

PANASAS® ACTIVESTOR® ULTRA

PRODUCT BRIEF

FAST AND SIMPLE STORAGE FOR HIGH-PERFORMANCE COMPUTING (HPC) APPLICATIONS

The new Panasas® ActiveStor® Ultra scale-out NAS storage appliance delivers the extreme performance, enterprise-grade reliability and manageability required to process the large and complex datasets associated with HPC workloads and emerging applications like AI, precision medicine, autonomous driving, AR and VR.

Architected for performance, simplicity and flexibility, ActiveStor Ultra features PanFS® 8, a completely re-engineered, portable parallel filesystem deployed on the latest industry standard hardware. ActiveStor Ultra with PanFS8 offers a high-performance, cost-effective storage solution capable of seamlessly adapting to new technology advancements, evolving workloads, and dynamic business needs.

ActiveStor Ultra goes from dock to data in one hour with a plug-and-play solution that is easy to install, manage and grow, all while maintaining the industry's lowest total-cost-of-ownership (TCO) at any scale. With its modular architecture and building-block design, enterprises deploying ActiveStor Ultra can start small and scale linearly by scaling metadata performance, bandwidth and capacity independently and without limitations, for faster time to results. And performance remains consistently high, up to 75 GB/s per rack, regardless of complexity.



USE CASES

AI

Machine Learning, Deep Learning, Training, Inference.

Manufacturing

Smart Manufacturing, CAE simulation and analysis, EDA design and simulation.

Life Sciences

Precision Medicine, Genomic sequencing, molecular imaging, computational chemistry.

Media

VFX, AR, VR, animation and video game rendering.

Government

Defense, intelligence, climate modeling, financial modeling.

Energy

Seismic processing, reservoir simulation, interpretation and analysis, renewables.

University Research

Climate modeling, computational chemistry, high-energy physics, life sciences.

PANFS 8 – THE INDUSTRY’S FASTEST PORTABLE PARALLEL FILE SYSTEM

ActiveStor Ultra is the first generation of Panasas storage to deploy the new PanFS 8 portable parallel filesystem. PanFS 8 is an intelligent, POSIX compliant parallel file system that incorporates the latest software innovations and runs on Linux to enable easy portability to new industry standard hardware. PanFS 8 includes the newly reengineered Storage Node software stack for use on the new ActiveStor Ultra family of Storage Nodes. It also includes the software stacks for the ActiveStor Director and PanFS DirectFlow® parallel data access protocol.

PanFS layers POSIX semantics over a massively scalable pool of storage objects. Metadata and data are separated and stored using advanced techniques. Metadata is placed in a dedicated database on NVMe SSD that allows for maximum and consistent performance even with increasing complexity. In addition, small files are stored on SSDs and large files on HDDs to enable exceptional mixed workload performance.

The PanFS DirectFlow® parallel data access protocol eliminates traditional scale-out NAS bottlenecks and hot spots by allowing compute clients to access all ActiveStor storage nodes directly.

ACTIVESTOR DIRECTOR – SCALABLE METADATA SERVICES

The ActiveStor Director functions as the “control plane” of the system, managing metadata services instead of storing user data. The Director controls distributed filesystem operations such as file-level and object-level metadata consistency, client cache coherency, recoverability from interruptions to client I/O, storage node allocation operations, and secure multiuser access to files.

In addition, the Director controls many other aspects of the overall storage system including managing the namespace, health of the system, failure recovery actions, and gateway functionality. The Director also facilitates scalability and virtualizes data objects across all available storage nodes enabling the system to be viewed as a single, easily managed global namespace. The ActiveStor Director nodes can be scaled independently to scale metadata performance.

PANASAS ACTIVESTOR ULTRA

MANAGEMENT SIMPLICITY

Going from dock to data in one hour, ActiveStor Ultra, offers exceptional low-touch administration that doesn't require deep technical skills to manage. A single point of management is delivered via a graphical user interface (GUI) or a command-line interface (CLI). Scalability is easy with a simple 10-minute system setup that doesn't interrupt ongoing operations.

