BROCADE FIBRE CHANNEL HOST BUS ADAPTERS FREQUENTLY ASKED QUESTIONS

Overview

Brocade® solutions enable organizations to better connect, consolidate, and manage their IT resources, and server connectivity is a critical element for the delivery of high-performance, simplified, end-to-end data center management. Brocade Fibre Channel Host Bus Adapters (HBAs) represent a new class of server connectivity products that is interoperable with the vast majority of the world's Storage Area Network (SAN) switch ports and that can leverage Brocade Advanced Fabric Services functionality. As a result, these HBAs provide high-performance, reliable, enterprise-class server connectivity.

- For more information, visit www.brocade.com/hba.

General Questions and Answers

Q **What are the Brocade HBA products?**

A Brocade HBAs are a new class of server connectivity products that supports feature-rich 8 Gbps and 4 Gbps Fibre Channel connectivity.

Designed to meet the growing connectivity, virtualization, and operating efficiency demands of enterprise data centers, these HBAs provide breakthrough performance, a highly robust services platform, seamless interoperability across fabrics and networking protocols, and built-in extensibility. Brocade HBA products include:

- **Brocade 415:** 4 Gbps PCIe 2.0 (x8) Fibre Channel single-port HBA (BR-415-0010)
- **Brocade 425:** 4 Gbps PCIe 2.0(x8) Fibre Channel dual-port HBA (BR-425-0010)
- **Brocade 815:** 8 Gbps PCIe 2.0 (x8) Fibre Channel single-port HBA (BR-815-0010)
- **Brocade 825:** 8 Gbps PCIe 2.0 (x8) Fibre Channel dual-port HBA (BR-825-0010)
- **Brocade 804:** 8 Gbps PCIe 2.0 (x8) Fibre Channel dual-port mezzanine HBA for HP BladeSystem c-Class family of blade servers

Q **When did these products become available?**

A The Brocade 415, 425, 815, and 825 HBAs have been generally available since June 2008 through Brocade Distributors and Resellers.

Q Are these products available from Brocade OEMs?

A Brocade HBAs are currently available through most major Brocade OEM Partners, including IBM, HP, Dell, EMC, and HDS.

The Brocade 804 HBA for HP BladeSystem c-Class became available through HP on June 21, 2010.

(NOTE: The Brocade 4 Gbps HBAs are not available through some OEMs.)

Q Why did Brocade enter the HBA market?

A Building on a strategy of growth and diversification, Brocade is addressing the problem of increased data center operational complexity resulting from increased server virtualization. Brocade is also broadening its evolving data center fabric offerings with server connectivity that combines industry-leading end-to-end performance with reduced total cost of ownership and simplified infrastructure management.

Q How does this market entry fit into the overall Brocade strategy?

A The Brocade server connectivity solution suite is an integral component of the Brocade One™ strategy, which is designed to help organizations dramatically increase the utilization of their server and storage assets while simplifying infrastructure provisioning, management, and fault isolation. As data centers become increasingly virtualized, organizations will require unified touch points throughout the storage network to deliver and manage advanced storage services. Brocade server connectivity products are a key element in building uniform infrastructures that provide end-to-end consistency in architecture, product design, and integrated microcode throughout the fabric to support new data center services. In addition:

- Brocade provides high-performance and high-availability storage data access; fabric extensibility and robustness; and streamlined fabric management for the most demanding business applications.
- Brocade has been leading the evolution of data centers by delivering highly reliable, high-performance core data center products and services for over a decade.
- The Brocade vision is aligned with current data center needs, with a singular focus on securely managing, sharing, and protecting data.
- Key elements of this vision are to simplify data networks and provide the foundation for critical solutions—such as server virtualization, data mobility, and data protection—that run seamlessly across fabrics without the burden of costly manual intervention or performance bottlenecks.
- Server connectivity plays a crucial role in the success of this end-to-end vision, and will help Brocade provide high-performance hardware and software products with feature interoperability.

Q What does Brocade mean by "end to end?"

A "End to end" means from the server initiator to the storage target in a SAN. However, with the advent of server virtualization, "end to end" more precisely means from the virtual server rather than just the physical server connection.

Given the complex connectivity configuration required to maintain high availability, low latency, and data reliability in shared storage environments, adding the application and workload mobility of a virtualized infrastructure increases the management burden.

