ThinkSystem Broadcom 57508 100GbE QSFP56 Ethernet Adapters

Product Guide

The ThinkSystem Broadcom 57508 100GbE QSFP56 Ethernet adapters are a high-performance low-power 100 Gb 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. The adapters are available in PCIe low-profile or OCP 3.0 form factors.

The following figure shows the PCIe Low Profile adapter.

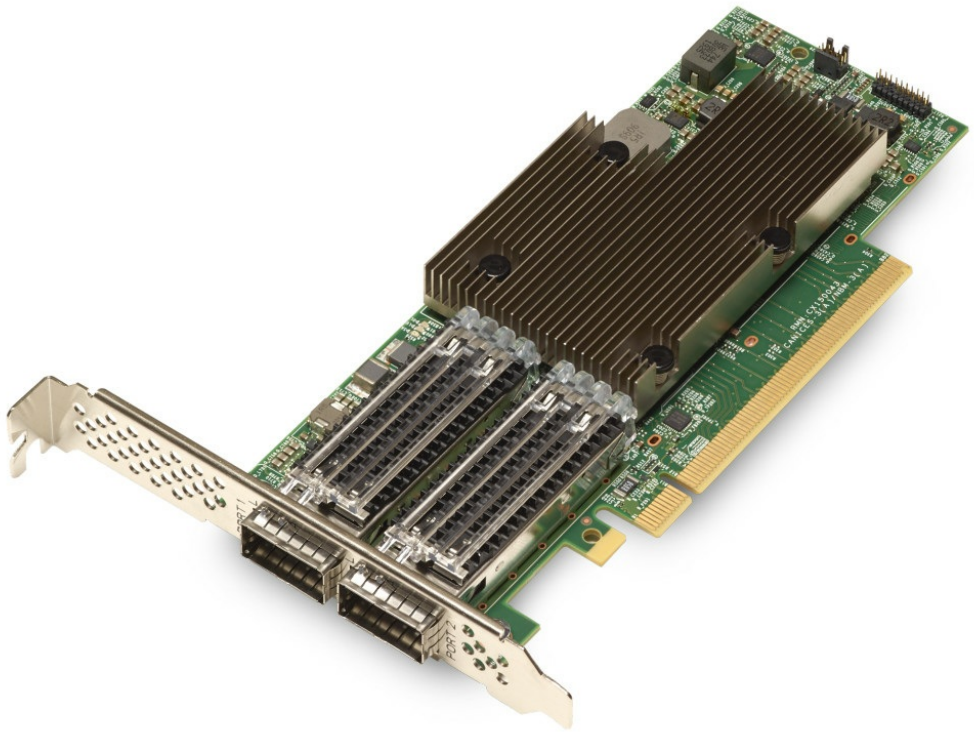

Figure 1. ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter

Did you know?

These adapters are based on the Broadcom BCM57508 scalable Ethernet controller architecture which is designed to build highly-scalable, feature-rich networking solutions. The adapters are an ideal choice for enterprise and cloud-scale networking and storage applications, including high-performance computing, telco, machine learning, storage disaggregation, and data analytics.

Part number information

The ordering information is listed in the following table.

Table 1. Ordering information

Part number	Feature code	Description
4XC7A08297	B96F / BK1J	ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter
4XC7A08243	BPPX	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter

The adapters, when shipped as a stand-alone option part number, include the following items:

- One Broadcom adapter
- PCIe adapter: An attached full-height (3U) bracket, and a low-profile (2U) bracket that can be substituted if needed
- Documentation flyer

The following figure shows the OCP adapter:

