



# Panasas® ActiveStor® 16

HYBRID SCALE-OUT NAS WITHOUT COMPROMISE:  
PERFORMANCE + MANAGEABILITY + RELIABILITY AT SCALE

IDC HPC USER FORUM – APRIL 13, 2015

PANASAS PRODUCT MARKETING

## “No Compromise” Scale-Out Solution:

- **High Parallel Performance**
  - Direct data access eliminates traditional NAS bottlenecks
  - Capacity and performance scale linearly to 12PB and 150GB/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 16**  
10 shelves, 1.2 PB

## ■ **RAID 6+ Triple Parity Protection**

- Per-file, distributed RAID 6+ based on erasure codes
- Dual-parity RAID 6 protects against two simultaneous device failures
- Vertical parity protects against unrecoverable media errors
- Overcomes limitations of traditional RAID
- Reliability increases with scale, not decreases

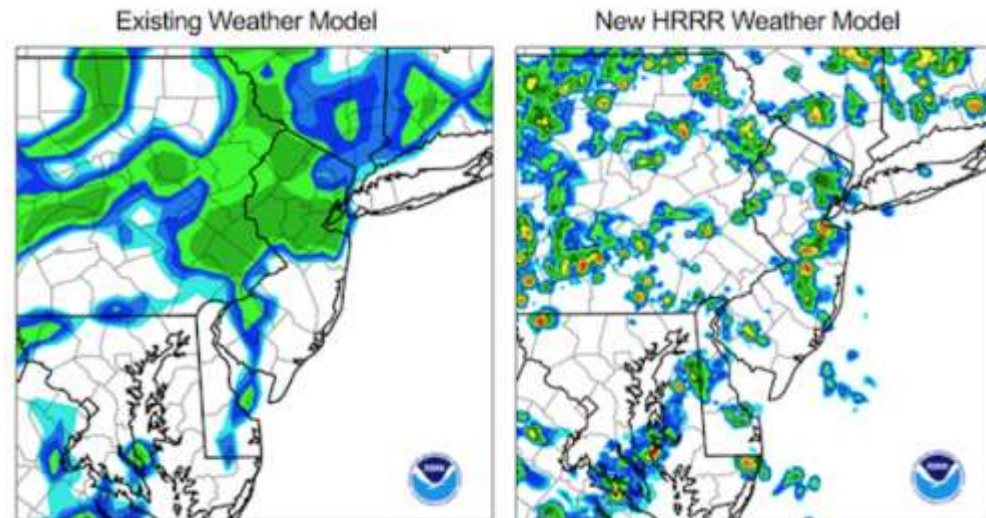
## ■ **Extended File System Availability**

- Ensures business continuity when other systems would be down
- Quickly restore specific files for disaster recovery, not whole file system

## ■ **High Performance Implementation**

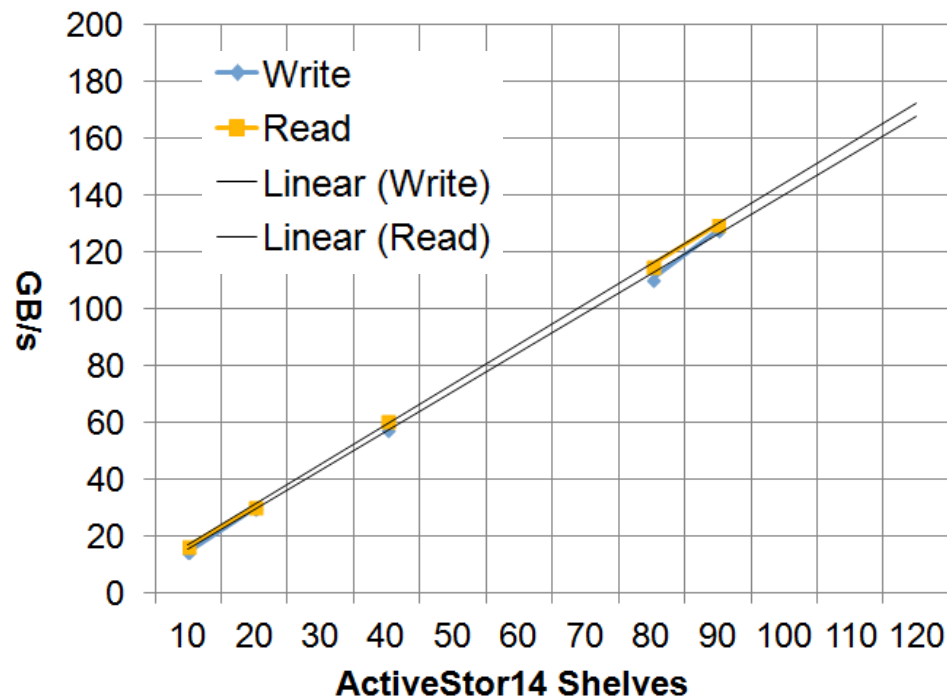
- Aggregate read performance comparable to RAID 5
- Aggregate write performance within ~7% of RAID 5 speed
- Metadata reads/stats faster due to third copy of RAID 6+ metadata

- **CSC/NOAA Weather Forecasting Supercomputing Upgrade**
  - 14.2 PB of ActiveStor 16 (108 shelves) in single namespace
  - Performance + manageability + reliability were all critical
  - Passed acceptance and already exceeding expectations
- **High-Resolution Rapid Refresh (HRRR) model helping meteorologists better predict the path, timing and intensity of hurricanes and other adverse weather events**



Source: <http://www.hpcwire.com/2014/10/06/noaa-refines-forecasting-ability/>

- **Now >15PB**
  - 130 shelves of ActiveStor
  - Initial install + 2 expansions
- **Storage management with less than one FTE**
- **Manageability + reliability + performance together**



- **Benchmarks Proved Linear Scalability as Expected!**
  - Tested to 90 ActiveStor 14 shelves (27 director blades) from 180 compute nodes (3200 processes) – only 2 compute nodes/shelf
  - 128.6 GB/s write, 128.4 GB/s read (1429MB/s per shelf )
  - 1550-1600MB/s possible with more clients – predicts 155-160GB/s at 100 shelves

- **Panasas continuing to win in Life Sciences**
  - NIH NCBI, a long time customer, now benefiting from RAID 6+
  - Many other customers in public and private sectors
- **Success when deployed with Illumina HighSeq X Ten**
  - Tens thousands human genomes per year at <\$1,000/genome
  - Unlike alternatives, Panasas storage can directly handle the high I/O rates required for analysis without having to cache data on local drives.
  - Lower TCO + faster time to results




Illumina HighSeq X Ten

# THANK YOU!

 <http://www.panasas.com>

 <http://www.linkedin.com/company/panasas>

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

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