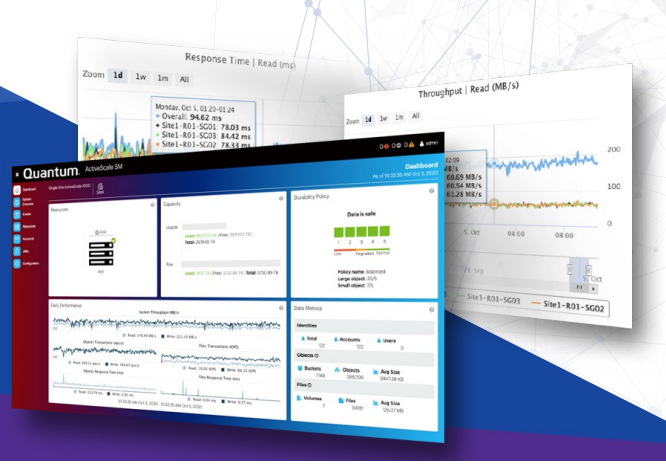
Quantum

ACTIVESCALE OBJECT STORAGE

Easily Store, Manage, and Extract Value from Exabytes of Unstructured Data



DATASHEET

FEATURES & BENEFITS

Simple to Manage, Unlimited Scale
Non-disruptive expansion of compute, network, and storage meets the growing needs for billions of objects and exabytes of capacity. Dynamic Data Placement optimally places objects across available resources for performance at scale with no rebalancing.

Always Available Data Access
With rolling system upgrades, an S3-compatible RESTful protocol, and a geo-spread design, ActiveScale tolerates component and site failures to maximize access and productivity.

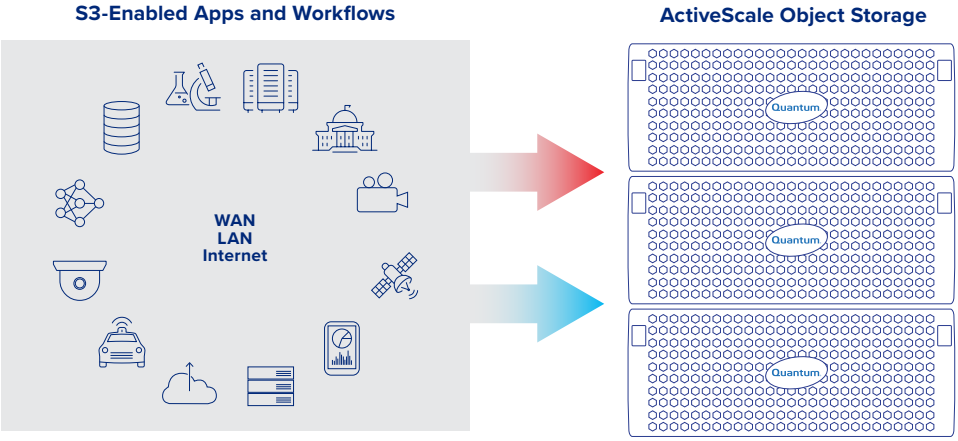
Lowest Total Cost of Ownership
Save up to 80% in storage costs with Active and Cold Storage Classes. Plus, without burdensome cloud access fees, continually enrich and extract value from your data sets without compromise.

Extreme Data Durability and Security
Advanced erasure coding, versioning, end-to-end encryption, object locking, and ongoing monitoring and repair ensure that data endures for years and decades with up to 19 9's of durability of both active and cold data.

Available as-a-Service
Deploy as a Quantum Object Storage Service in your data center, colocation facility, or Quantum-hosted cloud with flexible pay-as-you-grow pricing, 7x24 support, and seamless expansion.

The Industry's Only Object Storage Platform Architected for Active and Cold Data

ActiveScale® Object Storage provides a new, innovative approach to creating a simple, 'always-on' data repository that scales when and how you need it to—with the extreme data durability, accessibility, and security required of petabyte-scale growth. And with ActiveScale Cold Storage, ActiveScale reduces the cost of storing your cold data sets by up to 80%.



Durable, Secure, S3-Compatible Object Storage for Data Analytics, Active Archiving and Long-Term Retention

Whether you are developing solutions for life and Earth sciences, media production, government programs, web services, IoT infrastructure, AI/ML, or video surveillance, ActiveScale puts an affordable scalable solution within reach. Now, you can build your own private cloud storage environment - and seamlessly grow your data stores from terabytes to exabytes.

