 100GbE QSFP56 Ethernet Adapters

The ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 Ethernet Adapter is an advanced cloud Ethernet network adapter that accelerates mission-critical data-center applications such as security, virtualization, SDN/NFV, big data, machine learning, and storage.

Form factors: PCIe

Learn more:

• Product guide

### Mellanox ConnectX-4 100GbE/EDR IB QSFP28 VPI Adapters

ConnectX-4 from Mellanox is a family of high-performance and low-latency adapters. The 100GbE/EDR VPI adapters, available as either a 1-port or a 2-port adapter, supports 100 Gb Ethernet connections for the ultimate in network I/O performance.

Form factors: PCIe

Learn more:

• Product guide

### Xilinx Alveo U50 Data Center Accelerator Adapter

The ThinkSystem Xilinx Alveo U50 Data Center Accelerator Adapter is an advanced programmable computational accelerator that provides provide optimized acceleration for workloads in financial computing, machine learning, computational storage, high performance computing, and database search and analysis. The low-profile adapter is built on Xilinx UltraScale+ architecture includes 8GB HBM2 memory, 100GbE networking, and a PCIe 4.0 host interface. The Xilinx Vitis and Vitis AI development tools enable both Xilinx and third-party accelerated applications and solutions.

Form factors: PCIe

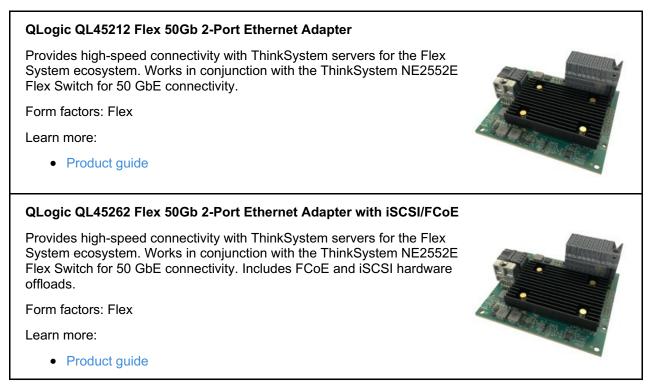
Learn more:





### **50Gb Ethernet Adapters**

50 Gb Ethernet adapters in the Flex System I/O adapter form factor, suitable for the ThinkSystem SN550 and SN850 blade servers.



### 40 Gb Ethernet Adapters

40 Gb Ethernet delivers improved application performance through higher bandwidth, lower latency enabling increased VM density per host.

### Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter

ConnectX-4 from Mellanox is a family of high-performance and low-latency adapters. The ConnectX-4 Lx 1x40GbE supports a single 40 Gb Ethernet port for high-speed networking with a PCIe x8 host interface.

Form factors: PCIe

Learn more:

• Product guide



### Mellanox ConnectX-4 FDR 2-Port QSFP VPI Adapter

Two-port ConnectX-4 VPI adapter supports either 40 Gb Ethernet or FDR InfiniBand. Ideal for customers need to maximize high-speed networking connectivity when only a PCIe x8 host interface is available.

Form factors: PCIe

Learn more:

• Product guide



### Mellanox ConnectX-3 Pro ML2 FDR 2-Port QSFP VPI Adapter

ConnectX-3 adapter with two QSFP ports supporting 40 Gb Ethernet or InfiniBand FDR speeds. Supported in servers with an ML2 adapter slot.

Form factors: ML2

Learn more:



### Mellanox ConnectX-3 Mezz 40Gb 2-Port Ethernet Adapter

Provides high-speed connectivity with ThinkSystem servers for the Flex System ecosystem. Works in conjunction with the EN6131 40Gb Ethernet Switch for Flex System.

Form factors: Flex

Learn more:

