

BROCADE 415, 425, 815, AND 825 FIBRE CHANNEL HBAS

SERVER CONNECTIVITY

HIGHLIGHTS

- Centralizes management across the data center by leveraging Brocade Network Advisor
- Provides fabric-based boot LUN discovery for simplified SAN boot configuration for both DAS and diskless server deployments
- Maximizes bus throughput with a Fibre Channel to PCIe Gen2 (x8) bus interface with intelligent lane negotiation
- Delivers unprecedented performance with I/O transfer rates of up to 500,000 IOPS per port and 1,000,000 IOPS per dual-port adapter
- Provides throughput of up to 1600 MB/sec per port full duplex
- Supports N_Port ID Virtualization (NPIV) with up to 255 virtual ports
- Extends advanced fabric services such as Quality of Service (QoS) to the application level, including Virtual Machine (VM) applications

The Brocade One™ strategy helps simplify networking infrastructures through innovative technologies and solutions. Brocade 415, 425, 815, and 825 Host Bus Adapters (HBAs) support this strategy by simplifying and optimizing server connectivity to Fibre Channel fabrics in highly virtualized data centers.

Server Connectivity for Next-Generation Data Centers

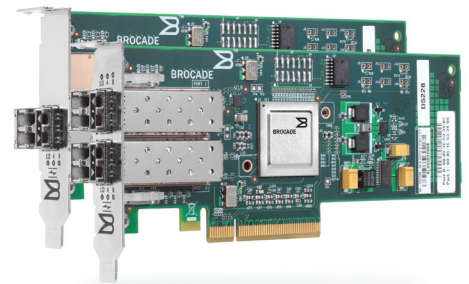
Today's IT professionals continue to seek ways to reduce cost and complexity in their environments while maintaining the ability to effectively comply with a wide variety of new Service Level Agreements (SLAs) and industry regulations. In order to do so, they are looking for ways to improve server and storage utilization, reduce ongoing operational costs, and increase their flexibility and responsiveness.

Two major industry trends aimed at reducing cost and complexity—server consolidation and virtualization—have quickly become the highest priorities for server administrators. Most data centers were designed to meet basic connectivity needs for physical servers, switches, and storage. However, consolidation and virtualization drive new connectivity requirements that legacy solutions are no longer able to meet, such as streamlined manageability, increased performance, and virtualization awareness. Performance of the applications under load and manageability are often critical concerns for organizations deploying server virtualization.

Brocade® 415 and 425 4 Gbps Fibre Channel Host Bus Adapters (HBAs) and the Brocade 815 and 825 8 Gbps Fibre Channel HBAs are a new class of server connectivity products with unmatched

hardware capabilities and unique software features. This new class of HBAs is designed to help IT organizations deploy and manage end-to-end Storage Area Network (SAN) services across next-generation data centers.

While legacy HBA providers focus on simple connectivity, the Brocade 4 Gbps and 8 Gbps HBAs leverage five generations of Application-Specific Integrated Circuit (ASIC) design. The current ASIC is an evolution of the industry-leading Brocade Fibre Channel switching ASIC. It leverages the same technology and features that make Brocade the market leader in storage networking, including frame-based trunking for additional performance and availability, and Virtual Channels (VCs) for Quality of Service (QoS) and isolation. This enables organizations to extend essential Virtual Machine (VM)-aware Brocade Advanced Fabric Services into the server.



BROCADE

UNIFIED MANAGEMENT

Brocade Network Advisor can monitor and manage multiple HBAs across a data center simultaneously—along with Brocade switches, directors, and backbones—all from a single central location. This enables organizations to monitor performance across groups of HBAs and HBA ports at the same time, capture diagnostics information automatically in the event of a failure, and receive proactive alerts when HBA events occur (see Figure 1).

Brocade HBAs also enable VM discovery in VMware ESX environments within Brocade Network Advisor. VM discovery provides an end-to-end view of the VM-to-Logical Unit Number (LUN) path information for all the VMs running on each physical server, with detailed information such as host OS, assigned CPU and memory resources, and all the data stores associated with each VM. This provides unprecedented levels of visibility into the virtual server infrastructure for SAN administrators, enabling them to more efficiently manage their storage network resources. Coupled with N_Port ID Virtualization (NPIV), Brocade Network Advisor can also provide end-to-end performance statistics with VM granularity.

