



# OceanStor 9000 Scale-out NAS

HUAWEI TECHNOLOGIES CO., LTD.

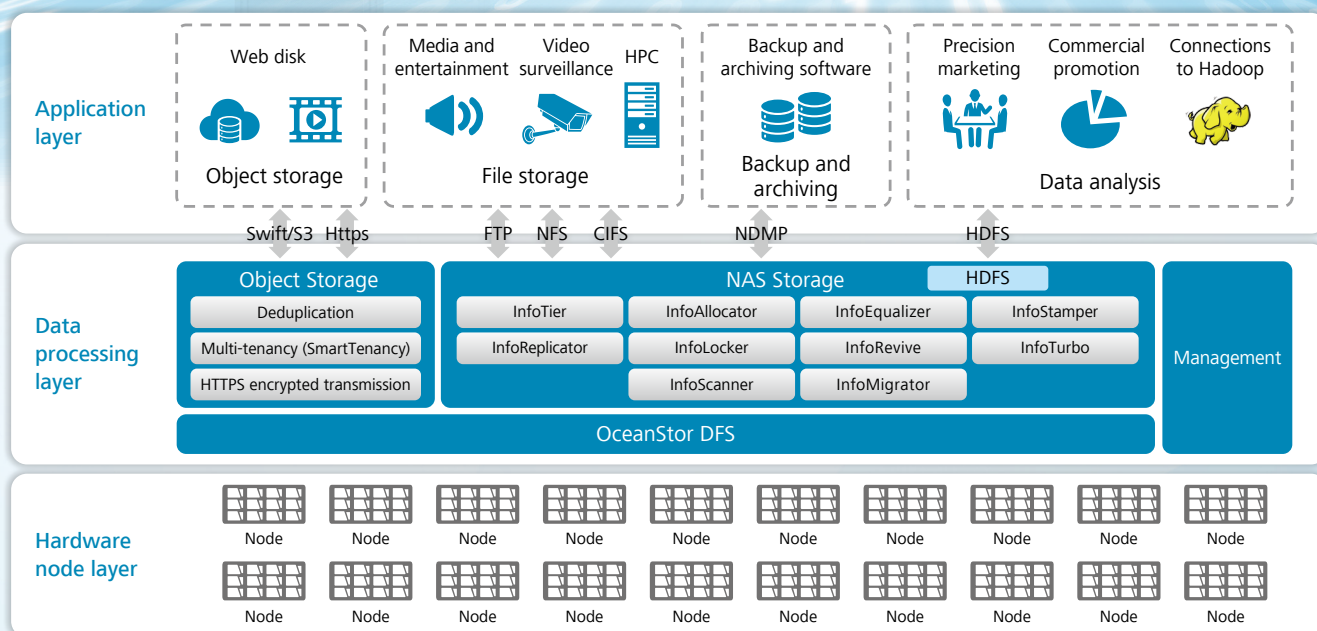




# OceanStor 9000

The Huawei OceanStor 9000 storage system features a symmetric distributed architecture that delivers superior performance, extensive scale-out capabilities, and a super-large single file system providing shared storage for unstructured data.

The OceanStor 9000 is ideal for Big Data service scenarios, such as film and TV, satellite mapping, gene sequencing, energy exploration, and scientific research, education, and provider services. With advanced processing features and data lifecycle management, the OceanStor 9000 helps customers build industry's most efficient Big Data storage capabilities.



## Fully symmetrical distributed architecture featuring impressive parallel read-write capabilities

- **High-performance read/write access:** Exclusive InfoTurbo acceleration technology achieves up to 2.5 GB/s in bandwidth over a single client.
- **Network acceleration:** Support 10 GE, InfiniBand and a variety of other networking schemes; supports RDMA mode transmission and TOE offload, to improve system transmission performance
- **Linear scalability:** Linear increase in system performance as nodes are added with up to 400 GB/s in bandwidth

## Linear Scaling of Capacity and Performance in a Super-Large Single File System

- **Single-file system:** A single file system of up to 100 PB simplifies system management and maintenance while eliminating data silos caused by multiple namespaces.
- **Impressive expansion capabilities:** Seamless expansion from 3 to 288 nodes enables linear expansion of capacity and performance.

- **Even data distribution:** The shared-nothing symmetric distributed architecture evenly distributes data and metadata data to all nodes, eliminating system bottlenecks.
- **Ultra-high utilization:** Ensures up to 95% disk utilization without compromising inter-node data reliability.

