Quantum

Accelerate Lustre HPC Environments with Quantum QXS Hybrid Storage

Reduce Time to Insight with Blazing Fast Storage at Extreme Scale

Solving the world's toughest problems requires complex and challenging analysis. Across the diverse fields in HPC, researchers create computational models to advance the understanding of our world and discover new possibilities. Whether in fluid mechanics, geosciences, oil and gas, genomics, climate modeling, intelligence, or network forensics—a vast amount of valuable data is being created and processed. Today's HPC applications require massive parallel processing and storage that can support the ultra-high streaming performance—both writes and reads—that enable HPC workflows.

KEY REQUIREMENTS FOR HPC STORAGE: FAST, FLEXIBLE, SCALABLE, ACCESSIBLE

HPC workflows demand speed and scale. The computational analysis involved in HPC applications is important—sometimes these projects are even changing the world. HPC storage needs to deliver extreme performance and massive scale in a way that integrates seamlessly into the rest of the environment. And the HPC storage needs to provide ready access to data, wherever and whenever it's needed, even at extreme scale.

Quantum offers two different high-performance storage solutions for HPC workflows: StorNext® scale-out storage and QXS™ hybrid storage deployed with Lustre®. This solution brief focuses on Quantum QXS hybrid storage for Lustre environments.

HPC STORAGE FOR LUSTRE: QXS HYBRID STORAGE WITH ADAPTIVE CACHE

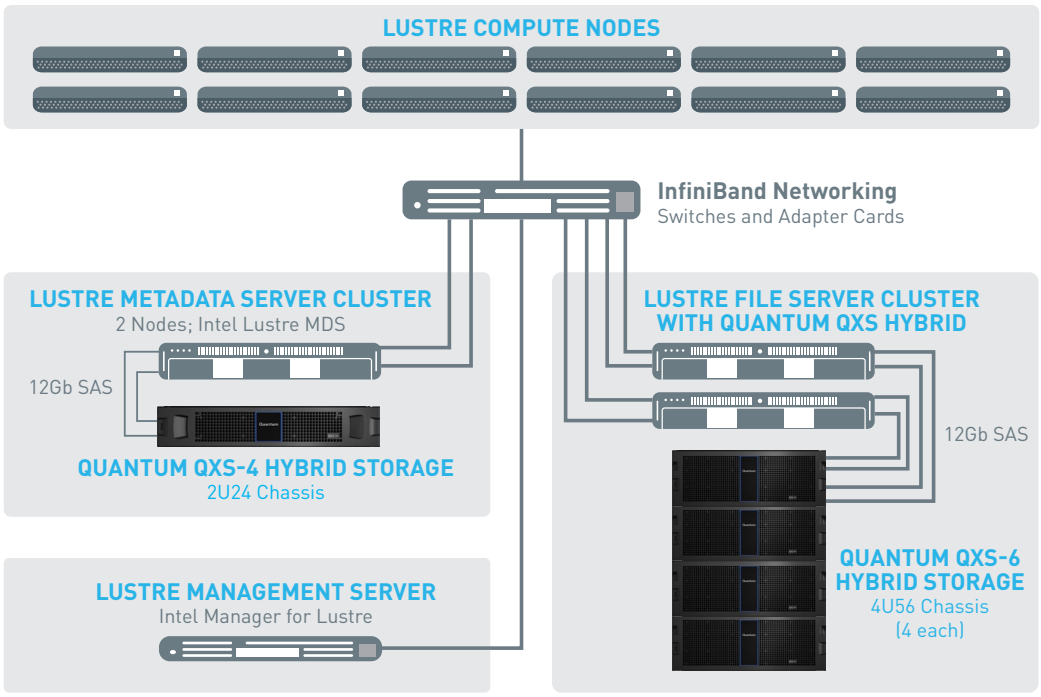
Quantum QXS hybrid storage delivers the high-speed storage required by demanding HPC environments and the Lustre file system. To enable massively parallel reads, QXS hybrid storage includes an adaptive caching technology to accommodate dozens of independent streams of data without degrading throughput. Adaptive caching is a critical feature for HPC applications that depend upon reliable, high-performance data streaming.

> Combining Intel Lustre with Quantum QXS hybrid storage, we achieved a cost-effective appliance that was reliable and easily scalable with impressive performance.
>
> *- Simone Tinti, VP Development & Operations E4 Computer Engineering*

QUANTUM QXS HYBRID STORAGE FOR HPC

- **Blazing fast read & write performance** with 12GB/s read, 5.7GB/s write, and up to 200,000 IOPS
- **Built for scale. Petascale.** With seamless capacity expansions
- **Proven 99.999% availability** via active-active controllers and redundant components
- **Intelligent real-time tiering optimizes** performance with the speed of flash at a fraction of the cost
- **NEBS and MIL-SPEC compliant** for ruggedized deployments

Figure 1. ***Lustre HPC Environments Powered by Quantum QXS Hybrid Storage***



LUSTRE FILE SYSTEM + QXS HYBRID STORAGE = MASSIVE SCALE & PERFORMANCE

The Lustre file system is an open-source file system widely used in high-performance computing environments because it enables high bandwidth and large-scale workloads.

The Lustre architecture contains Object Storage Servers (OSS), Metadata Servers (MDS), and Lustre client nodes, all connected over a high-speed network. QXS hybrid storage from Quantum can be the cornerstone of an HPC solution that is fully redundant and optimized for performance—ensuring that mission-critical applications always have access to critical data. Together, Lustre and Quantum QXS hybrid storage enable the massive scale and blazing fast performance required for HPC modeling, simulation, and analysis.

QXS HYBRID STORAGE: A PERFECT FIT FOR HPC AND LUSTRE ENVIRONMENTS

Quantum QXS hybrid storage delivers extreme performance, even at petascale—with 12GBs/sec for reads, 5.7GBs/sec for writes, and 200,000 IOPS. With a redundant architecture that is both NEBS and MIL-SPEC compliant, the ruggedized reliability of QXS hybrid storage is ideal for demanding HPC environments. Quantum QXS hybrid storage—with its combination of speed, scale, and reliability—is the perfect fit for open-source Lustre deployments in HPC.

Learn more at **www.quantum.com/hybridstorage**.

ABOUT THE LUSTRE FILE SYSTEM

The Lustre open-source file system is a distributed parallel file system that is designed for large-scale cluster computing. Lustre is used in many large and complex computing environments.

ABOUT QXS HYBRID STORAGE FROM QUANTUM

Quantum QXS hybrid storage is high-performance storage that delivers the extreme scale needed in HPC workflows. With its intelligent, real-time tiering, QXS hybrid storage provides all-flash performance at a fraction of the cost of an all-flash system. And it's designed for reliability, with proven 99.999% availability.

ABOUT QUANTUM

Quantum is a leading expert in scale-out storage, archive and data protection, providing solutions for sharing, preserving and accessing digital assets over the entire data lifecycle. From small businesses to major enterprises, more than 100,000 customers have trusted Quantum to address their most demanding data workflow challenges. With Quantum, customers can Be Certain™ they have the end-to-end storage foundation to maximize the value of their data by making it accessible whenever and wherever needed, retaining it indefinitely and reducing total cost and complexity. See how at **www.quantum.com/customerstories**.

Quantum

www.quantum.com • 800-677-6268

SB00127A-v04 Apr 2016