

OS NEXUS



**Supermicro + QuantaStor
Software Defined Storage Solutions**



> Unified File, Block & Object

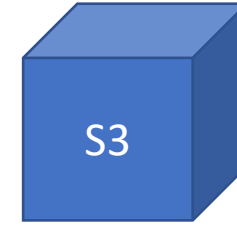
All major storage protocols are supported including NFS/SMB, iSCSI/FC, and S3.



FILE



BLOCK



OBJECT

> Storage Grid Technology

Storage Grid technology unifies management of QuantaStor servers and clusters across racks, sites, and clouds.

> Secure

Advanced RBAC, end-to-end encryption support, and compliance with NIST 800-53, 800-171, HIPAA, CJIS, & FIPS 140-2 L1 certified.

What is QuantaStor?

Enterprise Software Defined Storage Platform

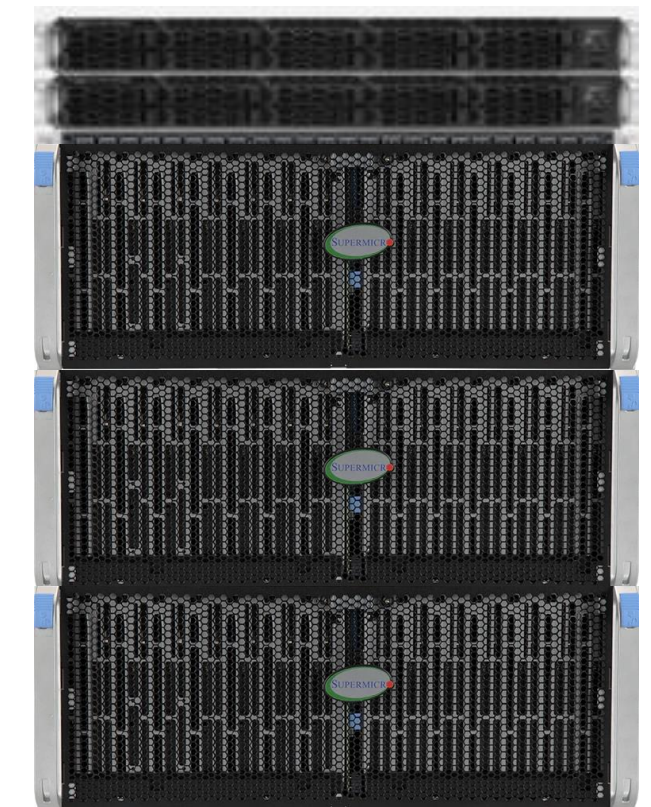
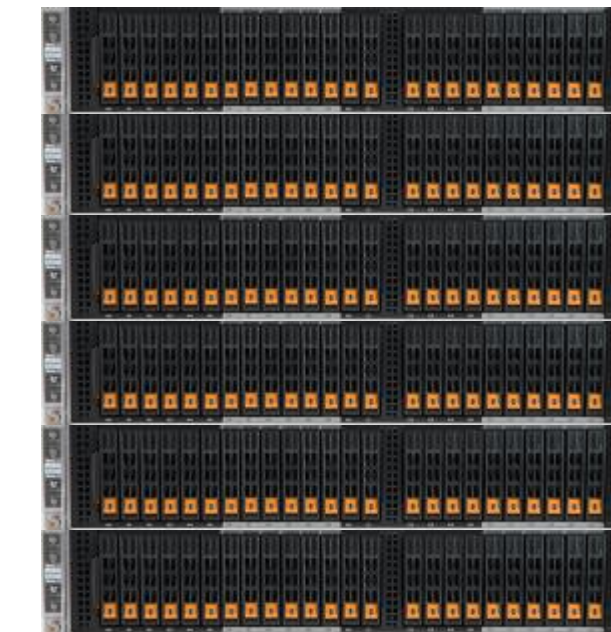
> Scale-up & Scale-out

Integrated with enterprise-grade open storage technologies (Ceph & ZFS).



