

Emulex 16Gb Fibre Channel Adapters for Lenovo Flex System

Product Guide

The Emulex 16Gb Fibre Channel Adapter family for Lenovo Flex System enables the highest FC speed access for Flex System compute nodes to an external storage area network (SAN). These adapters are based on the proven Emulex Fibre Channel stack, and work with 16 Gb Flex System Fibre Channel switch modules.

As the only 4-port HBAs for Flex System and ThinkSystem respectively, the FC5054 and LPm16004B-L provide unmatched scalability and redundancy. In addition, these two 4-port adapters have two separate ASICs with no bridge chip, so data flows directly to an independent PCIe bus for high availability without a single point of failure.



Figure 1. Flex System FC5054 4-port 16Gb FC Adapter

Did you know?

You can deploy faster and manage less when you combine Host Bus Adapters (HBAs) and Virtual Fabric Adapters (VFAs) that are developed by Emulex. Lenovo HBAs and VFAs use the same installation and configuration process, streamlining the effort to get your system up and running, and saving you valuable time. They also use the same Fibre Channel drivers, reducing the time to qualify and manage storage connectivity. And with the Emulex HBA Manager (formerly named Emulex OneCommand Manager), you can manage Lenovo HBAs and VFAs that are developed by Emulex through the data center from a single console.

Part number information

The following table shows the ordering information.

Table 1. Ordering information

Part number	Feature code	Description
7ZT7A00521	AVCW	ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter

The following figure shows the Flex System FC5052 2-port 16Gb FC Adapter.



Figure 2. Flex System FC5052 2-port 16Gb FC Adapter

Features

When compared to the previous-generation 8 Gb adapters, the Generation 5 16Gb adapters deliver 6x the IOPS, improve response times by up to 75%, and deliver double the throughput speeds for Fibre Channel traffic. As a result, it is possible to support significantly more IOPS-driven workload and applications per HBA, reducing costs, power, and complexity.

The LPm16002B-L two-port 16Gb adapters have these features:

- 2-port 16 Gb Fibre Channel adapter
- Single-ASIC controller using the Emulex XE201 design
- Auto-Negotiate to 16Gb, 8Gb, or 4Gb
- Up to 1.2 million IOPS on a single port (six times more IOPS than previous generation 8Gb FC HBAs)
- Cuts response times by up to 75% and doubles the throughput compared to the previous generation 8Gb FC HBAs
- Exceeds 10 million hours mean time between failure (MTBF) with the most advanced data integrity protection (T10 PI) offload to protect against silent data corruption
- PCIe Express 3.0 x8 host interface (5 GTps)
- MSI-X support
- x86 Fibre Channel common driver model with other Emulex adapters
- Arbitrated loop (supported on 4Gb and 8Gb speeds only)

All adapters offer the following Fibre Channel features:

- Fibre Channel protocol SCSI (FCP-SCSI) and Fibre Channel Internet Protocol (FCP-IP).
- Point-to-point fabric connection: F-Port Fabric Login.
- Fibre Channel Arbitrated Loop (FC-AL) and FCAL-2 FL-Port Login.
- Fibre Channel services class 2 and 3.
- LUN Masking, an initiator-based LUN masking for storage traffic isolation.
- N_Port Id Virtualization (NPIV) allows multiple host initiator N_Ports to share a single physical N_Port, dramatically reducing SAN hardware requirements.
- FCP SCSI initiator and target operation.
- Full-duplex operation.

Server support

The following table lists the ThinkSystem and Flex System compute nodes that support the adapters.

Table 2. Support for ThinkSystem and Flex System compute nodes

Part number	Description	x240 (8737, E5-2600 v2)	x240 (7162)	x240 M5 (9532, E5-2600 v3)	x240 M5 (9532, E5-2600 v4)	x440 (7167)	x880/x480/x280 X6 (7903)	x280/x480/x880 X6 (7196)	SN550 (7X16)	SN850 (7X15)	SN550 V2
7ZT7A00521	ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter	N	N	N	N	N	N	N	Y	Y	Y

I/O module support

The adapters support the I/O modules that are listed in the following table. One or two compatible switches must be installed in the corresponding I/O bays in the chassis. Installing two switches means that all ports of the adapter are enabled.

