Overview

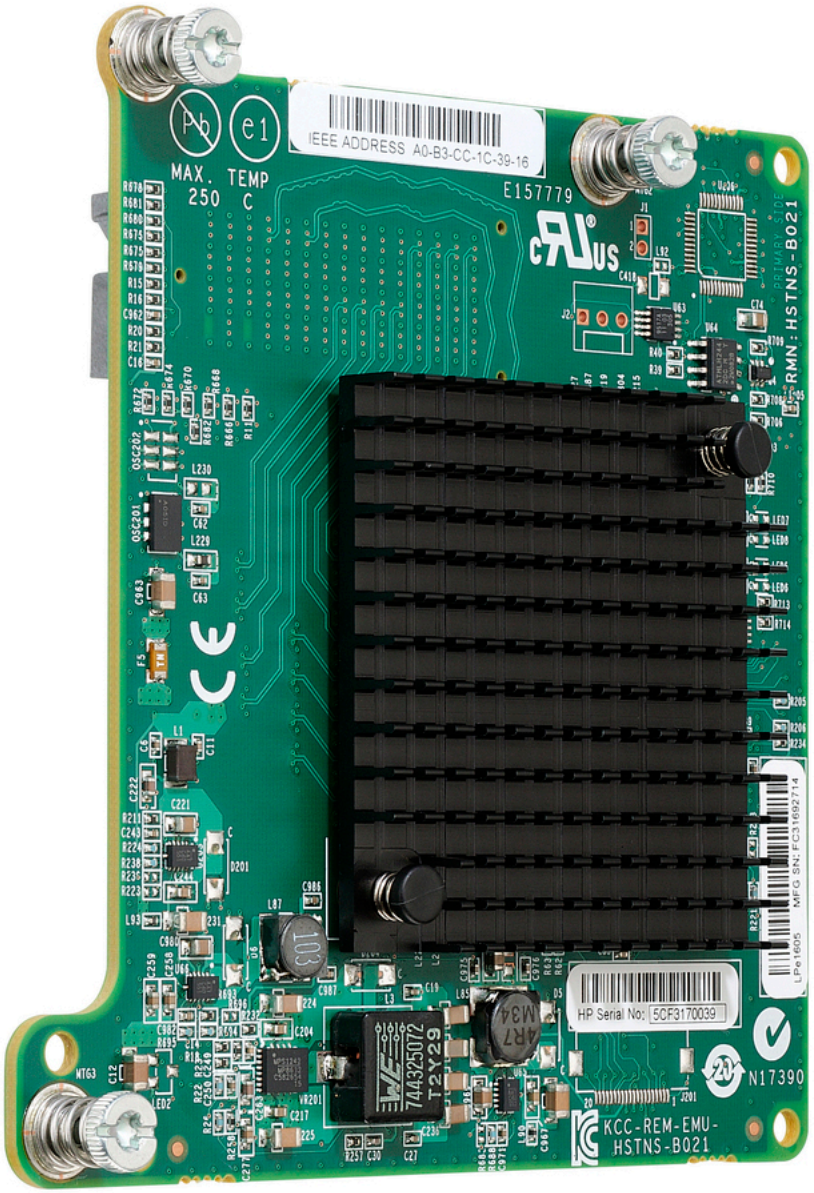
HPE LPe1605 16Gb Fibre Channel HBA for BladeSystem c-Class

Recommended SKU - This adapter is a recommended option that has been selected by HPE experts to provide the right technology for a range of workloads and market segments offering the best combination of performance, value and availability.

