

Technology Spotlight

NVMe over Fibre Channel Addresses the Accelerated Data Requirements of the Future

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The Next Digital Revolution Leverages IT as a Competitive Differentiator

Data is the transformative business asset in the modern, digital economy. However, only 6% of line-of-business executives view IT as a competitive differentiator for the business, as opposed to the 25% who view IT as a business inhibitor. Simply supporting the business is no longer enough. IT must fuel the creation of new opportunity, and data and the speed of accessing that data are the key for the highly demanding applications of today and the very near future. Among those executives who view IT as an inhibitor, 43% indicated that they view it so because they have difficulty accessing the data they need for business operations and analysis.¹

To become a differentiator, IT must architect to the business's future needs. Infrastructure technologies that dramatically accelerate the business's access to data, such as non-volatile memory express (NVMe), offer a great start.



Line-of-business executives are **4X more likely** to see IT as a **business inhibitor** than a competitive differentiator.

NVMe over Fibre Channel Poised to Transform Data Centers

For those not familiar with NVMe, it is a streamlined and parallel open logical device interface designed to maximize the low-latency performance of flash storage. For example, NVMe offers a queue depth of 64K commands with 64K separate queues, in contrast to SATA, with just a single queue and a depth of only 32 commands. This advantage fuels excitement for NVMe, as 79% of the IT managers surveyed by ESG who were familiar with NVMe technology said that they expected it would eventually replace traditional SAS- or SATA-connected flash storage.²

A common misconception, however, is that just using NVMe flash storage is enough. Flash transformed application performance, but only partly, as the bottleneck shifted and some devices became oversubscribed. To reap the maximum benefit, the low-latency NVMe interconnect must be extended all the way to the host application, across the storage network, with the NVMe over Fabrics (NVMe-oF) standard. The fabric performance will become increasingly important in the near future, as new application accelerators and higher performing storage media technologies, such as storage class memory (SCM), will require lower-latency interconnects to reach their potential.

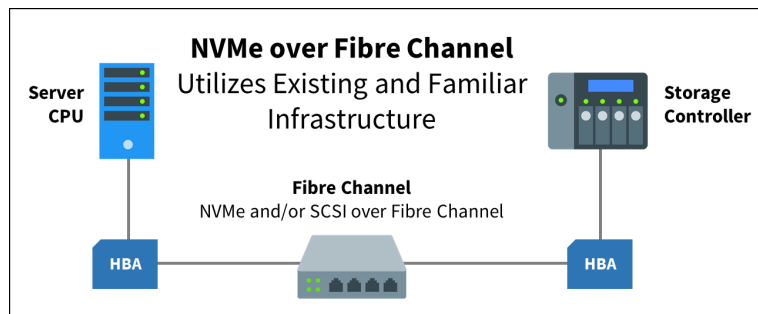
Given its already widespread enterprise adoption, leveraging NVMe over Fibre Channel could be the quickest, most cost-effective, and most risk-free way to integrate NVMe technology across the data center.

¹ Source: ESG Master Survey Results, [2019 Technology Spending Intentions Survey](#), March 2019.

² Source: ESG Master Survey Results, [2017 General Storage Trends](#), November 2017.

Why NVMe over Fibre Channel Changes the Game for Modern, Digital Businesses

A wide variety of industries, including health care, e-commerce, automotive, financial services, telecommunications, and manufacturing, are actively evaluating NVMe over Fibre Channel hoping to achieve a first-mover advantage. By utilizing data faster in data-centric initiatives, such as analytics or machine/deep learning, leading firms seek to turn data into a competitive differentiator.



Achieve Transformational Performance Improvements Faster with NVMe over Fibre Channel

Innovation often has a high cost, typically displacing existing investments. These changeovers introduce risk, consume precious personnel time, and slow technology adoption. Through advanced planning, the FC vendor community has addressed, and nearly eliminated, these concerns with NVMe over Fibre Channel, offering multiple benefits, including:

- **Reduced risk and investment:** FC-NVMe is delivered as a firmware upgrade to existing FC infrastructure, for 16 Gb/s and 32 Gb/s FC switches, as well as Gen 6 FC HBAs. As a result, it is highly likely that enterprises are already NVMe-ready. Enterprises can harness the performance benefits (50% higher performance, according to Broadcom) on the same hardware without deploying a separate environment, reducing the cost and risk of NVMe adoption, while simplifying the technology evaluation.
- **Simplified management:** FC-NVMe does not require a separate additional SAN. FC-NVMe is offered as an extension of existing FC SANs, enabling the same switch to support both FC-NVMe and traditional FC. FC-NVMe even uses the same cables as traditional FC.
- **Tested and validated enterprise environment:** By leveraging the same in-production infrastructure, enterprises can be more confident in the resilience of the FC-NVMe environment because the hardware is already deployed and in use. FC-NVMe leverages the immediate performance benefits of NVMe, delivering the benefits of NVMe parallelism, low latency, and higher IOPS on an established, reliable enterprise SAN platform.
- **Leveraged value:** Storage admins can use their existing management tools and skills sets. With no separate technology to learn and no new environment to stand up and validate, enterprises can integrate NVMe at their own pace. IT can run SCSI and NVMe over Fibre Channel concurrently, allowing for IT to transition easily, even by one LUN or a single server at a time, to NVMe over Fabrics as the predominant protocol.

The Bigger Truth

Fibre Channel is poised to redefine mission-critical storage and deliver what may be the most risk-free major technology transition in recent years. NVMe over Fibre Channel requires no new infrastructure or management skills. Businesses can harness the high-performance benefits right away and deliver that vital data access and competitive differentiation to their users.

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