

Product Brief

Emulex: 16Gb Fibre Channel for the Cloud Computing Era

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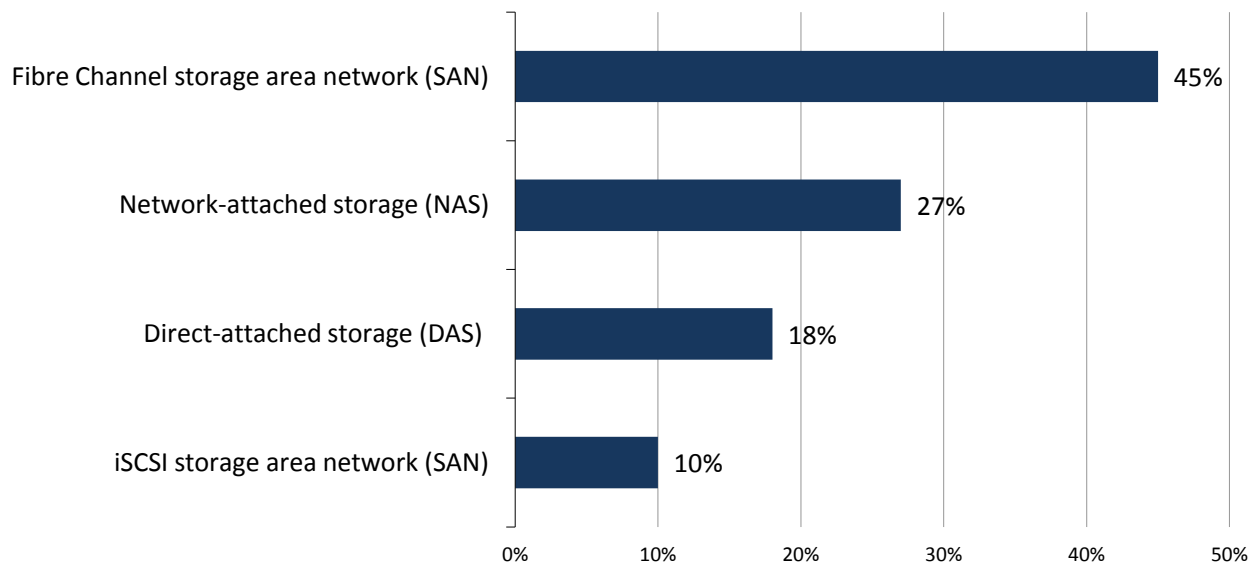
Abstract: Emulex has announced availability of its 16Gb Fibre Channel technology, but don't think this is just a simple bandwidth increase. Emulex has packed a lot of innovative technology into this release: it will enable highly virtualized and cloud computing environments to scale, take advantage of I/O virtualization technologies, and provide vastly increased IOPS while dramatically lowering latency. In short, you can expect more from Emulex than just improved throughput.

Overview

Virtualized server deployments are rapidly expanding into production environments and the number of virtual machines (VMs) per host is rapidly increasing—more than 30% of respondents to a recent ESG survey¹ expected to be running 25 or more VMs per host in less than two years. And, according to another ESG survey, cloud computing initiatives were the fastest growing IT initiative in 2011.² With that in mind, it's no surprise that IT organizations are changing the way they support their businesses. New architectures that leverage new technologies are being created in order to enable greater agility and foster optimization. A key component of these new architectures is networked storage and, as mentioned, steadily increasing VM densities in production environments are creating more demand for higher bandwidth solutions with advanced features like QoS and I/O virtualization. While converged networks have received a lot of media attention, organizations still rely on Fibre Channel. In fact, Fibre Channel is still the primary storage technology used to support virtualized server environments (see Figure 1).³

Figure 1. Primary Storage Technology Used to Support Virtual Server Environments

What would you consider to be the primary storage technology you are currently using to support your organization's virtual server environment? (Percent of respondents, N=187)



Source: Enterprise Strategy Group, 2010.

¹ Source: ESG Research Report, [The Evolution of Server Virtualization](#), November 2010.

² Source: ESG Research Report, [2011 IT Spending Intentions Survey](#), January 2011.

³ Source: ESG Research Report, [The Evolution of Server Virtualization](#), November 2010.