Boot-over-SAN enables the deployment of both Direct-Attached Storage (DAS) point-to-point topology as well as diskless servers and centralized management of OS images in the shared storage pool. Traditional boot-over-SAN environments, however, require access to each individual HBA BIOS (and each individual server console), making them cumbersome to configure, laborious to maintain, and prone to human error. To simplify the management of boot-over-SAN environments, Brocade HBAs provide fabric-based boot LUN discovery—a feature that enables each server to automatically retrieve its boot LUN information from the switch fabric. This provides a centralized management point for all boot-over-SAN operations through Brocade Network Advisor, enabling organizations to fully reap the benefits of diskless servers.

All HBA management and VM visibility features are available across all three editions of Brocade Network Advisor: Professional, Professional Plus, and Enterprise. For simple device configuration,

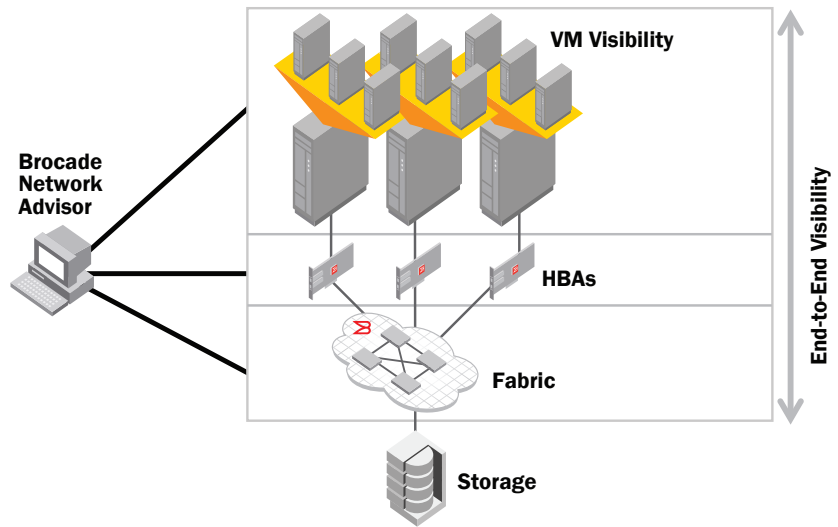


Figure 1. Brocade Network Advisor provides unified management of SAN and HBA resources with end-to-end VM visibility.

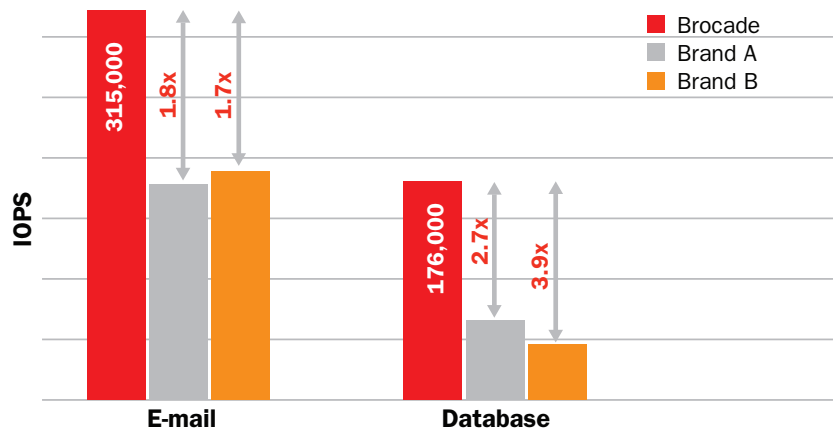


Figure 2. Brocade HBAs can provide nearly three times the performance of competing offerings in real-world application scenarios.

