Quantum

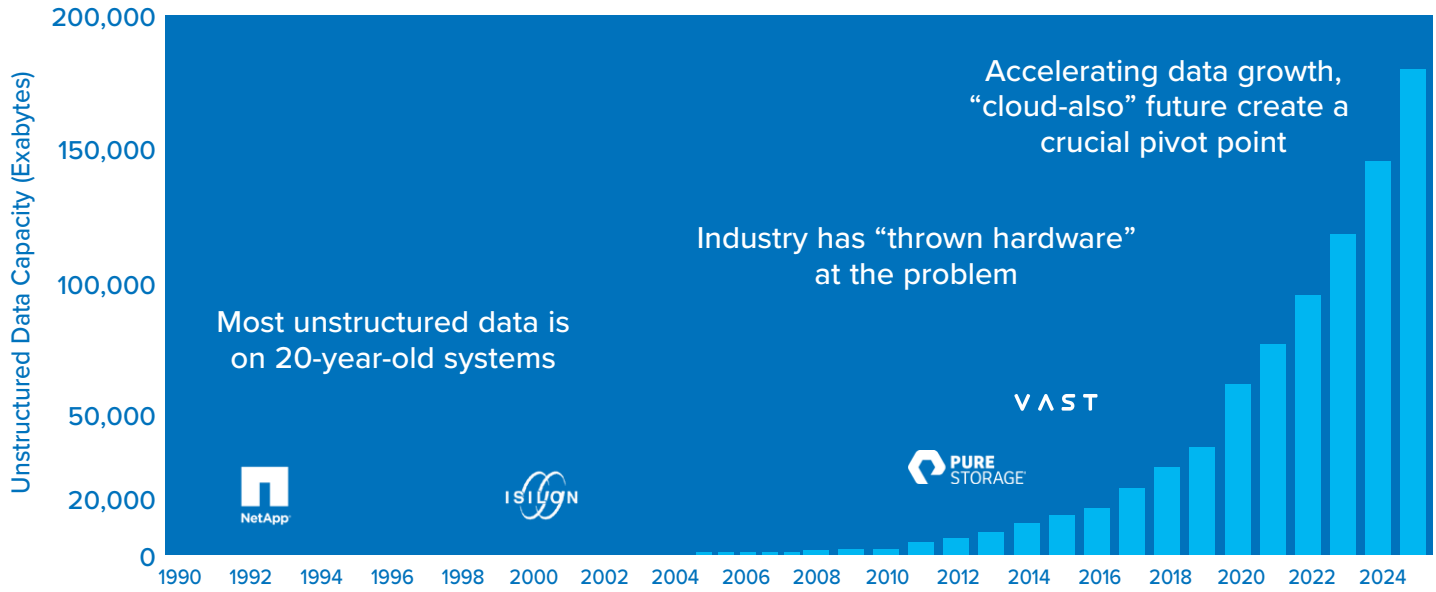
Myriad Product Overview

CLOUD-NATIVE, ALL-FLASH FILE AND OBJECT STORAGE SOFTWARE THAT ELIMINATES THE CONSTRAINTS, COMPLEXITIES, AND TRADEOFFS OF HARDWARE-CENTRIC STORAGE

PRODUCT BRIEF

Ending the Constraints, Compromises, and Tradeoffs of Legacy Hardware-Centric Storage Designs

The amount of unstructured data in the enterprise is expected to more than double in the next 5 years, yet most enterprises are storing this data on systems that were designed 20 years ago. These organizations have been stuck in an endless cycle of expanding and upgrading NAS systems; adding more disk drives for performance so their NAS cluster is now bloated and inefficient. Larger organizations may have a proliferation of different types of systems, or even different storage platforms for specific use cases – adding complexity to their infrastructure at a time when it is very difficult to hire IT personnel.



To keep pace with data growth, the industry has "thrown hardware" at the problem. Legacy architectures have tried to bolt-on flash storage, but their software is not designed to harness the true potential of flash. Even more recent file and object solutions designed for flash are shackled to specialized hardware and won't run natively in the cloud.