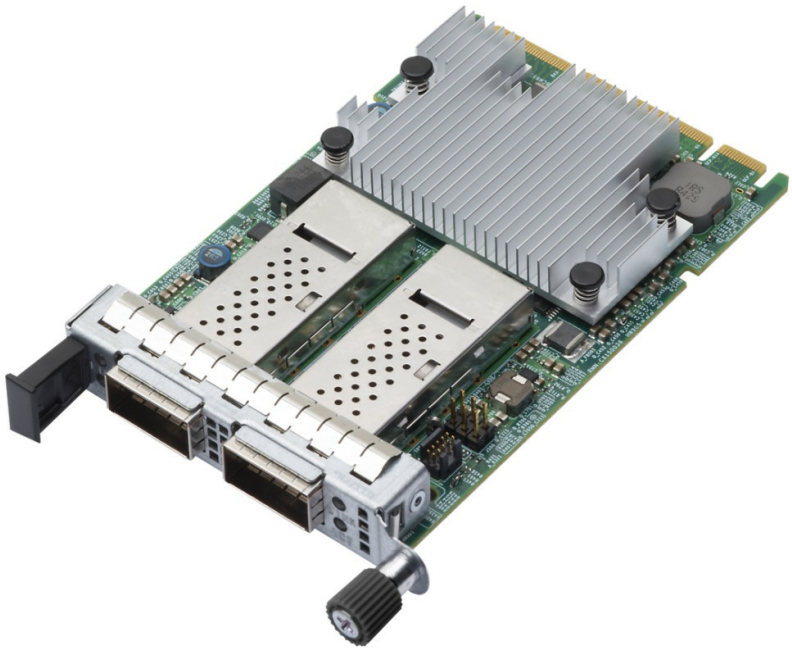

Figure 2. ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter

Supported transceivers and cables

The adapters have two empty QSFP56 cages for connectivity.

The following table lists the supported transceivers.

Table 2. Transceivers

Part number	Feature code	Description
100Gb transceivers		
7G17A03539	AV1D	Lenovo 100GBase-SR4 QSFP28 Transceiver
4M27A67042	BFH1	Lenovo 100Gb SR4 QSFP28 Ethernet Transceiver

The following table lists the supported fiber optic cables and Active Optical Cables.

Table 3. Optical cables

Part number	Feature code	Description
QSFP OM3 Optical Cables (these cables require a transceiver)		
00VX003	AT2U	Lenovo 10m QSFP+ MPO-MPO OM3 MMF Cable
00VX005	AT2V	Lenovo 30m QSFP+ MPO-MPO OM3 MMF Cable
QSFP28 100Gb Ethernet Active Optical Cables		
4Z57A10844	B2UZ	Lenovo 1m 100G QSFP28 Active Optical Cable
7Z57A03546	AV1L	Lenovo 3m 100G QSFP28 Active Optical Cable
7Z57A03547	AV1M	Lenovo 5m 100G QSFP28 Active Optical Cable
7Z57A03548	AV1N	Lenovo 10m 100G QSFP28 Active Optical Cable
7Z57A03549	AV1P	Lenovo 15m 100G QSFP28 Active Optical Cable
7Z57A03550	AV1Q	Lenovo 20m 100G QSFP28 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

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

Table 4. Copper cables

Part number	Feature code	Description
QSFP-to-QSFP Cables		
49Y7890	A1DP	1m QSFP+-to-QSFP+ cable
49Y7891	A1DQ	3m QSFP+-to-QSFP+ cable
00D5810	A2X8	5m QSFP+ to QSFP+ Cable
00D5813	A2X9	7m QSFP+ to QSFP+ Cable
QSFP28 100Gb 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

Features

Driven by the growing need for higher server bandwidth and storage capacity to support new and emerging applications (Machine Learning, HPC, Multi-node containers, NVMe, Web 2.0, NVMe storage disaggregation, HCI), enterprises, telcos and cloud providers are modernizing their data centers by adopting latest networking technologies, such as server virtualization and NVMe-oF™. The resulting expansion in data volumes increases server-to-server traffic and CPU loads for networking tasks.

With its market-leading hardware acceleration technologies, the ThinkSystem Broadcom 57508 100GbE adapters address these performance and service demands of mega-scale data center networks with high throughput and advanced flow processing. Features such as TruFlow™ increase VM density up to 50%, freeing more CPU cycles for additional virtual machines. On-chip tunneling protocol processing for Geneve, VXLAN, and NVGRE provides up to a 5X throughput increase while lowering CPU utilization up to 90 percent compared to software-only solutions.