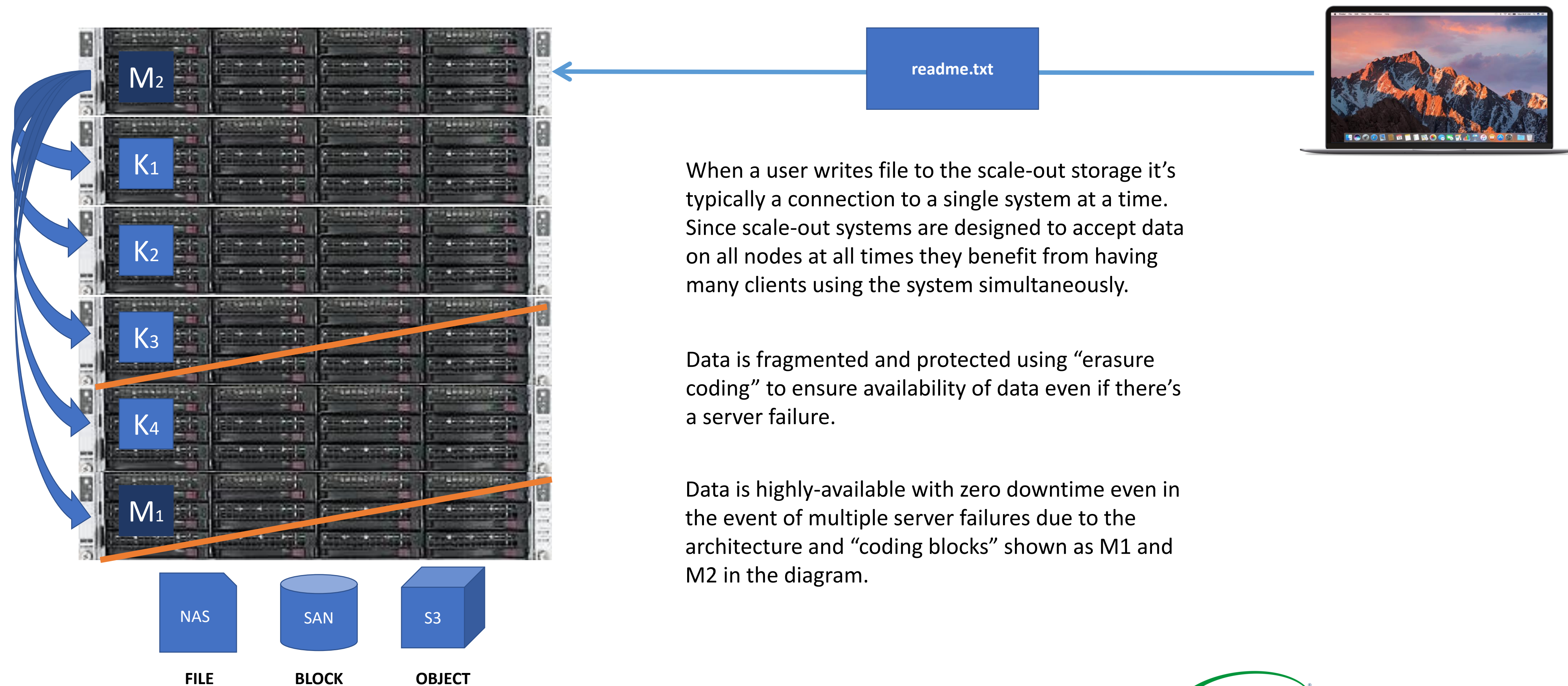
> Hardware Flexibility

QuantaStor supports and is integrated with the full line of Supermicro servers, JBODs, and SBB clustered storage solutions.



