Quantum

Quantum F-Series NVMe Storage

> DATASHEET

An ultra-fast, highly available storage array for editing, rendering, and processing of video content and other large unstructured data sets

The Quantum F-Series is a high-performance, highly available and reliable storage array designed for studio editing, rendering, and other performance-intensive workloads for large unstructured data sets.

The Quantum F-Series uses NVMe flash drives for ultra-fast reads and writes and to support a huge amount of parallel processing. In addition, F-Series uses the latest RDMA networking technology to provide direct access between workstations and the NVMe storage devices, to provide predictable, ultra-fast network performance. Lastly, both the software and hardware architecture are designed to be highly available.

Relative to traditional SSD and HDD storage arrays, the Quantum F-Series is orders of magnitude faster, enables users to move from Fibre Channel SAN infrastructures to Ethernet infrastructures without giving up performance, and gains back racks of data center space.

Unlike other NVMe storage arrays, the Quantum F-Series was designed specifically for video and video-like data sets, so it can easily handle the performance requirements of ultra-high-def content, high-resolution images, and other forms of unstructured data.

FEATURES & BENEFITS

Lightning-Fast Performance with NVMe and RDMA

Much faster than traditional flash storage, extremely low latency, and hundreds of thousands of IOPs per chassis.

Highly Available and Reliable Architecture

Both software and hardware are purpose built for high availability and reliability, with no single point of failure.

Predictable, Low-Latency Access via Fibre Channel or Ethernet

Enables users to reduce infrastructure costs by moving from Fibre Channel to IP-based infrastructures.

Meets Performance Requirements with Less Rack Space

Users that have had to use a large number of HDDs or SSDs to meet their performance requirements can gain back racks of data center space.

Tightly Integrates with Quantum's StorNext® File System

Enables workstations and applications to access content in file format, and provides broad and deep integration with the entire media production ecosystem.

> **LEARN MORE:**
> **www.quantum.com/f-series**

QUANTUM F-SERIES NVMe STORAGE

QUANTUM F2000 PRODUCT OVERVIEW

The first product in the Quantum F-Series, the Quantum F2000, is a highly available, highly performant storage server—purpose built for NVMe and with no single point of failure.

F2000 Front

24 dual-ported NVMe drives Available in three capacities:
- 46 TB (24 x 1.92 TB)
- 92 TB (24 x 3.84 TB)
- 184 TB (24 x 7.68 TB)

F2000 Rear

Dual-node server with two hot-swappable compute canisters.
Each compute canister can access all 24 drives.

Each compute canister includes:
- 2 Intel Xeon 6140 CPUs (18 cores/36 threads)
- 256 GB DRAM (32 GB x 8 slots)
- 2 M.2 Boot Drives (512 GB)
- 2 100 GbE ports (or) 4 FC-32 G ports
- 3 PCiE slots
- Battery Backup

Redundant 1800 W PSUs

The F2000 is a 2U, dual-node server with two hot-swappable compute canisters and up to 24 dual-ported NVMe drives. Each compute canister can access all 24 NVMe drives, and each compute canister includes processing power, memory, and connectivity specifically designed for the highest performance and availability.

The F2000 appliance holds up to 24 dual-ported NVMe drives, and is available in three capacity points:

- 46 TB (24 x 1.92 TB)
- 92 TB (24 x 3.84 TB)
- 184 TB (24 x 7.68 TB)

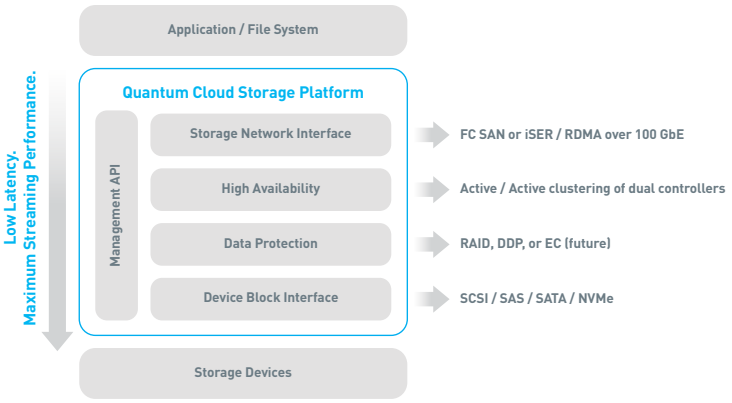
A detailed specification table is provided at the end of this datasheet.

