

Brocade CNAs Enhance 10Gb iSCSI Storage

By Frank Berry

January, 2011

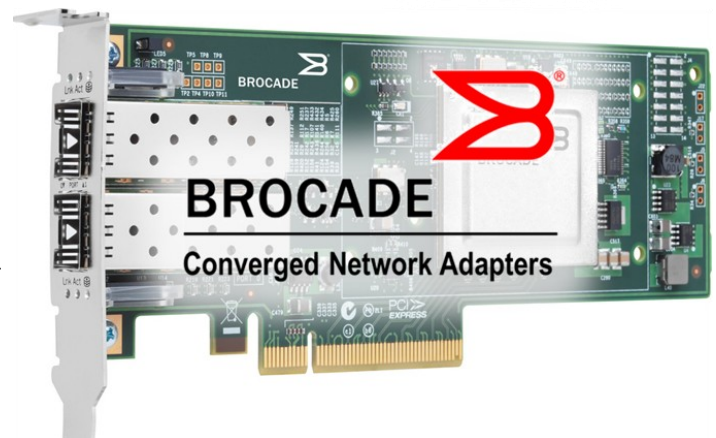
Since the introduction of iSCSI storage in 2004, the population of 1Gb iSCSI storage arrays has grown to comprise almost a third of all disk arrays shipped each year. Connecting servers to all those 1Gb iSCSI SANs requires only a generic port on a server LOM chip, or 1GbE NIC. No special Ethernet hardware or software is needed because IP networks don't discriminate between NAS/SAN storage traffic and LAN traffic. That's because the iSCSI protocol is transparently encapsulated into Ethernet packets and only basic iSCSI-related network services exist.



10GbE with DCB

Brocade and Dell are planning to use 10GbE with Data Center Bridging (DCB) as a platform to deliver enterprise-class iSCSI storage for large data centers. Their new generation of iSCSI SANs include network connectivity with 10x more throughput than 1Gb iSCSI storage, and 25% more throughput than 8Gb Fibre Channel storage. In addition, their new 10Gb iSCSI SANs use innovative implementations of the suite of new protocols that comprise DCB. Their unique implementation allows data center managers to converge NAS, SAN and LAN traffic onto one Ethernet port, while providing granular control of separate QOS, and other network policies, for each type of traffic.

With network connectivity that delivers 900% more throughput than 1Gb iSCSI and 25% more throughput than 8Gb Fibre Channel, 10Gb iSCSI from Dell is expected to become a common sight in large data centers.



CNAs from Brocade allow IT professionals in large data centers to converge LAN, SAN and NAS traffic on one adapter, while providing granular control of separate QOS and other network policies.