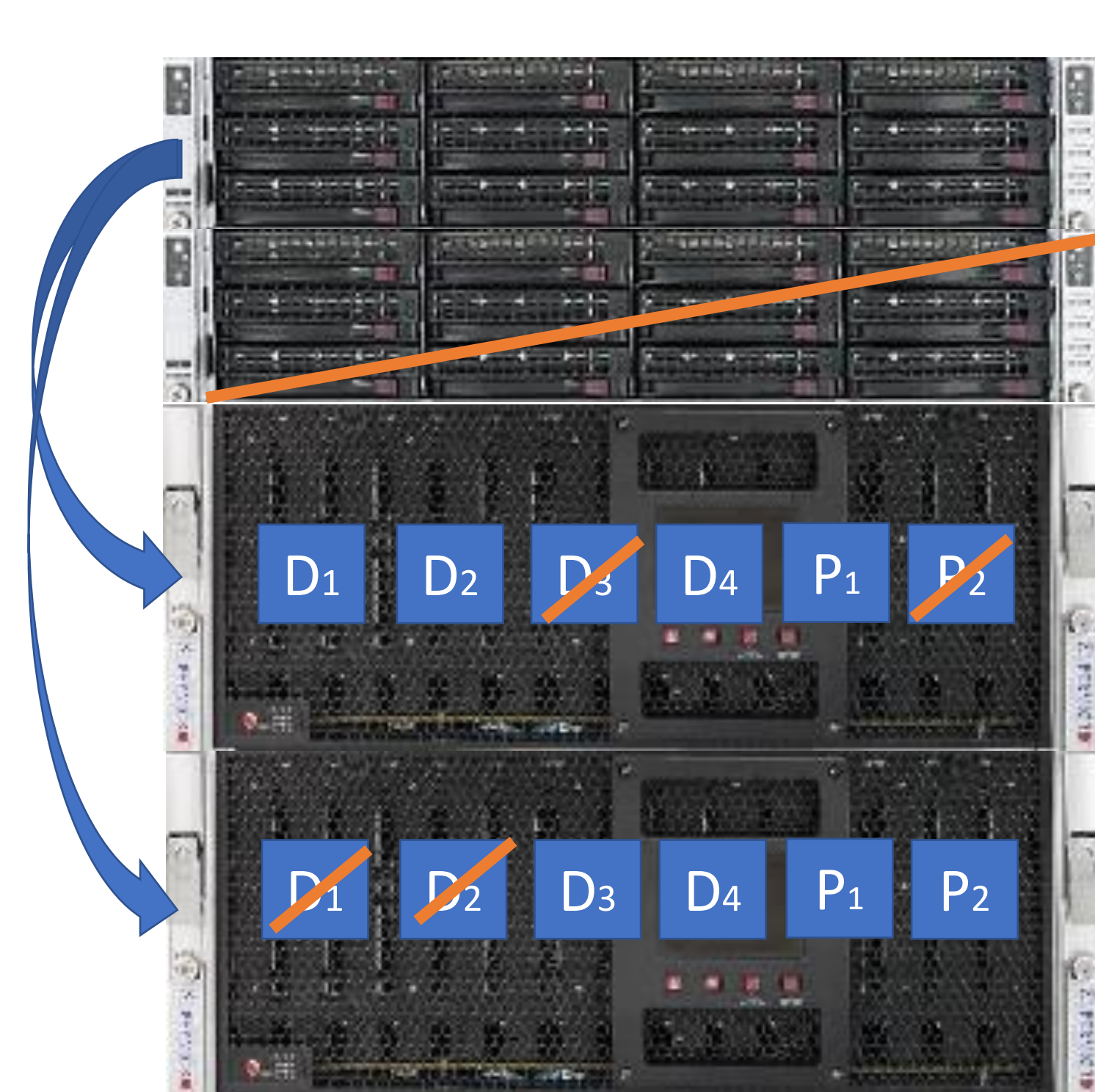
Scale-out Storage Architecture

Scale-out Storage Architecture



Scale-up Storage Architecture

Scale-up Storage Architecture



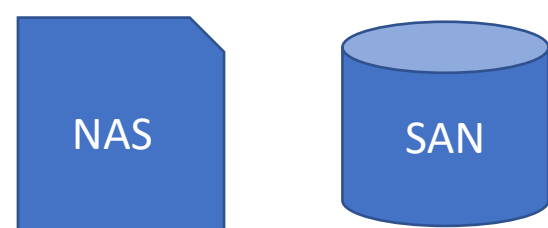
readme.txt



When a user writes file to scale-up storage it's to one of two servers that act as "controllers".

Data is mirrored or striped across external disk enclosures (JBODs) using RAID technology. External disk enclosures are typically much lower cost than servers.

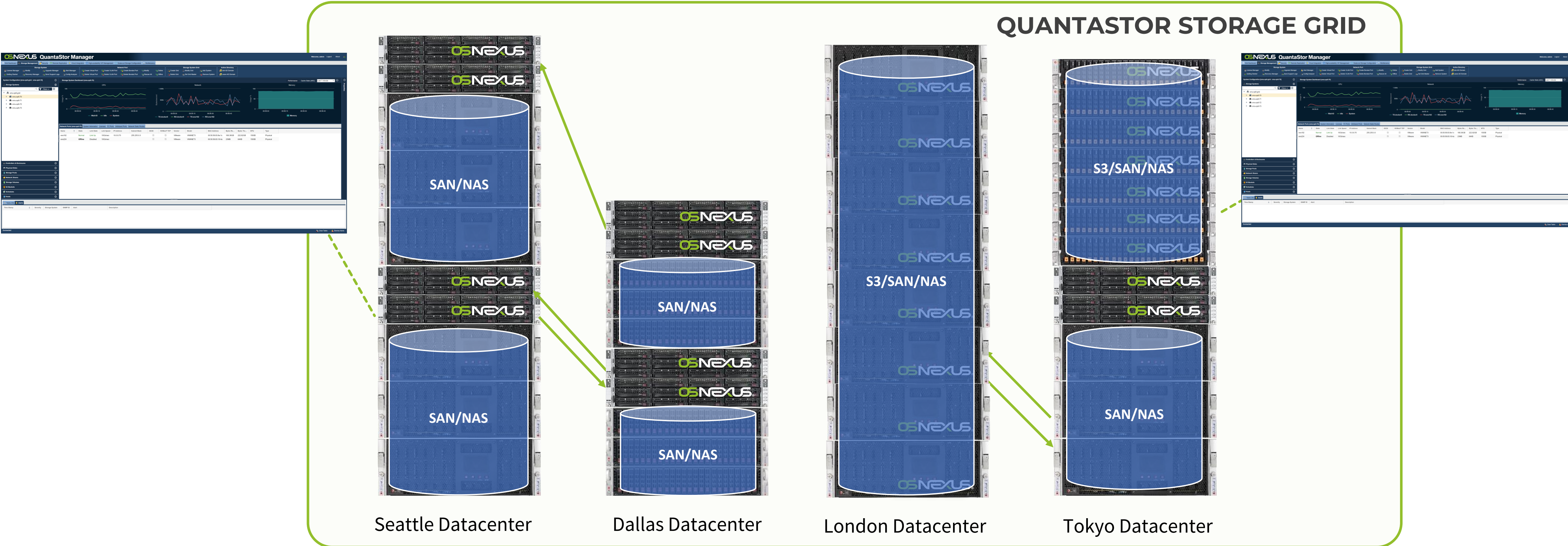
Data is highly-available with zero downtime even in the event of a server failure or a disk enclosure failure.