The FC5022 switches include a base number of port licenses, 12 or 24, depending on the part number that is ordered. Switch port licenses for the FC5022 switches can be used for internal or external ports. Each two-port adapter requires one internal switch port for each of the two switches that are installed. Each four-port adapter requires two internal switch ports for each of the two switches that are installed. Additional ports might be needed depending on your configuration.

For more information, see the Product Guide for the Flex System FC5022 SAN Scalable Switch, available from <http://lenovopress.com/tips0870>.

Table 3. I/O modules that are supported by the Emulex 16Gb FC Adapters

Part number	Feature code	Description	16 Gb adapter support
69Y1930	A0TD	Flex System FC3171 8Gb SAN Switch	No
69Y1934	A0TJ	Flex System FC3171 8Gb SAN Pass-thru	No
88Y6374	A1EH	Flex System FC5022 16Gb SAN Scalable Switch	Yes
00Y3324	A3DP	Flex System FC5022 24-port 16Gb SAN Scalable Switch	Yes
90Y9356	A2RQ	Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch	Yes

The following table shows the connections between adapters that are installed in the compute nodes and the switch bays in the chassis.

Table 4. Adapter to I/O bay correspondence

I/O adapter slot in the server	Port on the adapter	Corresponding I/O module bay in the chassis
Slot 1	Port 1	Module bay 1
	Port 2	Module bay 2
	Port 3 (4-port only)	Module bay 1
	Port 4 (4-port only)	Module bay 2
Slot 2	Port 1	Module bay 3
	Port 2	Module bay 4
	Port 3 (4-port only)	Module bay 3
	Port 4 (4-port only)	Module bay 4
Slot 3 (x440 / p460 only)	Port 1	Module bay 1
	Port 2	Module bay 2
	Port 3 (4-port only)	Module bay 1
	Port 4 (4-port only)	Module bay 2
Slot 4 (x440 / p460 only)	Port 1	Module bay 3
	Port 2	Module bay 4
	Port 3 (4-port only)	Module bay 3
	Port 4 (4-port only)	Module bay 4

These adapters can be installed in any I/O adapter slot of a supported Flex System compute node. One or two compatible 16 Gb switch modules must be installed in the corresponding I/O bays in the chassis.

The connections between the 2-port adapters that are installed in the compute nodes and the switch bays in the chassis are shown in the following figure. The figure shows both half-wide servers, such as the SN550 with two adapters, and full-wide servers, such as the SN850 with four adapters.

