

Nominated Company: Emulex

Nomination Title: Emulex LightPulse® Gen 5 Fibre Channel Host Bus Adapters

The Emulex LightPulse® Gen 5 Fibre Channel (FC) (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 LPe16004 quad-port HBA maintains Emulex's reputation for market-leading I/O operations per second (IOPS) performance, with twice the IOPS of other 16GFC HBAs, while also offering extremely fast response times. Combined, these revisions have made the LPe16004 Gen 5 FC HBA 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 2.4 million IOPS per HBA, 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 LPe16004 Gen 5 FC HBA features a high performance multi-core architecture that can flexibly scale resources between ports based on the resource requirement. The HBA can accommodate double the resources on a single port if needed, delivering up to 1.2 million IOPS on a single port¹, 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 or a quarter of the total IOPS capability 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 LPe16004 Gen 5 FC HBA 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 to date.

Key features:

The LightPulse Gen 5 FC HBAs offer 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 LPe16004 Gen 5 FC HBA features a tightly condensed adapter design for improved performance, efficiency, power use and heat generation, while a low profile version (LPe15004) is also available for space-restricted chassis configurations.

- 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 Emulex 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 Emulex Gen 5 FC HBA 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.
- Emulex Gen 5 FC HBAs have in-box drivers for VMware vSphere 5.1 and Windows Server 2012.
- The Emulex OneCommand® Manager plug-in for VMware vCenter™ Server: This enables comprehensive native control of all Emulex Gen 5 FC HBAs and other adapters provided by Emulex within a single VMware 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 LightPulse Gen 5 series also features:
 - Increased virtual machine (VM) ratios: up to 4x the virtual ports (vPorts) and superior CPU efficiency.
 - Mission-critical application virtualisation: Emulex Gen 5 FC adapters are three times faster for Oracle Database and Two times faster for Microsoft SQL Server, based on independent testing .
 - 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 Feature Comparison, December 2012

2. <http://www.emulex.com/products/fibre-channel-hbas/emulex-branded/lightpulse-lpe16004/features.html>

3. Demartek HBA Evaluation (Dec. 2012)

Why nominee should win

- Support for more than 1.2 million IOPS on a single port where other 16GFC HBAs are constrained to half the IOPS per port
- A proven driver stack built on a heritage of reliability, backward compatibility with legacy 4GFC and 8GFC HBAs, and the highest published mean time between failures exceeding 10 million hours
- Emulex Gen 5 FC HBAs can be managed from a single Emulex OneCommand Manager console, enabling scalability and time-saving features
- The adapters deliver consolidation benefits by enabling a reduction in cards, slots and cables
- Emulex adapters support operation under a variety of physical and virtual OS environments