



Panasas Update

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September 2015

PANASAS, INC.

- Performance that **improves with scale**
- Data protection that **increases with scale**
- Scalable storage that is **easy to access, deploy and manage**



**STORAGE THAT SCALES
AS BIG AS YOUR IDEAS**



33% increase in density

4TB and 8TB hard drive configurations

20PB and 200GB/s linear scalability

19% faster CPU and 2x cache

High Performance Hybrid Scale-Out NAS

- **Parallel Performance**
 - True scale-out architecture
 - Capacity and performance scale linearly to 20PB and 200GB/s
 - Flash-accelerated hybrid architecture
- **Easy Management**
 - Minimal management effort at scale
 - Set up or grow capacity in <10 minutes
 - Single, global namespace
- **Enterprise-Grade Reliability**
 - Triple parity protection with RAID 6+
 - Reliability increases with scale
 - Extended file system availability



ActiveStor 18

■ **33% Increase in Density**

- Western Digital HGST He⁸ Helium-filled 8TB drives
- 480GB SSD optimized for RAID 6+
- Up to 181.28TB per 4U shelf (0+11 config)

■ **4TB and 8TB Hard Drive Configurations**

- 4KB native sector size support
- 16GB cache per storage blade (2x compared to AS16)
 - Benefits aggregate throughput, random I/O, and NFS/SMB IOPS performance by increasing active data set in cache

■ **Linear Scalability**

- Field proven to 20PB and 200GB/s in a single, global namespace
 - 130 shelves, 2600 HDDs, 1300 SSDs

■ **Improved Director Blade Performance**

- 19% faster CPU (2.53GHz quad-core)
- Improves metadata, small file and RAID rebuild performance

ActiveStor Appliance



- Powered by PanFS storage operating system
- **New: 181.28TB per shelf → scales to 20PB**
- 1.5GB/s per shelf → scales to 200GB/s

Director Blade



- Metadata access
- System management

Storage Blade

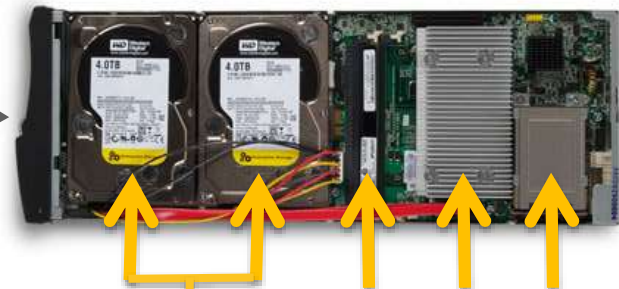


- Parallel data access
- Advanced caching

ActiveStor 18 (Per-Shelf)

Capacity	82.4TB	164.8TB
Hard Drive Size	4TB	8TB
SSD Size	240GB	480GB
DRAM Cache	208GB	
Throughput, Read/Write (MB/sec)	1,700 / 1,500	
Ideal Workload	Small File or Metadata Oriented	Large File Oriented
Value	Best Price/Performance	Best Price/Capacity

Note: Assumes 1 director and 10 storage blades per shelf.



8TB
HDD
x2

16GB
DRAM
Cache

C
P
U

480GB
SSD

Per-file distributed RAID 6+ with Triple Parity Protection

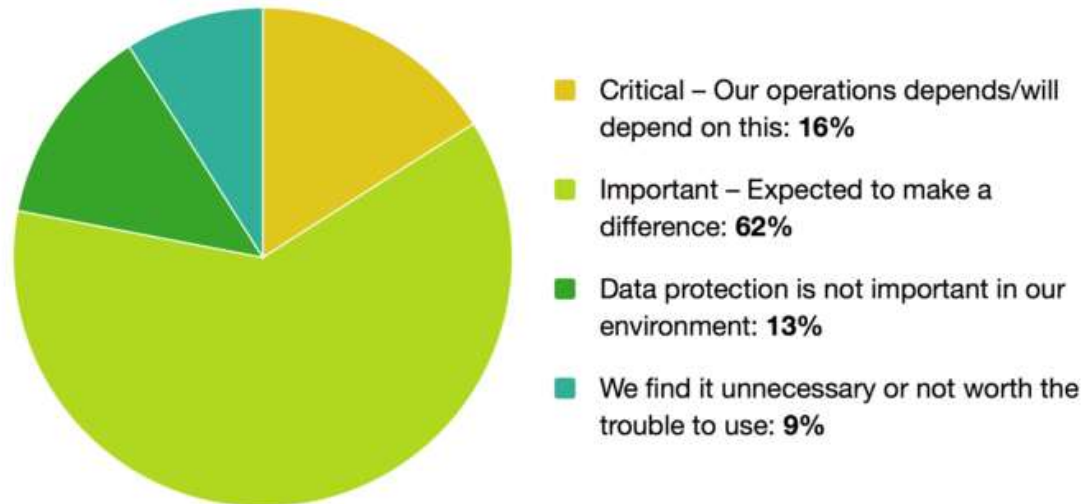
- **Erasur codes protect every file individually**
 - No hardware RAID, no block-level rebuilds
 - Limits rebuilds to affected files, not entire drives
- **150x increase in reliability over dual-parity approaches**
 - Triple parity protection guards against two simultaneous drive failures and single sector errors on multiple drives
 - Performance sensitive
 - Only ~25% capacity overhead
- **RAID rebuild performance scales linearly**
 - Mitigates risk from additional components at scale
- **Randomized distribution of data = increased reliability at scale**
 - Odds of “one-too-many” drive failures affecting data decrease with scale




Research by  TechValidate

RAID 6+ is highly valued

How important is the 150x increased data protection delivered by Panasas RAID6+ to your future production operations?




Source:  TechValidate survey of 90 users of Panasas ActiveStor

THANK YOU

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 <http://twitter.com/#!/panasas>

 <http://www.youtube.com/PanasasHPC>