

Technical Specifications

Model	OceanStor 18500	OceanStor 18800	OceanStor 18800F
Hardware specifications			
System architecture	Smart Matrix Architecture		
Max. number of controllers	8	16	16
Max. number of processors	Multi-core processors		
Max. cache size (GB)	768	3072	3072
Max. number of front-end host ports	96 (Fibre Channel/iSCSI/FCoE)	192 (Fibre Channel/iSCSI/FCoE)	192 (Fibre Channel/iSCSI/FCoE)
Max. number of disks	1584	3216	2304
Supported disk types	2.5-inch disks: SSD and SAS 3.5-inch disks: SSD, SAS, and NL-SAS		2.5-inch SSD
Software specifications			
Max. number of hosts	65,536		
Max. number of LUNs	65,536		
Data protection software	HyperSnap HyperClone HyperCopy HyperReplication S/A		
Storage efficiency software	SmartThin SmartMotion SmartTier SmartQoS SmartPartition SmartVirtualization		SmartThin SmartMotion SmartQoS SmartPartition SmartVirtualization
Host software	UltraAPM (multi-site DR management) UltraVR (virtualization DR management) UltraPath (host multipathing) DiskGuard (host data protection) SmartX Insight		
Compatible operating systems	AIX, HP-UX, Solaris, Linux, and Windows		
Supported virtual environment	VMware, XenServer, and Hyper-V virtual platforms VMware VAAI/VASA/SRM and Hyper-V ODX/TP value-added features vSphere and vCenter integration		
Physical specifications			
Power supply	System bay	AC 200 V to 240 V, 32 A, 50 or 60 Hz	
	Disk bay	AC 200 V to 240 V, 32 A, 50 or 60 Hz	
Dimensions and weight	Dimensions (H x W x D)	Maximum bay dimensions (including external pulleys and support feet): 1995 mm x 600 mm x 1100 mm	
	Weight	System bay: 658 kg (fully loaded with 2.5-inch disks)/654 kg (fully loaded with 3.5-inch disks) Disk bay: 570 kg (fully loaded)	574 kg (fully loaded)
Operating ambient temperature	5°C to 40°C (altitude: < 1800 m), 5°C to 30°C (altitude: 1800 m to 3000 m)		

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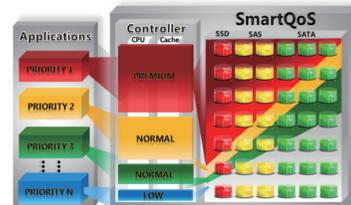
Smart Series Offering Flexible and Efficient Storage

SmartQoS — Easy Service Management

The SmartQoS classifies I/Os into priority-specific queues based on applications' priorities. Sufficient storage resources are reserved for I/O queues with high priorities to meet their performance requirements, while a resource upper threshold is set for I/O queues with low priorities to avoid excessive resource usage. The execution period of the SmartQoS policy is customizable.

SmartPartition — Cache Partitioning

The SmartPartition sets target values for cache partitions. Based on the values, cache resources are dynamically and separately allocated to services to avoid malicious cache contention and ensure critical services' performance.

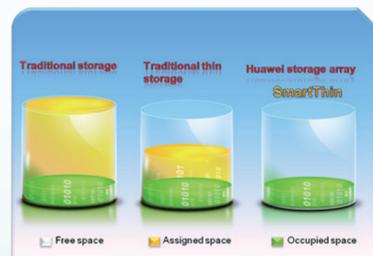


SmartTier — Intelligent Data Tiering

The SmartTier uses different types of disks to create storage tiers and automatically migrates data among these tiers based on its I/O access frequency statistics. In doing so, data is stored onto the right storage medium at the right time, increasing system performance and decreasing TCO.

SmartMotion — Balance Between Performance and Capacity

Within the same tier, the SmartMotion calculates I/O access frequencies and disk usage on different disks. Based on the generated statistics, the SmartMotion relocates data among disks of the same type to constantly maintain a balance between performance and capacity. The relocation prevents disk hot spots, boosts disk utilization, and raises the overall system performance. What's more, the SmartMotion helps ensure hitless system upgrade by redistributing disk performance and capacity.