## Open Convergence Storage System Designed for Diversified Applications

- **Multiple interface support:** NFS, CIFS, NDMP, FTP, HDFS, S3/Swift, and other interfaces to allow the system to support diversified applications and achieve data management throughout the entire lifecycle.
- **Support for varied node types:** Support for various types of nodes, including IO-intensive, bandwidth-intensive, and capacity-intensive nodes to suit different applications.
- **Integrated management:** One set of software centrally manages IT devices, provides analysis reports, simplifies management, and improves operation efficiency.

## Visualized and Unified Resource Management

- **Flexible configuration:** Directory-based redundancy ratio settings provide a variety of data protection levels for optimizing performance, space utilization, and reliability.
- **Automatic statistics collection and analysis:** Automatic performance statistics collection and analysis help customers use resources efficiently.
- **Automatic deployment:** The software platform is automatically deployed and configured and the one-click capacity expansion feature enables customers to add a single node within 60 seconds.
- **Rights management:** Access controls for IP addresses, users, and user groups ensure that storage pools are secure and mutually isolated.

## Info Series Software Brings Intelligent Management to Large-Scale Storage

**InfoEqualizer**, Huawei's load-balancing software, manages connections between clients and the OceanStor 9000.

- Manages access to IP addresses in a unified manner and supports automatic allocation, failover, and failback for node IP addresses.
- Implements load balancing based on domain names and supports a variety of load-balancing policies.
- Includes zone-based management for nodes, allowing an independent load-balancing policy and an independent domain name to be configured for each zone.

**InfoTier**, Huawei's Dynamic Storage Tiering (DST) software, ensures that frequently accessed data (hotspot data) is on the fastest performance tier.

- DST is implemented between performance and capacity nodes, fully leveraging the advantages of different types of storage media and reducing Total Cost of Ownership (TCO).
- A variety of data migration policies and migration priorities are supported to accommodate changing service needs.

**InfoAllocator**, Huawei's quota management software, manages storage space usage.

- Implements space quota management based on users, user groups,

and directories, meeting different customer requirements.

- Allows flexible and easy access to storage space with quota nesting management.

**InfoProtector**, Huawei's proprietary data protection software, ensures reliable data with redundant storage.

- N+M data protection technology protects data against a concurrent failure of four nodes.
- Multiple nodes restore data concurrently at a speed of up to 1 TB/hour.

**InfoExplorer**, Huawei's fast file retrieval software, provides flexible options for quick retrieval of target files from a large number of files.

- Retrieval time is shortened from dozens of hours to several seconds, improving search efficiency and convenience.
- The built-in, full-text retrieval function supports fuzzy search based on file name, path, user name, and user-defined tag.

**InfoStamper**, Huawei's Snapshot software, provides directory level snapshot for quick data recovery.

- Directory-level snapshots, quick data recovery.
- Support for manual and scheduled snapshots (daily/weekly/monthly).

**InfoLocker**, Huawei's WORM functionality software, provides enterprise level WORM function.

- Protection against data loss, malicious modification, and deletion.
- Supports setting of WORM clock and protection period.

**InfoReplicator**, Huawei's asynchronous remote replication software for disaster recovery.

- Shortens the time needed to perform a system restore; applicable to disaster recovery, data backup, and long-distance data migration scenarios.
- Supports 1:N and N:1 replication for different types of directories.

**InforRevive**: Huawei's Surveillance video and imagery restoration software.

- Failure or damage of any number of disks does not impact the video stream; only data on the failed or damaged disks is lost.