The adapters have the following features:

- 2x 100GbE network connectivity for high availability features eliminating throughput bottlenecks for data-intensive applications
- Industry's best performing and longest-reach 50G PAM-4 / 25G NRZ SerDes dramatically lowering TCO by reducing cable costs by 50% and doubling port density
- PCIe 4.0 x16 support maximizing the full potential of servers compliant with the PCI Express 4.0 specification, providing seamless interoperability and doubling server throughput while saving PCIe lanes
- Third generation Broadcom TruFlow™ engine for intelligent flow processing to increase server VM density and accelerate vSwitch processing of traffic flows with data path Acceleration. TruFlow enables efficient network flow processing, increases Virtual Machine density by offloading the server CPU to improve application performance.
- RoCE (RDMA over Converged Ethernet), allows Remote Direct Memory Access (RDMA) traffic to be communicated over Converged Ethernet using DCB. GPU Compute over RoCE enables scalable GPU clusters up to hundreds of nodes using Ethernet for HPC, AI, and ML applications.
- Broadcom's Smart Congestion Control provides consistent and predictable performance for real world workloads plus scaling for heavily loaded network traffic making it ideal for clients looking for deterministic low latency.
- Broadcom adapters are the industry's most secure PCIe Ethernet controller solution, leveraging Broadcom's BroadSAFE® technology to provide unparalleled platform security via Silicon Root of Trust (RoT). Broadcom is the first Ethernet Adapter vendor to store authentication key and code in silicon to protect clients from maliciously modified firmware.
- Broadcom's TruManage™ enhances server manageability, network management, and security for data center deployments. TruManage supports widely deployed management standards including DMTF NC-SI, MCTP, PLDM, and SPDM specifications.
- Support for SR-IOV which bypasses the hypervisor, reducing the latency by removing data copies and context switches between VM address space and hypervisor address space, when transmitting or receiving data over the network. The implementation supports 802.1Qbg Edge Virtual Bridging (EVB).
- Support for Data Center Bridging (DCB), including IEEE 802.1Qbb Priority based Flow Control (PFC) and 802.1Qaz Enhanced Transmission Selection (ETS). DCB technology allows the device to provide lossless data delivery, prioritize low latency traffic, and share bandwidth among data center physical links.
- In-band Network Telemetry features provide end-to-end real-time monitoring capability, enabling data center operators to fine tune their networks for maximum performance.

Specifications

The adapter has the following technical specifications:

- Based on the Broadcom BCM57508 (2-port) controller
- Supports 100Gb/s connectivity; other speeds currently not supported
- PCIe 4.0 x16 host interface

- Available adapter form factors:
  - PCIe low profile form factor
  - OCP 3.0 SFF form factor
- Supports Message Signal Interrupt (MSI-X)
- Interrupt coalescing
- Two QSFP56 external connectors supporting a transceiver, direct-attach copper (DAC) cable or active optical cable (AOC).
- Network boot - PXE, UEFI
- Support for PXE boot (iSCSI boot and Wake-on-LAN (WOL) are not supported)
- Fully compliant with the SFF-8402 standard
- Networking Features
  - Jumbo frames (up to 9600-Byte)
  - 3x flow control
  - Link Aggregation (802.3ad)
  - Virtual LANs-802.1q VLAN tagging
  - Configurable Flow Acceleration
  - Advanced Congestion Avoidance
  - IEEE 1588 and Time Sync
  - Forward Error Correction Clause 74, Clause 91 support over 25 Gbps
- Performance Features
  - 100M Packet Per Second
  - Low latency
  - Bidirectional wire speed throughput
- Stateless Offload Features
  - TCP, UDP, IPv4, IPv6 checksum offloads
  - Large Send Offload (LSO)
  - Receive Segment Coalescing
  - TCP Segmentation offload (TSO)
  - Large Receive Offload (LRO)
  - Generic Receive Offload (GRO)
  - Receive Side Scaling (RSS)
  - Transmit Side Scaling (TSS)
  - Header-Payload Split
  - Accelerated Received Flow Steering (aRFS)
- Virtualization
  - vSwitch Acceleration
  - NetQueue, VMQueue, and Multiqueue
  - PCI SIG SR-IOV compliant with support for 1024 Virtual Functions
  - Virtual NIC (vNIC) / Network Partitioning (NPAR) with support for up to 16 Physical Functions
  - VXLAN-aware stateless offloads
  - NVGRE-aware stateless offloads
  - Geneve-aware stateless offloads
  - IP-in-IP-aware stateless offloads
  - GRE-aware stateless offloads
  - Per Virtual Function (VF) statistics
  - Virtual Ethernet Bridge (VEB)
  - Virtual Ethernet Port Aggregator (VEPA)
  - MAC/VLAN filtering and Mirroring
  - VF Isolation, Source pruning, Anti-spoofing checks
  - Stateless and packet steering offloads per VF
- RDMA over Converged Ethernet (RoCE)
  - RoCEv2