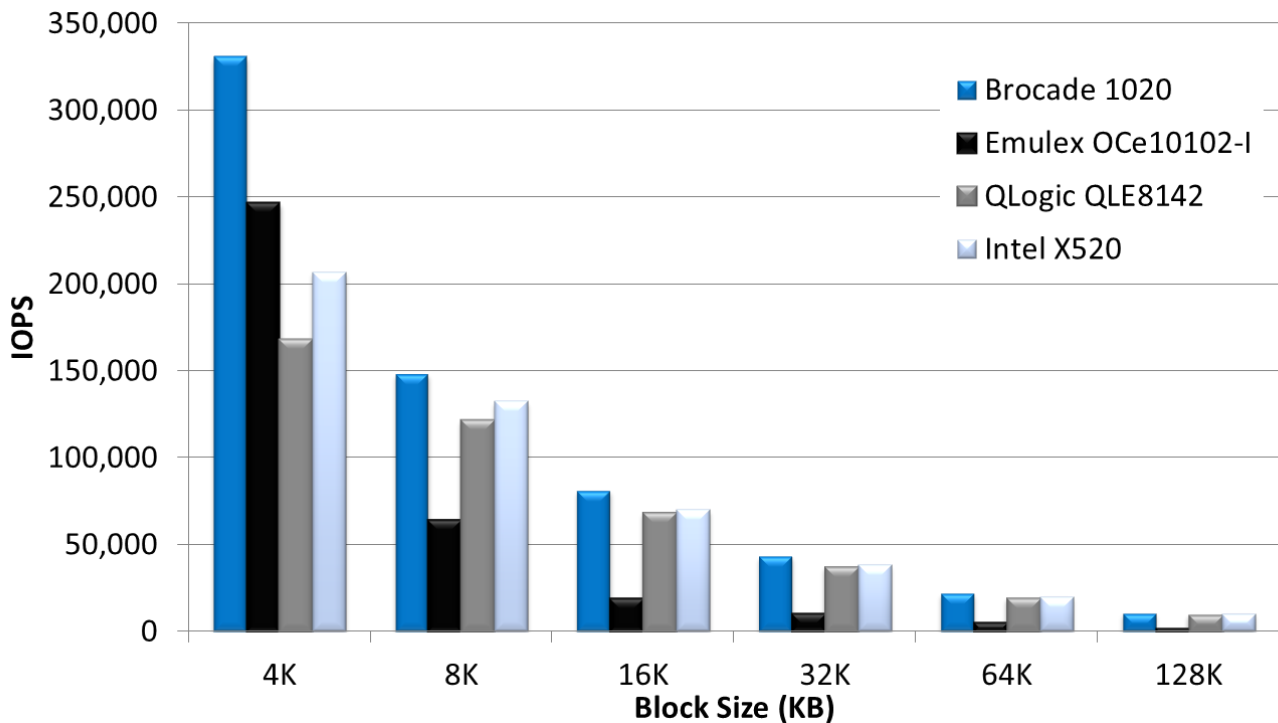
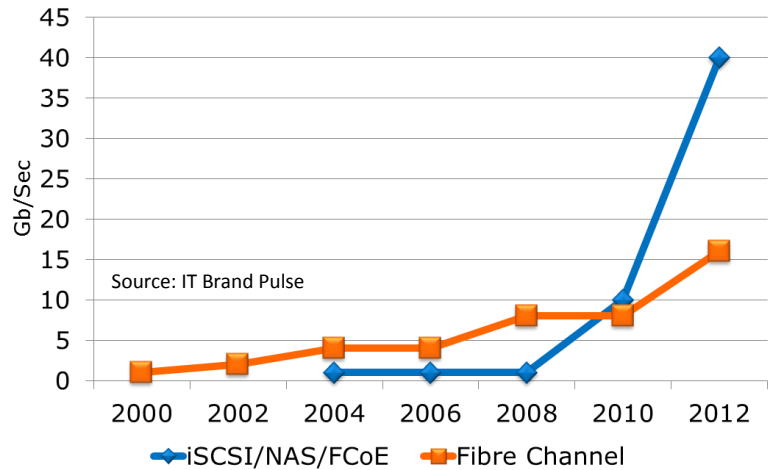
iSCSI: The New Data Center SAN Performance Leader

In 2010, the general availability of 10Gb iSCSI storage positioned iSCSI as the leading performance technology for data center SANs. IT Brand Pulse expects Ethernet-based storage, including iSCSI, to extend that leadership in the 2012 timeframe. Beginning in 2012, the next generation of 16Gb Fibre Channel SANs will be generally available while the performance of NAS, FCoE SANs and iSCSI SANs will begin the migration to 40Gb technology.

Best 10Gb iSCSI Performance with Brocade CNAs

While 10Gb iSCSI has emerged as the fastest SAN technology, [server I/O testing in real world environments](#) performed by IT Brand Pulse validates that Brocade CNAs have emerged as the best performing 10Gb iSCSI adapter. At larger block sizes (128KB) the Brocade 1020 CNA demonstrated a slight performance advantage but extended their advantage over the other products tested at small transfers, being most prominent at 4KB with 330,620 IOPS. This represents a 34% greater number of IOPS than the nearest competitor.