In response to these requirements, Emulex announced its new line of LightPulse 16Gb Fibre Channel Host Bus Adapters (HBAs). No stranger to Fibre Channel, this release actually marks Emulex's ninth generation of Fibre Channel adapters. The LightPulse LPe16000 is based on the Emulex Engine XE201 I/O Controller, a quad-port converged fabric controller capable of supporting up to 16Gb of Fibre Channel and up to 40Gb Ethernet based network convergence. This technology enables the LightPulse adapters to deliver more than just a performance bump. They also can provide:

- **Pooling of resources for dynamic allocation to multiple protocols.** The XE201 eight-core architecture allows workload-based performance and scalability by leveraging Emulex vPath virtual I/O support. This enables VM to VM connectivity while maintaining I/O traffic isolation.
- **Performance and scale to accommodate virtualized and cloud environments.** Emulex's vScale technology will not only deliver twice the performance of 8Gb Fibre Channel but, when combined with the XE201 engine, Emulex claims it can also support 255 virtual functions, 1024 MSi-X and 8192 logins, and open exchanges for maximum VM density—4x more than other adapters.
- **Advanced power efficiency.** Emulex's GreenState power management technology enables the adapters to dynamically reduce power and control heat.
- **Single screen management.** Leveraging OneCommand Manager, organizations can control all Emulex adapters, Fibre Channel or otherwise, from a single screen. For highly virtualized environments, Emulex also offers a plug-in for VMware vCenter that allows administrators to view and manage Emulex adapters in a vCenter window, reducing points of management.

Emulex has already been sampling these products with OEMs and they will be generally available in Q4. The LightPulse adapters are also backward compatible with 8 and 4Gb Fibre Channel.

Analysis

Emulex recognizes that organizations are still committed to their Fibre Channel environments and has developed this family of adapters to extend the useful life of their SANs and dramatically improve performance as well. So why should organizations consider 16Gb Fibre Channel? More importantly, why should they consider Emulex Adapters? Consider the following:

- **The 16Gb Fibre Channel ecosystem is rapidly maturing.** Switches are available now and storage vendors are planning to have this capability in 2012. Server vendors anticipating the Romley transition will require higher levels of I/O to eliminate bottlenecks. Emulex adapters are currently in qualification with major OEMs and will be generally available in Q4 2011. As organizations begin architecting their private clouds and deploying production environments on virtualized platforms, 16Gb technology should begin to play an increasingly important role.
- **Emulex HBA technology was designed for the Cloud Computing Era.** This is an important distinction as the new cards represent more than just an upgrade in performance. This release brings number of advances that deliver improved capabilities for highly virtualized environments such as the ability to support 255 NPIV virtual HBAs per card, preserve data integrity, and integrate directly with VMware Center. The additional bandwidth should also help to drive additional VM densities, which will be crucial as ESG research indicates that organizations are striving to achieve densities of 25 or more VMs to each physical server.
- **LightPulse HBAs are faster—a lot faster.** Not only does the LightPulse family have more capacity, it is also much faster. Emulex claims higher IOPS, over a million for a single port, and lower latencies, cut by as much as half. Clearly, this will be of interest to organizations supporting latency-sensitive applications. Designed to work with 12-core processors on one side and solid state disks (SSDs) on the other, the LightPulse adapters have to be fast. Based on initial Emulex testing, databases leveraging LightPulse LPe16000 adapters were able to deliver twice as many transactions when compared to its 8Gb Fibre Channel predecessors.

The Bigger Truth

Fibre Channel will continue to play an important role in the data center; it makes sense to continue to develop solutions to support those environments. Given the current 8Gb Fibre Channel install base and ESG research pointing to increasing interest in Fibre Channel to support virtualized environments, 16Gb Fibre Channel should see widespread adoption especially when considering that organizations are increasing VM densities and virtualizing mission-critical production environments. However, to be successful, it will be essential to have the proper QoS and I/O virtualization tools in order to deliver uncompromised performance. The transition may even be accelerated given the speed at which the market has demanded support for adapters and switches. And it's a safe bet that support for storage arrays is on the horizon. With new server technologies around the corner (12 core processors and Romley) and SSD becoming more common, high performance, scalable, low latency networks will be required to match the performance on both ends.

Leveraging its core XE201 controller technology, Emulex has delivered on 16Gb Fibre Channel *and* made serious strides to reduce latency and increase IOPS, even for 8Gb Fibre Channel environments. This adapter was designed to optimize cloud and virtualized server environments, enabling organizations to rapidly scale virtual environments and leverage the latest I/O virtualization techniques. It's good to see Emulex pushing the innovation envelope for what could have just been a routine bump in bandwidth. The enhanced services for virtualization and cloud, combined with the listed performance numbers, should make this a very popular 16Gb Fibre Channel adapter for Emulex's OEM partners and those organizations making a continued investment in Fibre Channel SANs.

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