The Emulex LPe1605-HPE dual port Fibre Channel HBA provides reliable, high-performance connectivity at 8Gb/s and 16Gb/s. In addition to providing greater bandwidth, the HPE LPe1605 also provides features such as data integrity, security and virtualization which are all complimentary to initiatives important to the enterprise data center. For greater system up time, the HPE LPe1605 dual port design is the ideal Fibre Channel connectivity solution for applications that rely on high-availability for business continuity. The HPE LPe1605 leverages several generations of Fibre Channel design to provide the greatest level of performance, scalability and manageability. Emulex's exclusive firmware architecture allows firmware to be upgraded without taking the server off-line or rebooting, and without the need to upgrade the driver. This provides hardware investment protection and ensures maximizes system uptime. As with all Emulex LightPulse Fibre Channel HBAs, the HPE LPe1605 is managed with Emulex OneCommand™ Manager (OCM) HBA management application. OCM provides a secure, centralized administration console to discover, and manage Emulex Fibre Channel HBAs on local and remote hosts. Powerful diagnostic tools and flexible interface options (GUI, CLI and Browser) provide the greatest level of manageability. Fibre Channel is the de-facto standard for virtual server storage connectivity and Emulex HBAs are fully qualified for virtual server environments.

The HPE BladeSystem c7000 Platinum Enclosure is required to permit 16Gb/s speed. Other HPE BladeSystem c7000 Enclosures and HPE BladeSystem c3000 Enclosures will have a maximum speed of 8Gb/s.

Overview



HPE LPe1605 16Gb Fibre Channel HBA for BladeSystem c-Class

Platform Information

Models

HPE LPe1605 16Gb Fibre Channel HBA for BladeSystem c-Class	718203-B21

Kit Contents

HPE LPe1605 16Gb FC HBA
Quick install card
Product warranty statement

Compatibility - Supported Servers

16Gb c-Class HBA Mezzanine (Mezz) Card Applications
HPE ProLiant BL460c Gen9 Server
HPE ProLiant BL660c Gen9 Server
HPE ProLiant WS460c Gen9 Server
HPE ProLiant BL460c Gen10 Server

NOTE: The HPE LPe1605 16Gb FC HBA for HPE BladeSystem c-Class must be deployed with the BladeSystem c-Class infrastructure and will only work with the BL c-Class Server Enclosures.

NOTE: The HPE BladeSystem c7000 Platinum Enclosure is required to permit 16Gb/s speed. Other HPE BladeSystem c7000 Enclosures and HPE BladeSystem c3000 Enclosures will have a maximum speed of 8Gb/s.

NOTE: The HPE LPe1605 16Gb FC HBA for HPE BladeSystem c-Class is not compatible with 4Gb BladeSystem c-Class Fibre Channel interconnects.

NOTE: The HPE LPe1605 16Gb FC HBA for HPE BladeSystem c-Class is not compatible with HPE ProLiant G7 and earlier server blades.

NOTE: This is a Type A mezzanine card, and can be configured in either Type A or Type B slots on HPE ProLiant Gen8 Server Blades.

Interoperability - HPE Storage and Third Party Switches

16/8/4 Gb external Switches and Directors
Compatible with external Fibre Channel switches including Hewlett Packard Enterprise and third party vendors including Cisco and Brocade
Compatible with 8Gb and 16Gb HPE BladeSystem c-Class Fibre Channel switches and Virtual Connect Modules
For details on supported HPE Fibre Channel SAN Switches, please consult the SAN Design Reference Guide at the following WEB address: **http://www.hpe.com/support/san-documentation**.

Standard Features

At a Glance Features

- Comprehensive virtualization capabilities with support for N-Port ID Virtualization (NPIV) and Virtual Fabric
  - Support for up to 255 VPorts improves server consolidation capabilities and asset utilization
- Superior performance capable of sustaining up to 1.2 Million I/Os per second per channel
  - Delivers the performance needed for high transaction data base environments (ie: Oracle, SQL Server, etc)
- Host to Fabric FC-SP authentication
  - Provides advanced security protecting the SAN from potential threats such as WWN spoofing, compromised servers etc.
- BlockGuard™ ready (T10-DIF) - ensures end-to-end data integrity
- Common driver model allows a single driver to support all Emulex HBAs on a given OS
- Easy deployment of new firmware with minimal server reboots
- Efficient centralized administration of Emulex HBAs via powerful management tools
- 16 and 8 Gb/s Fibre Channel link speed support
- Full fabric support with automatic topology and auto-negotiation
- Message Signaled Interrupts eXtended (MSI-X) Support for Greater Host CPU Utilization
  - Streamlines interrupt routing to improve overall server efficiency
- Multi-Path support for redundant HBAs and paths
- Support FC-Tape devices
- Operating Systems and Virtualization Software Supported: Windows Server 2008, Windows Server 2012, Windows Server 2012 R2, VMware 5.0, RHEL 5, RHEL 6, RHEL 7, SLES 11, Citrix, UEK, Solaris 10 x86