SmartThin — Intelligent Resource Distribution

The SmartThin allocates storage capacity on demand. Storage space is allocated and reclaimed in a unit of 64 KB. The SmartThin supports space reclamation for mainstream applications such as VMware, Veritas Storage Foundation, and Windows Server. Besides, it delivers space pre-distribution for thin LUNs, enabling switchover and data replication between thin and thick LUNs.

SmartVirtualization — Heterogeneous Storage Virtualization

The SmartVirtualization consolidates and reuses legacy devices by enabling the Huawei Enterprise Storage system series to take over storage resources from existing third-party devices. All resources are managed in a unified manner to fully utilize existing storage space, simplify management, and maximize customers' ROI.

Hyper Series Safeguarding Service Continuity

HyperSnap

The HyperSnap generates snapshots of online data at specified points in time without interrupting system services. Those snapshots can be used for backup, R&D, testing, data mining, and data recovery in case data is lost due to virus infection or misoperations. A data snapshot occupies only changed data to save storage space.

HyperClone

The HyperClone generates full physical copies (data mirrors) of a primary LUN. After synchronizing and splitting the primary LUN and secondary LUN, the HyperClone obtains data copies consistent with the primary LUN. A maximum of 16 physical copies of a primary LUN can be generated to apply to various application scenarios.

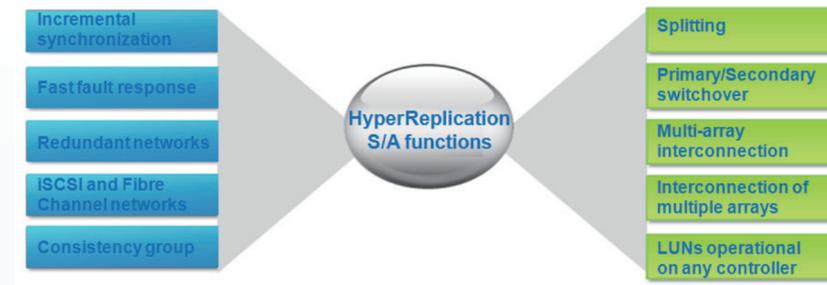
The HyperReplication /S mirrors data from a primary LUN to a secondary LUN on a different storage array. It applies to intra-city data protection and minimizes data loss risks.

HyperReplication /A

The HyperReplication /A replicates data from a primary LUN to a secondary LUN in a remote location thousands of kilometers away. The minimum recovery time objective (RTO) is 5 seconds, minimizing data loss during system downtime. The data replication period can also be customized to off-peak hours to minimize adverse impact on application and host performance.

HyperReplication /CG

The HyperReplication /CG creates a consistency group comprised of multiple data volumes that have share the same replication policy. The consistency group ensures data consistency among the member data volumes.



UltraAPM

The UltraAPM provides application-level disaster recovery solutions to keep data consistent among applications. The software supports disaster recovery drill, incremental data synchronization, and centralized management. It can protect data on most mainstream applications, such as Oracle, DB2, and SQL Server.

UltraVR

As a vCenter Server plug-in, the UltraVR works seamlessly with value-added functions of HUAWEI storage arrays. It delivers VMware-based one-stop service integrating backup, testing, and recovery and ensures speedy and highly predictable recovery point objective (RPO) and RTO.

OceanStor 18500/ 18800/ 18800F Data Sheet

HUAWEI ENTERPRISE ICT SOLUTIONS
A BETTER WAY





OceanStor 18500/ 18800/ 18800F Enterprise-Class Data Center Storage System

Secure and Reliable

- **Smart Matrix Architecture:** The innovative architecture provides up to 16 redundant controllers to ensure stable system running and permanent service continuity.
- **Core service assurance:** SmartQoS and SmartPartition ensure that sufficient resources are allocated for mission-critical services to meet their performance requirements.
- **Comprehensive DR solution:** The solution delivers the lowest recovery point objective (RPO) to ensure business service continuity.

Scalable and Efficient

- **All-around expansion technologies:** The 4S technologies (scale-up, scale-out, scale-deep, and scale-in) deliver flexible system expansion that enables performance and capacity to automatically improve as services grow, meeting increasing requirements in the coming 10 years.
- **Unrivalled performance and specifications:** Industry-leading specifications including 1 million IOPS, ms-level latency, 16 controllers, 7 PB capacity, and 3 TB cache meet performance and capacity requirements of heavily loaded applications.
- **Easy adaptation to virtualization trends:** The architecture's compliance with extensive virtualization standards improves the storage efficiency, data protection, and management capability in virtual environments.