FILE BLOCK



One Platform, Unified Management

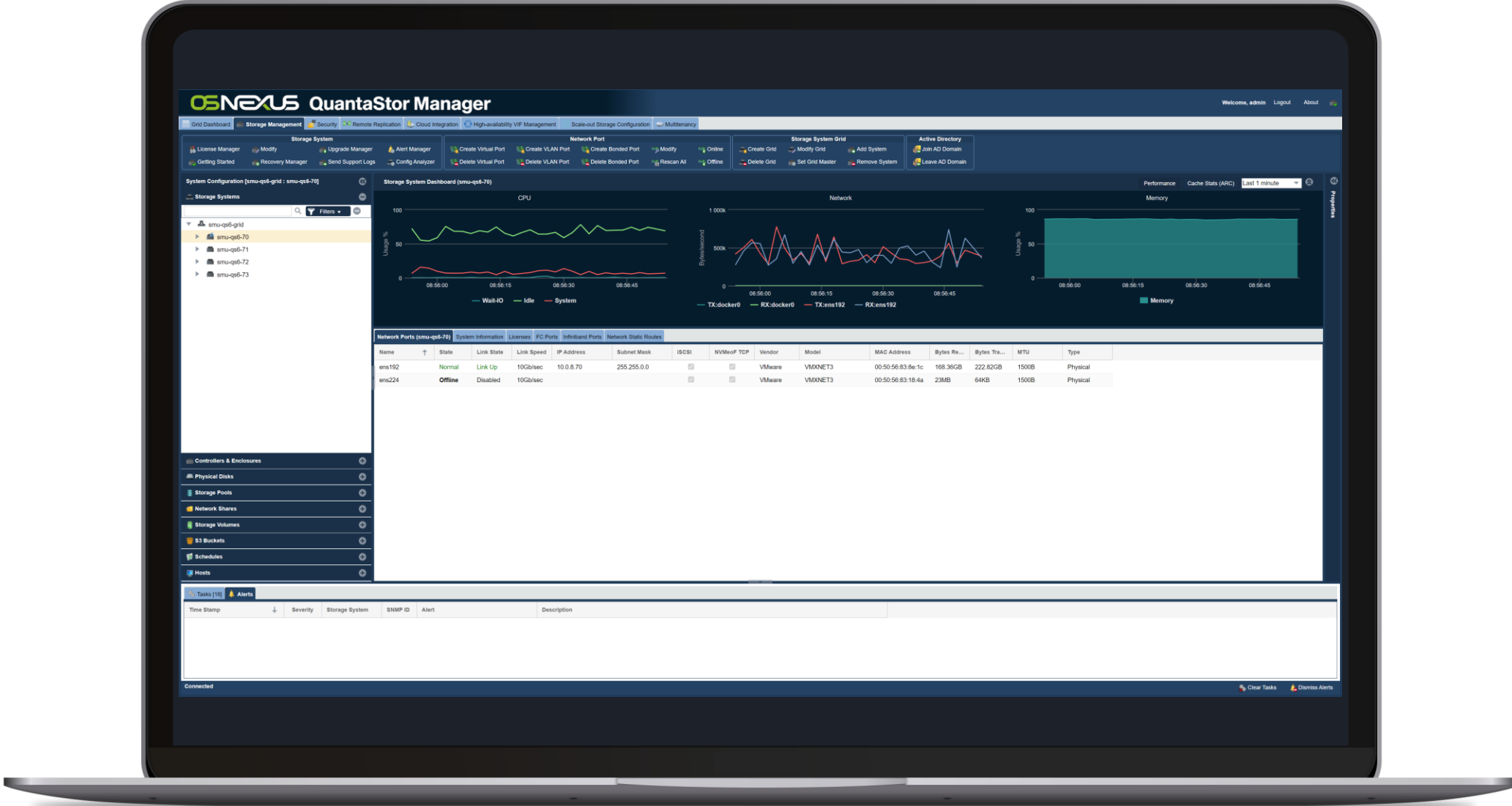


Grid technology simplifies security enforcement, storage management while enabling organizations to scale without bounds.



One Platform, Unified Management

Unified storage platform with advanced grid technology, security features, and industry leading hardware integration.



Designing Scale-up Solutions

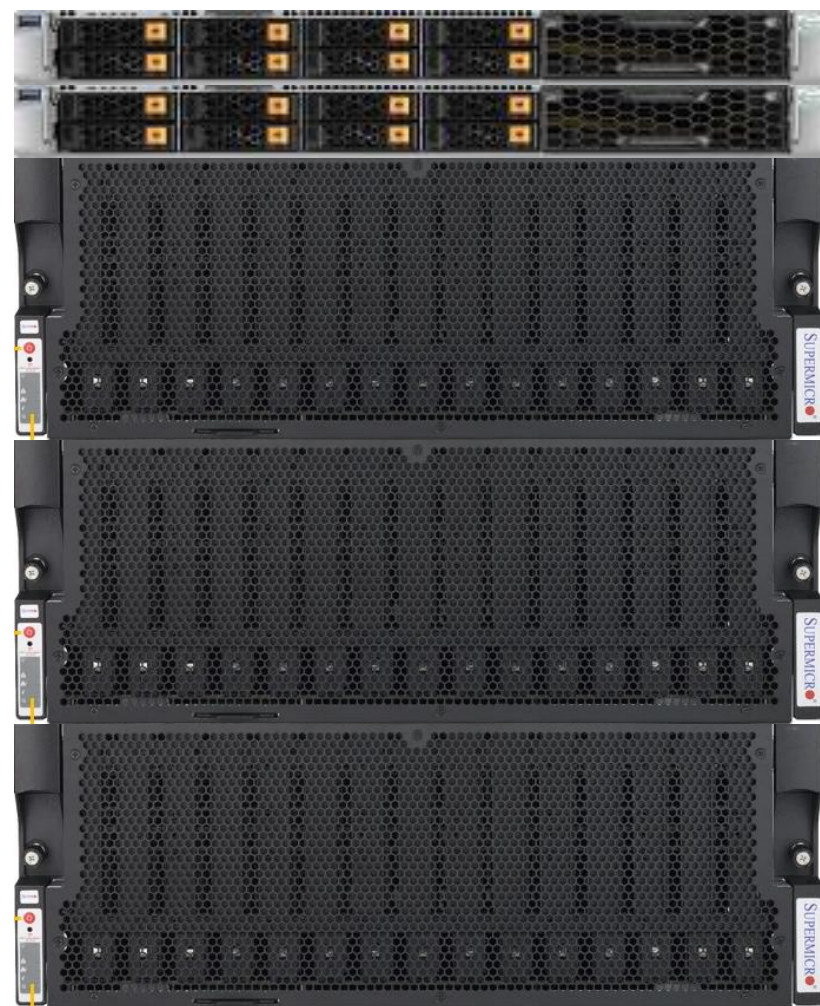


High Performance SAN/NAS Cluster

Use Cases



- Compact low cost footprint
- Unified File & Block Storage (iSCSI/FC/SMB/NFS)
- Dual-port NVMe, SAS, and hybrid options
- Scale up to 6x JBODs (~600 disks) per cluster (> 10PB)