Product guide

### **25 Gb Ethernet Adapters**

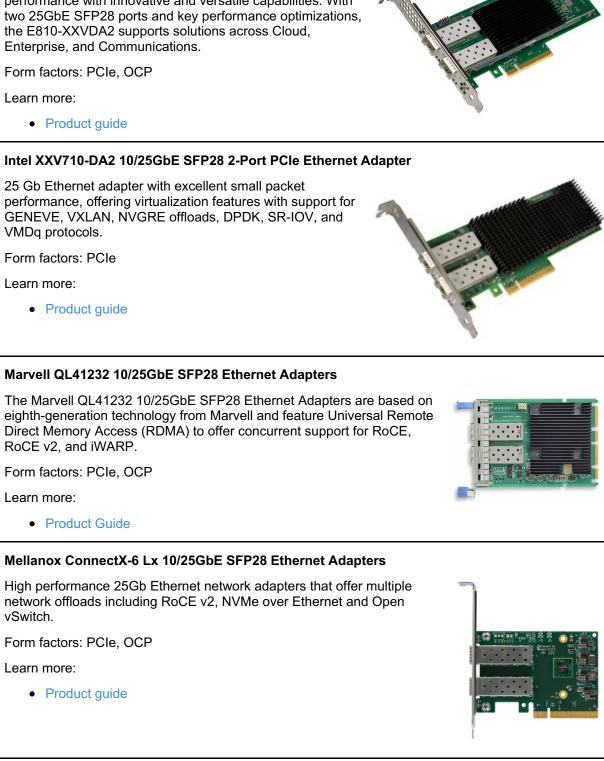
25 Gb significantly lowers cost per Gb and enables server future proofing. Lenovo's 25 Gb adapters can be installed now and operated at 10 Gb utilizing existing switches and cabling.

# Broadcom 57412/57414 10/25GbE SFP28 PCle Ethernet AdaptersBroadcom 57412 and 57414 25GbE adapters offer TruFlow<br/>intelligent flow processing and support advanced networking<br/>technologies including RoCE, SDN, NFV and virtualization. The<br/>25Gb adapters are offered as a 1-port PCle adapter (57412) or a<br/>2-port adapter (57414).Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"Colspan="2"<td c

Learn more:







Intel E810-DA2 10/25GbE SFP28 Ethernet Adapters

The ThinkSystem Intel E810-DA2 10/25GbE SFP28 network adapters improve application efficiency and network performance with innovative and versatile capabilities. With

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Mellanox ConnectX-5 EN 10/25GbE SFP28 Ethernet Adapters					
The ThinkSystem Mellanox ConnectX-5 EN 10/25GbE SFP28 Ethernet Adapter is a high performance 25Gb Ethernet network adapter that offers multiple network offloads including RoCE v2, NVMe over Ethernet and Open vSwitch. Form factors: PCIe Learn more: • Product guide					
Mellanox Innova-2 ConnectX-5 FPGA 25GbE 2-port Adapter					
An advanced programmable network adapter that combines the ac ConnectX-5 Ethernet network controller ASIC with an onboard stat the-art FPGA, enabling customers to develop custom-made offload range of applications, including storage, HPC, machine learning, a security. Form factors: PCIe Learn more: • Product guide	te-of- ds for a				
Mellanox ConnectX-4 Lx 10/25GbE SFP28 Adapters					
ConnectX-4 from Mellanox is a family of high-performance and low-latency adapters. The 25 GbE adapters are available as either 1-port or 2-port. Form factors: PCIe, ML2, OCP Learn more: • Product guide					
QLogic QL41262 10/25GbE SFP28 2-Port PCIe Ethernet Adapter					
<ul> <li>2-Port 25 GbE adapter based on eighth-generation technology from Marvell featuring Universal Remote Direct Memory Access (RDMA) to offer concurrent support for RoCE, RoCE v2, and iWARP. It also supports FCoE and iSCSI storage offloads.</li> <li>Form factors: PCIe</li> <li>Learn more:</li> <li>Product Guide</li> </ul>					

QLogic QL45214 Flex 25Gb 4-Port Ethernet Adapter		
Provides high-speed connectivity with ThinkSystem servers for the System ecosystem. Works in conjunction with the ThinkSystem NE Flex Switch for 25 GbE connectivity.		
Form factors: Flex		
Learn more:		
Product guide		
Selections V2522 Dive 40/25ChE SED29 2 Devt DCle Ethernet A	denter	
Solarflare X2522-Plus 10/25GbE SFP28 2-Port PCIe Ethernet A	dapter	
The ThinkSystem Solarflare X2522-Plus 10/25GbE SFP28 2-Port PCIe Ethernet Adapter is a high-performance 25 GbE adapter that is designed for high-performance electronic trading environments and cloud and enterprise data centers.		
Form factors: PCIe		
Learn more:		
Product guide		
Xilinx Alveo U25 25GbE SFP28 2-Port PCle FPGA Adapter		
An advanced programmable network adapter enabling customized hardware acceleration and offload.		
Form factors: PCIe	U25 5 BAK	
Learn more:	U25 E ALVEO.	
Product guide		

### 10 Gb Ethernet RJ45 Adapters

10GBASE-T adapters with CAT-6a cabling are a low-cost way to implement 10 Gb Ethernet.