Network Storage Technology Road Map

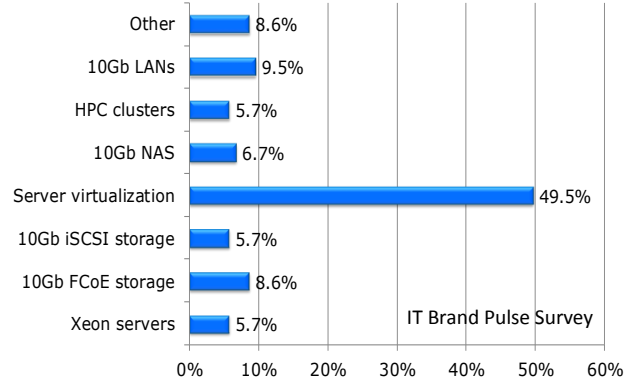


Brocade IOPS performance topped the competition at every block size which indicates Brocade CNAs would be a favorable alternative for host connectivity to an iSCSI SAN — for just about any application.

Today: Fat 10GbE Pipes for Virtualized Servers

After six years of limited adoption, the deployment of 10Gb Ethernet took off in 2010 as server virtualization emerged as the killer app. IT professionals are heavily loading servers with virtual machines and applications, which is creating the need for higher performance LAN and SAN connectivity. Data center managers are eliminating the potential I/O bottleneck by deploying the latest generation of 10GbE switches and CNAs to solve their performance problem today, and to provide a platform for converged networks in the future.

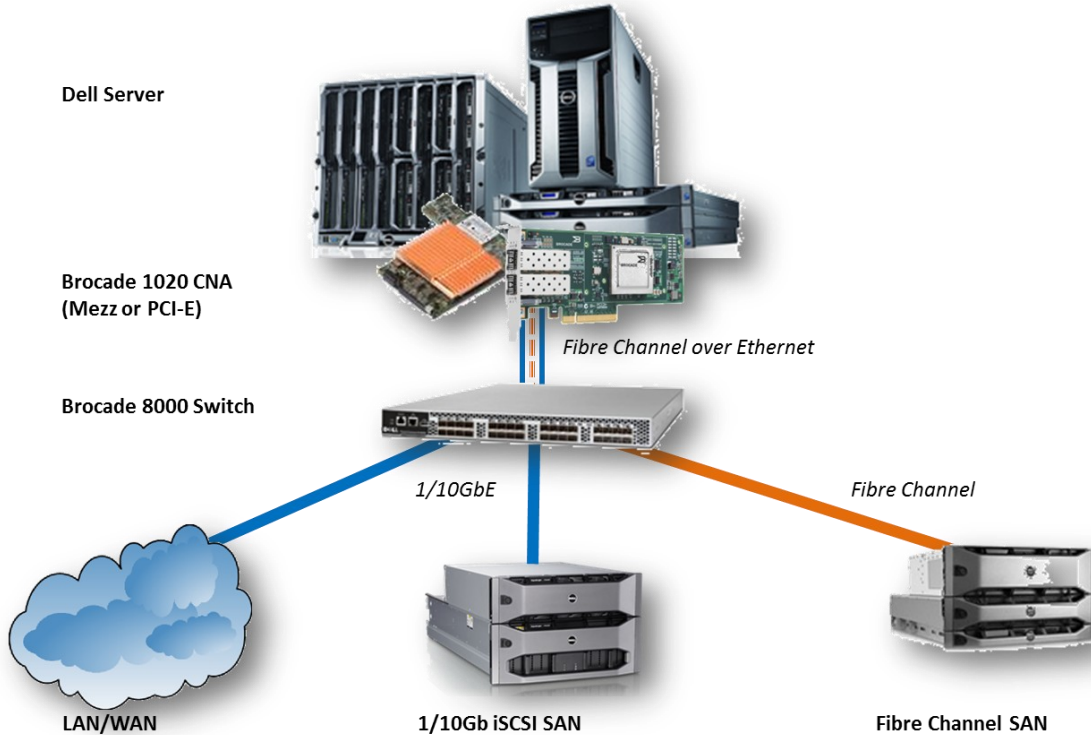
The application in my data center that is driving the adoption of 10Gb Ethernet is:



Tomorrow: Convergence with Brocade CNAs

A next logical step for server admins that have deployed Brocade CNAs for virtualized server and/or iSCSI SAN connectivity, is to exploit the converged networking capabilities of the Brocade CNAs. Once installed, Brocade CNAs can eliminate the cost and complexity of additional NICs, Fibre Channel HBAs and their associated cabling.