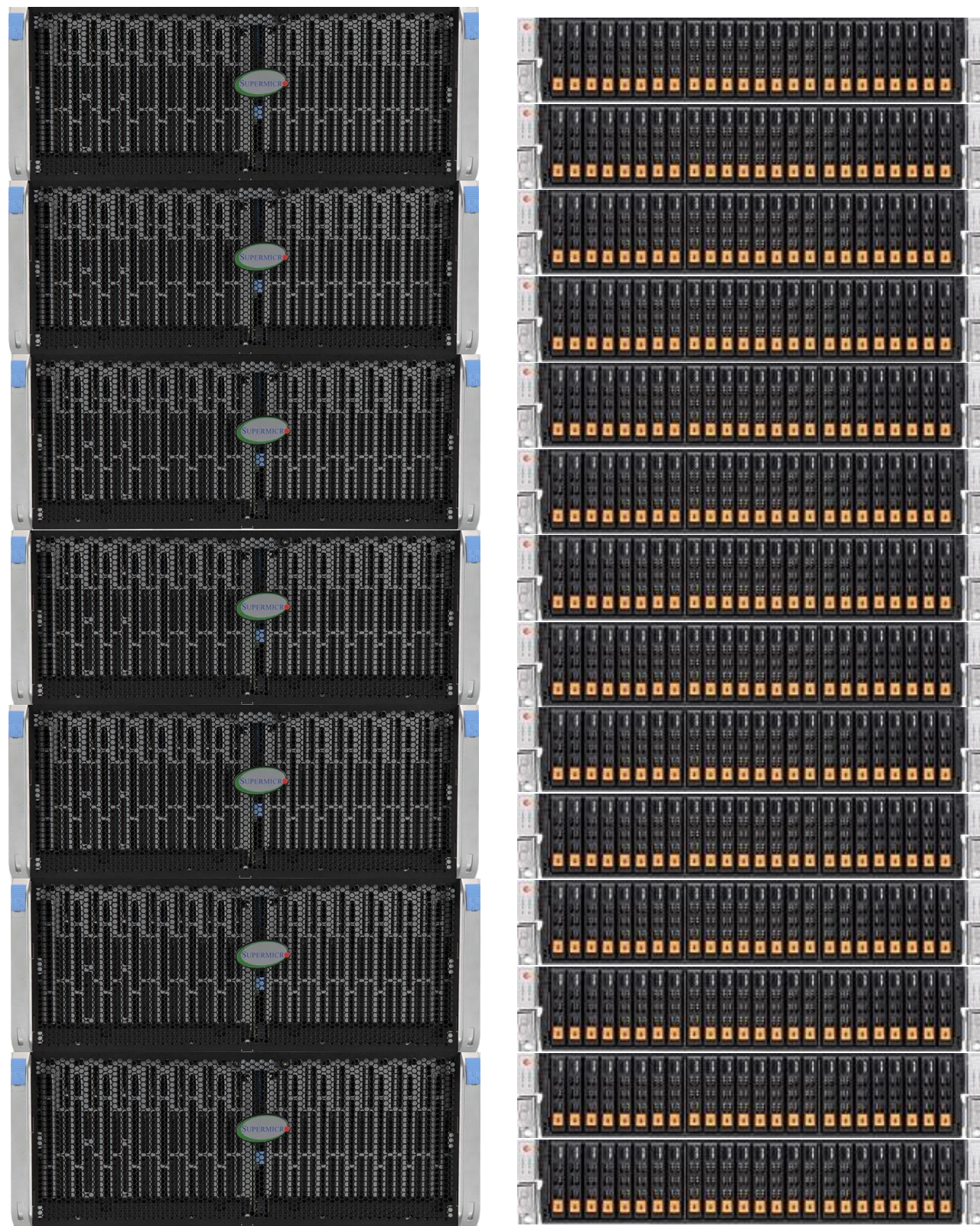
High Capacity SAN/NAS Cluster

Use Cases



- Scale out to over 100PB per Storage Grid
- All-Flash Performance (300K IOPS per Pool)
- Hybrid Performance (4GB/sec per Pool)