In addition, ActiveStor Ultra is a self-managing system with preselected settings that are applicable to the majority of today's workloads, meaning users can easily add new workloads without tuning or retuning. Advanced data algorithms handle complex, data-intensive applications without manual intervention, eliminating hotspots.

COMPATIBILITY AND DATA MIGRATION

ActiveStor Ultra is fully backward compatible with ActiveStor Prime and ActiveStor Classic enclosures. All three platforms can co-exist in the same realm under different blade sets, while being under a single global name space and managed by a single GUI. ActiveStor Prime and ActiveStor Classic enclosures need to be upgraded to PanFS 8 or later software to support this functionality.

It is easy to migrate from existing ActiveStor enclosures to ActiveStor Ultra with the migration tools provided by Panasas such as Pan_snap_replicator and Pan_site_sync. Panasas also offers professional services to assist with the migration process from third-party storage.

FLEXIBILITY AND SCALE

ActiveStor Ultra is as easy to scale as it is to deploy. Scalability is accomplished by growing the number of ActiveStor storage nodes, with each one adding to the capacity, performance, and network bandwidth of the solution. As new ActiveStor Ultra enclosures are added to the system, automated load balancing ensures optimal performance by evenly distributing data across all available storage nodes.

RELIABILITY AND AVAILABILITY

PanFS 8 offers exceptional data reliability and availability by combining the functions of a distributed and clustered filesystem, a scalable software-based erasure-coding data-protection engine, and intelligent management and failure recovery algorithms.

Per-file distributed triple parity protection offers unmatched enterprise-grade reliability. The Extended File System Availability (EFSA) feature takes advantage of deeper protection of directory data above and beyond N+M erasure code levels to preserve file system integrity and accessibility.

Automatic data rebuild protects against system wide failures. Redundant networking data paths automatically fail over. All components are field replaceable for easy servicing. ActiveStor Ultra uses advanced NVDIMM technology for ultra-low latency, persistent storage and superior power failure recovery.

The result is a high-performance storage system that serves up to hundreds of gigabytes per second of data from a single namespace and increases in reliability as the storage deployment gets bigger.

COST-EFFECTIVE AT ANY SCALE

ActiveStor Ultra delivers the most cost-effective performance at any scale with the industry's lowest admin overhead. By combining performance, scalability, flexibility, reliability, and ease of management in a turn key appliance, ActiveStor Ultra has the lowest TCO in its category. In addition, the investment is fully protected with backward and forward compatibility between generations of Panasas products. And unlike open-source solutions in the market, Panasas offers timely world-class L1-L4 support with just one phone call to resolve issues within minutes to hours rather than days.

MULTI-PROTOCOL SUPPORT

Clients requiring the highest performance access to the ActiveStor Ultra solution use the Panasas DirectFlow data protocol. The PanFS 8 DirectFlow parallel data access protocol supports Linux and macOS clients. The ActiveStor Director provides scalable access for client systems via the NFS or SMB protocols via "gateway" services. User authentication is managed via a variety of options including Active Directory and Lightweight Directory Access Protocol (LDAP).

FLEXIBLE NETWORK CONNECTIVITY

ActiveStor Ultra provides flexible networking options to choose from including Ethernet, Infiniband or OmniPath to match cluster connectivity and performance requirements.

ACTIVESTOR ULTRA PRODUCT DETAILS

Per 4U	ActiveStor Ultra
Performance	7.5 GB/s (Up to 75 GB/s per rack in a configuration of 10 ActiveStor Ultra enclosures with one ActiveStor Director)
Hardware	Industry standard hardware, 4 nodes / 4U
Capacity	HDD: 96TB - 288TB SATA SSD: 0TB - 32TB NVMe SSD: 8TB
Network	8 x 25 GbE 4x FDR or EDR IB, OmniPath
Min. Config	288TB, 12U, 22 GB/s