Evolution of Infrastructure to Support Tomorrow’s Business Needs

Robust QLogic-Nexsan SAN Infrastructure Satisfies a Wide Range of I/O Metrics

Converged QLogic networks on Nexsan efficient, enterprise-class storage prepares organizations to meet their business goals today and in the future by virtualizing, consolidating, and converging storage and network fabric while reducing cost, simplifying management, and improving flexibility to deal with unforeseen challenges.

EXECUTIVE SUMMARY

Virtualization has resulted in consolidation within many data centers. The trend of virtualization continues to gain speed, and the cloud is driving it even faster. How does this impact data center administrators?

With the introduction of virtualization and the cloud, the complexity of data center management increases significantly, resulting in the need for additional automation and other methods to achieve greater simplicity. Server-based stack management that is integrated to storage through a flexible fabric becomes even more important. Simplification of the fabric will decrease complexity within the system and reduce costs. This is the very point of QLogic’s convergence initiatives.

INTRODUCTION

Business has expanded beyond markets and stores (“bricks”) and the touch of human involvement to include the now essential element of commerce over the Internet (“clicks”). Over time, the way data is obtained, used, and stored has changed and it continues to evolve. Business is built on information, and it is the data and network infrastructure and supporting technology that provides the data required to serve the needs of both “bricks” and “clicks.”

The first and probably most game-changing component of data center infrastructure that is evolving is server management sophistication and reach. Now offered as part of the suite of services that are within a server, the capabilities support the entire network and include closely integrated and cooperative services within storage. From applications to storage, this can be thought of as a stack (see Figure 1).

Businesses face a multitude of challenges these days; how to increase virtualization efficiencies, leverage shared computing models while adopting cloud implementations, and reduce network costs and complexities.

QLogic® and Nexsan® understand how to address these challenges and have implemented foundational software for this purpose. QLogic networks on Nexsan enterprise-class storage can be used to deliver simpler, more cost-effective storage infrastructures to support current and future business requirements.

This paper provides an in-depth look at how QLogic and Nexsan will address these network challenges.
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**CHALLENGE**
Meeting the demands for reduced complexity in today’s data centers cannot be accomplished with yesterday’s architectural approaches. Data center administrators are looking for their infrastructures to not only achieve high performance but also use data efficiently and adapt to different workloads at different times while being seamlessly scalable.

Consequently, today’s data center administrator is challenged with the difficult task of implementing strategic initiatives, including the following:

- Simplifying management to accommodate ever-increasing growth
- Reducing cost and improving efficiency through consolidation and virtualization of compute and storage resources
- Increasing flexibility to respond to changing needs through network convergence

Successfully implementing these initiatives will allow data centers to handle current and future business challenges at price points that are appropriate for a challenging economy.

**SOLUTION**

**Simplification of Management**
The most important component of the data center infrastructure that is evolving is server management. Now, management through the stack can provide the full services of the stack, from the server through the network, including closely integrated and cooperative services within storage (Figure 1).

To help organizations simplify management through the stack, QLogic and Nexsan have developed foundational software.

For example, QLogic now has the QConvergeConsole® (QCC), which allows administrators to manage iSCSI, Fibre Channel, and NIC ports from a single-pane-of-glass management tool. QCC is designed to enable businesses to simplify implementation and use of QLogic’s family of products that support Fibre Channel, iSCSI, Ethernet, and IP traffic through an intelligent port, which adjusts automatically to whatever data is flowing on the media.

Nexsan arrays support a hierarchy of SSD, SAS, and SATA disk drives and easily fit into complex SAN fabrics with multiple options that combine both Fibre Channel and iSCSI connectivity. As a result, a single Nexsan array provides a mid-size organization with multiple storage targets that support a broad range of application-specific requirements with respect to access (IOPS), throughput (MB per second), and capacity (price per GB).

“By complementing end-to-end SAN visibility from both physical and virtual servers with high performance, sophisticated management software, and tight integration with third-party applications, Nexsan empowers IT to use any advanced automation features to provision storage, enhance the performance of applications, and ensure process availability.”

– Jack Fegreus, Managing Director of openBench Labs
Consolidation and Virtualization
Data center administrators began to seek efficiency as well as reduced costs and decreased power by consolidating storage and server resources. They focused on using virtualization to extend efficiency and resource utilization, thus reducing the amount of servers, network infrastructure, and storage required. The wave of virtualization through hypervisors that began in servers has now moved to the network and storage.

QLogic’s fourth generation of Converged Network Adapters supports simultaneous LAN (TCP/IP) and SAN (FCoE and iSCSI) traffic at 10Gbps Ethernet (10GbE) speeds and at extremely low CPU utilization with full hardware offloads. This extreme performance eliminates potential I/O bottlenecks in today’s powerful multi-processor, multi-core servers. In addition, support for powerful virtualization features make this adapter ideal for virtualized environments that need excellent I/O performance to service growing numbers of virtual machines (VMs). NPAR allows up to four virtual functions per physical port with quality of service management. The ability to support multiple protocols simultaneously with virtual NIC ports on the same hardware offers multi-tenancy flexibility, which is ideal for private and public cloud environments.

The new UA5900 switch allows every port to assume either a Fibre Channel, an iSCSI, or an FCoE/Ethernet personality, enabling the deployment of as much or as little FCoE as required by an organization’s strategic IT roadmap. In addition, the switch allows changes to be made to the roadmap in the future with minimal effort and cost.