Quantum F-Series Software: Powered by the Quantum Cloud Storage Platform

The Quantum Cloud Storage Platform is the software that powers the Quantum F-Series. Quantum's Cloud Storage Platform is a software-defined storage platform that was designed specifically for video and other large unstructured data sets.

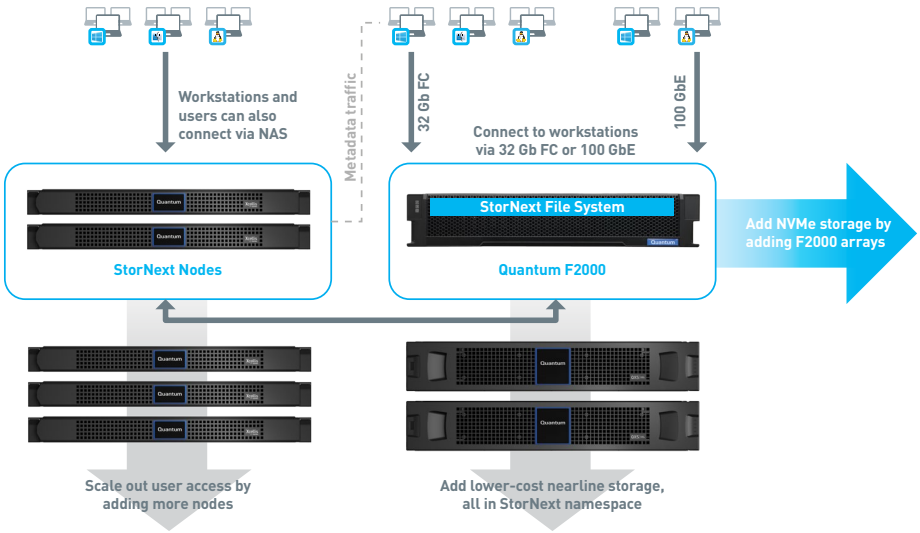
The Quantum Cloud Storage Platform is:

- **Software-defined:** Run on bare metal, in a VM, or in the cloud. No hardware dependence.
- **Highly available:** With capabilities that include active/active clustering, failover, and different forms of data protection.
- **Tuned for low latency and fast streaming performance:** Because the Quantum Cloud Storage Platform was built for video and video-like data, we've stripped out the data services that don't apply to video, making the architecture more efficient and maximizing streaming performance to the storage.



QUANTUM F2000 USE CASE

With the F2000 in a StorNext shared storage environment, users access data directly from the storage—either on the SAN or on an IP network—without the bottlenecks associated with current storage and networking technologies. The result? Dramatically lower, and predictable, latencies for anyone working in UHD and high-frame-rate content.



As shown in the figure, workstations and applications are able to access the NVMe storage directly via 32 Gb Fibre Channel, or via 100 GbE using RDMA.

In addition, users can connect into the NVMe storage using CIFS/NFS, in which case the clients access the storage through StorNext server nodes.

Users can add more NVMe storage by adding more F-Series storage arrays and can scale out access to more users by adding additional StorNext file system nodes.

In addition, users can build out nearline storage with less-expensive SSD or HDD storage, all within the StorNext shared storage environments.