Current Storage Architectures are Failing
Performance constraints, networking issues, management nightmares

Proliferation of Storage Platforms Adds Complexity and Costs
Burden on IT personnel at a time when it is difficult to find talent

Rising Energy & Data Center Costs, ESG Considerations
Reduce data center footprint, reduce power, cooling, emissions

Businesses Lack Agility to Address Hybrid- and Multi-Cloud
Stuck with platforms that are shackled to specialized hardware

Data-driven organizations are constrained by their existing storage infrastructure. Legacy architectures are failing in the face of the volume and variety of unstructured data being generated. This has resulted in a proliferation of storage platforms, adding cost and complexity. Racks of inefficient disks are consuming power and cooling, and businesses lack the agility for the hybrid-cloud and multi-cloud future.

Myriad Scale-Out All-Flash File and Object Storage

To solve these challenges, Quantum Myriad™ was created. Myriad's cloud-native, all-flash file and object storage software brings new levels of simplicity and adaptability to high-performance unstructured data workloads.

Consistent Low-Latency Performance at Any Scale

Myriad introduces an all-new, distributed software architecture designed for the latest NVMe flash and RDMA memory protocols, and combines several breakthrough software innovations to deliver consistent, low-latency performance for any unstructured data workload at any scale.

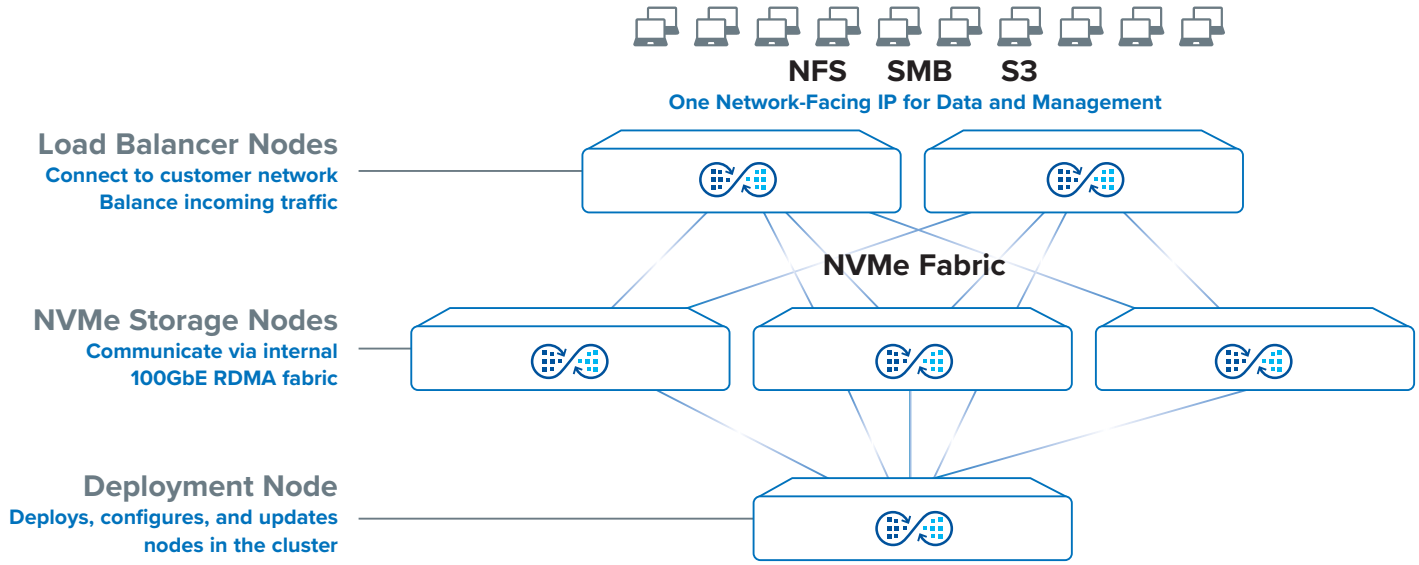
Modern Microservices Architecture

Myriad is based on a modern, microservices architecture using recent advances in application frameworks and design that were not available just a few years ago. Myriad is cloud-native: It is 100% containerized and those containers are orchestrated by Kubernetes. Not only does this simplify the ongoing orchestration of the microservices running in a Myriad cluster, but it allows customers to adopt new features and fixes faster and with less risk. In short, Myriad delivers cloud-like simplicity wherever it is deployed.