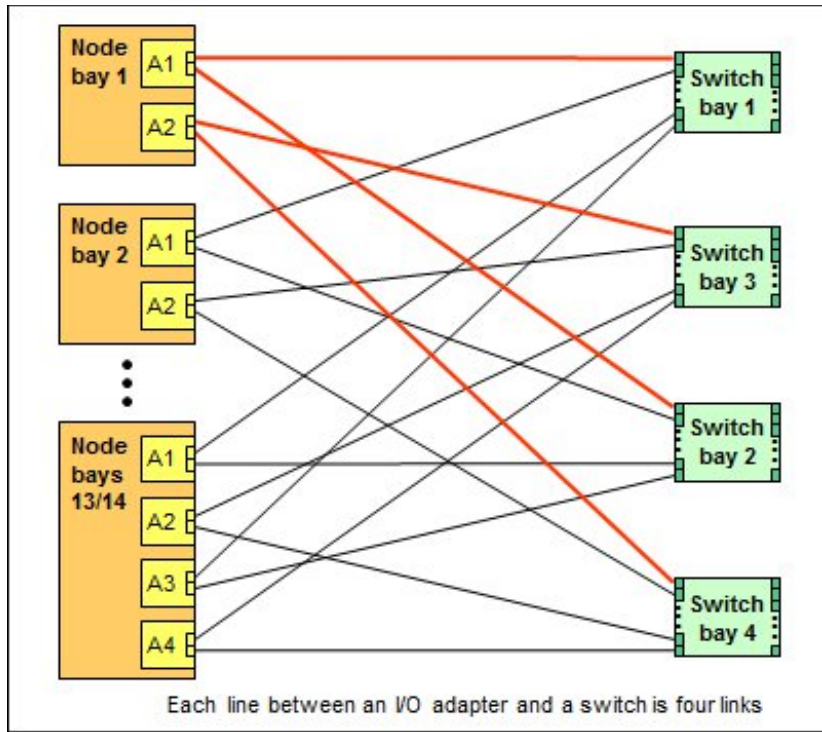


Figure 3. Logical layout of the interconnects between the 2-port adapters and I/O modules

The connections between the 4-port adapters that are installed in the compute nodes and the switch bays in the chassis are shown in the following figure.

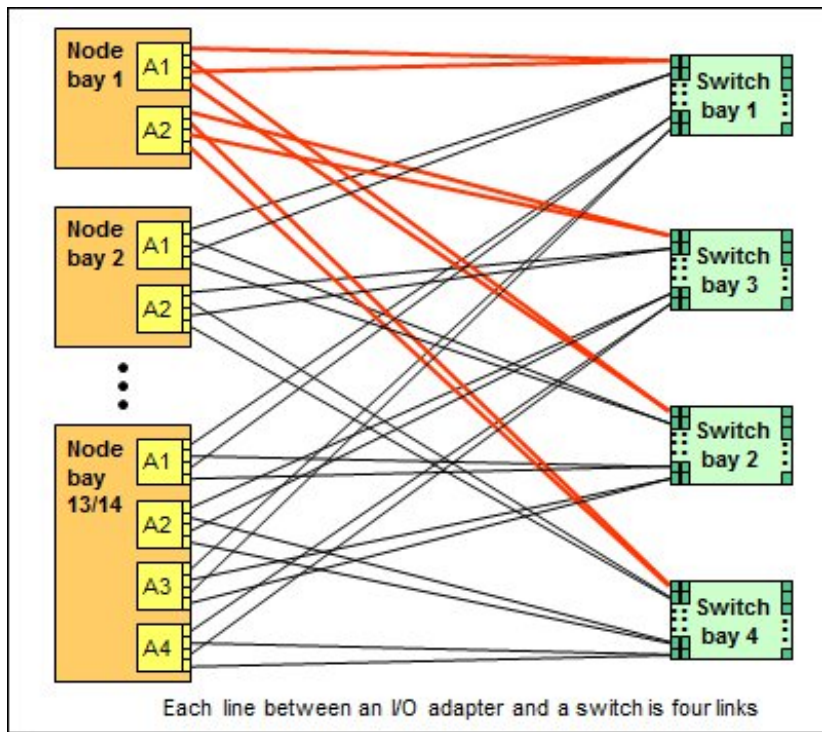


Figure 4. Logical layout of the interconnects between the 4-port adapters and I/O modules

Operating system support

Operating system support

The following tables list the operating system support:

- [ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter, 7ZT7A00521](#)

Table 5. Operating system support for ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter, 7ZT7A00521