Converged Network with Brocade CNAs

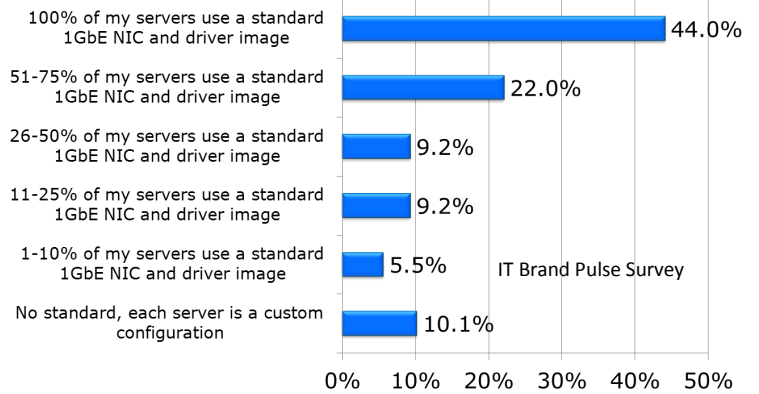


Once installed, Brocade CNAs offer server admins the opportunity to consolidate LAN, NAS, iSCSI SAN and Fibre Channel SAN connectivity onto a single adapter.

Today: Standardization of 1GbE Adapter and Driver Images

To efficiently deploy and manage server connectivity to LANs and iSCSI SANs, it's very common for data center managers to standardize on a single 1GbE adapter and driver image. It's then easier to: maintain one type of spare hardware; become familiar with a single type of driver and management software; and to troubleshoot problems. In a survey conducted by IT Brand Pulse, 66% of the IT professionals that responded said that at least half of their servers used a standard NIC and driver image. Only 10% of the respondents said each of their servers is a custom configuration.

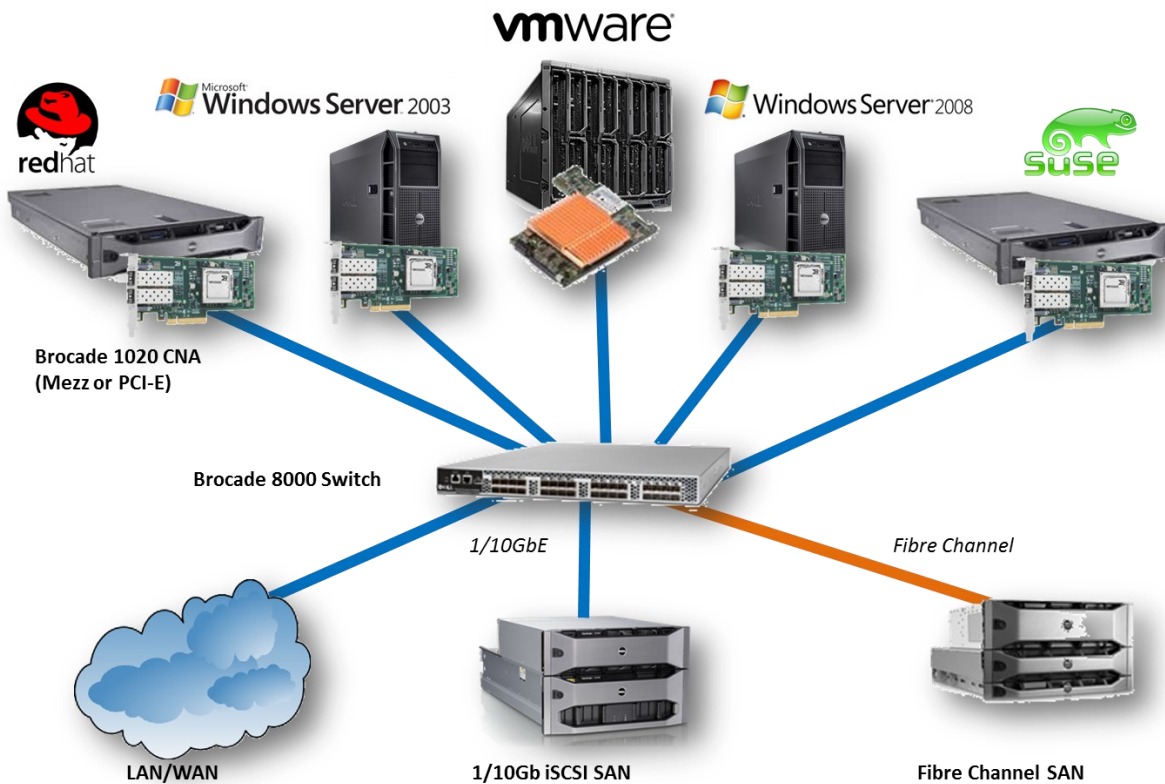
What percent of your servers are configured with a standard 1GbE NIC and driver image?



