ThinkSystem Emulex SecureHBA LPe37102/LPe38102 32Gb/64Gb Fibre Channel Adapters

Product Guide

The Lenovo ThinkSystem Emulex® SecureHBA Fibre Channel Adapters by Broadcom are designed to deliver the highest level of security, performance, and manageability for mission-critical infrastructures.

Cybersecurity is a focal point of enterprises and governments globally. The longstanding approach of protecting critical data via firewalls is no longer sufficient, and the combination of artificial intelligence (AI) and quantum computing magnifies the risk if data is not encrypted at all points in the data center including the network. Emulex Secure HBAs integrate the most robust quantum-resistant algorithms to ensure that encrypted data remains encrypted even as quantum computing and AI put legacy encryption at risk.

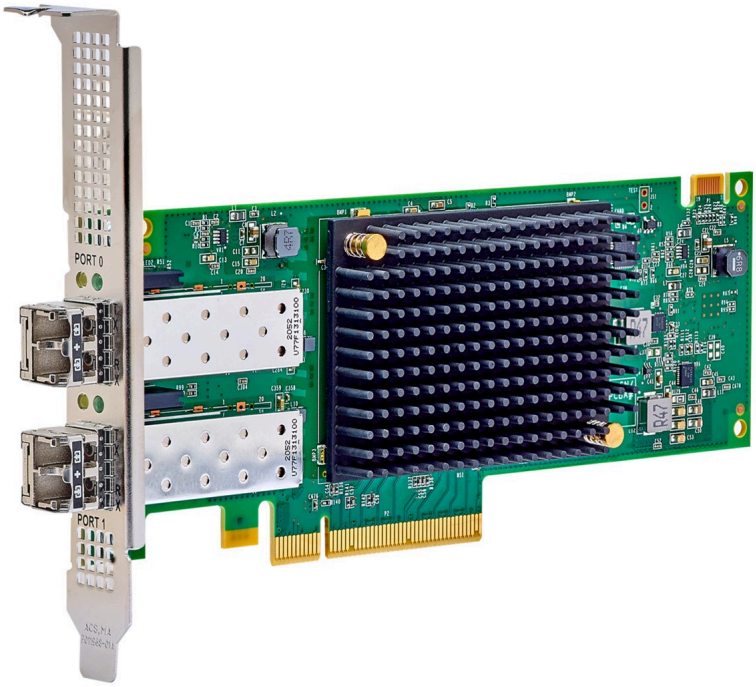

Figure 1. ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)

Did you know?

Emulex makes it easy to deploy, manage and upgrade SANs with no server reboots needed for firmware updates, queue depth changes, or optics replacements. The adapters implement the industry-standard INCITS/T11 specification, which includes full Fabric Performance Impact Notification (FPIN) and signaling support to collaborate with the fabric to identify and address performance problems.

Part number information

The following table lists the ordering information for the adapters.

Table 1. Part number information

Part number	Feature code	Description
4XC7A96457	C5FC	ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)
4XC7A96458	C5FD	ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)

The part number includes the following items:

- One adapter with two FC SW SFP+ optical transceivers installed
  - LPe37102 includes 2x 32Gb transceivers (32/16/8 Gbps speeds)
  - LPe38102 includes 2x 64Gb transceivers (64/32/16 Gbps speeds)
- 3U (full-height) bracket attached and 2U (low-profile) bracket included in the box
- Publications flyer

The following figure shows the ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW).

Figure 2. ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)

Fiber optic cables

The transceivers support the following Multi-Mode Fiber (MMF) cable lengths:

Note: A minimum cable length of 0.5m is required.

- Operating at 64 Gbps:
  - Up to 70 m on 50/125 µm OM3 MMF
  - Up to 100 m on 50/125 µm OM4 MMF
  - Up to 100 m on 50/125 µm OM5 MMF
- Operating at 32 Gbps:
  - Up to 20 m on 50/125 µm OM2 MMF
  - Up to 70 m on 50/125 µm OM3 MMF
  - Up to 100 m on 50/125 µm OM4 MMF
  - Up to 100 m on 50/125 µm OM5 MMF

The following table lists the supported optical cables.

Table 2. Optical cables

Part number	Feature code	Description	NVIDIA part number
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	-
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	-

Key features

Security

Today IT managers rely on Fibre Channel with field-proven security for the world's mission-critical data in banking, finance, health care, government, transportation, and military. FC offers air gap protection with no connectivity to vulnerable IP networks.

Emulex Secure HBAs introduce a cost-effective, easy-to-manage solution that encrypts all data in-flight (EDIF), protecting data as it moves across databases, applications, servers, and storage. Emulex Secure

HBAs integrate the most robust quantum-resistant algorithms to ensure that encrypted data remains encrypted even as quantum computing and AI put legacy encryption at risk.

