



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:

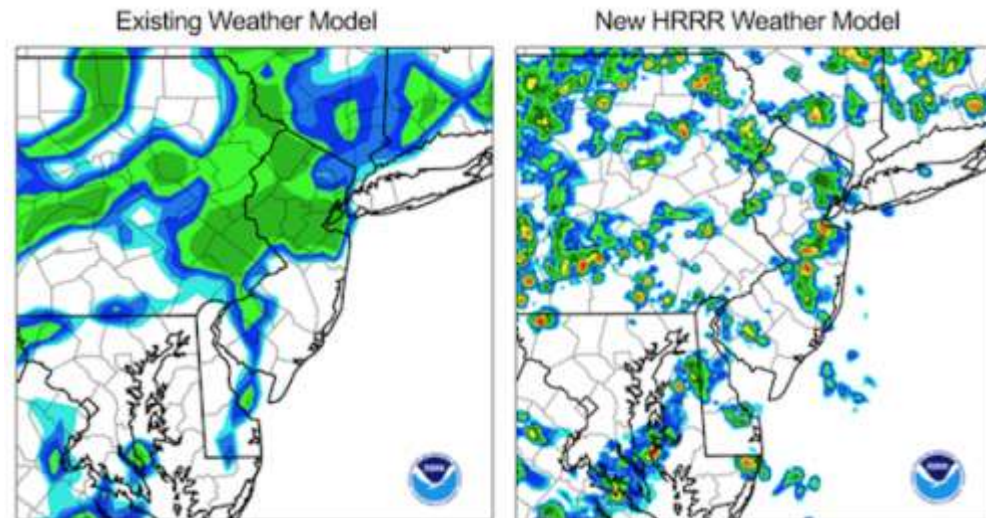
- **High Parallel Performance**
 - Direct data access eliminates traditional NAS bottlenecks
 - Capacity and performance scale linearly to 12PB and 150GB/s
 - Flash accelerated hybrid architecture
- **Easy Management**
 - Minimal management effort at scale
 - Set up or grow capacity in <10 minutes
 - 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**



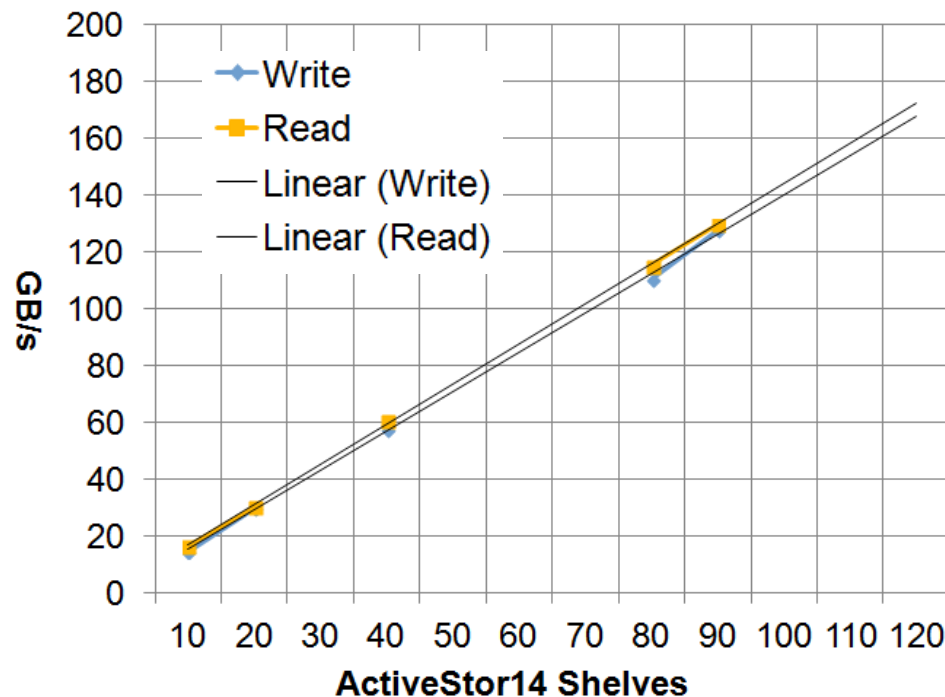
Source: <http://www.hpcwire.com/2014/10/06/noaa-refines-forecasting-ability/>

- **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>