Tomorrow: One 10GbE CNA for Multiple Operating Environments

Brocade CNAs offer broad operating system support, including Windows Server 2003, Windows Server 2008, SuSE Linux, Red Hat Linux and VMware. The result is data center managers who are planning to migrate their LAN or iSCSI SAN to 10GbE, can also plan on standardizing on one 10GbE CNA that can support multiple operating environments.

One CNA: Multiple Operating Environments



Brocade 10GbE CNAs are available in PCIe and Mezzanine form-factors. Add drivers for multiple operating environments, and deploying Brocade CNAs is an efficient way to connect servers to both LANs and SANs across an entire data center.

Brocade and Dell Shape DCB

The following describes how Brocade and Dell recently collaborated to shape two DCB protocols, Priority Flow Control and Enhanced Transmission Selection into tools for granular control of 10GbE and for optimizing the performance of a converged LAN / iSCSI SAN.

Priority Flow Control (PFC)

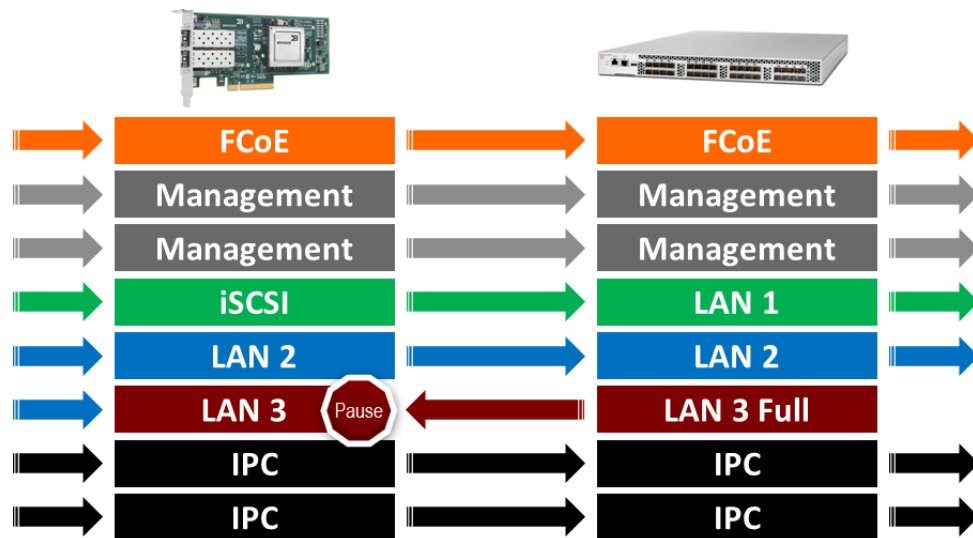
Originally developed to support Fibre Channel over Ethernet (FCoE) so that no frames would be dropped, PFC extends the granularity of PAUSE to accommodate different priority classes. Using PFC, a lossless lane for FCoE traffic can be created while retaining packet-drop congestion management for IP traffic. The result is SAN traffic can share the same link as LAN and IPC traffic.