    - Data Center Bridging with RoCE
    - Reliable Connection (RC) Queue Pair
    - Unreliable Datagram (UD) Queue Pair
    - Raw Ethertype Queue Pair
    - Up to 1 million Queue Pairs
    - Up to 64K Shared Receive Queues
    - Up to 1 million Completion Queues
    - Up to 1 million Memory Regions and Memory Windows
    - Up to 1 million Protection Domains
    - Up to 256 outstanding RDMA Reads or Atomics per Queue Pair
    - Congestion Avoidance (hardware-based flows tracking and rate adjustment)
    - Fast Memory Register
    - Linux OFED 3.5 and later
    - MS-Windows Network Direct Kernel Provider Interface and SMBDirect
    - MS-Windows Network Direct Service Provider Interface
    - GPU Direct RDMA
    - MPI
- Integrated Flow Processing
    - Exact Match Flow Lookup
    - Wildcard Match Flow Lookup
    - VLAN insertion/deletion
    - VLAN PRI Edits
    - NAT/NAPT
    - Tunnel Encapsulation/De-capsulation
    - Flow tracking and aging
    - Mirroring
    - Metering
    - Flow counters/statistics
    - Custom tunnel header support
    - Connection tracking
- Data Center Bridging
    - Priority-based flow control (PFC; IEEE 802.1Qbb)
    - Enhanced transmission selection (ETS; IEEE 802.1Qaz)
    - Quantized Congestion Notification (QCN; IEEE 802.1Qau)
    - Data Center Bridging Capability eXchange (DCBX; IEEE 802.1Qaz)
    - Up to 8 traffic classes per port; fully DCB compliant per 802.1Qbb
- Manageability
    - TruManage Technology based on Distributed Management Task Force (DMTF) standards and protocols, support for NC-SI, MCTP, PLDM, and SPDM specifications
    - Management Component Transport Protocol (MCTP) – MCTP/SMBus 2.0 and MCTP/PCIe VDM
    - NC-SI – 1.1 spec compliance, both NC-SI/RBT and NC-SI/MCTP supported
    - PLDM – Monitoring and control, Firmware Update, NIC Model
    - SPDM 1.1 support for device attestation and firmware measurements
    - NIC Inventory, Monitoring and Control
    - Temperature reporting
    - Out-Of-Band Firmware update
    - Link and Media Management
    - In-Band Network Telemetry
- Power Saving
    - ACPI compliant power management
    - PCI Express Active State Power Management (ASPM)
    - PCI Express eCLKREQ support
    - PCI Express unused lane powered down

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 5. Server support (Part 1 of 3)

Part Number	Description	Edge		1S Intel V2			AMD V3			Intel V3				Dense V3				2S Intel V2			
		SE350 (7Z46 / 7D1X)	SE450 (7D8T)	ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	SR675 V3 (7D9Q / 7D9R)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)	ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR670 V2 (7Z22 / 7Z23)
4XC7A08297	ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	Y	Y
4XC7A08243	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N

Table 6. Server support (Part 2 of 3)

Part Number	Description	AMD V1					4S/8S V2			4S V1			Dense V2				1S Intel V1			
		SR635 (7Y98 / 7Y99)	SR655 (7Y00 / 7Z01)	SR655 Client OS	SR645 (7D2Y / 7D2X)	SR665 (7D2W / 7D2V)	SR850 V2 (7D31 / 7D32)	SR860 V2 (7Z59 / 7Z60)	SR950 (7X11 / 7X12)	SR850 (7X18 / 7X19)	SR850P (7D2F / 2D2G)	SR860 (7X69 / 7X70)	SD630 V2 (7D1K)	SD650 V2 (7D1M)	SD650-N V2 (7D1N)	SN550 V2 (7Z69)	ST50 (7Y48 / 7Y50)	ST250 (7Y45 / 7Y46)	SR150 (7Y54)	SR250 (7Y52 / 7Y51)
4XC7A08297	ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter	Y	Y	N	Y	Y	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N
4XC7A08243	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 7. Server support (Part 3 of 3)

Part Number	Description	2S Intel V1								Dense V1			
		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)
4XC7A08297	ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter	N	N	N	N	N	N	N	N	N	N	N	N
4XC7A08243	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter	N	N	N	N	N	N	N	N	N	N	N	N

Operating system support

The following table lists the supported operating systems:

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

Table 8. Operating system support for ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter, 4XC7A08297