Zero-Touch Storage and Network Management

Everything about Myriad is designed with simplicity in mind. The software automates much of the storage management and networking management, so that even large clusters can be managed with almost no IT involvement. Software automatically detects, deploys, and configures new storage nodes within a cluster so you can scale, modify, and even shrink your cluster non-disruptively. NVMe Storage Nodes communicate via an internal 100GbE RDMA fabric that is managed by the software, eliminating the networking complexities associated with legacy scale-out NAS systems.

Myriad Cluster Architecture



You can start small and scale big with Myriad. Clusters are comprised of Load Balancer Nodes, which are switches that connect to the customer network and balance incoming traffic, as well as some number of NVMe Storage Nodes and a Deployment Node.

NVMe Storage Nodes communicate with each other and the Load Balancer Nodes via an internal 100GbE NVMe/RDMA fabric, providing for a fully distributed all-flash architecture that provides consistent low-latency performance for both high-bandwidth and high-IOPS workloads.

The Deployment Node is not in the data path and is a switch that is only used when deploying new software or when new nodes are added to the cluster. The software is comprised of a number of microservices that are orchestrated by Kubernetes, which is used to orchestrate the cluster, maintain the correct state of the cluster, and more.

It is easy to scale the cluster non-disruptively by adding more NVMe storage nodes. Over time, Quantum plans to add different server and storage options, including high density storage nodes, higher density drives, faster servers, and more. With Myriad, the future is built in – simply modify and adapt your cluster with more performance and/or more capacity to meet your requirements.

Myriad Software Architecture and Feature Set

Clients	NFS v4	NFS v3*	SMB*	S3*	Proprietary Client*	GPU-Direct*
Data Services	Snapshots	Clones	Inline Deduplication and Compression		Replication*	Data Catalog and Analytics*
File System	Fully distributed		Composable (one FS per user, per app, etc.)			
Transactional Key/Value Store	Redirect-on-write		Lock-free	Self-Balancing, Self-Healing		Dynamic n+m Erasure coding

*Some features listed are not available at initial product GA. Contact Quantum representative for details.

Myriad Client Connectivity

Myriad supports connectivity via NFS v4, NFS v3*, SMB*, and in the future will add S3 and additional interfaces. Clients connect through a single IP address no matter how large the cluster grows. Myriad automatically load-balances client connections across multiple 100GbE ports using equal cost multipathing (ECMP). BGP routing using unnumbered interfaces minimizes networking effort at initial deployment and when scaling.

Myriad Data Services

Myriad provides inline deduplication and compression. Versioning support is via snapshots and clones and does not impact file service operation.

Myriad File System

Myriad was designed to take full advantage of NVMe flash storage and fast, low-latency RDMA networking. The Myriad distributed file system stores both file and object data, attributes, and inherent metadata in an underlying key/value store. Both data and metadata are distributed across all nodes for maximum resiliency.

Myriad Transactional Key/Value Store

Myriad is designed for lock-free scaling across even the largest of systems and responds on-the-fly to changes in storage node availability. The redirect-on-write nature of Myriad ensures that new data is always written to free space vs. overwriting data in place. This inherently supports versioning, snapshots, and rollback, providing resistance to data loss from accidental deletion and ransomware alike.

Dynamic Erasure Coding Data Protection

Stored data is protected with dynamic n+m erasure coding. As the cluster grows or shrinks and drives or nodes fail and are replaced, the EC spread dynamically adjusts for maximum efficiency and protection, all without administrator intervention.