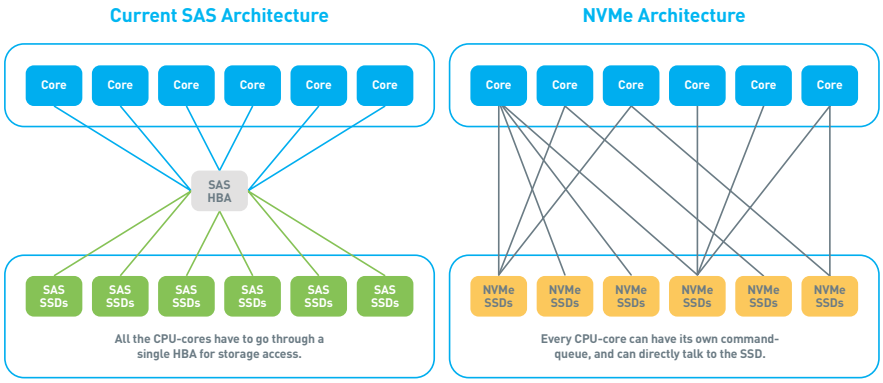
QUANTUM F-SERIES BENEFITS

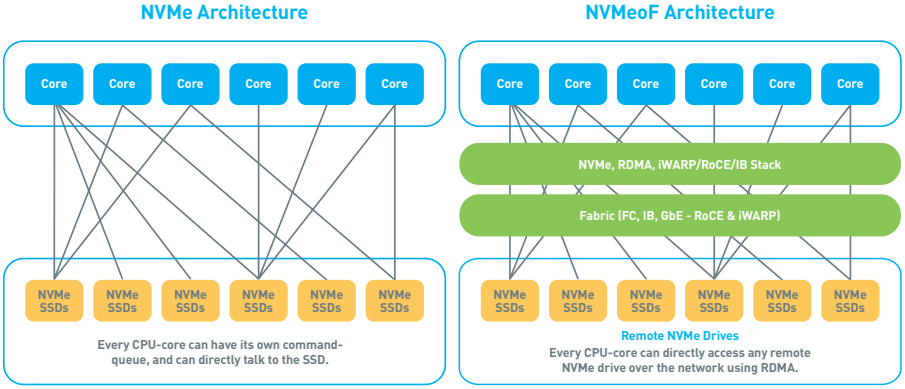
Lighting-Fast Performance

With the ability to support massive 1000+ node render farms without data contention, support playout to multiple digital intermediaries from a single volume, or work effortlessly with uncompressed 8K content, Quantum F-Series supports all these workflows and more. It does this by taking advantage of NVMe performance and parallelism.

Designed for the Future

The Quantum F-Series uses NVMe, which inherently provides direct access to storage, and massive parallelism to unlock the true performance of flash.





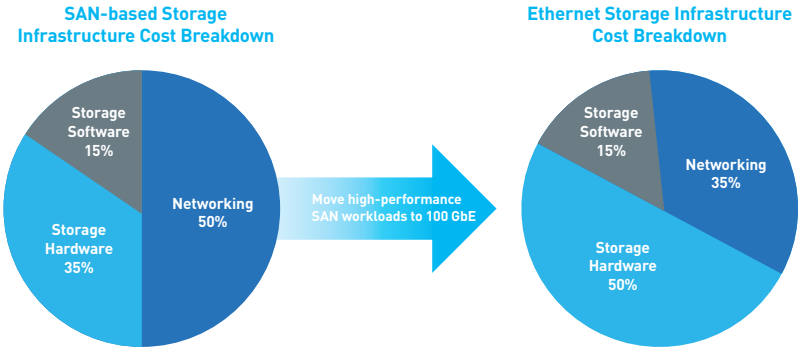
But the Quantum F-Series also supports RDMA protocols—another networking technology that reduces network overhead, and provides direct client access to storage.

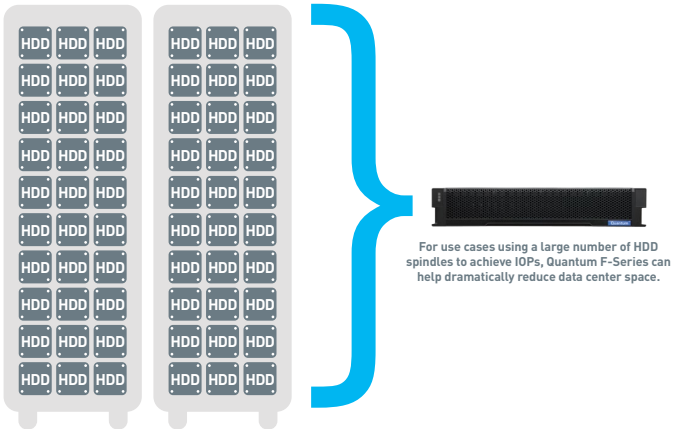
For users moving to IP-based workflows and infrastructures, the combination of these technologies will enable users to future-proof their infrastructure and accelerate their workflows in the process.