Designing Scale-out Solutions



Use Cases

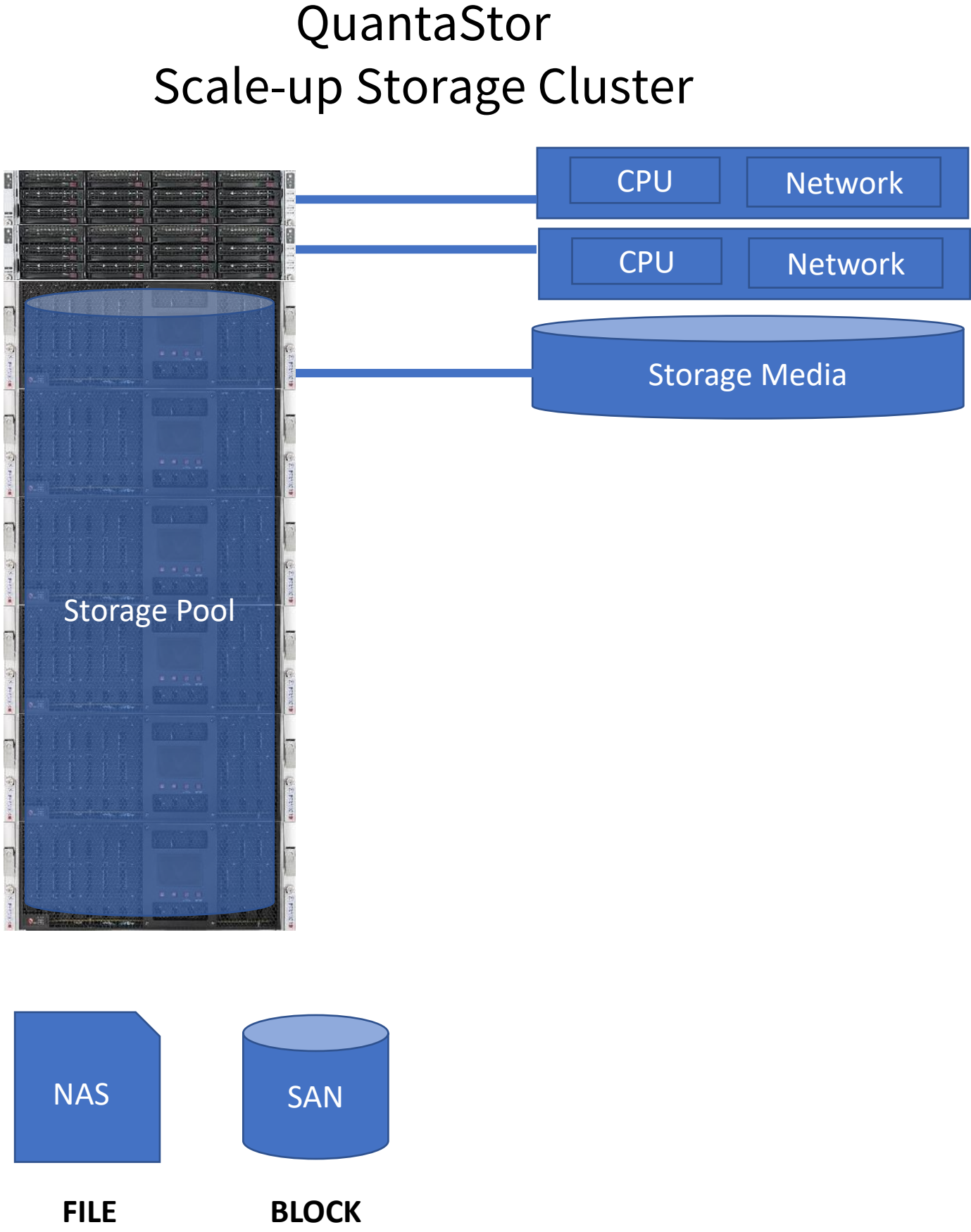
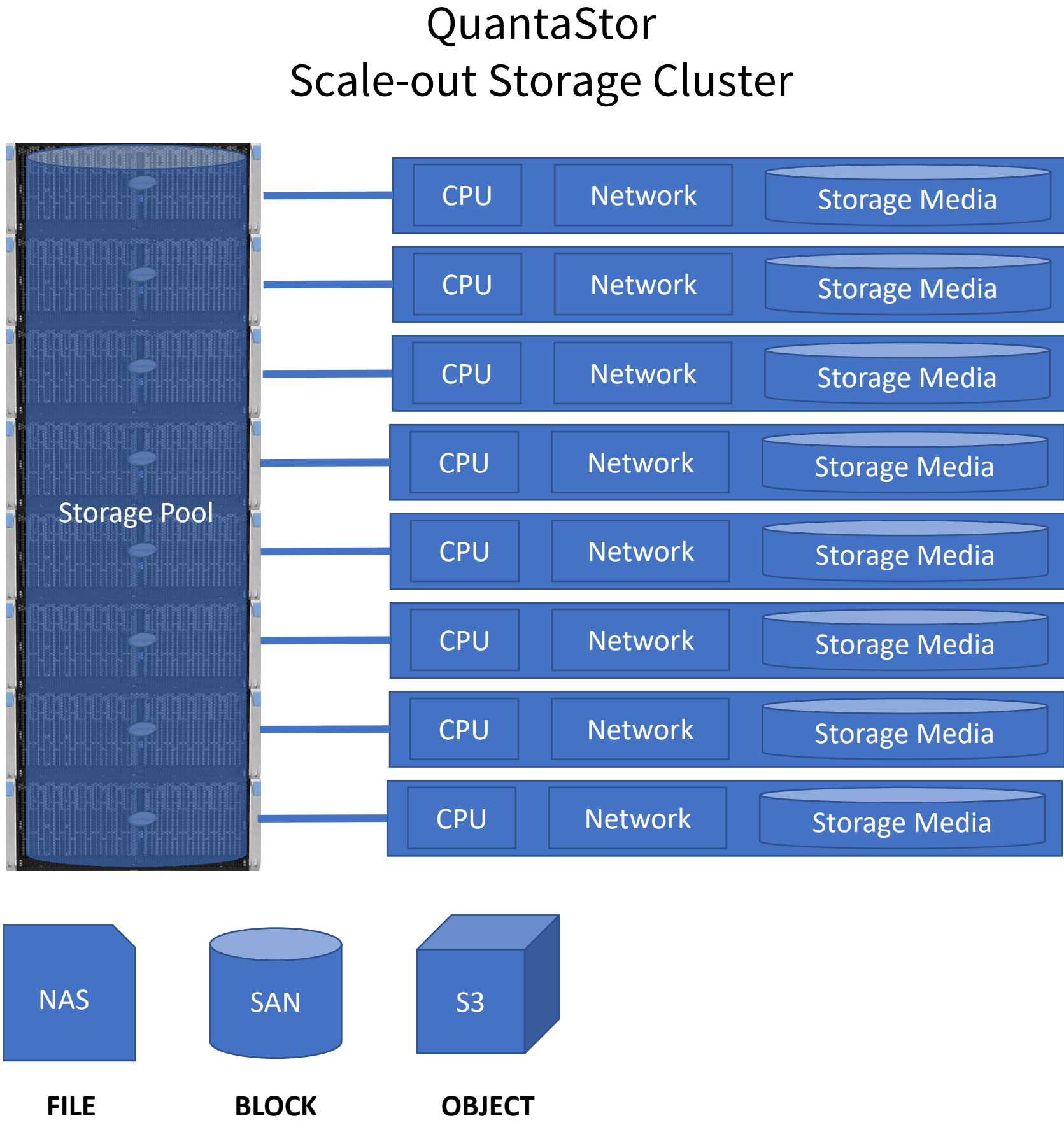