The session-based key management solution, based on the emerging ANSI/INCITS FC-SP-3 standard, does not require complex and prohibitively expensive key management software. Compared to other encryption methods, such as application-based encryption, Emulex Secure HBAs can encrypt all applications, at a lower cost, and with no impact to storage array services such as compression, dedupe, and ransomware detection.

Performance

Compared to alternative approaches to network encryption that significantly impact application performance or limit the ability to compress or dedupe data, the Emulex Secure HBA delivers network encryption with better performance and no impact to storage services. The Emulex Dynamic Multi-core architecture delivers unparalleled performance and the most efficient port utilization with 8 fully redundant data engines and 16 threads that dynamically apply ASIC resources to any port that requires them, ensuring that SLAs are met.

Compared to Gen 6 HBAs, Emulex Gen 7 HBAs can support 64GFC to deliver up to 2x greater bandwidth. The Gen 7 HBAs deliver 12,800 MB/s (two 32GFC ports) or 25,600 MB/s (two 64GFC ports) full duplex; they deliver 3x better hardware latency; and the 64GFC LPe38100-series HBAs deliver industry-leading performance over 10 million IOPS.

LPe38100-series is available with dual 64GFC optics (installed) with backward compatibility to 32GFC and 16GFC networks. LPe37100-series is available with dual 32GFC optics (installed) with backward compatibility to 16GFC and 8GFC networks.

Operational Efficiency

Emulex Gen 7 HBAs offer enhanced reliability, availability, and serviceability (RAS), including port isolation and port-based error isolation that enable users to easily detect, isolate, and recover from errors.

Emulex HBAs fully support industry standards that enhance Broadcom® autonomous SAN innovations (Broadcom Autonomous Self-healing SANs) to self-learn, self-optimize, and self-heal, proactively keeping the SAN running at maximum speed and avoiding downtime. The new industry standards supported by Emulex HBAs around Fabric Performance Impact Notifications (FPINs) include Link Integrity notification (FPINLI), Congestion notification (FPIN-CN), Peer Congestion notification (FPIN-PN), and Delivery notification (FPIN-DN). The Emulex SAN Manager application is the first application in the industry to automatically identify, minimize, and mitigate application performance problems caused by SAN congestion by utilizing the FPIN-CN standard.

Emulex HBAs are easy to manage and save administrators time and operating costs with features such as no reboots for firmware updates, queue depth changes, or optics replacements. Emulex Gen 7 hot-plug (hot-swappable) optics enable optics to be removed and replaced without shutting down the system, allowing for uninterrupted service. The Emulex HBA Manager application provides centralized management of current and previous generations of Emulex FC HBAs. Emulex HBA troubleshooting is simplified with Emulex HBA Capture, an Emulex utility that gathers system, adapter, and device driver information. Data collected by HBA Capture is compressed into a single file and can be sent to Broadcom Technical Support for analysis when debugging system issues or for diagnostic purposes.

Emulex HBAs fully support the Brocade® Fabric Vision® suite of features, facilitating a solution from the switch to the server endpoints that have Emulex HBAs installed. Supported features include ClearLink™ (D_Port), Link Cable Beaconing, Host Name Registration, Read Diagnostic Parameters, VMID, BB Credit Recovery, FC Trace Route, FC Ping, REST APIs, and more. Visit www.broadcom.com for additional information on supported Fabric Vision features.

Technical specifications

Emulex Secure FC HBAs are powered by the XE701 SEC controller and use PCIe 4.0 x8 host connection. The architecture enables resources to be applied to any port that needs them, delivering up to 10M IOPS for Gen 7 64GFC HBAs.

Throughput:

- 32GFC: 6,400 MB/s full-duplex line rate per port
- 64GFC: 12,800 MB/s full-duplex line rate per port

Optical:

- Data rates, automatically detected:
  - 64GFC (28.9 Gbaud PAM4) (LPe38100-series only)
  - 32GFC (28.05 Gbaud NRZ)
  - 16GFC (14.025 Gbaud NRZ)
  - 8GFC (8.5 Gbaud NRZ) (LPe37100-series only)
- Optics: Short-wave lasers with LC-type connectors

Performance Features

- Support for NVMe/FC for lowlatency, high-performance, end-to-end NVMe/FC storage networks.
- Registration and support for FPINs and congestion signaling.
- Buffer-to-buffer credit recovery: automatic buffer credit loss detection and recovery for reliable performance.
- Frame-level multiplexing increases link efficiency and maximizes HBA performance.
- N_Port ID Virtualization (NPIV) increases network scalability by enabling a single FC adapter port to provide multiple virtual ports.
- Enhanced data protection is provided by T10 PI with highperformance offload. T10 PI provides additional data protection in environments such as Oracle Unbreakable Linux.