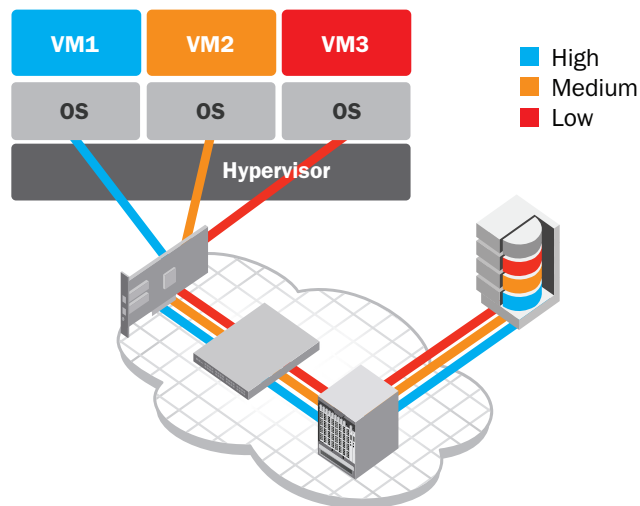


Figure 3. SAO extends QoS to the VM level.

driver updates, or to obtain HBA and port statistics, a Graphical User Interface (GUI) element manager and a Command Line Interface (CLI) are also available. Both Brocade Network Advisor and the element manager provide open APIs and standards-based interfaces for integration with popular third-party applications and higher-level frameworks to help orchestrate Brocade hardware and SAN services.

UNMATCHED PERFORMANCE

With the recent advances in server technology, including Intel Nehalem processors, servers are now capable of running more workloads than ever. This drives higher consolidation and virtualization ratios, with more VMs being deployed per server, which in turn drives unprecedented I/O requirements. The superior performance of Brocade HBAs provides the necessary bandwidth and I/O power for the most demanding environments (see Figure 2).

Ultimately, this means that businesses of all sizes can scale their virtual server deployments and virtualize high-demanding applications with greater confidence, resulting in better server resource utilization and lower capital and operational costs.

OPTIMIZED FOR VIRTUAL ENVIRONMENTS

In a non-virtualized environment, every application is tied to a physical server, which in turn connects to a physical SAN switch port in a “static” manner. Applying network policies such as zoning or QoS—or monitoring application performance—is simple because the application is permanently associated with the physical port.

With server virtualization, multiple applications reside in a physical server and share a physical SAN port. Furthermore, applications can move across the virtualized server infrastructure, based on a number of user-defined policies, to respond to dynamic business requirements. A virtualization-aware SAN infrastructure and server connectivity solution enables organizations to apply network policies at the VM level. Such policies will then be able to “follow” the application transparently as it moves to a new physical server.

Brocade HBAs were built from the ground up with virtualization in mind. They support NPIV with up to 255 virtual ports, and they are qualified with all major hypervisor solutions in the industry. Leveraging NPIV technology, organizations can not only extend Brocade fabric services to the server, but all the way to the VM and application

level. Server Application Optimization (SAO) helps IT organizations avoid downtime and more effectively meet their SLAs by allowing them to apply QoS policies with a per-VM granularity and ensure that mission-critical VMs will not be affected in the event of HBA link congestion—even as they move across the infrastructure (see Figure 3). SAO also provides isolation to protect individual VMs from the effect of slow-drain devices that would otherwise impact the entire physical server and all applications.

BROCADE GLOBAL SERVICES

Brocade Global Services has the expertise to help organizations build scalable, efficient cloud infrastructures. Leveraging 15 years of expertise in storage, networking, and virtualization, Brocade Global Services delivers world-class professional services, technical support, network monitoring services, and education, enabling organizations to maximize their Brocade investments, accelerate new technology deployments, and optimize the performance of networking infrastructures.

MAXIMIZING INVESTMENTS

To help optimize technology investments, Brocade and its partners offer complete solutions that include professional services, technical support, and education. For more information, contact a Brocade sales partner or visit www.brocade.com.

BROCADE 415, 425, 815, AND 825 SPECIFICATIONS

Models	
Brocade 415	Single-port, 4 Gbps HBA
Brocade 425	Dual-port, 4 Gbps HBA
Brocade 815	Single-port, 8 Gbps HBA
Brocade 825	Dual-port, 8 Gbps HBA
Fibre Channel Specifications	
Data rate	Brocade 815/825: 8 Gbps (1600 MB/sec); 4 Gbps (800 MB/sec); 2 Gbps (400 MB/sec) (per port) Brocade 415/425: 4 Gbps (800 MB/sec); 2 Gbps (400 MB/sec); 1 Gbps (200 MB/sec) (per port)
Performance	Up to 500,000 IOPS per port at 4 Gbps and 8 Gbps <ul style="list-style-type: none"> • 315,000 IOPS per port at 8 Gbps with 4 KB block size and 50% read/50% write operations (typical e-mail) • 176,000 IOPS per port at 8 Gbps with 8 KB block size and 50% read/50% write operations (typical database)
Protocols	SCSI-FCP, FCP-2, FCP-3, FC-SP

