

# PANASAS® ACTIVESTOR® DIRECTOR 100

## High-Performance Metadata Processing Engine

The Panasas® ActiveStor® Director 100 (ASD-100) is the control plane for the high-performance ActiveStor scale-out network attached storage (NAS) solution. Delivered as a disaggregated appliance built on industry standard hardware, the ASD-100 offers the raw CPU power and RAM capacity required to drive exceptional metadata performance on intense workloads. The ASD-100 controls many different aspects of the overall ActiveStor storage system including the management of metadata, the global namespace, the distribution and consistency of user data across storage nodes, the overall health of the system, failure recovery actions, gateway functionality, and more.

Combining the ASD-100 with the ActiveStor Hybrid (ASH-100) configurable storage appliance creates a modern, flexible storage solution that enables users to design a storage system that meets their exact specifications and workflow requirements. The combined ActiveStor solution is the most flexible plug-and-play high-performance storage system on the market, accelerating workflows with ultrafast streaming performance, true linear scalability, enterprise-grade reliability, and unparalleled ease of management.

Powered by the Panasas PanFS® parallel file system, performance and capacity scale independently for all data types and file sizes, and as the system scales, reliability and availability increase, while administrative overhead remains low.

### HIGHLIGHTS

#### Configuration Flexibility

Ability to configure and reconfigure to exact performance specifications to manage different types of workflows and vastly different file sizes without compromising performance.

#### Unmatched Mixed Workload Performance

Lower costs and complexity by consolidating multiple applications on a storage system that supports mixed workloads of large and small files at high performance.

#### Automatic Capacity Balancing

Automatic load balancing when adding nodes helps increase application performance and eliminates data bottlenecks by distributing file content across all available storage nodes, thereby contributing to higher system performance.

#### Multi-Protocol Cache Coherency

Multi-protocol support for industry standard protocols such as NFS and SMB in addition to the Panasas DirectFlow® parallel data access protocol. With cross-protocol cache coherency, clients can access files from multiple protocols at the same time.

### USE CASES

#### Manufacturing

CAE simulation & analysis, EDA

#### Life Sciences

Genomic sequencing, molecular microscopy/imaging, bioinformatics, computational chemistry

#### Media

VFX/rendering, active archive, transcode, video editing

#### Government

Climate modeling, defense, intelligence, financial modeling

#### University Research

Climate modeling, materials science, high energy physics, computational mathematics

#### Energy

Seismic processing, reservoir simulation, interpretation & analysis, renewables (wind, biofuel)



### HIGH-SPEED METADATA PROCESSING

The ActiveStor Director manages system activity and provides clustered metadata services to drive higher overall system performance. It orchestrates file system activity from outside the data path, allowing reads/writes to occur in parallel directly between compute clients and Panasas storage blades, speeding data transfers while facilitating scalability. It also virtualizes files across all available storage nodes, enabling the system to be viewed as a single, easily managed global namespace. Separating metadata processing from data storage enables the linear scaling of performance for any type of small file, large file, or mixed workloads.

### CONSISTENT HIGH PERFORMANCE

When using the PanFS DirectFlow® protocol, users see a single system image with full POSIX compatibility and data consistency across many different hosts. Traditional NAS protocols, such as NFS and SMB, do not support simultaneous access to metadata and data from multiple computers without the risk of data loss from those protocols' lack of cache coherency. This creates problems for an increasing number of applications that need to scale out to produce results within a business driven time limit.

When enclosures are added or files are added or deleted, the ActiveStor Director rebalances the distribution of files across storage nodes so the nodes can all contribute equally and maximize overall system performance.

### SUPERIOR MANAGEABILITY

The ASD-100 provides simple, high-level coordination of all file system functions with a single point of management, allowing storage administrators to focus on core business tasks instead of storage system management. It easily addresses capacity and performance planning, mount point management, and data load balancing across multiple pools of storage. The ASD-100 easily integrates into growing heterogeneous environments through multi-protocol support for Linux®, macOS®, and Microsoft® Windows® clients, while also offering high-performance DirectFlow protocol support for Linux and Mac that is easy to deploy and monitor.

