



## Broadcom First to Sample Industry-Standard NVMe over Fibre Channel HBA Solution

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**The lossless, robust Emulex Fibre Channel solution delivers a 55% improvement in latency, 28% performance advantage, datacenter-proven fabric**

SAN JOSE, Calif., and SINGAPORE, July 19, 2016 (GLOBE NEWSWIRE) -- Broadcom Limited (NASDAQ:AVGO) today announced the availability of the industry's first Non-Volatile Memory Express (NVMe) over Fibre Channel HBA solution. Broadcom is currently sampling this standards-based solution to OEMs on its Emulex® Gen 6 Host Bus Adapters (HBAs). The NVMe over Fibre Channel solution delivers 55% lower latency when used with NVMe drives compared to SCSI drives and a 28% performance advantage versus Ethernet solutions.

NVMe over Fibre Channel builds on the performance improvements delivered by Emulex Gen 6 HBAs, which cuts latency in half versus the previous generation. The combination of Emulex Gen 6 with NVMe over Fibre Channel delivers an even greater reduction of 75% in latency versus legacy 8Gb Fibre Channel storage networks.

Emulex NVMe-enabled HBAs meet the newly ratified [NVMe over Fabrics \(NVMf\) standard](#) to ensure interoperability across the eco-system. Broadcom has been a leading contributor to the NVM Express working group and contributed the Fibre Channel driver code for the NVMe Fabrics Linux Driver working group. NVMe deployments are expected to ramp quickly in enterprise datacenters with analysts forecasting shipments to grow at a rate of 78%. (2016-2020 CAGR, IDC April, 2016)

Fibre Channel supports both standard storage arrays and new NVMe over Fibre Channel arrays on the same fabric. The dual-mode feature provides investment protection by supporting SCSI storage arrays installed in the datacenter and new NVMe storage arrays, concurrently. The solution is also Software Defined Storage-ready with the availability of an Software Development Kit (SDK) for Emulex HBAs that provides all the tools needed to build an NVMe external storage system based on standard server hardware.

NVMe over Fibre Channel is the optimal fabric solution providing multiple advantages including:

### Performance:

- Gen 6 Fibre Channel at 32Gb delivers 28% faster performance than 25Gb Ethernet solutions
- Provides consistent performance under heavy workloads due to the robust, credit based flow control, Fibre Channel fabric
- Provides scale to NVMe storage solutions built on a robust network, scaling beyond a rack to across the Enterprise Data Center

### Protection:

- Lossless, robust protocol
  - Fibre Channel's purpose-built design ensures consistent and reliable data delivery
- Easy and cost effective to implement
  - FC switches available today support NVMe over Fibre Channel and require no hardware changes and no new training or expertise

### Proven:

- Fibre Channel is the dominant choice for enterprise-class workloads
- 90% of all-flash array deployments use Fibre Channel
- High performance Fibre Channel connected storage represents a \$100 billion installed base

Emulex NVMe over Fibre Channel is expected to be broadly deployed with the release of servers based on Intel's Purley Platform and supporting operating system releases.

### Industry Support for NVMe over Fibre Channel

"NVMe over Fabrics is going to fundamentally change datacenter architectures over the next few years," said Jeff Hoogenboom, vice president and general manager, Emulex Connectivity Division, Broadcom Limited. "Fibre Channel will play a pivotal role in NVMe deployments because it delivers a superior connectivity solution by providing better performance, lossless and reliable networking with no dropped packets, and it's incredibly easy to deploy."

"NVMe will be the next disruptive technology for enterprise storage," said Jack Rondoni, vice president of storage networking, Brocade. "Fibre Channel is the obvious choice for NVMe over fabrics since it's purpose-built for storage, and Gen 6 fabrics will seamlessly integrate with NVMe storage. Brocade and Broadcom are working closely to develop NVMe storage solutions that will raise the bar for application and storage performance."

"Fibre Channel is an excellent transport for NVMe over Fabrics because of its strong presence in enterprise datacenters supporting storage systems," said Dennis Martin, Demartek President. "Fibre Channel can carry NVMe over Fabrics traffic and standard Fibre Channel storage traffic over the existing network at the same time, allowing for a relatively simple upgrade."

"Broadcom has delivered a solution for customers that require high performance, shared storage over a network with NVMe over Fibre Channel," said Randy Kerns, senior strategist, Evaluator Group. "The high performance of Gen 6 Fibre Channel and the very low latency of NVMe complement the transition to flash storage, enabling the use of storage as a memory extension for applications including performance-critical databases. NVMe over Fabric is the gateway to use of solid state storage technology in enterprise environments and other performance critical areas."

"Sharing storage over a network brings a number of benefits including more efficient use of storage which avoids storage islands and storage arrays providing full featured, mature storage services such as snap shots, backup, replication, thin provisioning, de-duplication, encryption, compression, and more," said Rupin Mohan, CTO Storage Networking, Hewlett Packard Enterprise and Marketing Chairman of Fibre Channel Industry Association (FCIA). "NVMe over Fibre Channel provides a low-latency solution for storage area networks that significantly improves I/O performance."

#### **About Broadcom Limited**

Broadcom Limited (NASDAQ:AVGO) is a leading designer, developer and global supplier of a broad range of analog and digital semiconductor connectivity solutions. Broadcom Limited's extensive product portfolio serves four primary end markets: wired infrastructure, wireless communications, enterprise storage and industrial & other. Applications for our products in these end markets include: data center networking, home connectivity, broadband access, telecommunications equipment, smartphones and base stations, data center servers and storage, factory automation, power generation and alternative energy systems, and displays. For more information, go to [www.broadcom.com](http://www.broadcom.com).

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