



Extraordinary Storage for Extraordinary Jobs

Panasas is the premier storage system for high-performance computing environments (clusters, server farms, single clients). Panasas ActiveStor Performance Modules are utilized by Fortune 500 companies are the world to:

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

All Panasas storage clusters contain the object-based, PanFS™ parallel file system. Panasas solutions break the storage I/O bottleneck and are deployed in a broad range of government, academic and Fortune 500 organizations.

Panasas Target Markets

Panasas targets high-performance environments (clusters, server farms, single clients) utilizing high performance, data-intensive applications. Target industries and applications include:

- Energy: Seismic Processing, Reservoir Simulation, Interpretation
- Automotive: Crash Analysis, Fluid Dynamics, Acoustic Analysis
- Aerospace: Fluid Dynamics (CFD), Structural Mechanics, Finite Element Analysis
- Bio/Pharm: Bioinformatics, Computational Chemistry, Molecular Modeling
- Finance: Credit Analysis, Risk Analysis, Portfolio Optimization
- Industrial Manufacturing: EDA Simulation, Optical Correction, Thermal Mechanics
- University Research: High Energy Physics, Molecular Dynamics, Quantum Mechanics
- Government: Imaging & Search, Stockpile Stewardship, Weather Forecasting

Scalable Storage for High Performance Environments – Market Evolution

Ordinary storage cannot keep up with the stringent demands of today's computing environments: very complex problems and simulations, very large number of data (files) being used concurrently, very large data files, and the very large number of concurrent users. So, a fundamental change is occurring in the large-scale computing landscape. The emergence of high performance computing clusters, and the new generation of data-intensive parallel applications built to run on these clusters, is driving a new approach to scalable computing. Now it is essential to extend the benefits of clustering to storage. A new storage paradigm is needed to complement high performance clusters by offering linear scaling of performance, massive growth in capacity, and an appliance-like management approach to a unified storage resource.

The Panasas Parallel Storage Cluster delivers a new architecture uniquely suited to complement clusters by delivering the performance and scalability required of these emerging clustered applications.

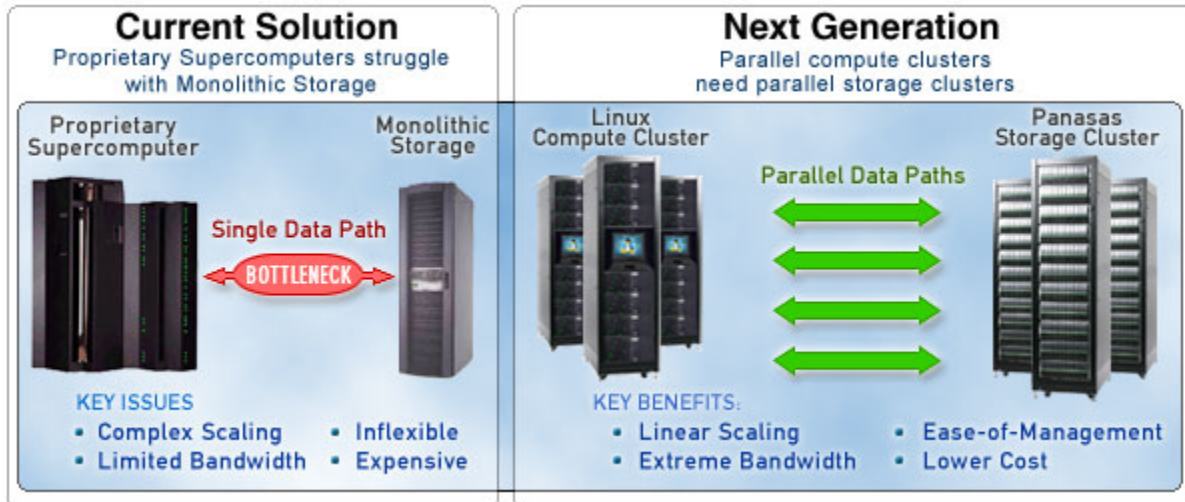


Figure 1: Market Evolution

Parallelism is Critical

Several companies are attempting to address the storage needs of clusters today. However Panasas is unique because our focus is on delivering a truly parallel architecture that is designed and optimized for clusters of multi-core servers. Applications are now being actively designed specifically to take advantage of clusters that use multi-core chipsets and threaded operating systems.

This creates a need for storage that matches the parallel nature of these applications and compute models – that storage needs to be both parallel AND standards-based so that it can be accessed easily from any compute environment and by any application.

Panasas already solves the parallel component of this need with its fully parallel patented DirectFLOW® protocol. The DirectFLOW protocol is the foundation of the Parallel NFS (pNFS) standard.

Leveraging Object-Based Architecture

The Panasas Parallel Storage Cluster represents the next major evolution in networked storage. Designed from the ground up to radically boost I/O performance and enhance manageability, it is the first storage solution optimized for cluster, server farm, and single client environments. Groundbreaking Panasas solutions herald a next-generation, object-based storage clustering architecture. This, combined with cost-effective intelligent hardware components – Panasas ActiveStor Performance Modules – delivers record-breaking performance in both throughput and random I/O. All components are managed within a single seamless namespace that dramatically simplifies cluster management.

The Panasas solution is developed within a standards-based framework allowing customers to maximize their return on infrastructure investment. Everything from the components used to the

protocols supported are industry standard and will integrate seamlessly into all customer environments. For example, Panasas supports NFS and CIFS network file system protocols for UNIX and Windows client access, NDMP protocol for backup and Ethernet-based TCP/IP for connectivity.

ActiveStor Performance Modules

The Panasas ActiveScale File System provides a scalable architecture capable of achieving performance in the 100's of GB/sec by simply adding as many individual Performance Modules, or racks, to achieve aggregate performance. All aggregated Performance Modules are presented as a single system featuring a global name space providing unified management. The Panasas ActiveStor 7, 8 and 9 Series Performance Module building blocks provides three options to meet a wide range of application requirements.

ActiveScale Operating Environment

The foundation for the Panasas ActiveStor parallel storage solutions is the Panasas ActiveScale operating environment that includes the PanFS parallel file system.

- **Single Client Performance** - 200% improvement compared to previous versions
- **4GB cache StorageBlades on the ActiveStor 8 Series** - larger memory cache for optimized application workloads
- **Disk Migration Utility** - transparent shelf to shelf data migration to new hardware
- **Asynchronous Mirroring** - Integrated Replication for disaster recovery, back up consolidation and content distribution
- **LDAP & Samba Update** - improved Windows interoperability
- **Access Control List** - export PanFS ACL for more flexible security policies
- **Linux Power 6 Client Support** - support for IBM's latest high-performance compute platform

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