### GATEWAY SERVICES

The ActiveStor Director also provides scalable access for client systems via the standard NFS or SMB protocols using "gateway" services. This enables the PanFS platform to integrate into heterogeneous IT environments consisting of a combination of Linux, macOS and Windows clients. Using these gateway solutions, users can easily manage files created by a Microsoft Windows or macOS environment. User authentication is managed via a variety of options including Active Directory and Lightweight Directory Access Protocol (LDAP).

### HIGH AVAILABILITY

The ActiveStor solution delivers reconstruction within hours rather than days. All metadata transactions are journaled for safety to a different director node, and all data is protected by RAID 6+ across storage nodes plus an additional parity layer. All volumes remain online in case of failover and no file system check is required.

# PANASAS ACTIVESTOR DIRECTOR 100

Redundant network links automatically fail over in the event of a failure, and all hardware components are hot swappable for easy field servicing. All the Director nodes share the reconstruction workload and enable load balancing during reconstruction.

## ENTERPRISE-GRADE RELIABILITY

Per-file distributed RAID 6+ triple-parity protection offers enterprise-grade reliability. The PanFS storage operating system reduces rebuild times by rebuilding specific files rather than entire drives, using all the ActiveStor storage blades in the system in parallel.

The distributed approach ensures that RAID reconstructions are performed in parallel to rapidly restore data protection. Due to the intelligent placement of user data with RAID 6+, ActiveStor reliability increases with scale rather

than decreasing, as is the case with traditional storage products.

The Extended File System Availability (EFSA) feature takes advantage of even deeper protection of directory data in RAID 6+ to preserve file system integrity and accessibility in extreme cases.

## A FUTURE-READY STORAGE SOLUTION

Storage needs are always growing and mixed workloads are ever changing. The Panasas ActiveStor solution is ready to meet even the most demanding workflow requirements, now and in the future, with a modular architecture that includes customizable, flexible components that seamlessly adapt to new technology advancements to meet dynamic business needs. With ActiveStor, users have the ability to mix and match HDD and SSD configurations under a

single global namespace to best match the system performance to their specific workload requirements. In addition, metadata performance, data bandwidth, and data capacity can be scaled independently for faster time to results.

## ACTIVESTOR DIRECTOR 100 SPECIFICATIONS

HARDWARE	SPECIFICATIONS
Enclosure	2U with up to 4 director nodes
Nodes	4 nodes per chassis. Minimum 3 nodes required
Power Supplies	Dual Redundant 1600W
Processor	Intel Xeon 1630 v4 (Broadwell)
Memory	96GB DDR4 RAM, 8GB NVDIMM
Dimensions/Weight	Width: 3.42 inches, Depth: 17.24 inches, Net weight: 45.2 pounds
BTU Rating	4294 BTU/hr
Operating Temperature	10°C to 35°C with maximum rate of change not to exceed 10°C
Input Line Voltage	100-240 VAC, 47-63Hz.
Input Power Rating	AC Inlet Power 1259W (5.7 Amps at 220 VAC); DC Power Consumption: 1184W
Networking	2x40 GbE QSFP+ or 4x10GbE NIC per node
Management	In-Band Management and IPMI (RJ45) dedicated management port including web interface
PRODUCT ATTRIBUTES	
Performance	Improved metadata performance, improved NFS/SMB performance and accelerated small-file access compared to DB18 and DB20
Modular Design	4 self-contained nodes include compute assembly and storage media in a 2U rack mountable chassis. Integrates easily into existing realm
ActiveStor Software	ActiveStor® 7.0 and above
Multi-Protocol Support	Panasas DirectFlow®, NFS, SMB
Data Protection	RAID6+ erasure code structure with N+2 erasure coding. Stripe width N can be set individually per file and defaults between 10 and 12 NVDIMM for transaction logs
Scalability	No fixed maximum for nodes in a cluster. Supports millions of files in single directory
Data Replication	Pan_Snap_Replicator provides flexible and high-performance data replication