- Unified object, file, and block storage
- Deploy multiple clusters per Storage Grid
- Scalable to over 100PB per Storage Grid
- Supports all major protocols S3, NFS, SMB, iSCSI, and FC
- Native file protocol for HPC use cases
- All-flash Performance (+300MB/sec per SSD/NVMe)
- Hybrid Performance (+60MB/sec per HDD)

Scale-out File, Block & Object



One Platform, Scale-up & Scale-out



QuantaStor delivers both scale-up and scale-out in a single platform because both are needed for different application workloads.



Designing Storage Solutions

Supermicro scale-out QuantaStor Storage Solution Designer

Supermicro scale-out QuantaStor solutions provide file (NFS/SMB/CephFS), block (iSCSI/FC/CephRBD) and S3 compatible object storage. Storage is made highly-available using 3x or more servers and a storage layout support includes erasure-coding and replicas. QuantaStor bare-metal installs onto Supermicro servers and this utility enables designing solutions using recommended reference hardware. QuantaStor scale-out solutions use integrated Ceph open storage technology.

Usable Capacity: 3,616 TB (50,000 TB max)

Use Cases: General Backup & Archive

Server/Cluster Specification

- Server Model: Supermicro NVMe Server (2U24) (24 Drives)
- Data Device: 15.36TB SSD
- Metadata & Write-Log: 750GB SSD (Optane)
- RAM/Device Ratio: 0.7
- Metadata/Data Ratio: 2

Storage Configuration

- Storage Layout: Erasure Coding (4k+2m)
- Data Compression (%): 10
- Backfill Reserved Space (%): 10
- Reserved Drive Slots (%): 0

License Summary

- License Duration: 3 Years
- Support Level: Enterprise Edition - Gold Support (24/7 with max 4 hour response time)
- License Capacity: 5530TB

Rack Summary

Solution Summary

Servers	15
Data Devices (per server)	360 (24)
Journal/Metadata SSDs (per server)	0 (0)
Rack Space Required	30 RU
Usable Capacity	3688 TB
Usable w/ Compression	4098 TB
Raw Capacity	5530 TB
Estimated Power Req	15600 W
Estimated Power Cost/mo	\$1236
Estimated HW Cost	N/A
HW Price/TB (raw)	N/A
MSRP SW Price/TB/yr (raw)	N/A
HW+SW+PW/GB/mo (usable)	N/A

Server Specification

- 15x Supermicro Ultra SuperServer 2U24 NVMe (2029U-TN24R4T)
- 2x Intel Xeon 5218R Gold (20 core) processors
- 192GB DDR4 ECC RAM
- 2x 480GB SATA SSDs (boot)
- Quad-port Intel 10GBase-T (onboard)
- 1x Dual-port 100GbE NIC
- Dual redundant power supplies

Device Specification

- 360x 15.36TB SSD (data)

<https://link.osnexus.com/smc-scale-out>

Supermicro SAN/NAS QuantaStor Storage Solution Designer

Supermicro SAN/NAS QuantaStor solutions provide scalable storage up to 11PB per cluster delivering block (iSCSI/FC) and file storage (SMB/NFS). Storage is made highly-available using 2x or 3x servers per cluster with scalability to 32x clusters per Storage Grid.

Usable Capacity: 500 TB (50,000 TB max)

Use Cases: General Backup & Archive (Double Parity, Enclosure Redundant)

Server/Cluster Specification

- Server Model: Supermicro Server SYS-120C-TN10R (1U10)
- Storage Enclosure: Supermicro 216 Series (2U 24x SFF) (24 Drives)
- Data Device: 12TB NL-SAS HDD
- Write Log Devices / Pool: 400GB (3DW/D) SAS SSD
- Cache & Offload / Pool: 800GB SAS SSD
- RAM/Device Ratio: 0.3
- Pools/Cluster: 1
- Servers/Cluster: 2

Storage Configuration

- Storage Layout: Double Parity (RAID22, 4d+2p)
- Data Compression (%): 10
- Reserved Capacity (%): 10
- Reserved Drive Slots (%): 0