Enhanced Transmission Selection (ETS)

ETS is used to assign traffic to specific lanes using class of service (CoS) values to identify which lane the traffic belongs to. PFC and ETS together allow administrators to allocate buffers, queues and other resources based on the priority of the application. The result is a predictable, high level of service for business-critical traffic.

Brocade and Dell Implement New iSCSI Type-Length Values (TLVs)

CoS values are transmitted and discovered using the Link Layer Discovery Protocol (LLDP), and data for the different types of traffic are formatted as Type-Length Values (TLVs). Until recently, administrators could not separate LAN and iSCSI SAN traffic simply because support for iSCSI TLVs were not incorporated into most DCB implementations. Brocade and Dell are the first to provide an end-to-end 10Gb iSCSI SAN that takes full advantage of PFC and ETS.

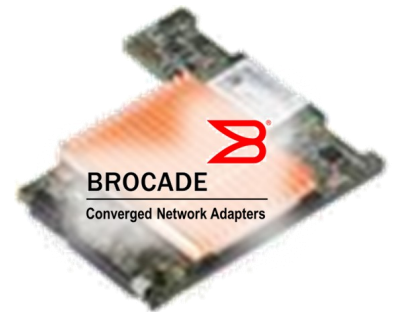


With the availability of iSCSI TLVs (green), switches from Brocade and Dell enable PFC, then configure the CNAs from Brocade and Dell to apply the pause functionality to packets based on the IEEE 802.1p CoS standard.

Conclusions

Performance for Virtualized Servers Today, A Platform for Convergence Tomorrow

The killer app for 10GbE is server virtualization. The 10Gb switches and adapters being installed today for more virtualized server I/O performance, also form a platform for convergence in the future.



It has to be 10GbE with DCB

If you're purchasing a 10GbE server, networking or storage product, it has to incorporate DCB to ensure interoperability with other products in the future.

Brocade Delivers Highest Performance for Dell 10Gb iSCSI Storage

Testing shows that Brocade CNAs are also the fastest iSCSI adapters available.

Brocade Delivers Granular Control of Dell 10Gb iSCSI Storage

If you are planning to deploy a converged LAN / iSCSI SAN, ask your vendor if they have TLVs for iSCSI. You need them to implement Quality of Service using PFC and ETS. Brocade and Dell deliver it today.

Related Links

Dell EqualLogic Storage

<http://www.dell.com/us/en/enterprise/storage/equallogic/cp.aspx?refid=equallogic&s=biz&cs=555&~ck=mn>

Brocade 1020 Converged Network Adapter

http://www.dell.com/content/products/productdetails.aspx/switch-brocade-1020?c=us&l=en&s=biz&cs=555&baynote_bnrnk=0&baynote_irrank=1&~ck=dellSearch

Brocade BR1741M-k CNA for Dell™ PowerEdge M-Series blade servers

<http://www.dell.com/us/en/enterprise/networking/switch-brocade-br1741m-k/pd.aspx?refid=switch-brocade-br1741m-k&s=biz&cs=555>

PowerConnect B-800 Network Switch

http://www.dell.com/content/products/productdetails.aspx/switch-powerconnect-b-8000?c=us&l=en&s=biz&cs=555&baynote_bnrnk=0&baynote_irrank=1&~ck=dellSearch

About the Author



Frank Berry is founder and senior analyst for IT Brand Pulse. As former vice president of product marketing for the host bus adapter group and vice president of corporate marketing for QLogic, Mr. Berry has over 9 years experience in the development and marketing of host bus adapters. Prior to that Mr. Berry was vice president of worldwide marketing for the automated tape library (ATL) division of Quantum. You can contact Frank at frank.berry@itbrandpulse.com.