Operating systems	SR630 V2	SR650 V2	SR670 V2	SR850 V2	SR860 V2	SR635	SR645	SR655	SR665
Microsoft Windows 10	N	N	N	N	N	N	N	Y [2]	N
Microsoft Windows 11	N	N	N	N	N	N	N	Y	N
Microsoft Windows Server 2016	Y	Y	Y	Y	Y	Y	Y	N	Y
Microsoft Windows Server 2019	Y	Y	Y	Y	Y	Y	Y	N	Y
Microsoft Windows Server 2022	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	N	N	N	N	N	Y [1]	Y [1]	Y [1]	Y [1]
Red Hat Enterprise Linux 7.9	Y	Y	Y	Y	Y	Y [1]	Y [1]	Y [1]	Y [1]
Red Hat Enterprise Linux 8.0	N	N	N	N	N	Y [1]	N	Y [1]	N
Red Hat Enterprise Linux 8.1	N	N	N	N	N	Y [1]	Y [1]	Y [1]	Y [1]
Red Hat Enterprise Linux 8.2	Y	Y	Y	Y	Y	Y [1]	Y [1]	Y [1]	Y [1]
Red Hat Enterprise Linux 8.3	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.4	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.5	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.6	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.7	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.0	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.1	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	N	N	N	N	N	Y [1]	N	N	N
SUSE Linux Enterprise Server 12 SP5	Y	Y	Y	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 15 SP1	N	N	N	N	N	Y [1]	Y [1]	Y [1]	Y [1]
SUSE Linux Enterprise Server 15 SP1 with Xen	N	N	N	N	N	Y [1]	Y [1]	Y [1]	Y [1]
SUSE Linux Enterprise Server 15 SP2	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP4	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP4 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ubuntu 18.04.5 LTS	Y	Y	Y	N	N	N	N	N	N
Ubuntu 20.04 LTS	Y	Y	N	N	N	N	N	N	N
Ubuntu 22.04 LTS	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U3	Y	Y	Y	N	N	Y	Y	N	Y
VMware vSphere Hypervisor (ESXi) 7.0	N	N	N	N	N	Y [1]	Y [1]	Y [1]	Y [1]
VMware vSphere Hypervisor (ESXi) 7.0 U1	N	N	N	Y	Y	Y [1]	Y	Y [1]	Y
VMware vSphere Hypervisor (ESXi) 7.0 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U3	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 8.0	Y	Y	Y	Y	Y	Y	Y	Y	Y

[1] The OS is not supported with EPYC 7003 processors.

[2] ISG will not sell/preload this OS, but compatibility and cert only.

Physical specifications

The PCIe adapter has the following dimensions:

- Length: 167 mm (6.6 in.)
- Height: 63 mm (2.5 in)

The OCP adapter has the following dimensions:

- Width: 76 mm (3 in.)
- Depth: 115 mm (4.5 in.)

Operating environment

The adapter is supported in the following environment:

- Temperature (operating): 0 to 55 °C (32 to 131 °F)
- Temperature (storage): -40 to 65 °C (-40 to 149 °F)
- Humidity: 5 to 95% non-condensing

Warranty

One-year limited warranty. When installed in a supported server, these adapters assume the server's base warranty and any warranty upgrade.

Agency approvals

The adapter conforms to the following standards:

- EN 55022:2010 + AC:2011 Class B (CE EU)
- EN 55024 Class B (EU)
- CFR47, Part 15 Class B (USA FCC)
- ICES-003 Class B (Canada)
- CNS13438 Class B (BSMI Taiwan)
- RRL KN22 Class B (S. Korea)
- KN24 (ESD) (S. Korea)
- V-3 / 2014 / 04 (VCCI Japan)
- EN 60950-1
- UL 60950-1
- CTUVus UL
- CSA 22.2 No. 950
- CNS14336 Class B
- ICES 003
- UL 1977 (connector safety)
- UL 796 (PCB wiring safety)
- UL 94 (flammability of parts)

Related publications

For more information, see the following resources:

- Networking Options for ThinkSystem Servers
  https://lenovopress.com/lp0765-networking-options-for-thinksystem-servers
- Lenovo ServerProven compatibility information:
  http://www.lenovo.com/us/en/serverproven/

Related product families

Product families related to this document are the following:

- 100 Gb Ethernet Connectivity
- Ethernet Adapters

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