Finally, the F-Series is NVMeoF ready. So, as more applications start to leverage the NVMeoF protocol, the F-Series is built to take advantage of those future enhancements.

Reduce Infrastructure Costs

A majority of today's most demanding video workflows involving high-resolution, high-frame-rate content are still operating on SAN-based storage architectures. And although there are benefits of Fibre Channel, the infrastructure is costly to buy—and just as expensive to maintain. By leveraging the power of 100 GbE networking, cutting-edge RDMA protocols, and direct access to storage enabled by NVMe, Quantum F-Series can become the bridge to help your organization move to a more cost-effective network architecture that still provides all the performance your users require.





Gain Back Racks of Data Center Space

Because F-Series is able to offer extremely high levels of performance in such a dense form factor, organizations no longer need to overprovision their storage to achieve the performance required by certain applications. Not only does this offer savings by needing to purchase less infrastructure for the same amount of performance, but organizations can also reduce the data center space required to house these solutions, further reducing infrastructure costs.

TECHNICAL SPECIFICATIONS

Specification	F2000, 46 TB	F2000, 92 TB	F2000, 184 TB
Drives	24 x 2.5" Dual-port NVMe SSDs		
SSD Capacity	24 x 1.92 TB 1 DW/D	24 x 3.84 TB 1 DW/D	24 x 7.68 TB 1 DW/D
CPU	Dual Xeon 6140, 2.3 GHz, 18 C, 140 W		
Memory per Controller (Two Controllers per F2000)	32 GB ECC RDIMM, DDR4-2666 MHz - Total: 256 GB (128 GB per node) 24 DIMM slots on each motherboard		
Expansion per Controller	2 PCIe Gen3 x16 Low Profile 1 PCIe Gen3 x16 Standard Height		
Networking per Canister I/O per Canister Fibre Channel Model	2 Dual-port 32 Gb Fibre Channel		
Networking per Canister I/O per Canister Ethernet Model	1 Dual-port 100 Gb Ethernet		
I/O Onboard per Controller	4 10 Gb Ethernet (RJ45) 2 USB 3.0 1 VGA, DB15 1 RJ45 BMC / Management		
Management	IPMI 2.0 System Management		
Physical Dimensions	Height: 87.6 mm (3.45") Width: 446.4 mm (17.58") Depth: 836.4 mm (32.93") Product w/o SSDs: ~39.1 kg (86.0 lbs) Product w/ 24 SSDs: ~42.1 kg (92.6 lbs)		
Power	1+1 1800 W, CRPS, 80+ Platinum 200-240 V AC input 56.2 WHr Battery Backup Unit (BBU) per canister with 5-year expected life		
Cooling per Canister	4+1 40 mm fans, cold-swappable		
LED Indicators	Front: Power, ID, Fault Drive: Activity, Fault		
Serviceability	Hot-swappable power supplies, compute canister, and SSD modules		
Environmental	Operating Temperature: 5 to 35 °C Non-op Temperature: -30 to 60 °C Humidity: 8 to 85% relative humidity		

ABOUT QUANTUM

Quantum technology and services help customers capture, create, and share digital content—and preserve and protect it for decades at the lowest cost. Quantum's platforms provide the fastest performance for high-resolution video, images, and industrial IoT, with solutions built for every stage of the data lifecycle, from high-performance ingest to real-time collaboration and analysis and low-cost archiving. Every day the world's leading entertainment companies, sports franchises, research scientists, government agencies, enterprises, and cloud providers are making the world happier, safer, and smarter on Quantum. See how at **www.quantum.com**.

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