Cost-savvy

- Emulex installation and management tools automate installation and provide local and remote HBA configuration and management, therefore reducing cost of HBA installations across the enterprise.
- Emulex's automated installation facilities and extensive management capabilities speed HBA deployment and device management, while reducing administration costs and protecting IT investment.
- Emulex HBAs feature a firmware upgradeable architecture for long-term investment protection, feature and performance upgrades and seamless backward compatibility.

Change-ready

- Fully compatible with Virtual Connect.
- Emulex's unique Service Level Interface (SLI) architecture allows complete independence between HBA hardware, firmware and drivers. That means no reboots during configuration changes and no need for OS specific firmware. A single driver model simplifies management and upgrades across multiple generations of HBAs.
- Powerful automation capabilities facilitate remote driver parameter, firmware and boot code upgrades. Advanced diagnostic features such as HBA beaconing and HBA statistics help to 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.

Standard Features

Energy-thrifty	• Increasing the Fibre Channel link rate to 16Gb/s provides greater bandwidth as a percentage of power consumed. • Enhanced virtualization capabilities (NPIV and Virtual Fabric improves server consolidation capabilities and asset utilization. • Frame-level Multiplexing and out-of-order frame reassembly increases link efficiency and maximizes HBA performance.
Time-smart	• A common driver model amongst all Emulex HBAs enables a customer to standardize on one driver version across their entire installed base - thus reducing the cost and complexity of managing all HBAs. • Superior Quality and Reliability- Emulex HBAs deliver industry-leading reliability levels which minimizes downtime and increases productivity. • Emulex LightPulse HBA management capabilities enable secure, centralized discovery, monitoring, reporting, and administration of Emulex HBAs on local and remote hosts. • With in-band and out-of-band management capabilities, Emulex provides data center administrators with the greatest level of management flexibility.
Superior Quality and Reliability	Emulex HBAs deliver industry-leading reliability levels by utilizing a field-proven, single-chip design that minimizes components. Emulex HBAs also use a combination of parity, CRC, ECC and other advanced error checking methods to verify the integrity of data blocks, which are passed from the host interface through the HBA.
The Most Efficient Installation and Management	Emulex management tools automate installation and provide local and remote HBA configuration and management. Emulex's unique Service Level Interface (SLI™) architecture allows complete independence of device drivers from HBA hardware and firmware. That means no reboots during most configuration changes and no need for OS specific firmware. A single driver model simplifies management across multiple generations of HBAs. In addition, Emulex HBAs have a firmware-based architecture that enables feature and performance upgrades without costly hardware changes, for long-term investment protection and seamless backward compatibility.
Maximum SAN Performance	Emulex HBAs deliver maximum performance levels in real-world application environments, with superior fullduplex data throughput and I/Os per second. And Emulex's exclusive Dynamic Frame Multiplexing ensures consistently superior performance in mixed load environments such as disk and tape back-up applications.
The Fastest Diagnosis and Recovery	Comprehensive diagnostic functions, coupled with detailed event logging and tracing, provide for fast, efficient SAN troubleshooting.
The Broadest Enterprise Deployment	With the largest installed base of any Fibre Channel HBA supplier, Emulex is trusted by the world's largest, mission critical enterprises. Long-standing partnerships with leading storage vendors ensure unparalleled compatibility levels.

Standard Features

Software Features

A rich suite of management tools complements the LightPulse family of enterprise Fibre Channel HBAs. As a centralized management suite, HBAnyware incorporates agent technology that provides discovery, reporting and management of local and remote HBAs with both in-band Fibre Channel and out-of-band IP support, enabling sophisticated management capabilities such as remote firmware upgrades and advanced diagnostics from a single console anywhere in the SAN.

All Emulex device drivers are fully compatible with previous generations of Emulex host bus adapters. A single driver binary supports all Emulex HBAs on a given host platform, streamlining the management of device drivers in environments with multiple generations and versions of HBAs, simplifying the upgrade process, and providing investment protection.