To deliver on the cost reduction and improved efficiency promises of consolidation and virtualization, organizations can reduce their growing operational costs through a comprehensive approach to managing the virtual infrastructure. This requires an extension of Brocade Advanced Fabric Services from the SAN to the Virtual Machines (VMs), where server-side analysis and remediation tools can be directly applied to alleviate congestion or allocate bandwidth to data streams based on proactive, automated policies.

Q What is Brocade Adaptive Networking?

A Brocade Adaptive Networking is a suite of tools for optimizing fabric behavior and ensuring ample bandwidth for mission-critical applications. Among these tools, Quality of Service (QoS) helps organizations meet mission-critical Service Level Agreements (SLAs) by prioritizing traffic flows within the fabric and thus reducing or eliminating the effects of congestion in the SAN. QoS leverages Brocade Virtual Channel (VC) technology to assign different priorities to differentiated traffic flows. Additionally, VCs also isolate those traffic flows to protect the data and relieve congestion. Brocade Adaptive Networking is a licensed feature on Brocade switches, directors, and backbones.

Q What is Brocade Server Application Optimization?

A Brocade Server Application Optimization (SAO) is a technology that enables the extension of Brocade Advanced Fabric Services from Brocade fabrics all the way to the server and VM levels. With Brocade SAO, organizations can extend QoS from the fabric to the application level to provide virtualization-aware networking services. N_Port Trunking with frame-level hardware-based load balancing is another feature that can be extended to the host through Brocade SAO. Organizations need to install a Brocade SAO license on the edge switch connected to the Brocade HBAs in order for these features to be extended.

Q How will users benefit from Brocade HBAs?

A Key benefits include:

- **Superior application performance:** In an IBM 8 Gbps end-to-end performance test, Brocade HBAs achieved more than 315,000 sustained average I/Os Per Second (IOPS) at 4 KB block size and 50 percent read/write I/O distribution (typical e-mail workload), and 175,000 IOPS at 8 KB block size (typical database workload)—up to 2.7 times better than the competition. Higher, power-efficient performance and scalability help support simultaneous mission-critical workloads per HBA, which is critical to meet the increased performance demands of a highly virtualized data center.
- **Virtualization-aware services:** End-to-end manageability features are extended from the fabric to virtual servers. With 255 virtual N_Port ID Virtualization (NPIV) ports and broad hypervisor support, Brocade HBAs are the only adapters that can extend vital fabric services to the application level while enabling transparent VM mobility. Brocade SAO leverages VC technology to provide three distinct priority levels (low/medium/high), which are enforced at the ASIC level to provide dedicated bandwidth for maintaining application service levels.
- **Unified management:** A unified management stack simplifies HBA installation, configuration, and management, coupled with the simplicity of single-vendor server-to-SAN support that is tested and qualified for interoperability with Brocade HBAs and fabrics:
  - Brocade Network Advisor provides unified management of server connectivity and fabric resources, including HBAs, switches, directors, and backbones—all from a single, central location within and across data centers. It provides end-to-end VM-to- LUN path visibility by integrating with third-party management tools from storage, server, and virtualization hypervisor vendors.
  - Brocade Host Connectivity Manager (HCM) provides element management of Brocade adapters—including SFP diagnostics, FC-Ping, FC-Traceroute, and Port Beaconing—to verify device paths, connectivity, and physical rack location.
  - Fabric-based boot LUN discovery enables servers to retrieve boot LUN information from the fabric at boot time, allowing organizations to fully reap the benefits of diskless server deployments by automating and simplifying SAN boot configuration and ongoing management.

Q What operating systems are supported?

A Drivers are provided for Microsoft Windows, Microsoft Hyper-V, Red Hat Linux, Xen for Red Hat, Novell SUSE Linux, Xen for SUSE, Oracle Linux, Oracle Solaris, Oracle VM, VMware (ESX/ESXi), and Citrix XenServer. For more specific operating system product/version information, see the latest Brocade Interoperability Matrix at www.brocade.com/hba.

Q What software utilities are available?

A Brocade HCM and Command Line Interface (CLI) utilities are provided for remote and local configuration and control of Brocade HBAs. Brocade HCM can be launched in context from Brocade Network Advisor.

Q Where can Brocade HBA drivers, documentation, and HCM software be obtained?

A Brocade HBA drivers, documentation, and HCM management software can be downloaded at www.brocade.com/hba, under the Downloads section.

