

Nominee: Emulex Corporation

Nomination title: Emulex LightPulse LPe16000B-series 16Gb Fibre Channel Host Bus Adapter

The Emulex LightPulse® LPe16000B-series 16Gb Fibre Channel (16GFC) Host Bus Adapter (HBA) is the company's latest iteration of its highly-regarded LightPulse product line. With support for PCI Express (PCIe) 3.0, the LPe16000B 16GFC HBA provides market-leading I/O operations per second (IOPS) performance, while also offering extremely fast response times and a fourfold improvement on IOPS performance per watt.¹ Combined, these improvements have made the LPe16000B the preferred choice for a multitude of system builders and end user organisations looking to sell and implement solutions capable of handling the toughest virtualised, cloud and mission-critical storage and infrastructure deployments. With support for more than 1.2 million IOPS¹ on a single port, it is ideally suited for FC connectivity to the latest generation of solid state disk (SSD) arrays making their way into the mainstream marketplace, as well as new multi-core processors and virtualised mission-critical applications.

The LPe16000B-series 16GFC HBA features a high performance 8-core architecture that can flexibly scale resources between ports based on the resource requirement. A dual-port card can accommodate double the resources on a single port if needed, enabling service level agreements (SLAs) to be met- especially in peak-workload situations. This is in contrast to other 16GFC designs that cannot reallocate resources to other ports if needed--only applying half the IOPS on a port and putting SLAs at risk if a port fails because the other port cannot scale its resources to handle the workload required to meet SLAs. Its advanced management functionality can also shave days off installing and managing adapters, dramatically reducing not only the time and disruption associated with a new deployment or upgrade, but also the overall cost of implementation.

The LightPulse LPe16000B-series features the Emulex bullet-proof driver-stack, backward compatibility with 4GFC and 8GFC HBAs and proven reliability with a heritage that spans back to the first generation of FC. Emulex is trusted by system implementers, server manufacturers and data centre operators the world over, with more than 12 million HBA ports shipped and installed through the channel to date. Independent testing by Demartek lab released in February 2013² confirmed that LPe16000B-series adapters outperform those of its nearest competitor in throughput, CPU efficiency, reliability and power efficiency. As a result, Demartek concluded that the LPe16000B was the world's fastest HBA, offers superior performance for applications including email and database workloads, and has the highest published mean time between failures (MTBF), delivering enterprise class reliability, with a unmatched MTBF exceeding 10 million hours for the LightPulse family of HBAs (2,4,8 and 16GFC).

Key features: The LPe16000B-series offers a broad range of important features designed to improve the deployment and operational experience for customers looking to tackle the challenges posed by big data and the increasing importance of reliable I/O access to storage resources.

- **Firmware-based architecture:** With a software-driven architecture, the HBA can undergo feature and performance upgrades without costly hardware changes, simplifying the

upgrade process for end users and providing system builders and system implementers with a unique way to deliver added value to installed solutions.

- Integrated multi-processor design: The LPe16000B features a tightly condensed adapter design for improved performance, efficiency, power use and heat generation.
- Advanced integrated error-checking: On-board features ensure the integrity of block data as it traverses the storage area network (SAN).
- Fourth generation Service Level Interface (SLI™): By using a common driver core across all of Emulex's HBAs on the same operating system, server reboots can be kept to a minimum and deployment is simplified by requiring only one common driver payload.
- Comprehensive platform support: The LPe16000B-series and its driver stack ensures compatibility with key operating systems and hypervisors including Windows Server and Windows Hyper-V, VMware vSphere, multiple Linux distributions and Solaris LPe16000B is has in-box drivers for VMware vSphere 5.1 and Windows Server 2012.
- The Emulex OneCommand® Manager plug-in for VMware vCenter™ Server enables comprehensive native control of all LPe16000B and other adapters provided by Emulex within a single VMware's vCenter Server management console.
- Flexibility across VMware clients: Emulex OneCommand Manager plug-in for VMware vCenter Server supports both the new VMware vSphere 5.1 Web Client and the VMware vCenter Server desktop client with an identical feature set regardless of the client where other 16GFC HBAs do not offer a Web Client for vSphere 5.1

The LPe16000B-series also features:

- Improved link rate: Doubling the maximum FC link rate from 8GFC to 16GFC and enhanced virtualisation capabilities, help support green IT initiatives.
- Data protection and integrity: End-to-end data protection with hardware parity, CRC, ECC and other advanced error checking and correcting algorithms ensure data is safe from corruption.
- Universal boot capability: A key software architecture feature that allows the appropriate boot environment to be automatically selected for any given hardware, along with a Boot from SAN capability that reduces system management costs and increases uptime.

Management features include: The Emulex OneCommand Manager enterprise-class management application features a multi-protocol, cross-platform architecture that provides centralised management of all adapters provided by Emulex. This enables IT administrators to manage network connectivity with one tool in one dashboard for maximum efficiency and maximum awareness of the state of the network. Emulex OneCommand Manager enables centralised discovery, monitoring, reporting, and administration of Emulex storage and Ethernet adapters on local and remote hosts. Powerful automation capabilities facilitate remote driver parameter, firmware and boot code upgrades. Emulex's management instrumentation complies to open management standards, such as SMI-S and common HBA API support, enabling seamless upward integration into enterprise storage and server management solutions.

Key management features include:

- Advanced diagnostic features including adapter port beaconing and adapter statistics
- Network performance optimisation tools

- Environmental monitoring capabilities
- Scriptable Command Line Interface to automate management functions
- Web interface for remote and mobile management 1. Demartek Emulex LPe16000B 16Gb Fibre Channel HBA Evaluation, October 2012 2. Demartek, Emulex LPe16000B 16Gb Fibre Channel HBA Feature Comparison, December 2012

Why nominee should win

- Performance: LightPulse 16Gb HBAs enable a fourfold improvement on IOPS performance per watt, supporting more than 1.2 million IOPS on a single port
- Reliability: A proven driver stack built on a heritage of reliability, coupled with backward compatibility with legacy 4GFC and 8GFC HBAs
- Manageable I/O: LightPulse 16Gb HBAs can be managed from a single Emulex OneCommand Manager console
- Data Centre Simplicity: The adapters deliver consolidation benefits by enabling a reduction in cards, slots and cables
- Broad Platform Support: Support for a variety of physical and virtual OS environments including Windows Server, Hyper-V, VMware vSphere, multiple Linux distributions and Solaris