Topology	Point-to-point (N_Port), switched fabric (N_Port), including N_Port Trunking with frame-based load balancing
Class of service	Class 3, Class 2 control frames supported
Boot-over-SAN	DAS (point-to-point topology) and diskless Fabric-based LUN discovery
LUN masking	Initiator-based LUN masking for storage traffic isolation
Target rate limiting	Throttles traffic based on target's (slower) speed capability
Distance support	Brocade 815/825 <ul style="list-style-type: none"> • 21 meters at 8 Gbps on 62.5/125 µm Multi-Mode Fiber (MMF) • 50 meters at 8 Gbps on 50/125 µm OM2 MMF • 150 meters at 8 Gbps on 50/125 µm OM3 MMF Brocade 415/425 <ul style="list-style-type: none"> • 70 meters at 4 Gbps on 62.5/125 µm MMF • 150 meters at 4 Gbps on 50/125 µm OM2 MMF • 380 meters at 4 Gbps on 50/125 µm OM3 MMF

Host Specifications	
Server platform	Intel (IA32, IEM64T), AMD (x86, 64), and Sun (x86, SPARC)
Server chipset	Intel, nVidia, ServerWorks/Broadcom, AMD/ATI, and SPARC
Bus interface	PCI Express Gen 2.0 (x8) and Gen 3.0 compatible, with MSI-X and INTx
Software	
Management	Brocade Network Advisor (Professional, Professional Plus, Enterprise), including multiple host driver updates Brocade Host Connectivity Manager (HCM) Command Line Interface (CLI)
Driver- and HCM-supported operating systems	Microsoft Windows, Red Hat Linux, SUSE Linux, Oracle Linux and Oracle Solaris, VMware (ESX/ESXi), Microsoft Hyper-V, Oracle VM, Citrix XenServer, Xen for Red Hat, Xen for SUSE
APIs	SNIA-HBA-API 2.0 and FDMI-I
Warranty and Support	
	Three years advance replacement hardware warranty with 24x7x365 telephone/e-mail support and lifetime software updates
Physical Specifications	
Transceivers	Brocade 815/825: 8 Gbps Fibre Channel LC-style pluggable (SFP+), MMF (850 nm), hot-swappable Brocade 415/425: 4 Gbps Fibre Channel LC-style pluggable (SFP), MMF (850 nm), hot-swappable
Form factor	PCI Express low-profile form factor; 16.77 cm x 6.89 cm (6.60 in. x 2.71 in.)
Bracket size	Standard: 1.84 cm x 12.08 cm (0.73 in. x 4.76 in.) Low profile: 1.84 cm x 8.01 cm (0.73 in. x 3.15 in.)

Environmental and Power Requirements	
Airflow	No airflow required
Operating temperature	0° C/32° F to 55° C/131° F (dry bulb)
Non-operating temperature	-43° C/-40° F to 73° C/163° F (dry bulb)
Operating humidity	5% to 93% (relative, non-condensing)
Non-operating humidity	5% to 95% (relative, non-condensing)
Power dissipation	6 W (full line rate)
Operating voltage	3.3 V
Agency Approvals	
United States	Bi-Nat UL/CSA 60950-1 1st Ed; ANSI C63.4; cCSAus; FCC Class B
Canada	Bi-Nat UL/CSA 60950-1 1st Ed; ICES-003 Class B; cCSAus
Japan	CISPR22 Class B and JEIDA (Harmonics); VCCI-B
European Union	EN60950-1; EN55022 Class B and EN55024; TUVBauart, CE Mark
Australia, New Zealand	EN55022 and CISPR22 Class B or AS/NZS CISPR22; C-Tick
Russia	IEC60950-1; 51318.22-99 and 24-99; GOST Mark
Korea	KN22 and KN24; MIC Mark Class B
Taiwan	CNS 14336(94); CNS 13438(95) Class A; BSMI Mark



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