### Broadcom 57454 10GBASE-T Ethernet Adapters

The ThinkSystem Broadcom 57454 10GBASE-T Ethernet Adapters are high-performance 10 Gb Ethernet adapters. They offer TruFlow intelligent flow processing and support advanced networking technologies including RoCE v1/2, SDN, NFV and virtualization.

Form factors: PCIe, OCP

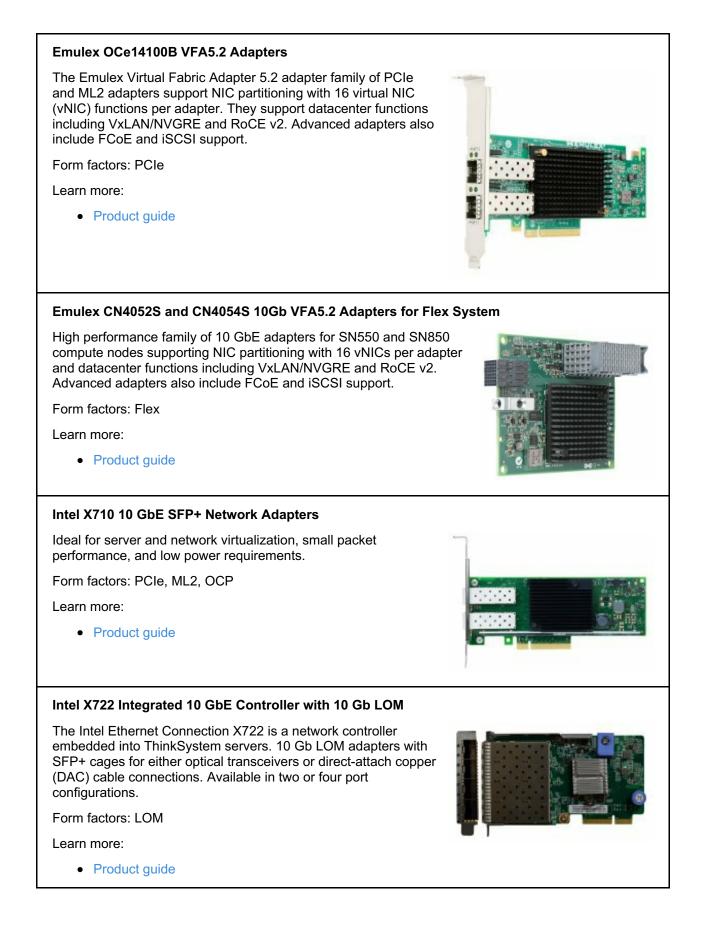
Learn more:



Broadcom 57416 10GBASE-T PCIe Ethernet Adapter					
Dual-port 10GBASE-T adapters that are fully compliant with the IEEE 802.3an standard and provide a low-cost solution for 10 Gb Ethernet using copper wiring.					
Form factors: PCIe, ML2, OCP					
Learn more:	A Least				
Product guide	~				
Intel X710-T4 4x10Gb Base-T Adapter					
4-port 10GBASE-T adapter ideal for server and network virtualization, small packet performance, and low power requirements.					
Form factors: PCIe					
Learn more:					
Product guide					
Intel X550 10 Gb Ethernet 10GBASE-T Adapters					
A cost-effective and power-efficient 10 GbE performance adapter for all data center applications. Support for standard CAT 6a cablin	ata center applications. Support for standard CAT 6a cabling with ponnectors, the X550 offers a low barrier of entry to 10 Gb Ethernet				
RJ45 connectors, the X550 offers a low barrier of entry to 10 Gb E networking. Available as a 1-port or 2-port adapter.					
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networking. Available as a 1-port or 2-port adapter. Form factors: PCIe Learn more: • Product guide					
networking. Available as a 1-port or 2-port adapter. Form factors: PCIe Learn more: • Product guide Intel X722 Integrated 10 GbE Controller with 10 Gb LOM The Intel Ethernet Connection X722 is a network controller embedded into ThinkSystem servers. 10 Gb LOM adapters with 10GBASE-T connections enable support for two or four 10 GbE					
networking. Available as a 1-port or 2-port adapter. Form factors: PCIe Learn more: • Product guide Intel X722 Integrated 10 GbE Controller with 10 Gb LOM The Intel Ethernet Connection X722 is a network controller embedded into ThinkSystem servers. 10 Gb LOM adapters with 10GBASE-T connections enable support for two or four 10 GbE connections using low-cost RJ45 twisted-pair cabling.					

