EMULEX

DATASHEET

CONNECTIVITY

LightPulse®

LPe16000/LPe16002

HP SN1000E 16Gb Single Port Fibre Channel Host Bus Adapter - Part # QR558A
HP SN1000E 16Gb Dual Port Fibre Channel Host Bus Adapter - Part # QR559A

SIMPLIFIED NETWORKING, MAXIMUM PERFORMANCE AND INCREASED BUSINESS AGILITY

Exceptional price/performance, advanced management functionality that can shave days off installing and managing adapters, coupled with up to 3x better IOPS performance per watt, make Emulex LightPulse 16G Fibre Channel (16GFC) host bus adapters (HBAs) the clear choice for the toughest virtualized, cloud and mission critical deployments. The LightPulse single-channel LPe16000 (HP QR558A) and dual-channel LPe16002 (HP QR559A) feature the Emulex bullet-proof driver-stack, backward compatibility to 4 and 8G Fibre Channel HBAs and rock-solid reliability with a heritage that spans back to the first generation of Fibre Channel adapters to today's 16GFC adapters. Emulex is trusted by data centers the world-over, with more than 11 million HBA ports shipped and installed to date.

Proven Design, Architecture and Interface

The Emulex LightPulse highly integrated multi-processor design 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). Emulex's 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.

Powerful Management Software for Maximum Data Center Efficiency

The Emulex OneCommand™ Manager enterprise-class management application features a multi-protocol, cross-platform architecture, that provides centralized management of all Emulex HBAs and Universal Converged Network Adapters (UCNAs). This enables IT administrators to manage Fibre Channel (FC), Fibre Channel over Ethernet (FCoE), Internet Small Computer System Interface (iSCSI) and Network Interface Card (NIC) adapters with one tool for maximum efficiency. The unique OneCommand Manager plug-in for VMware vCenter™ enables adapters to be managed directly within the VMware environment, further simplifying the management process.

OneCommand™

Key Benefits

- Maximum performance—over 1 million input/output operations per second (IOPS) to support larger server virtualization deployments and scalable cloud initiatives, as well as performance to match new multi-core 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

Key Features

- vScale™ performance and scalability—multi-core ASIC engine 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
  - Unique OneCommand Manager plug-in for VMware vCenter for centralized management of adapters within a VMware environment
- GreenState™ power efficiency—reduces data center power consumption and associated OPEX by delivering exceptional power to port ratios
- vEngine™ 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 16G, 8G and 4G FC 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 Emulex HBAs on a given OS

LightPulse® LPe16000/LPe16002

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SPECIFICATIONS

Standards

General Specifications
· The host system interface of the XE201 controller consists of an eight-lane (x8) PCI Express PCIe 2.0 bus (backward compatibility to to PCIe 1.0 supported)

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 2.0
· PCIe card electromechanical spec 2.0
· Fibre Channel class 2 and 3
· PHP hot plug-hot swap

Architecture

· Single-channel (LPe16000) or dual-channel (LPe16002)
· Supports 16GFC, 8Gb FC and 4Gb FC link speeds, automatically negotiated
· Supports up to 2 FC ports at 16Gb FC max (dual port model)
· Integrated data buffer and code space memory

Comprehensive OS Support

· Windows
· Linux
· VMware ESX/ESXi

Hardware Environments

· HP Proliant ML & DL G7 Server Families, DL980 G7

Optical

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

Physical Dimensions

· Short, low profile MD2 form factor card
· 167.64mm x 68.91mm (6.60" x 2.71")
· Standard bracket (low profile available)

Power and Environmental Requirements

Power supply 1.8V, 1.2V, 0.9V
· Volts: +3.3, +12
· Operating temperature: 0° to 55° C (32° to 131° F)
· Storage temperature: -40° to 70° C (-40° to 158° F)
· Relative humidity: 5% to 95% non-condensing
· 23° C wet bulb

Agency and Safety Approvals

North America:
  - FCC Class A
  - UL/CSA Recognized
Europe:
  - CE Mark
  - EU RoHS compliant
  - TUV Bauart Certified
Japan:
  - VCCI Class A
Taiwan:
  - BSMI Class A
Korea:
  - MSIP (formally KCC/MIC) Class A
China:
  - China RoHS Compliant

(Please refer to the product page on www.emulex.com for further details)

HP Ordering Information

The LPe16000 and LPe16002 are available from HP. To order, use the following HP part numbers:

· QR558A
  - 1Port 16Gb Short Wave Optical – LC SFP+
· QR559A
  - 2 Ports 16Gb Short Wave Optical – LC SFP+

Added Features

Performance Features
· Doubling the maximum Fibre Channel link rate from 8Gb to 16Gb 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.

Deployment and Management Features
· 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 Emulex AutoPilot Installer automates the HBA installation process and significantly reduces time to deployment and administrative costs. Automated installation and configuration of driver and management tools simplifies deployment of multiple adapters within Windows environments. A single installation of driver and management application, eliminates multiple reboots and ensures that each component is installed correctly and the HBA is ready to use.
· The Emulex OneCommand™ Manager application enables centralized discovery, monitoring, reporting, and administration of Emulex HBAs and UCNAs 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. With in-band and out-of-band management capabilities, Emulex provides data center administrators with the greatest level of management flexibility.
· Emulex's 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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