Operating systems	SN550 V2	SN550 (Xeon Gen 2)	SN850 (Xeon Gen 2)	SN550 (Xeon Gen 1)	SN850 (Xeon Gen 1)
Microsoft Windows Server 2012 R2	N	N	N	Y	Y
Microsoft Windows Server 2016	N	Y	Y	Y	Y
Microsoft Windows Server 2019	Y	Y	Y	Y	Y
Microsoft Windows Server 2022	Y	Y	Y	Y	Y
Microsoft Windows Server version 1709	N	N	N	Y	Y
Microsoft Windows Server version 1803	N	N	N	Y	N
Red Hat Enterprise Linux 6.10	N	N	N	Y	Y
Red Hat Enterprise Linux 6.9	N	N	N	Y	Y
Red Hat Enterprise Linux 7.3	N	N	N	Y	Y
Red Hat Enterprise Linux 7.4	N	N	N	Y	Y
Red Hat Enterprise Linux 7.5	N	N	N	Y	Y
Red Hat Enterprise Linux 7.6	N	Y	Y	Y	Y
Red Hat Enterprise Linux 7.7	N	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	N	Y	Y	Y	Y
Red Hat Enterprise Linux 7.9	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	N	Y	Y	Y	Y
Red Hat Enterprise Linux 8.1	N	Y	Y	Y	Y
Red Hat Enterprise Linux 8.2	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.3	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.4	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.5	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.6	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.7	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 9.0	N	Y	Y	Y	Y
Red Hat Enterprise Linux 9.1	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 SP4	N	N	N	Y	Y
SUSE Linux Enterprise Server 11 SP4 with Xen	N	N	N	Y	Y
SUSE Linux Enterprise Server 12 SP2	N	N	N	Y	Y
SUSE Linux Enterprise Server 12 SP2 with Xen	N	N	N	Y	Y
SUSE Linux Enterprise Server 12 SP3	N	N	N	Y	Y

	SN550 V2	SN550 (Xeon Gen 2)	SN850 (Xeon Gen 2)	SN550 (Xeon Gen 1)	SN850 (Xeon Gen 1)
Operating systems					
SUSE Linux Enterprise Server 12 SP3 with Xen	N	N	N	Y	Y
SUSE Linux Enterprise Server 12 SP4	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4 with Xen	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5 with Xen	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1 with Xen	N	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2 with Xen	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3 with Xen	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP4	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP4 with Xen	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP5	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP5 with Xen	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 with Xen	N	Y	Y	Y	Y
Ubuntu 18.04.5 LTS	Y	N	N	N	N
VMware vSphere Hypervisor (ESXi) 6.0 U3	N	N	N	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5	N	N	N	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5 U1	N	N	N	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5 U2	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5 U3	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U1	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U2	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U3	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U1	N	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U2	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U3	Y	Y	Y	Y	Y

Warranty

There is a 1-year, customer-replaceable unit (CRU) limited warranty. When installed in a server, these adapters assume the server's base warranty and any warranty upgrade.

Physical specifications

The dimensions and weight of the adapters are as follows:

- Width: 100 mm (3.9 in.)
- Depth: 80 mm (3.1 in.)
- Weight: 13 g (0.3 lb)

Shipping dimensions and weight (approximate):

- Height: 58 mm (2.3 in.)
- Width: 229 mm (9.0 in.)
- Depth: 208 mm (8.2 in.)
- Weight: 0.4 kg (0.89 lb)

Regulatory compliance

The adapters conform to the following regulatory standards:

- United States FCC 47 CFR Part 15, Subpart B, ANSI C63.4 (2003), Class A
- United States UL 60950-1, Second Edition
- IEC/EN 60950-1, Second Edition
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1-03
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC 60950-1(CB Certificate and CB Test Report)
- Taiwan BSMI CNS13438, Class A
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A

Related publications

For more information, see the following resources:

- *Lenovo Flex System Products and Technology*
<http://lenovopress.com/sg248255>
- Flex System Interoperability Guide
<http://lenovopress.com/fsig>
- Flex System FC5022 SAN Scalable Switch product guide:
<http://lenovopress.com/tips0870>

Related product families

Product families related to this document are the following:

- [Blade Storage Adapters](#)

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This document, TIPS1044, was created or updated on October 12, 2022.

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