

ClusterStor™ 9000

Engineered Solution for Lustre®

FASTEST TIME TO RESULTS AT ANY SCALE Data Sheet

Fast

- First to Deliver Sustained 1 TB/sec File System Throughput
- Up to 63 GB/s per Rack – 50% Faster!

Reliable

- Engineered solution with end to end support
- ClusterStor GridRAID up to 400% Faster MTTR!

Efficient

- Highest Efficiency Per Drive
- 33% Less Power for the Same Performance!

ClusterStor tightly integrates the Lustre parallel file system on the fastest converged scale-out storage hardware platform, to extract the maximum attainable sustained performance out of every system.

ClusterStor 9000 customers benefit not only from industry-leading performance but also from reduced data center floor space, power, cooling and administrative costs, up to 60% better than competitive solutions. Customers using the ClusterStor 9000 get maximum sustained application performance at the lowest Total Cost of Ownership in the market.

Benefits

Designed for productivity critical HPC and Big Data applications, the ultra-efficient ClusterStor 9000 out-paces all parallel file system data storage offerings. This unique combination of performance and capacity efficiency as well as productivity effectiveness enables fastest time to results yielding consistent superior Return on Investment (ROI).

- Production proven scalability of over 1TB/sec and 25,000 clients per single file system
- Highest performance efficiency per rack
- ClusterStor Distributed Namespace provides scalable and reliable metadata performance
- Lowest Operating Expense

Features

ClusterStor 9000 delivers...

- Up to 63 GB/s per rack – requires fewer racks to meet your requirements – The fastest just got faster!
- Industry's highest Lustre parallel file system performance per disk drive, key to attain lowest power, cooling and data center floor space
- Unprecedented levels of integrated solution reliability and efficiency, as well as ease of use with comprehensive end-to-end management, critical to attain lowest OPEX



ClusterStor™



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Key Capabilities

Lustre 2.5 Distributed Namespace - Expands Metadata Performance and Scalability

- With Lustre 2.5, customers may optionally add Distributed Namespace (DNE) metadata servers. Lustre client metadata operations can now be allocated across multiple metadata servers. This enables greater scalability in the size of the namespace and provides increased metadata performance.
- Expand metadata performance and scalability with up to sixteen Distributed Namespace metadata servers, each configured in an active / active high availability pair within Seagate 2U enclosures. Each 2U Distributed Namespace Server provides two metadata servers and metadata storage capacity, along with seamless integration including manageability.

ClusterStor GridRAID

- As a standard feature in the ClusterStor 9000, GridRAID provides up to 400% faster data reconstruction rates, compared to legacy RAID 6 methods
- GridRAID consolidates the number of Object Storage Targets (OSTs) by 4 times compared to legacy RAID 6 (8+2) methods, thus reducing management tasks and costs

ClusterStor Manager

- As a standard feature, ClusterStor Manager provides a comprehensive solution dashboard displaying all aspects of the physical configuration, system performance, asset status, health and utilization of the entire users' storage system
- ClusterStor Manager enables seamless integration with other data center management tools providing greater visibility across users' management platforms and assets

Specifications	
General Information	
Parallel File System Performance	Up to 63 GB/s bandwidth performance per 42RU height rack
File System Capacity (raw)	Up to 3,444 TB per rack using 6TB SAS HDDs
Scalable Storage Unit (SSU)	Up to 6 in base rack (first) Up to 7 in storage expansion racks (second and greater)
Object Storage Servers	Up to 12 in base rack (first) Up to 14 in storage expansion racks (second and greater)
Base Metadata Management Server (ClusterStor Management Unit - CMU)	High availability server attached to storage enclosure 2U four node server and 2U 24 drive enclosure
Distributed Namespace Server	Optional feature enables Lustre Distributed Namespace (DNE) functionality Requires ClusterStor 9000 with Lustre 2.5 supports up to sixteen Distributed Namespace metadata servers 2U two node server with 22 drives
Client Access	InfiniBand QDR or FDR, or Ethernet 10GE or 40GE
Management Network	1 Gigabit Ethernet (dual management network)
File System	Lustre® 2.1 + Seagate supported enhancements, or Lustre® 2.5 + Seagate supported enhancements
Maximum inodes	Lustre® 2.1 - Up to 2.4 Billion Lustre® 2.5 - Up to 16 Billion (requires optional Distributed Namespace Servers)
Hierarchical Storage Management (HSM)	HSM Ready (requires Lustre 2.5)



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Disk Drives	
SSU Hard Disk Drive	Dual ported 6Gb/s SAS drives (4 or 6 TB capacity per drive)
Base Metadata Management Server Hard Disk Drive (CMU)	Dual ported 6Gb/s SAS drives (600 or 900 GB capacity per drive)
Distributed Namespace Server Hard Disk Drive (requires selection of Distributed Namespace Server and Lustre 2.5)	Dual ported 6Gb/s SAS drives (900 GB capacity per drive)
Solid State Disk	SLC dual ported SAS drives
Scalable Storage Unit Drive Configuration	2 SSDs, RAID 1, 1+1 82 HDDs, 3.5" 7.2K RPM, ClusterStor GridRAID
Expansion Storage Unit Drive Configuration	82 HDDs, 3.5" 7.2K RPM, ClusterStor GridRAID
Base Metadata Management Server Storage 2U 24 (CMU)	2 SSDs, RAID 1, 1+1 20 HDDs, 2.5" 10K RPM, RAID 1 & 10, 2 Global Hot Spare drives
Distributed Namespace Server Storage (requires selection of Distributed Namespace Server and Lustre 2.5)	20 HDDs, 2.5" 10K RPM, configured as 2 MDTs (5+5, RAID10) 2 Global Hot Spare drives
Dimensions	
Height	1,991 mm (78.4 in)
Width	600 mm (23.62 in)
Depth	1,200 mm (47.24 in)
Weight	1,141 Kg (2,510 lbs)
Systems Availability	
Hot Swappable	Disk Drives, Power Supplies, Fans, Power Cooling Modules and Server Modules
Power	Redundant Power Supplies and Power Cooling Modules
SSU Power Cooling Modules	5 redundant fan modules per SSU, each with dual fans
Power Consumption	
Base Rack Configuration	11.93 Kilowatts Nominal
Storage Rack Configuration	12.27 Kilowatts Nominal
Heat Dissipation	
Base Rack Configuration	40,721 BTU Nominal
Storage Rack Configuration	41,882 BTU Nominal
Altitude and Temperatures	
Operational Altitude	-30 to 3048m (-100 to 10,000ft)
Operational Temperature Range	5°C to 32°C
Temperature Variance	De-rated by 1°C/300m above 900m below the specified maximum temp.
Humidity	20% to 80% non-condensing
Warranty Information	
Hardware	1 Year
Software	90 Days
Environmental Standards	
<p>Disk enclosures 80 PLUS® Gold Certified power efficiency with adaptive cooling, or option for 90 PLUS® Platinum Certified power efficiency with adaptive cooling technology. Seagate is registered through BSI to the international standard for environmental management systems ISO 14001:2004 and holds certificates for each of its three manufacturing locations at Havant UK, Guadalajara Mexico and Seremban Malaysia. 1 Rack configuration attributes above provide a representative example.</p>	

Take the Next Step:

To learn more about Seagate® Cloud Systems and Solutions, visit www.seagate.com/hpc

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