Zero-Click Upgrades

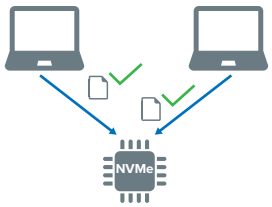
Adding storage is as simple as racking and cabling new storage nodes, powering them on, and walking away. No need to submit tickets to the networking team or even open the UI. Myriad automatically detects new nodes and deploys them into the cluster for immediate use.

Myriad comes with a simple, intuitive user interface for all administrative functions. Admins can see real-time system analytics, and in the future, will be able to visualize data and metadata simply with a data catalog. Myriad clusters can connect to cloud AIOps software so customers can monitor multiple Myriad clusters, along with other Quantum products, from a single, secure online portal.

Consistent Low-Latency Performance

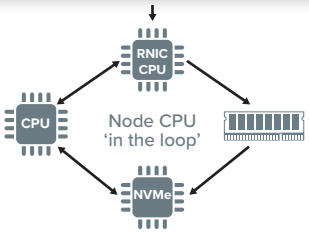
Myriad software introduces a series of breakthrough innovations that take advantage of the NVMe flash protocol and the RDMA networking protocol to deliver consistent low-latency performance for any unstructured data workload at any scale.

Lock-Free Design



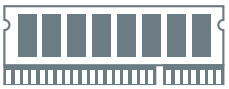
Instead of managing file locking, which takes up valuable system CPU, memory, and performance, Myriad employs a lock-free design that allows and manages conflicts as a way to reduce write latency.

Enhanced NVMe Protocol



Myriad software uses an enhanced NVMe protocol that offloads tasks from the basic RNIC CPU to the more powerful storage node CPU. This reduces latency for both writes and reads.

Target-Side Read Cache



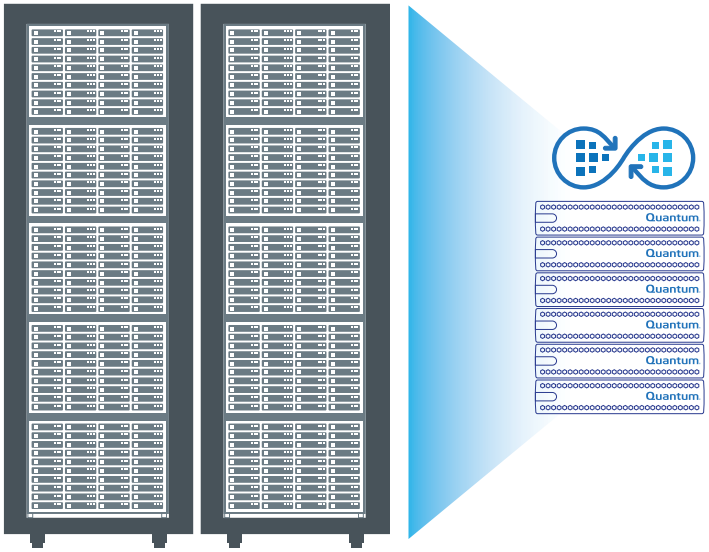
Myriad leverages a global, target-side read cache to and further reduce read latencies.

Replace Racks of Disk with a Simple, Fast, Efficient Myriad Cluster

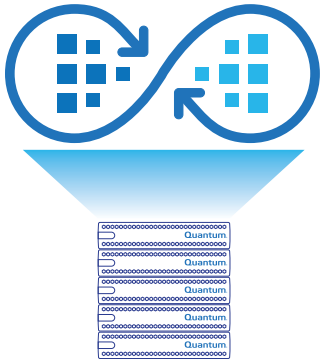
Many enterprise customers use racks of scale-out NAS disk as a way to achieve performance. In other words, they require many disk spindles to achieve a specific performance target that can be met far more efficiently with a smaller all-flash system.

Myriad software unlocks the full potential of flash performance and uses always on inline deduplication and compression to reduce the cost of flash. Myriad offers up to 60% better storage efficiency than legacy scale-out NAS systems that require a lot of storage overhead for metadata and metadata operations.

Reduce data center footprint, reduce power and cooling costs, and reduce emissions. "Go green" with a simple, fast, and efficient Myriad all-flash cluster.