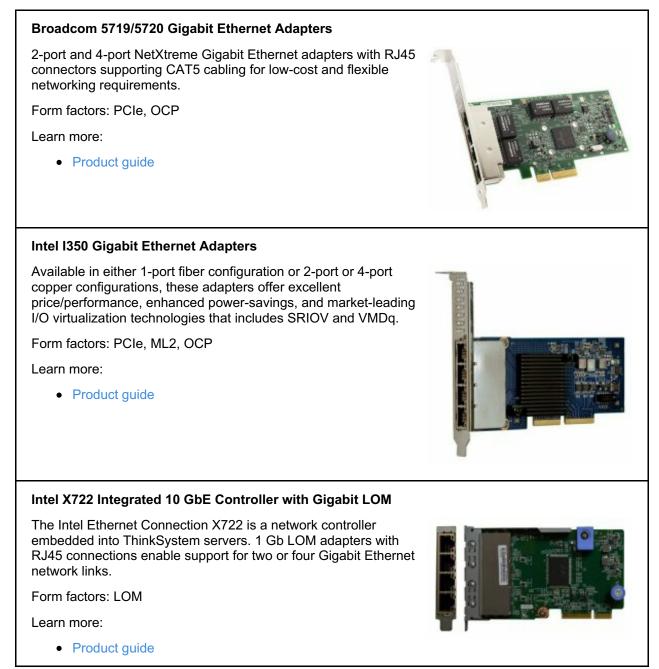
# 10 Gb Ethernet SFP+ Adapters

10 GbE SFP+ adapters offer the flexibility of using either short-run copper cables or SFP+ transceivers and lightweight long-run fibre optic cabling.



# **Gigabit Ethernet Adapters**

1 Gb adapters offer low cost, low power solutions enabling server virtualization and reduced CPU overhead with adapter offloads.



# **Fibre Channel Adapters**

Connecting Lenovo Servers to Storage Area Networks. High performance single and dual port Fiber Channel adapters provide performance, power efficiency, reliability and investment protection for connectivity to data center storage.

- 64 Gb Fibre Channel HBAs
- 32 Gb Fibre Channel HBAs
- 16 Gb Fibre Channel HBAs

### 64 Gb Fibre Channel HBAs

64 Gb FC host bus adapter are Generation 7 (Gen 7) Fibre Channel offerings that provide the ultimate in Storage Area Network connectivity.

### Emulex LPe36002 64Gb 2-port PCle Fibre Channel Adapter

The next generation Emulex 64 Gb LPe36002 2-port Fibre Channel host bus adapter for ThinkSystem servers is an ideal solution when requiring high-speed 64 Gb/s data transfer in storage connectivity for virtualized environments, data backup, and mission-critical applications.

Learn more:

- Product Guide
- Analyst Performance Report



### 32 Gb Fibre Channel HBAs

32 Gb FC host bus adapter are Generation 6 (Gen 6) Fibre Channel offerings that provide the ultimate in Storage Area Network connectivity.

### Emulex LPe35000 32Gb Fibre Channel Adapters

Emulex LPe35000 32 Gb 1-port and 2-port Gen 7 FC HBAs for ThinkSystem servers are an ideal solution when requiring high-speed data transfer in storage connectivity for virtualized environments, data backup, and mission-critical applications.

Learn more:



### Emulex LPe32000 32Gb Fibre Channel Adapters

Emulex 32 Gb 1-port and 2-port FC HBAs for ThinkSystem servers are an ideal solution when requiring high-speed data transfer in storage connectivity for virtualized environments, data backup, and mission-critical applications.

Learn more:

Product Guide



32Gb FC adapters offering industry leading native FC performance with extremely low CPU usage with full hardware offloads. With performance of up to 1 million I/O operations per second (IOPS) per port, these adapters can be used to support all-flash arrays (AFAs) -- Fibre Channel storage systems comprised completely of high-speed solid-state drives.

Learn more:

Product Guide

### QLogic 2740 32Gb Fibre Channel Adapters

1-port and 2-port adapters based on Cavium technology offering industry leading native FC performance with extremely low CPU usage with full hardware offloads.