License Summary

- License Duration: 3 Years
- Support Level: Enterprise Edition - Gold Support (24/7 with max 4 hour response time)
- License Capacity: 792TB

Rack Summary

Solution Summary

Clusters	1
Servers	2
Storage Enclosures	3
Devices per Enclosure	22
Total Data Devices	66
Total Write Log Devices	4
Total Offload & Cache Devices	2
Total Rack Space	8 RU
Total Usable Capacity	528 TB
Total Usable w/ Compression	587 TB
Total Raw Capacity	792 TB
Total Pool Count	2
Capacity/Pool (Avg. Usable)	250 TB
Capacity/Pool (Avg. Raw)	396 TB
Estimated Power Req	2892 W
Estimated Power Cost/mo	\$229
Estimated HW Cost	N/A
HW Price/TB (raw)	N/A
MSRP SW Price/TB/yr (raw)	N/A
HW+SW+PW/GB/mo (usable)	N/A

Server Specification

- 2x Supermicro SYS-120C-TN10R 1U10 server
- 2x Intel Xeon 4316 Silver processors
- 256GB DDR4 ECC RAM
- 2x 480GB SSDs (boot)
- 2x Dual-port 25GbE NIC (Slim-AIOM)
- 2x Quad-port 12Gb SAS HBAs
- Dual redundant power supplies

Disk Enclosure Specification

- 3x Supermicro SAS disk enclosure chassis with 24x SFF drive bays
- 4x HD 12Gb mini-SAS cables
- Dual redundant SAS expanders
- Dual redundant hot-swap power supplies

Device Specification

- 4x 400GB (3DW/D) SAS SSD
- 2x 800GB SAS SSD
- 66x 12TB NL-SAS HDD

<https://link.osnexus.com/smc-scale-up>

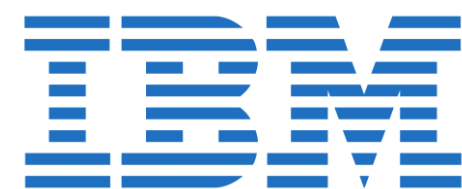


Maintenance Made Easy

- Zero-touch maintenance
 - Auto-heals after replacing media, no further action required.
- Single-pane-of-glass management, accessible from all systems
 - No extra software to install, it's all built in.
- Automated self diagnostics, health reporting & email alerting
- Easy setup & deployment
 - Configure in less than an hour after rack & stack.
- 24/7 support is comprehensive, global support team comprised of all tier-3 experts
 - Support covers complete stack, root cause analysis with one support call.
- Scale from 100TB to over 100PB
 - Pricing continually decreases as you expand.
- End-to-end encryption with automated snapshots to protect against ransomware



Customer Success Stories



IBM has been offering QuantaStor as it's mass-storage-server SAN/NAS platform in the IBM Cloud since 2011 with hundreds of deployments across it's 23 datacenters worldwide.



ServiceNow has been using QuantaStor since 2018 on a large scale across datacenters worldwide as a high performance data archive tier.



Required next-gen storage option to replace aging NetApp systems for internal applications and disk-to-disk backup. Deployed QuantaStor instances in IBM Cloud to deliver HIPAA compliant, fast, encrypted storage for backups.



TerraPower is developing next generation clean nuclear reactors that will use spent fuel rods from older reactors to extract unused energy and reduce nuclear waste. TerraPower has a large Windows based HPC cluster that uses a QuantaStor storage system using HPE hardware for high performance NAS. QuantaStor aggregates capacity and performance to meet the high-performance SMB protocol requirements for their HPC cluster.



Dynamic transcoding and processing of sports data streams to produce game highlights delivered directly to mobile phone platform. QuantaStor is an integral part of all the processing stages with the final output transferred up to a global cloud based content delivery network (CDN).



Netflix uses QuantaStor in the AWS cloud for color processing on dedicated systems with NVMe.



Customer Success Stories



Global coordinated media production & software engineering. Integrated solution with Resilio for multi-site data sync.



Virtualization use cases, storage for global engineering teams.



Virtualization use cases, storage for global software engineering teams.



Global R&D storage for research, databases, virtualization, user home directories.



Backup storage and CCTV use cases using Milestone.



FC block storage use case combined with IBM SAN Volume Controller.



QUANTASTOR 6 – New Features

➤ General Improvements

- Support for 32GB FC HBAs (QLE 2742/2692)
- Support for latest server hardware including Supermicro X13 and H13 based systems.
- Greater scalability of web interface and storage grids, support for over 100K+ snapshots
- Automatic multi-node sequenced upgrades / rolling upgrades
- Updated Localization for Japanese, Korean, and Chinese (Simplified & Traditional)
- QuantaStor Powershell module for Windows scripting
- Dark-mode web UI theme
- Veeam SOSAPI and Veeam 12 certification (QS 6.2)
- Software RAID1 boot and hot-spare management

➤ Scale-up Improvements

- Faster HA failover (over 200% speed boost for large configurations)
- Support added for ZSTD compression, DRAID storage pools and per Network Share encryption
- Support for Meta-data Offload SSDs for boosting performance of HDD pools, requires 3x SSDs per pool
- WORM Support
- Remote replication reporting and auto-recovery improvements

➤ Scale-out Improvements

- Real-time stats for scale-out S3 object storage
- Support for S3 objects > 30TB
- Optimized cluster expand / shrink, easy reweighting via web interface
- Support for erasure-coded block-storage pools
- Support for Ceph v17 (Quincy)
- Automated Ceph Cluster upgrades





Q&A

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