NOTE: For the latest Driver and Operating System options, please visit: **http://h17007.www1.hpe.com/us/en/enterprise/servers/supportmatrix/redhat_linux.aspx#.V4e8tPkrJD8**.

Warranty

Maximum: The remaining warranty of the HPE product in which it is installed (to a maximum three-year, limited warranty).

Minimum: One year limited warranty.

NOTE: Additional information regarding worldwide limited warranty and technical support is available at: **http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty/index.aspx#.V4e3tPkrJhE**

Service and Support

Service and Support	**NOTE: This adapter is covered under HPE Support Services/ Service Contract applied to the HPE ProLiant Server or enclosure. No separate HPE Support Services# need to be purchased.** Most HPE branded options sourced from HPE that are compatible with your product will be covered under your main product support at the same level of coverage, allowing you to upgrade freely. Additional support is required on select workload accelerators, switches, racks and UPS options 12KVA and over. Coverage of the UPS battery is not included under HPE support services; standard warranty terms and conditions apply.
Warranty and Support Services	Warranty and Support Services will extend to include HPE options configured with your server or storage device. The price of support service is not impacted by configuration details. HPE sourced options that are compatible with your product will be covered under your server support at the same level of coverage allowing you to upgrade freely. Installation for HPE options is available as needed. To keep support costs low for everyone, some high value options will require additional support. Additional support is only required on select high value workload accelerators, fibre switches, InfiniBand and UPS options 12KVA and over. Coverage of the UPS battery is not included under TS support services; standard warranty terms and conditions apply.
Protect your business beyond warranty with HPE Support Services	HPE Technology Services delivers confidence, reduces risk and helps customers realize agility and stability. Connect to HPE to help prevent problems and solve issues faster. HPE Support Services enable you to choose the right service level, length of coverage and response time as you purchase your new server, giving you full entitlement to the support you need for your IT and business. Protect your product, beyond warranty.
Parts and Materials	Hewlett Packard Enterprise will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements. Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services. The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by Hewlett Packard Enterprise due to malfunction.
For more information	Visit the Hewlett Packard Enterprise Service and Support **website**.

Technical Specifications

System Unit	**Dimensions (L x W)**	3.5 in x 3.9 in
Power and Environmental Specifications	**Media**	N/A (Always connects to BladeSystem interconnect module)
	Ports	Two
	Power	11.3 W Max
	Temperature - Operating	10° to 70°C (55° to 158°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 10°C/hr (18°F/hr). The upper limit may be limited by the type and number of options installed. System performance may be reduced if operating with a fan fault or above 30°C (86°F).
	Temperature - Non-Operating	-30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr).
	Humidity - Operating	10 to 90% relative humidity (Rh), 28°C (82.4°F) maximum wet bulb temperature, non-condensing.
	Humidity - Non-operating	5 to 95% relative humidity (Rh), 38.7°C (101.7°F) maximum wet bulb temperature, non-condensing.
	Altitude - Operating	3050 m (10,000 ft). This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
	Altitude - Non-operating	9144 m (30,000 ft). Maximum allowable altitude change rate is 457 m/min (1500 ft/min).
Environment-friendly Products and Approach - End-of-life Management and Recycling	Hewlett Packard Enterprise offers end-of-life **product return, trade-in, and recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner. The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the **Hewlett Packard Enterprise web site**. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.	

Summary of Changes

Date	Version History	Action	Description of Change
02-Apr-2018	Version 8	Changed	At a Glance Features Section was updated
05-Feb-2018	Version 7	Changed	Overview section was updated
17-Jul-2017	Version 6	Changed	Compatibility section was updated.
26-May-2017	Version 5	Changed	Match Product Bulletin version.
10-Feb-2017	Version 4	Changed	Products Highlights, Compatibility, Service and Support, Technical Specifications sections were updated.
26-Oct-2016	Version 3	Changed	Re-branding edition.
24-Apr-2015	Version 2	Changed	Service and Support section was updated.
18-Feb-2014	Version 1	Changed	Initial version.

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