Industry Standards:

- Current ANSI/INCITS standards: FC-PI-8; FC-FS-6; FC-LS-5; FC-GS-9; FCP-5; FC-SP-2; FC-SP-3 INCITS 577-202x rev 3.04; SPC-5; SBC-4; SSC-5; FC-NVMe-2
- Legacy ANSI/INCITS standards: – FC-PI-1/2/3/4/5/6/7; FC-FS-1/2/3/4/5; FC-LS-1/2/3/4; FC-GS-1/2/3/4/5/6/7/8; FC-PH-1/2/3; FC-DA-1/2; FCP-2/3/4; FC-HBA; FC-TAPE; FC-MI; SPC-3/4; SBC-2/3; SSC-2/3/4; FC-NVMe with AM1
- DMTF management standards, specifications: – DSP0222 (NC-SI); DSP0261 (NCSI over MCTP Binding); DSP2037 (MCTP Packets and NC-SI over MCTP Overview); DSP0237 (MCTP SMBus/I2C Transport Binding); DSP0240 (PLDM Base Spec); DSP0248 (PLDM Platform Monitoring and Control); DSP0257 (PLDM for FRU Data); DSP0267 (PLDM for FW Update); DSP0274 (Security and Data Model, SPDM); DSP0275 (SPDM over MCTP Binding); DSP0266 (Redfish, RDE Spec)
- PCIe base spec 4.0
- PCIe card electromechanical spec 4.0
- UEFI 2.7

HBA Port Virtualization (NPIV):

- Support for NPIV

Logins, Exchanges

- Support for 2048 concurrent logins (RPIs) and 6000 active exchanges (XRIs) per port
- Boot from SAN (BFS)

Zero Trust Security Features:

- Secure boot and signed drivers
- Security Protocol and Data Model (SPDM)
- Post-Quantum Silicon Root of Trust (Leighton-Micali Signature, LMS)
- Data Encryption In-Flight (EDIF, AES-GCM-256)
- Support for Post-Quantum Digital Signature and Key Exchange Method (FIPS 203, 204)
- CNSA (Commercial National Security Algorithm Suite) Compliant

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 3. Server support - Current servers (Part 1 of 2)

Part Number	Description	AMD V3					2S Intel V3/V4						1S V3				4S 8S Intel V3/V4				
		SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	SD535 V3 (7DD8 / 7DD1)	ST650 V3 (7D7B / 7D7A)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR630 V4 (7DG8 / 7DG9)	SR650 V4 (7DGC / 7DGD)	SR650a V4 (7DGC / 7DGD)	ST45 V3 (7DH4 / 7DH5)	ST50 V3 (7DF4 / 7DF3)	ST250 V3 (7DCF / 7DCE)	SR250 V3 (7DCM / 7DCL)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SR950 V3 (7DC5 / 7DC4)	SR850 V4 (7DJT / 7DJS)	SR860 V4 (7DJQ / 7DJN)
4XC7A96457	ThinkSystem Emulex SecureHBA LPe37102 32Gb 2-Port PCIe Fibre Channel(Generic FW)	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y
4XC7A96458	ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)	N	N	N	N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	Y	Y

Table 4. Server support - Current servers (Part 2 of 2)

Part Number	Description	AI Servers					Edge		Super computing		
		SR675 V3 (7D9Q / 7D9R)	SR680a V3 B200 (7DM9)	SR685a V3 (7DHC)	SR780a V3 (7DJ5)	SR680a V4 (7DMK)	SE100 (7DGR)	SE455 V3 (7DBY)	SC750 V4 (7DDJ)	SC777 V4 (7DKA)	SD665 V3 (7D9P)
4XC7A96457	ThinkSystem Emulex SecureHBA LPe37102 32Gb 2-Port PCIe Fibre Channel(Generic FW)	N	N	N	N	N	N	N	N	N	N
4XC7A96458	ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW)	N	N	N	N	N	N	N	N	N	N

Operating system support

The following tables list the supported operating systems for the adapters:

- ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW), 4XC7A96457
- ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW), 4XC7A96458

ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW), 4XC7A96457

The following table lists the OS support for the ThinkSystem Emulex LPe37102 32Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW).

