PAS 9

KEY FEATURES

- **Extreme Performance:** Highest IOPS and bandwidth performance on a single disk system with CIFS, NFS and Parallel NFS access to a single file.
- **High Scalability:** Modular hardware architecture that grows with your storage needs. Seamless scalability as the size and number of jobs to be processed increases.
- **Superior Manageability:** Single point of management for distributed and scalable architecture, eliminating individual islands of data and performance.

USE CASES

- **Finance:** Risk Analysis, MonteCarlo Simulations, Tickdata Capture, Algorithm Development
- **Energy:** Seismic Processing, Migration and Interpretation, Reservoir Simulation
- **Bio/Pharmaceutical:** BioInformatics, Computational Chemistry, Molecular Modeling
- **Industrial Manufacturing:** EDA Simulation, Optical Correction, Thermal Mechanics

Highest Performance Scale-Out NAS

The Panasas family of scale-out NAS solutions enables enterprise customers to rapidly solve complex computing problems, speed innovation and bring new products to market faster. The PAS 9 is designed to deliver blazing performance supporting very high I/O rates for scientific and technical applications, delivering the highest levels of performance, scalability and manageability. Integrated hybrid solid state disks accelerate the performance of the PAS 9 for ultra low latency metadata and small file performance, as well as large capacity rotational disk drives for larger data files. The PAS 9's efficient design provides up to 20 TB of raw capacity in a compact 4U rack-unit (7") shelf, and virtually any number of shelves can be networked together to create scalable, high performance storage pool.

Utilizing the patented PanFS™ storage operating system, PAS 9 complements the entire PAS family of scale-out NAS solutions to create a single pool of storage under a global namespace. This provides customers with the flexibility to support multiple applications and workflows in a single storage system, high performance for complex technical applications and high capacity to support growth, eliminating multiple islands of storage which dramatically reduces system cost and complexity.

Industry leaders worldwide are using Panasas Scale-Out NAS systems to deliver unprecedented breakthroughs in energy, government, finance, manufacturing, bioscience and higher education industries.

Panasas storage systems are utilized by Fortune 500 companies to:

- Improve time-to-market
- Extend research, science, and knowledge
- Solve critical and complex problems at lower cost
- Increase the certainty of research and investments
- Investment protection
- Minimize risk for better returns
- Improve predictability
- Deliver unprecedented ROI

Performance

The PAS 9 supports a broad range of application performance profiles for NFS, Parallel NFS and CIFS data access protocols which seamlessly integrate seamlessly into existing IT infrastructures, accelerating return on investment. PAS 9 delivers scalable performance in the 100,000's of I/Os and 100's of GB/sec in a single disk system. Simply add individual shelves or racks to achieve desired performance and capacity. All aggregated shelves are presented as a single system featuring a global name space providing unified management.

Scalability

PAS 9 provides extremely high scalability through a modular pay as you grow hardware architecture to meet storage requirements. The PanFS operating system

provides a global namespace and a single pool of storage that scales throughput and capacity symmetrically. PAS 9 also provides unique horizontal and vertical parity that isolates and repairs media errors at the disk level helping to prevent the need for performance-robbing RAID rebuilds. In addition, PAS 9's modular architecture allows for simple removal or replacement of components, and capacity can be added without disruption.

Manageability

All Panasas scale-out NAS systems utilize a graphical user interface that offers a single, comprehensive view of your entire storage pool. A single mount point and administrative interface avoids the incremental system administration that burdens traditional storage alternatives, dramatically reducing administration overhead and providing a low total cost of ownership (TCO). As the system scales, administrators continue to view a single, easy to manage namespace and the console operates with the simplicity of an appliance. PAS 9 provides fast set- up and configuration utilities that allow storage capacity to be added and available in less than 15 minutes. In addition, PAS 9 provides redundant load-sharing controls, power and cooling that automatically and transparently transition to redundant resources in the event of a malfunction.

Panasas PAS 9 Product Specifications

PRODUCT ATTRIBUTES

Clustered Architecture	Parallel clustered file system that turns files into smart data objects and then dynamically distributes and load balances data transfer operations across a networked blade architecture.
Modular Design	Fully integrated storage shelves includes operating and file system, network connectivity, redundant and hot swappable metadata director and storage blades, power supplies and battery backup.
File System	ActiveScale distributed file system creates a cluster with a single file system and single global namespace. Fully journaled, fully distributed, globally coherent write/read cache.
Scalability	Up to 12,000 clients, over 50GB/sec, and 100,000's of IOPS aggregate production reliability performance of multiple nodes per single name space.
High Availability	No single point of failure. Self-healing design protects against disk or node failure including back end intracluster failover. Redundant instances of metadata service blades. End to end data parity. Redundant network data path with failover option.
Advanced RAID Protection	Intelligent system assigned RAID level based on file size providing performance optimization. Single object high performance reconstruction with parallel rebuild reads from RAID stripe. Disk drive sector RAID parity rebuilds.
Data Protection	Supports Panasas Snapshots and Panasas Asynchronous Replication.
Protocol Support	Panasas Parallel NFS Client, NFS v3 (UDP or TCP), CIFS, NDMP, SNMP, LDAP, ADS
Client Support	Red Hat and SuSE Linux on x86, x86-64, IA64, and IBM POWER6, UNIX, Microsoft Windows

NODE/SHELF HARDWARE ATTRIBUTES

Capacity	8TB, 9TB, 10TB, 20TB per shelf
Hard Drives (3.5" SATA)	Eight (8), Nine (9) or Ten (10) 1TB Hard Drives per shelf.
Solid State Disk Drives	Eight (8), Nine (9) or Ten (10) 32GB Solid State Disk Drives per shelf.
ECC Memory	32GB, 36GB or 40GB per shelf
Integrated Network Switch	1Gbe x 4, 10Gbe x1 (CX4, SFP+ or Twinax). Second switch optional.
External Indicators	Cluster status and alert (LED)
Optional Network Connectivity	InfIniBand DDR & QDR

NODE/SHELF SOFTWARE ATTRIBUTES

File System	Panasas PanFS File System
Parallel NFS Client	Panasas DirectFLOW Clients
High Availability	Panasas Network and Volume Failover
Data Protection	Panasas Snapshot
Optional Data Protection	Panasas Replicator Asynchronous Replication

ENVIRONMENTAL SPECIFICATIONS

Power Supply	Dual redundant hot swappable, Output power rating 950W each, Input power rating 1200W each, 100V to 240V self regulating voltage, Typical operating current 4.4A @208VAC, Maximum in rush current 30A, Maximum current 7A @208VAC
Backup Battery	Self charging, hot swappable, several minutes of system backup power
Operating Environment	Ambient Operating temperature +10C to +35C, Operating relative humidity 10% to 90%, Altitude 0m to 2440m
Non-Operating	Non-operating temperature -20C to 70C. Non-operating relative humidity 5% to 95%, Altitude 0m to 2440m

About Panasas

Panasas, Inc., the leader in high performance parallel storage for business-critical applications, enables customers to rapidly solve complex computing problems, speed innovation and accelerate new product introduction. All Panasas storage products leverage the patented Panasas® PanFS™ parallel file system to deliver superior performance, data protection, scalability, and manageability. Panasas systems are optimized for demanding storage applications in the energy, government, finance, manufacturing, bioscience, and higher education industries.

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