Panasas ActiveStor Director 200

Built for Price/Performance, Engineered for Manageability

The Panasas® ActiveStor® Director 200 (ASD-200) is the control plane for the ActiveStor high-performance scale-out network attached storage (NAS) solution. The ASD-200 is a disaggregated appliance built on industry standard hardware, enabling independent scaling of metadata to meet the requirements of metadata intensive workloads. ASD-200 nodes control many aspects of the overall storage system including namespace management, distribution and consistency of user data on storage nodes, system health, failure recovery, and gateway functionality. ActiveStor systems powered by the Panasas PanFS® parallel file system and composed of ASD-200 directors and Panasas storage nodes increase both performance and capacity by the same factor with nearly perfect scaling. As the system scales, reliability and availability increase, while administrative overhead remains low.

Highlights

No-Compromise Mixed Workload Performance

ASD-200 directors allow customers to manage different types of workflows and file sizes without compromising performance.

Unprecedented Metadata Performance

With their fast and efficient handling of metadata, ASD-200 directors excel at addressing workloads with large numbers of small files, such as those generated by OpenFOAM® and BLAST®.

Efficient Data Management

Panasas PanActive Manager allows customers to easily control their entire namespace in a single UI, regardless of the amount of data or number of working sets. PanFS provides automatic rebuilding and load balancing when adding or removing nodes.

Multi-Dimensional Scaling

With the ability to scale-up or scale-out metadata independently, customers can configure the ratio of director to storage nodes to meet the demands of specific application workloads and file protocols.

Multiple-Protocol Global Namespace

ASD-200 directors provide multi-protocol support for industry standards such as NFS and SMB in addition to the PanFS DirectFlow® parallel data access protocol.

Use Cases

Manufacturing

Design and simulation, fluid dynamics, optical correction, thermal modeling

Life Sciences

Next generation sequencing, bioinformatics, cryo-EM

Government

Defense, intelligence, weather forecasting

University Research

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

Energy

Seismic processing/migration/interpretation, reservoir simulation

Scalable Metadata Services

ASD-200 directors manage system activity and provide clustered metadata services. The directors orchestrate file system activity and speed data transfers while facilitating scalability and virtualizing data objects across all available storage nodes. This enables the system to be viewed a single, easily managed global namespace.

PanFS metadata services running on ASD-200 nodes implement all file system semantics and manage sharding of data across the storage nodes. They control distributed file system operations such as file-level and object-level metadata consistency, client cache coherency, recoverability from interruptions to client I/O, storage node operations, and secure multiuser access to files. Storage administrators can easily create volumes within the PanFS global namespace to manage hierarchies of directories and files that share common pools of storage capacity. Per-user capacity quotas can be defined at the volume level. Each volume has set of management services to govern the quotas and snapshots for that volume. This type of partitioning allows for easy linear scaling of metadata performance.

Superior Manageability

A single point of management for a scale-out file system allows the storage administrator to focus on core business tasks instead of the storage system. Panasas easily addresses capacity and performance planning, mount point management, and data load balancing across multiple pools of storage. ASD-200 directors easily integrate into growing heterogeneous environments through multiprotocol support for Linux, macOS, and Microsoft Windows clients while also introducing high-performance Panasas DirectFlow protocol support for Linux.

Gateway Services

ASD-200 directors provide scalable access for client systems via NFS or SMB protocol "gateway" services. Director nodes do this without being in the data path. Using these gateway solutions, users can easily manage files created by Windows or macOS environments. User authentication is managed via a variety of options including Active Directory and Lightweight Directory Access Protocol (LDAP).

File-level Reconstruction

Data protection in the PanFS operating environment is calculated on a per-file basis rather than per-drive or within a RAID group, as in other architectures. ASD-200 directors also provide an additional layer of data protection called Extended File System Availability (EFSA) for the namespace, directory hierarchy, and file names. In the extremely unlikely event of encountering errors that erasure coding cannot recover from, the system knows which files have been affected and fenced off and which files are known to not have been impacted.

High Availability

All metadata transactions are journaled on a backup director node. All volumes remain online in case of failover, with no required system check. Network failover ensures there is no single point of failure in the system network. All director nodes share the reconstruction workload and enable load balancing during reconstruction, providing fast reconstruction within hours rather than days.

Automatic data rebuilding protects against systemwide failures. Redundant networking data paths automatically fail over. All components are hot swapped for easy field servicing.

EFSA takes advantage of erasure coding of directory data to preserve file system integrity and accessibility.

Enterprise-Grade Reliability

Per-file, distributed, dual-parity erasure coding offers enterprise-grade reliability. The PanFS storage operating system reduces rebuild times by rebuilding specific files rather than entire drives by using all the ActiveStor storage nodes in the system in parallel.

This distributed approach ensures that RAID reconstructions are performed in parallel to rapidly restore data protection. Due to the intelligent placement of user data with erasure coding, ActiveStor reliability increases with scale rather than decreasing, as with traditional storage products.

Security Assurances

The need for data security has grown in the modern world, and PanFS now offers two core features to help protect your valuable data. Encryption at Rest ensures both that removeable media drives are unreadable if taken outside your datacenter, and that data destruction can be guaranteed when a PanFS system needs to be repurposed. PanFS' support for SELinux when used with DirectFlow enables deploying PanFS in environments that require Multi-Level Security.

Timely High-Quality Service and Support

Unlike open-source solutions and even commercial alternatives from broad portfolio vendors, Panasas offers timely world-class L1-L4 support to resolve issues within minutes to hours rather than days and weeks.

Specifications

Hardware	Industry standard 2U enclosure w/ 4 node bays
Size & Weight	760mm L x 438mm W x 88mm H; 31.6kg
Networking	2x25GbE ports per node
Power Supply	2x redundant 2220W units per enclosure
Processor	1x Intel Xeon Silver 4251R per node
Memory	96GB DRAM per node
Software	PanFS OS 9.0.1 and above
BTU Rating	1491 BTU/hour @ 205VAC
Power Usage	437W and 1.97A @ 205VAC
Input Voltage	200-240VAC, 50-60Hz
Operating Tmp.	0° C to 35° C
Protocols	DirectFlow, NFS, SMB

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