## Technical Specifications of the Distributed Storage System



Model	P25	P36	P12	C36	C72
Hardware Specifications					
System architecture	Fully symmetrical distributed architecture				
Number of nodes	3 to 288				2 to 144
CPUs per node	2 x Intel E5 series				2 x Intel Atom
NVDIMM	2 GB NVDIMM				-
Cache per node	Standard configuration: 48 GB, scalable to 192 GB		Standard configuration: 32 GB, scalable to 192 GB		Standard configuration: 64 GB
Data disk type	2.5-inch SSD and SAS disks	3.5-inch SSD, SATA disks, and NL-SAS disks		3.5-inch SSD, SATA, and NL-SAS disks	3.5-inch SATA disks
Number of disks per node	Standard configuration: 1 x 2.5-inch 400 GB SSD + 24 x 2.5-inch 900 GB/1.2 TB SAS (The SSD/HDD configuration ratio can be adjusted based on actual performance requirements.)	Standard configuration: 1 x 3.5-inch 400 GB SSD + 35 x 3.5-inch 2 TB/4 TB/6 TB/10 TB SATA or 2 TB/4 TB NL-SAS (The SSD/HDD configuration ratio can be adjusted based on actual performance requirements.)	Standard configuration: 12 x 3.5-inch 2 TB/4 TB/6 TB/10 TB SATA or 2 TB/4 TB NL-SAS (The SSD/HDD configuration ratio can be adjusted based on actual performance requirements.)	Standard configuration: 36 x 3.5-inch 2 TB/4 TB/6 TB/10 TB SATA or 2 TB/4 TB NL-SAS	Standard configuration: 72 x 3.5-inch 2 TB/4 TB/6 TB SATA

Front-end network type	10GE, InfiniBand, and 1GE			10GE and 1GE	1GE
Internal network type	10GE and InfiniBand			10GE	
Application Scenarios	OPS-intensive	Large-capacity and high-bandwidth	Small-capacity	Video surveillance and archiving	
Software Features					
Data protection level	N+1, N+2, N+3, N+4 (Data is still usable even if 4 nodes failed.)				
File system	OceanStor DFS, which supports the global namespace and can be dynamically expanded up to 100 PB				
Value-added features	Dynamic storage tiering (InfoTier) Automatic load balancing of client connections (InfoEqualizer) Space quota management (InfoAllocator) Snapshot (InfoStamper) WORM (InfoLocker) Remote replication (InfoReplicator) Performance acceleration (InfoTurbo) Surveillance video and imagery restoration (InfoRevive) Data Migration (InfoMigrator) Anti-virus (InfoScanner)				
Value-added object storage feature	Object-level deduplication Multi-tenant HTTPs Encrypted transmission				
Thin provisioning	Support for thin provisioning, which does not need to be configured				
Data self-healing	Automatic, concurrent, and quick data restoration, with maximum restoration speed at 1 TB/hour				
System expansion	One-click online expansion, with less than 60 seconds needed for expansion of a single node				
Global cache	Up to 55 TB of global cache				
Operating system	Windows, Linux, UNIX, and Mac OS				
Supported protocols	NFS, CIFS, FTP, HDFS, S3/Swift, NDMP, NIS, Microsoft Active Directory, and LDAP				
System management	Support for users with different management rights, and domain- and rights-based user management Alarm notification by email, SMS, and SNMP				
Bad disk detection	Automatic bad disk detection and alarm notification as well as batch replacement of bad disks, avoiding the need for immediate replacement while freeing up maintenance personnel to handle more pressing tasks.				
Physical Specifications					
Power supply	200 V AC to 240 V AC				
Dimensions (H x W x D)	Node	2 U, 86.1 mm x 446 mm x 582 mm (3.39 in. x 17.56 in. x 22.91 in.)	4 U, 175 mm x 446 mm x 582 mm (3.39 in. x 17.56 in. x 22.91 in.)	2 U, 86.1 mm x 446 mm x 582 mm (3.39 in. x 17.56 in. x 22.91 in.)	4 U, 175 mm x 446 mm x 582 mm (3.39 in. x 17.56 in. x 22.91 in.)
	Cabinet	Maximum size: 2000 mm x 600 mm x 1200 mm (78.4 in. x 23.62 in. x 47.24 in.)			
Weight	Fully loaded with 2.5-inch disks: ≤ 35 kg (77 lb.)	Fully loaded with 3.5-inch disks: ≤ 70 kg (154 lb.)	Fully loaded with 3.5-inch disks: ≤ 32 kg (71 lb.)	Fully loaded with 3.5-inch disks: ≤ 70 kg (154 lb.)	Fully loaded with 3.5-inch disks: ≤ 96 kg (212 lb.)
Typical power	420 W	580 W	260 W	580 W	920 W
Operating temperature	5°C to 35°C (41°F to 95°F) when the altitude ranges from –60 m to +1,800 m (–196.85 ft to +5,905.44 ft) When the altitude is higher than 1,800 m (5,905.44 ft) but lower than or equal to 3,000 m (9,842.4 ft), the ambient temperature drops by 0.6°C (1.08°F) for every 100-m (328.08-ft) increment in altitude.				
Operating humidity	20% RH to 80% RH				

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