Built for the 'Cloud Also' Future



No Specialized Hardware

Quickly benefit from market-driven hardware innovation and falling flash costs

Data Where You Need It, When You Need It

Replicates files, folders, objects, and buckets based on metadata

Runs Natively in the Cloud

Gain agility and benefit from reduced cloud storage costs

Infrastructure decision makers need to have the agility to run workloads on-premises and in any cloud. Because Myriad uses a cloud-native design and does not rely on specialized hardware, it will run natively in any cloud using standard cloud services, providing for a seamless experience no matter where it is deployed. And Myriad will replicate data between Myriad clusters and between other file and object storage systems, including Quantum StorNext®, Quantum ActiveScale™, and third-party file and object stores.

Business Outcomes

Reduce Operational Costs Through Workload and Platform Consolidation

Consistent low-latency performance for any unstructured data workload, at any scale

Free Up IT Personnel to Focus on Business Enablement

Even large clusters can be managed with little IT involvement and without networking expertise

Take Advantage of Reduced Flash Storage and Cloud Storage Costs Over Time

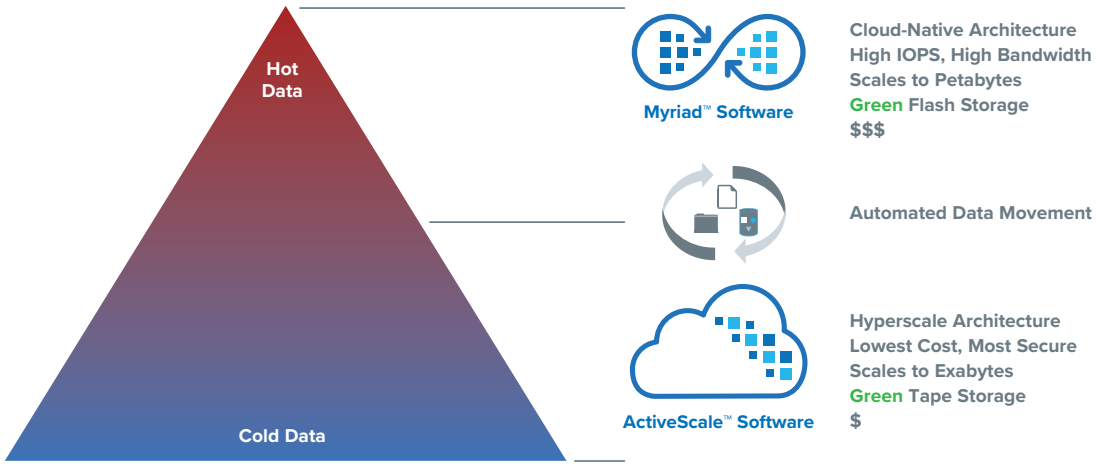
No specialized hardware, runs natively in any cloud so you can adapt and benefit quickly

End-to-End Solutions Across the Unstructured Data Lifecycle

Myriad extends Quantum's portfolio of industry leading solutions that span the full lifecycle of unstructured data.

For many emerging unstructured data sets, such as AI/ML, enterprise video, images and imaging in healthcare, earth and life sciences, and other file and object data, this data must be kept for years, decades, and longer.

Unlike other vendors that suggest keeping Exabytes of data on flash for decades, Quantum takes a different approach with software platforms optimized for hot and cold data across the entire data lifecycle. Files and objects will be able to be moved automatically between these platforms based on metadata and user-defined policies, simplifying the management of unstructured data, and putting data where it needs to be, when it is needed.



Quantum

Quantum technology, software, and services provide the solutions that today's organizations need to make video and other unstructured data smarter – so their data works for them and not the other way around. With over 40 years of innovation, Quantum's end-to-end platform is uniquely equipped to orchestrate, protect, and enrich data across its lifecycle, providing enhanced intelligence and actionable insights. Leading organizations in cloud services, entertainment, government, research, education, transportation, and enterprise IT trust Quantum to bring their data to life, because data makes life better, safer, and smarter. Quantum is listed on Nasdaq (QMCO) and the Russell 2000® Index. For more information visit www.quantum.com.