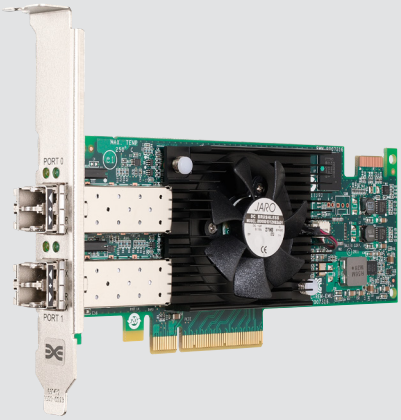
Product Brief

Emulex® LPe16000B/16002B

16G Fibre Channel HBAs for Dell



Key Benefits

- Maximum performance—up to 1.2 million input/output operations per second (IOPS) to support larger server virtualization deployments and scalable cloud initiatives, as well as performance to match new multicore processors, SSDs, and faster server host bus architectures
- Improves IT staff productivity through simplified deployment and management
- Reduces the number of cards, cables, and PCIe slots required
- Exceptional performance per watt and price/performance ratios
- Integrates seamlessly into existing SANs
- Allows application of SAN best practices, tools, and processes with virtual server deployments
- Assures data availability and data integrity

Simplified Networking, Maximum Performance, and Increased Business Agility

Exceptional price/performance, advanced management functionality that can shave days off installing and managing adapters, and 4x better IOPS performance per watt make the Dell 16Gb Fibre Channel (16GFC) host bus adapters (HBAs) the clear choice for the toughest virtualized, cloud, and mission-critical deployments.

Emulex 16GFC HBAs by Broadcom are compatible with the integrated Dell Remote Access Controller (iDRAC) with the Lifecycle Controller systems management solution. iDRAC7 with Lifecycle Controller technology allows administrators to deploy, monitor, manage, configure, update, troubleshoot, and remediate Dell servers from any location, and without the use of agents. It accomplishes this regardless of operating system, hypervisor presence, or state. Dell and Broadcom further extend this technology by including support for Emulex 16GFC HBAs; allowing administrators to configure, update, and monitor the adapters without the use of additional tools or agents.

The Dell single-port LPe16000B and dual-port LPe16002B feature the bullet-proof Emulex driver-stack, backward compatibility to 4GFC and 8GFC HBAs, and rock-solid reliability with a heritage that spans back to the first generation of Fibre Channel HBAs to today's 16GFC HBAs. Emulex HBAs are trusted by data centers the world over, with more than 12 million HBA ports shipped and installed to date.

Proven Design, Architecture, and Interface

Emulex HBA's highly integrated multicore processor minimizes onboard components to improve host performance and efficiency. Advanced error-checking features ensure the integrity of block data as it traverses the storage area network (SAN). This firmware-based architecture enables feature and performance upgrades without costly hardware changes.

The unique 4th Generation Service Level Interface (SLI®) allows use of a common driver across all models of Emulex HBAs on a given operating system (OS) platform. Installation and management facilities are designed to minimize server reboots and further simplify deployment.

Key Features

- Emulex Dynamic Multicore Architecture with eight cores supports 255 VFs, 1024 MSi-X, and 8192 logins/open exchanges for maximum VM density—up to 4x more than other adapters
- 2x management functionality, and takes half the time to manage with OneCommand® Manager
  - OneCommand Manager plug-in for VMware vCenter for centralized management of adapters within a VMware environment
- Reduces data center power consumption and associated OPEX by delivering exceptional power to port ratios
- T10-PI support protects against silent data corruption
- CPU offload lowers CPU burden on host server, enabling support for more VMs
- Rock-solid reliability and thermal characteristics, essential for mission-critical, cloud, and virtualized applications
- Support for Message Signaled Interrupts eXtended (MSI-X), improves host utilization and enhances application performance
- Support for 16GFC, 8GFC, and 4GFC devices
- Comprehensive virtualization capabilities with support for N_Port ID Virtualization (NPIV) and Virtual Fabric
- Host-to-fabric Fibre Channel Security Protocol (FC-SP) authentication
- Common driver model, allows a single driver to support all HBAs provided by Emulex on a given OS