Q Where do I go for support on Brocade HBAs?

A Please call Brocade Technical Support toll-free at 1-800-752-8061 and make sure that you have activated your Brocade HBA warranty. To activate your warranty, visit: www.brocade.com/dotcom/services-support/returns-warranties/warranties.page.

Q Is this HBA design unique to Brocade?

A The HBAs are designed entirely by Brocade and leverage five generations of the industry's most advanced Fibre Channel ASIC technology. This, in combination with industry-leading switch ASICs, is the basis of all the advanced features and performance, and it enables an end-to-end management and orchestration solution across the largest installed base of SAN fabrics in the world.

Q What is Target Rate Limiting (TRL)?

A Target Rate Limiting relies on the storage driver to determine the speed capability of a discovered target port. It then uses this information to throttle FCP traffic rate to slow-draining targets. This reduces or eliminates network congestion and alleviates I/O slowdowns at faster targets.

Q What is meant by "hot-swappable" optics?

A Legacy 4 Gbps HBAs from other vendors used fixed (SFF) media that could not be replaced in the field, forcing customers to shut servers down in order to replace an HBA when the optic component failed. In the transition to 8 Gbps, vendors adopted the Small Form-Factor Pluggable (SFP+) transceivers that can be replaced without shutting the server down. However, those vendors still treat the entire HBA as a Field Replaceable Unit (FRU) and require customers to replace the HBA when an optical module fails. Brocade 4 Gbps and 8 Gbps HBAs all support hot-swapping of optical SFP+ modules.

Q How is Brocade positioned to succeed in the HBA market?

A Brocade leverages its strategic relationships with OEM and channel partners that value a single product qualification process that saves time and money. As the SAN leader, Brocade is uniquely positioned to provide other key advantages:

- Only the Brocade One strategy enables OEM and channel partners to leverage Brocade Advanced Fabric Services—integrated features in HBAs and switches that uniquely enable placement, positioning, and mobility of virtual resources throughout the fabric—using their own familiar OEM-branded management interfaces.
- Only Brocade HBAs extend these architectural capabilities into the server to gather and assess the statistical information that enables administrators to manage and automate the deployment of services such as virtualization, QoS, and security across the entire fabric—from server to storage.

Q How can I get trained or accredited on the Brocade adapter offerings?

A The *HBA 100* Web-based training course provides an introduction to the Brocade HBA technology. To enroll, visit www.brocade.com/education/course-schedule/index.page.

In addition, the Server Connectivity Accreditation Program provides a clear path for professionals to demonstrate their knowledge of Brocade server adapters, including HBAs and Converged Network Adapters (CNAs). For more information, visit www.brocade.com/education/certification-accreditation/accredited_server_connectivity/index.page.

Q Are Brocade HBAs compatible with fabric switches from other vendors?

A Brocade HBAs conform to industry standards and are fully interoperable with other vendors' Fibre Channel switches and directors. For the most up-to-date interoperability information, visit www.brocade.com/hba.

However, many of the advanced features require the integration with the switch ASIC present in Brocade switches, directors, and backbones, and, as such, will only be available when connected to Brocade products.

Q How do I obtain Brocade HBAs for evaluation in my test, development, or lab environment?

A Send an e-mail to HBAsamples@brocade.com. A Brocade representative will contact you to assess your environment and coordinate the delivery of the evaluation cards.

Q What new features and functions are available with the version 3.0 driver (released in August 2011) for 8 Gbps and 4 Gbps Fibre Channel HBAs?

A The version 3.0 driver enables three new feature/function capabilities on these HBAs:

- Initiator-based LUN Masking for storage traffic isolation
- Boot-from-SAN fabric-based boot LUN discovery, including Direct-Attached Storage (DAS) point-to-point topology
- Multiple host driver updates via Brocade Network Advisor

Q What future plans does Brocade have for the HBA market?

A Brocade is committed to a long-term investment in server connectivity, with plans for a growing product line. In all segments where Brocade competes, the goal is to lead and to remain at the forefront of the marketplace. As such, Brocade announced in May 2011 the industry-unique Brocade 1860 Fabric Adapter with AnyIO™ technology, which allows each adapter port to be configured on-demand as an HBA, CNA, or NIC. Visit www.brocade.com/adapters for more information on the new Brocade 1860 Fabric Adapter.

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