Table 8. Operating system support for ThinkSystem Emulex SecureHBA LPe37102 32Gb 2-Port PCIe Fibre Channel(Generic FW), 4XC7A96457

Operating systems	SR630 V4	SR650 V4/SR650a V4	SR850 V4	SR860 V4
Microsoft Windows Server 2025	Y	Y	Y	Y
Red Hat Enterprise Linux 9.5	Y	Y	N	N
Red Hat Enterprise Linux 9.6	Y	Y	Y	Y
Red Hat Enterprise Linux 9.7	Y	Y	Y	Y
Red Hat Enterprise Linux 9.8	Y	Y	Y	Y
Red Hat Enterprise Linux 9.9	Y	Y	Y	Y
Red Hat Enterprise Linux 10.0	Y	Y	Y	Y
Red Hat Enterprise Linux 10.1	Y	Y	Y	Y
Red Hat Enterprise Linux 10.2	Y	Y	Y	Y
Red Hat Enterprise Linux 10.3	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y	N	N
SUSE Linux Enterprise Server 15 SP7	Y	Y	Y	Y
SUSE Linux Enterprise Server 16	Y	Y	Y	Y
SUSE Linux Enterprise Server 16 SP1	Y	Y	Y	Y
Ubuntu 26.04 LTS or later with HWE kernel	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.0	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.1	Y	Y	Y	Y

ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW), 4XC7A96458

The following table lists the OS support for the ThinkSystem Emulex LPe38102 64Gb 2-port SecureHBA PCIe Fibre Channel Adapter(Generic FW).

Table 9. Operating system support for ThinkSystem Emulex SecureHBA LPe38102 64Gb 2-Port PCIe Fibre Channel ((Generic FW), 4XC7A96458

Operating systems	SR630 V4	SR650 V4/SR650a V4	SR850 V4	SR860 V4
Microsoft Windows Server 2025	Y	Y	Y	Y
Red Hat Enterprise Linux 9.5	Y	Y	N	N
Red Hat Enterprise Linux 9.6	Y	Y	Y	Y
Red Hat Enterprise Linux 9.7	Y	Y	Y	Y
Red Hat Enterprise Linux 9.8	Y	Y	Y	Y
Red Hat Enterprise Linux 9.9	Y	Y	Y	Y
Red Hat Enterprise Linux 10.0	Y	Y	Y	Y
Red Hat Enterprise Linux 10.1	Y	Y	Y	Y
Red Hat Enterprise Linux 10.2	Y	Y	Y	Y
Red Hat Enterprise Linux 10.3	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP6	Y	Y	N	N
SUSE Linux Enterprise Server 15 SP7	N	Y	Y	Y
SUSE Linux Enterprise Server 16	Y	Y	Y	Y
SUSE Linux Enterprise Server 16 SP1	Y	Y	Y	Y
Ubuntu 26.04 LTS or later with HWE kernel	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.0	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 9.1	Y	Y	Y	Y

SAN switches

Lenovo offers the ThinkSystem DB Series of Fibre Channel SAN switches for high-performance storage expansion. See the DB Series product guides for models and configuration options:

- ThinkSystem DB Series SAN Switches: https://lenovopress.com/storage/switches#rt=product-guide

Warranty

The adapters carry a one-year limited warranty. When installed in a supported server, the adapters assume the server's base warranty and any Lenovo Services warranty upgrade.

Physical specifications

The adapters have the following dimensions:

- Length: 168 mm
- Height: 69 mm

Operating environment

The adapters are supported in the following environment:

- Temperature:
  - Operating: 0 to 55 °C (32 to 131 °F)
  - Storage: -20 to 85 °C (-4 to 185 °F)
- Relative humidity: 5 - 95% (non-condensing)

Agency approvals

The adapters conform to the following regulations:

- North America
  - FCC/ICES Class A
  - UL/CSA Recognized
- Europe
  - CE Mark
  - UKCA Mark
  - EU RoHS Compliant
  - EU Low Voltage Directive
- Australia
  - RCM Class A
- Japan
  - VCCI Class A
- Korea
  - KCC Class A
- China
  - China RoHS Compliant
- Taiwan
  - BSMI Class A
  - BSMI RoHS Compliant

Related publications and links

For more information, see the following resources:

- Analyst report: "64 Gb Fibre Channel Performance with Lenovo ThinkSystem Emulex LPe36002 Gen 7 FC HBA"
  https://www.lenovo.com/us/en/resources/data-center-solutions/analyst-reports/64-gb-fibre-channel-performance-with-lenovo-thinksystem-emulex-lpe36002-gen-7-test-report/
- Lenovo ServerProven
  http://serverproven.lenovo.com
- Broadcom product pages:
  - LPe37102: https://www.broadcom.com/products/storage/fibre-channel-host-bus-adapters/lpe37102
  - LPe38102: https://www.broadcom.com/products/storage/fibre-channel-host-bus-adapters/lpe38102
- Emulex HBA Manager (formerly Emulex OneCommand Manager)
  https://www.broadcom.com/products/storage/fibre-channel-host-bus-adapters/emulex-hba-manager

Related product families

Product families related to this document are the following:

- Host Bus Adapters

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