Specifications

Industry Standards

- Current ANSI/IETF Standards: FC-PI-4; FC-PI-5; FC-FS-2 with amendment 1; FC-AL-2 with amendments 1 and 2; FC-LS-2; FC-GS-6; FC-DA; FC-SP-2; FCP-4; FC-MJS; FC-SB-4; FC-SP; SPC-4; SBC-3; SSC-3; RFC4338
- Legacy ANSI/IETF standards: FC-PH; FC-PH-2; FC-PH-3; FC-PI; FC-PI-2; FC-FS; FC-AL; FC-GS-2/3/4/5; FCP; FCP-2; FC-SB-2; FC-FLA; FC-HBA; FC-PLDA; FC-TAPE; FC-MI; SPC-3; SBC-2; SSC-2; RFC2625
- PCIe base spec 3.0
- PCIe card electromechanical spec 3.0
- Fibre Channel class 2 and 3
- PHP hot plug-hot swap

Architecture

- Single-port (LPe16000B) or dual-port (LPe16002B)
- Supports 16GFC, 8GFC and 4GFC link speeds, automatically negotiated
- Supports up to two FC ports at 16GFC max (dual-port model)
- Integrated data buffer and code space memory

Comprehensive OS Support

- Microsoft Windows
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- Oracle Solaris
- VMware vSphere
- Additional support is available from OEMs and partners

Hardware Environments

- Dell PowerEdge 13G Servers

Optical

- Data rates: 14.025 Gb/s (1600 Mb/s); 8.5 Gb/s (800 Mb/s); 4.25 Gb/s (400 Mb/s) (auto-detected)
- Optics: Short wave lasers with LC type connector
- Cable: Operating at 16 Gb
  - 15m at 16 Gb on 62.5 µm/125 µm OM1 MMF
  - 35m at 16 Gb on 50 µm/125 µm OM2 MMF
  - 100m at 16 Gb on 50 µm/125 µm OM3 MMF
  - 125m at 16 Gb on 50 µm/125 µm OM4 MF

Physical Dimensions

- Short, low profile MD2 form factor card
- 167.64 mm × 68.91 mm (6.60 in. × 2.71 in.)
- Standard bracket (low profile available)

Power and Environmental Requirements

Power Supply 1.8V, 1.2V, 0.9V

- Volts: +3.3, +12
- Operating temperature: 0°C to 55°C (32°F to 131°F)
- Storage temperature: −40°C to 70°C (−40°F to 158°F)
- Relative humidity: 5% to 95% non-condensing
- 23°C wet bulb

Agency and Safety Approvals

North America

- FCC/ICES Class A
- UL/CSA recognized

Europe

- CE Mark
- EU RoHS-compliant
- TUV Bauart-certified

Australia

- RCM

Japan

- VCCI Class A

Taiwan

- BSMI Class A

Korea

- KCC Class A

China

- China RoHS-compliant

Ordering Information

Dell 16GFC HBAs Available from Dell

- LPe16000B: One-Port 16GFC Short Wave Optical – LC SFP+
  - Part Number: 406-BBGW (full-height bracket)
  - Part Number: 406-BBGY (low-profile bracket)
- LPe16002B: Two-Port 16GFC Short Wave Optical – LC SFP+
  - Part Number: 406-BBGH (full-height bracket)
  - Part Number: 406-BBHF (low-profile bracket)

Added Features

Performance Features

- Doubling the maximum Fibre Channel link rate from 8GFC to 16GFC and enhanced virtualization capabilities, help support IT "green" initiatives
- Frame-level Multiplexing and out-of-order frame reassembly increases link efficiency and maximizes HBA performance

Data Protection Features

- End-to-end data protection with hardware parity, CRC, ECC, and other advanced error checking and correcting algorithms ensure data is safe from corruption
- Enhanced silent data corruption protection provided by T10 Protection Information (T10-PI)
- T10-PI provides additional protection against corruption in Oracle Unbreakable Enterprise Linux environments

Deployment and Management Featuress

- Universal boot capability allows the appropriate boot environment to be automatically selected for any given hardware
- Boot from SAN capability reduces system management costs and increases uptime
- Detailed, real-time event logging and tracing enables quick diagnosis of SAN problems
- Beaconing feature flashes the HBA LEDs simplifying their identification within server racks
- Environmental monitoring feature helps optimize SAN availability

Management Features

- The OneCommand Manager application enables centralized discovery, monitoring, reporting, and administration of Emulex HBAs on local and remote hosts. Powerful automation capabilities facilitate remote driver parameter, firmware, and boot code upgrades
- Advanced diagnostic features, such as adapter port beaconing and adapter statistics, help optimize management and network performance, while the environmental monitoring feature helps to maintain optimum host-to-fabric connections. In addition to the GUI interface, management functions can also be performed via a scriptable Command Line Interface (CLI) as well as a web browser
- Emulex's HBA management instrumentation complies to Open Management Standards, such as SMI-S and common HBA API support, which enables seamless upward integration into enterprise storage and server management solutions

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