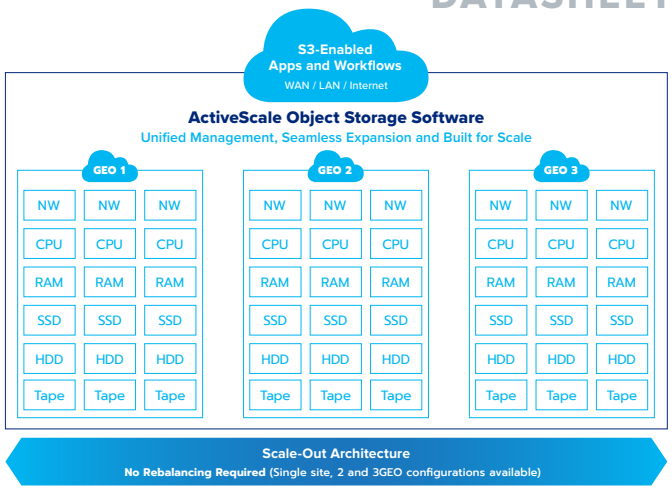
> "We needed a simple, scalable storage infrastructure that could last well into the future. The Quantum team showed us the ActiveScale Object Storage solution, and it ticked all the boxes."
>
> *- Michael Whelan, Managing Director, Amidata Ltd.*

LEARN MORE:
www.quantum.com/object-storage

ActiveScale Object Storage

DATASHEET

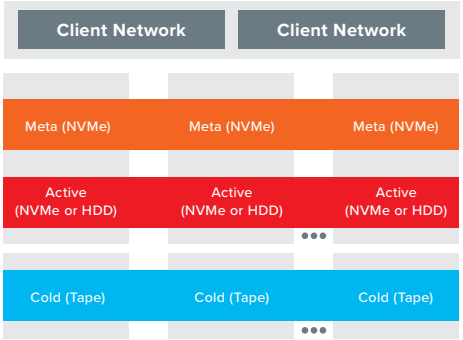
With ActiveScale, performance, capacity, and scaling are seamless. As new nodes are added, network and computing resources come online immediately to load balance data requests and system tasks. New storage is added to the capacity pool and write activity is optimally distributed across storage resources using Dynamic Data Placement heuristics.



Key Features

Two Layer Hybrid Storage Architecture

ActiveScale's unique scale-out architecture employs high levels of parallelism throughout to achieve high performance without high cost. Within the Access Layer, system performance is optimized by load balancing across all cluster nodes. Object metadata is stored in NVMe storage for high performance. The Data Layer provides unlimited scalability of active and cold data at consistent levels of availability and performance at scale.



Active and Cold Storage Classes

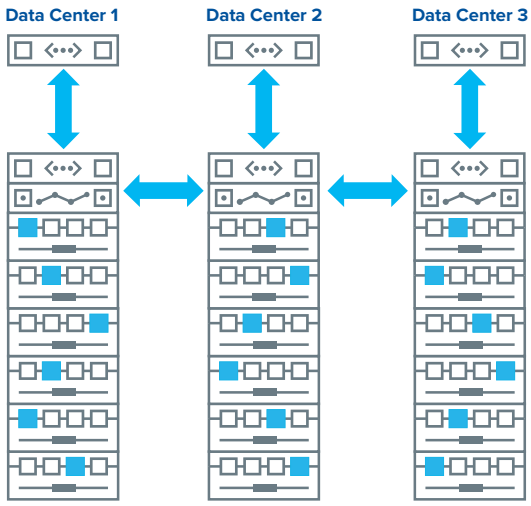
As the industry's only object storage platform with Active and Cold Storage Classes, ActiveScale configurations and data layouts are easily optimized for both performance and affordability, even at massive scale. Dedicate Active Storage to those data sets that you are currently working on. Dedicate Cold Storage to data that is not accessed frequently. Simply restore cold data sets to Active Storage when it makes sense, typically in minutes, with no access or storage fees.

Cold Storage is a low-cost S3 Glacier-compatible storage class based on Quantum's RAIL Architecture (Redundant Array of Independent Libraries) and patented* two-dimensional erasure coding (2D EC). 2D EC distributes object shards within and across tapes, drives, libraries, and data centers, simultaneously maximizing performance, durability, and efficiency. ActiveScale Cold Storage inherits tape's outstanding economics, reliability, and security, while dramatically simplifying tape management.