For organizations struggling with the tradeoffs between current legacy network constraints, synergies between QLogic and Nexsan devices provide an immediate means to start with what is in place and build toward a cohesive, flexible infrastructure needed to transition into a fully converged fabric topology. A fully converged network is a single network that is performance managed to support intranet, Internet, and storage on a common managed fabric. This significantly reduces cost and increases shared assets while improving management simplicity.

Convergence
In time, the strain of management will reach a new inflection point and administrators will need to find a new method for managing their data centers. The infrastructural building blocks for a new approach are being laid today for the dream that has long been talked about, and that is autonomic management. Autonomic management is still in the future, but a combined infrastructure of virtualized server and storage on converged fabrics lays the pathway for a level of cooperation in the management intelligence in a disk controller integrated into a stack-managed approach. QLogic and Nexsan believe that making good decisions in building infrastructure today will prevent misfires that cause rework and expense over time.

With businesses facing unprecedented growth in data and networking requirements, maintaining two separate networks (Ethernet and Fibre Channel) is becoming an expensive nightmare for enterprises.

The cost of separate media, separate adapters (10GE Network Interface Cards and Fibre Channel Host Bus Adapters), separate management, and additional power will become unsustainable.

Eliminating one physical fabric by converging connectivity for both data and networking into a single fabric provides valuable physical benefits, such as less space, less heat, less electricity, and even greater management benefits based on a single converged management schema. These capabilities yield one major benefit that everyone in IT and, in fact, the entire company will appreciate—less cost.

QLogic’s newest solutions are designed to help companies smoothly transition their data center networks at their own pace and provide the versatility to handle any protocol, any host, any storage, and any fabric, empowering virtualized enterprises and cloud computing environments with complete fabric freedom. QLogic’s Adaptive Convergence strategy extends proven Fibre Channel investments while simplifying the migration path toward converged, highly virtualized IT environments.

“QLogic’s latest, highly scalable portfolio provides an excellent cost-to-performance ratio for Fibre Channel customers while at the same time enabling organizations to seamlessly adopt network convergence in the future. With the ability to handle any protocol at any port, the new QLogic platform is highly versatile with the capability to reduce costs and complexity in the data center.”

– Bob Laliberte, Senior Analyst, Enterprise Strategy Group

BENEFITS
QLogic and Nexsan Combined Benefits
• Meet availability and performance SLAs
• Deliver needed capacity with low overall cost
• Tightly integrated management software
• Adaptive Convergence provides both the framework needed for today and seamless migration to tomorrow’s converged fabric

While IT overhead is the primary factor in operating cost reduction, organizations also have to worry about meeting Service Level Agreements (SLAs) made with line-of-business executives in association with business initiatives, such as enhanced internal and external collaboration. These executives think in terms of business process parameters. As a result, SLA objectives focus around two distinct measurements: process availability and process execution. With respect to these needs, IT sites struggling with implementing critical business-driven initiatives from collaboration to cloud computing have the ability to provide a highly manageable multi-fabric SAN infrastructure.
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The robust QLogic-Nexsan SAN infrastructure provides IT with an environment that satisfies a wide range of I/O metrics measured in IOPS, throughput (MB per second), and capacity (price per GB and GB per unit of rack space) while simultaneously supporting multiple levels of resource availability and security. By complementing end-to-end SAN visibility from both physical and virtual servers with high-performance, sophisticated management software, and tight integration with third-party applications, Nexsan empowers IT to use any advanced automation features to provision storage, enhance application performance, and ensure process availability.

For architects struggling with the tradeoffs between current legacy network constraints and future migration concerns, the synergies between Nexsan and QLogic devices provide an immediate means to build a cohesive flexible infrastructure needed to transition into a fully converged fabric topology. Specifically, IT can immediately leverage Nexsan E-Series™ arrays to simultaneously support SSD, SAS, and SATA drives across both Fibre Channel and iSCSI.

QLogic is the leader in deploying FCoE in data centers today. The company’s Adaptive Convergence strategy (Figure 2) is the most complete approach available today, providing protection of current investments and the ability to seamlessly migrate to an easily managed converged infrastructure.

CONCLUSION

As a result of virtualization and the cloud, challenges have emerged in capturing, storing, searching, sharing, analyzing, and visualizing data. The benefits are too large for business leaders to ignore based on these difficulties alone. For example, the ability to readily access important data has allowed analysts to uncover business trends that were previously unknown, the medical world to research cures for diseases, and even law enforcement to combat crime. These and many other benefits are driving today’s infrastructure and tomorrow’s emerging converged solution.

The data center in the not too distant future will look and be managed differently. Converged QLogic networks on Nexsan efficient, enterprise-class storage prepares the way for organizations to be ready to keep on track in meeting their business goals today and into the future by virtualizing, consolidating, and converging storage and network fabric while reducing cost, simplifying management, and improving flexibility to deal with unforeseen challenges.

ABOUT CAVIUM

Cavium, Inc. (NASDAQ: CAVM), offers a broad portfolio of infrastructure solutions for compute, security, storage, switching, connectivity and baseband processing. Cavium’s highly integrated multi-core SoC products deliver software compatible solutions across low to high performance points enabling secure and intelligent functionality in Enterprise, Data Center and Service Provider Equipment. Cavium processors and solutions are supported by an extensive ecosystem of operating systems, tools, application stacks, hardware reference designs and other products. Cavium is headquartered in San Jose, CA with design centers in California, Massachusetts, India, Israel, China and Taiwan.

Figure 2. QLogic’s Adaptive Convergence Strategy Ensures High Performance, Efficiency, Scalability, and Adaptability
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