Learn more:

• Product Guide



### 16 Gb Fibre Channel HBAs

Fibre Channel HBAs deliver performance, operational agility, & maximum power of cloud virtualization.

### Emulex 16 Gb Gen 6 Fibre Channel Host Bus Adapters

1-port and 2-port adapters with an advanced ASIC that can achieve 1.6M IOPS on a single port. Based on Emulex's new Dynamic Multicore architecture, which for the 2-port adapter, dynamically scales HBA resources to one port if the other port is idle.

Learn more:

• Product guide



### **QLogic Enhanced Gen 5 16 Gb Fibre Channel HBAs**

1-port and 2-port adapters based on QLogic StorFusion architecture to delivers ultimate reliability to meet the needs of mission-critical enterprise applications. Consumes less power and fewer CPU cycles, all while maintaining peak performance.

Learn more:

Product guide



### Emulex LPm16002B-L Mezz 16Gb Fibre Channel Adapters for Flex System

1-port and 2-port Flex System mezz cards based on the proven Emulex XE201 design. Deliver 6x the IOPS, improve response times by up to 75%, and deliver double the throughput speeds compared to previous-generation 8 Gb adapters.

Learn more:



### QLogic QML2692 16 Gb Enhanced Gen 5 Fibre Channel Adapter for Flex System

2-port mezz card for Flex System based on the advanced Cavium StorFusion architecture and ASIC. Delivers higher IOPS and performance with lower power consumption compared to previous generation.

Learn more:



# InfiniBand and Omni-Path Adapters

InfiniBand and Omni-Path Architecture (OPA) adapters are the gateway to high-performance low-latency networking, ideal for clusters and time-sensitive applications.

- InfiniBand Adapters
- Omni-Path Adapters

### **InfiniBand Adapters**

InfiniBand adapters solve HPC cluster networking challenges by delivering high bandwidth, low latency, and CPU offloads to get the highest server efficiency and application productivity at scale.

# Mellanox ConnectX-6 HDR InfiniBand Adapters The ThinkSystem Mellanox ConnectX-6 HDR InfiniBand Adapters offer 200 Gb/s InfiniBand connectivity for highperformance connectivity when running HPC, cloud, storage and machine learning applications. Planned additional support for 200 Gb Ethernet. Learn more Product guide Mellanox ConnectX-6 HDR100 InfiniBand Adapters The ThinkSystem Mellanox ConnectX-6 HDR100 InfiniBand Adapters offer 100 Gb/s InfiniBand connectivity for highperformance connectivity when running HPC, cloud, storage and machine learning applications. Planned additional support for 100 Gb Ethernet. Learn more Product guide Mellanox ConnectX-4 100GbE/EDR IB QSFP28 VPI Adapters 1-port or 2-port adapters that offer InfiniBand EDR speeds (25.8 Gb/s per lane) to enable high performance networking, clustering, or storage to operate seamlessly over any converged network leveraging a consolidated software stack. Learn more: Product guide

Mellanox ConnectX-4 FDR 2-Port QSFP VPI Adapter	
2-port adapter supporting InfiniBand FDR speeds (14 Gb/s per lane). Ideal for customers needing high-speed cluster interconnects using a PCIe x8 host interface.	7
Learn more:	
Product guide	
Mellanox ConnectX-3 Pro ML2 FDR 2-Port QSFP VPI Adapter	
Two QSFP ports supporting InfiniBand FDR speeds (14 Gb/s per lane) or 40 Gb Ethernet. Supported in servers with an ML2 adapter slot. Learn more: • Product guide	
Mellanox ConnectX-3 Mezz FDR 2-Port InfiniBand Adapter for	Flex System
Delivers low latency and high bandwidth for performance-driven server clustering applications on ThinkSystem servers in a Flex System ecosystem. Operates at InfiniBand FDR speeds (56 Gbps or 14 Gbps per lane) Learn more:	
Product guide	

### **Omni-Path Adapters**

Omni-Path Architecture is a new networking topology that was designed specifically to scale cost-effectively from entry level HPC clusters to larger clusters with 10,000 nodes or more.



Enable high-performance connectivity between servers in a cluster. Available as either a PCIe 3.0 x16 adapter supporting bandwidths up to 100 Gb/s, or a PCIe 3.0 x8 adapter supporting up to 58 Gb/s.

Learn more:

• Product guide



## **Related product families**

Product families related to this document are the following:

- Ethernet Adapters
- Host Bus Adapters
- InfiniBand & Omni-Path Adapters

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