*U.S. Patent #11,216,196

Advanced Erasure Coding

ActiveScale software enables high-data resiliency with configurable erasure coding policies for both Active and Cold Storage Classes, so you can confidently optimize deployments according to capacity, performance, availability, and durability needs. Objects written to the Cold Storage Class achieve up to 40% better storage efficiency than replication or two-copy approaches, and orders of magnitude greater data durability than any other cold data solution.



Dynamic Data Placement (DDP)

ActiveScale DDP intelligently erasure codes your data, equally balanced across all available storage resources according to policies that you set. DDP prevents hot spots over time and simply overcomes hardware failures. Best of all, DDP easily allows for resource expansion without the painful rebalancing typical of static, deterministic policies that prevent scaling in other systems.

Dynamic Data Repair (DDR)

DDR provides out-of-band continuous system monitoring, data integrity verification, predictive failure detection, and self-healing of object data to ensure the highest durability of all data objects. The DDR self-healing process is not dependent on replacing failed drives, and is performed in parallel to shorten rebuild times.

Data Services

S3 Standard, S3 Glacier, and NFS Compatibility ActiveScale supports an S3-compatible API for easy integration of S3 and S3 Glacier-enabled applications and workflows. ActiveScale supports file system volumes, accessible via NFS to simply access and manage file-based data.

Account Quotas Account quotas allow you to easily set and limit capacity usage with hard or soft limits on a per account basis, applicable to both object buckets and NFS volumes.

Lifecycle Policies Define Object Lifecycle policies on a per bucket basis to easily expire or archive data automatically. Transitioning objects between Active and Cold Data Classes incurs no storage, access, or restoration charges that inhibit your access to your archived data.

Strong Consistency ActiveScale leads the industry in strong, immediate data consistency across all nodes to ensure that accurate data is presented with no performance impact, whether in a single site or 3GEO deployment.

Object Versioning For rapid recovery of data due to ransomware, inadvertent deletion, or just to maintain data history, Versioning systematically saves versions of objects. Users can easily set bucket policies to retrieve and restore prior object versions.

Object Notifications Object Notifications enable you to trigger workflow processing via Kafka clusters. Deploy end-to-end data pipelines and streaming applications for real-time analytics, IoT, mobile apps, and media workflows.

Large/Small Object Optimization ActiveScale is optimized for both large and small objects. Large objects performance policies are built for durability and economics. Small object policies are designed to minimize latency when storing and retrieving large numbers of small objects.

Availability Services

Inflight & Keyless At Rest Encryption For maximum security, encrypt your data in-flight with SSL/TLS and at-rest with ActiveScale. ActiveScale encrypts both object data and metadata, including custom metadata, in both Active and Cold Storage Classes.

Immutable Object Locking Object Lock prevents objects from being deleted to help you protect against ransomware and meet regulatory requirements for write-once-read-many (WORM) storage and retention policies.

Single Site Deployment A single-site ActiveScale deployment simply protects against all component failures with metadata, data, and parity intelligently spread across all computing and storage resources within the cluster. Resources are actively load balanced for maximum performance.

Continuous Data Availability With 3GEO Deployment 3GEO configurations deliver the highest availability and protection against disaster, automatically erasure coding objects across all three locations. Even with a data center outage, the two remaining locations host all the data and parity required to continue servicing all data requests

2GEO Deployments and Cloud Replication ActiveScale also provides uni- and bi-directional asynchronous per-bucket replication between ActiveScale clusters or to public cloud services for data protection, backups, and disaster recovery. Features include the abilities to replicate between storage classes, and to replicate immutable objects with the same retention policy in place. Plus, ActiveScale provides the industry's one and only Glacier-to-Glacier replication capability, providing a low-cost, multi-copy tape-based data protection solution.

Unified Management

Web UI, CLI, API The System Management (SM) web-based interface lets you: manage accounts, users, and access keys, monitor system health, capacity and performance, retrieve reports and logs, configure notifications, and perform upgrades and expansions. To automate tasks, RESTful APIs and a command line interface are also available.

Prometheus Monitoring & Alerts ActiveScale maintains local and global metrics that can be downloaded to your local Prometheus database for long-term retention and viewed using Grafana visualization tools.

Predictive Cloud Monitoring Cloud Management (CM) is a cloud-based tool that receives telemetry data from ActiveScale systems to create standard and custom reports. Features include basic management, historical trends, capacity modeling, usage, and forecasting, to help identify conditions for preemptive action.

	ActiveScale Software
Operating system software	ActiveScale OS 7.x
Storage classes	Active (S3 Standard-compatible), Cold (S3 Glacier-compatible)
Access protocols	RESTful S3, S3a, NFS v3
Management interfaces	ActiveScale SM Real-time System Management Console, CLI, RESTful API, ActiveScale View
System analytics	Quantum Cloud-Based Analytics (CBA) storage analytics service, Prometheus Monitoring, Alerting, Exporting to Grafana
Security	Data encryption in flight SSL/TLS using AES-256, Data encryption at rest using AES-256, FIPS 140-2 certified (optional)[1]
Management services	User accounts, Authentication, IAM, Quotas, Notification Services, Active and Cold Storage Class Management, Lifecycle Policies
Data protection	Strong/Immediate Consistency, Advanced Active and Cold Erasure Coding, Dynamic Data Placement, Versioning, Object Locking, 3GEO Geospreading, Replication
Data durability	Up to 19 nines for both Active and Cold Storage Classes
HW/SW/FW upgrades	Non-disruptive rolling upgrades and seamless system expansion

Scale-Out Expansion	P200	X200	Z200
Min/max number of nodes	3 nodes (3U) / Unlimited	4 nodes (twin servers, 8U) / Unlimited	3 nodes (3U) / Unlimited
Min/max raw disk capacity[2]	648 TB (36 x 18 TB HDD) / Unlimited	1,080 TB (60 x 18 TB HDD) / Unlimited	460.8 TB (30 x 15.36 TB SSD) / Unlimited
Min/max licensed Active usable capacity[3] (S3 Standard)	100 TB / Unlimited		
Min/max ActiveScale Cold Storage (S3 Glacier)	1 PB (optional) / Unlimited		
Min/max client connectivity[4]	6 x 10/25 Gb / Unlimited	8 x 10/25 Gb / Unlimited	6 x 10/25 Gb / Unlimited
Max object counts for min/max configs	1.25B (3 nodes) / Unlimited	5B (4 nodes) / Unlimited	50 Billion[5] (3 nodes) / Unlimited
Maximum multi-part object size	50 TB		

ActiveScale Server Nodes	P200	X200	Z200
Form factor	1U12	4U90 twin server	1U10
Drives	18, 24 TB HDD	18, 24 TB HDD	15.36, 30.72[6], 61.44[6] TB NVMe SSD
Client connectivity	2 x 10/25 Gb	4 x 10/25 Gb	2 x 10/25 Gb
Width	17.6 in (44.7 cm)	17.68 in (44.9 cm)	17.2 in. (43.7 cm)
Height	1.7 in (4.3 cm)	6.97 in (17.7 cm)	1.7 in. (4.3 cm)
Depth	37 in (94 cm)	42.9 in (109.1 cm)	23.5 in. (59.7 cm)
Configuration weight (kg/lbs)	27.2 kg/60 lbs.	130 kg/290 lbs.	13.02 kg/28.7 lbs.
Power consumption – typical/max (W)	0.35/0.43 KW	1.93/2.5 KW	0.46/0.54 KW
Power supplies	100-240 VAC	200-240 VAC	100-240 VAC

[1]Contact Quantum for details.
[2]One MB is equal to one million bytes, one GB is equal to one billion bytes, one TB equals 1,000 GB (one trillion bytes), and one PB equals 1,000 TB when referring to storage capacity.
[3]Usable capacity will vary from the raw capacity due to configured erasure coding policies.
[4]1GEO: Minimum of 1 configured port to client network required, 2 configured ports for high availability. Depending on performance requirements, not all available ports need to be configured.
3GEO: Minimum of 1 configured port per geo required, 2 configured ports per geo for local highly available access. Depending on performance requirements, not all available ports need to be configured.
[5]Massive object counts for Z200 most relevant to ActiveScale Cold Storage configurations; assumes 100 TBs NVMe storage for storing objects.
[6]Contact Quantum for availability.

Quantum.

Quantum delivers end-to-end data management solutions designed for the AI era. With over four decades of experience, our data platform has allowed customers to extract the maximum value from their unique, unstructured data. From high-performance ingest that powers AI applications and demanding data-intensive workloads, to massive, durable data lakes to fuel AI models, Quantum delivers the most comprehensive and cost-efficient solutions. Leading organizations in life sciences, government, media and entertainment, research, and industrial technology trust Quantum with their most valuable asset – their data. Quantum is listed on Nasdaq (QMCO). For more information visit www.quantum.com.

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