Matchless Reliability

- The Huawei Enterprise Storage system is incomparably reliable, promising service continuity in various respects including architecture, data storage, and service applications.
- The Huawei Enterprise Storage system adopts the Smart Matrix multi-controller architecture where 16 redundant controllers ensure stable system running and service continuity. Controllers adopt PCIe 2.0 full optical interconnection to implement safe and sound service failover between controllers. All hardware components and channels are redundant to perform independent fault detection, recovery, and isolation on each component and channel to further enhance system stability.
- The innovative block virtualization technology shrinks reconstruction time per TB from over 10 hours to 30 minutes, substantially improving data reliability. The DIF-based end-to-end data integrity verification mechanism prevents accidental data damage.
- SmartQoS and SmartPartition ensure that mission-critical services have sufficient resources to run stably. The Hyper series and Ultra series data protection software together safeguard customers' data locally and remotely. The two series of software play an important role in Huawei's DR solutions for strengthening service continuity.

DIF+DIX Providing End-to-End Data Protection

- The DIF+DIX end-to-end data integrity solution ensures data integrity of application systems, HBAs, storage systems, and disks. It prevents silent data damage and provides end-to-end protection, and delivers higher level of customer service assurance.

9-Intensity Shock Resistance Certification Ensuring Data Safety

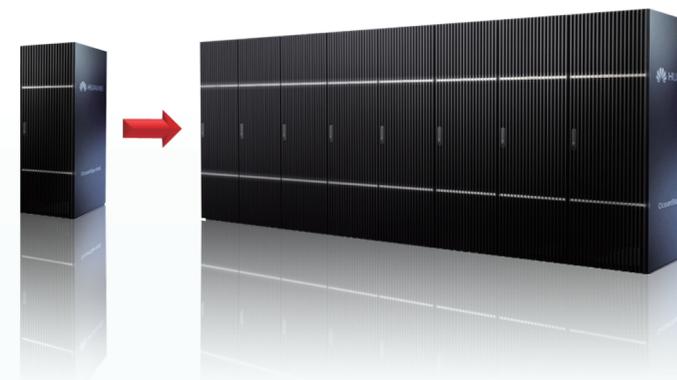
- The Huawei Enterprise Storage system is the only enterprise storage product that has passed the 9-intensity shock resistance certification of Shock-Resistance Performance and Quality Supervision and Inspection Center for Information Industrial Communication Devices. The device is effectively resistant to mechanical vibration and shock during transportation and usage. It can withstand 90% earthquakes in 50 years and remains safe and sound before and after the disasters without data loss.

Predictable and Manageable SSD Service Life

- The all-SSD enterprise storage system OceanStor 18800F provides global wear leveling. The innovative technology globally balances erasure frequencies of flash chips and reduces the erasure counts of SSDs with small redundant space to prolong their service life. In addition, the OceanStor 18800F implements global anti-wear leveling. When SSDs reach their erasure thresholds, the technology centralizes the erasure counts on a few disks to decrease the possibility of multiple disk failures. Based on the known allowed erasure accounts of flash media, the OceanStor 18800F can accurately predict the service life of SSDs and visualizes the service life on a graphical management interface.

Incomparable Scalability and Performance

- The Huawei Enterprise Storage system boasts unparalleled scalability. Both storage capacity and computing performance can be expanded online and on demand. Based on the Smart Matrix Architecture, each Huawei Enterprise Storage system system houses up to 3216 disks with a maximum of 7 PB storage capacity. In addition, each system provides up to 3 TB cache, and 192 Fibre Channel or iSCSI ports.
- As for expansion, the Huawei Enterprise Storage system series adopts the 4S technologies. Scale-up expands the storage capacity and processing performance of existing controllers. Scale-out enables linear performance increase as storage capacity grows. Scale-deep consolidates storage space from third-party devices. Scale-in fully explores system's internal potentials, raising host volumes' performance and storage capacity without adding any hardware resources. Therefore, the storage system can infinitely adapt to service needs.
- The Huawei Enterprise Storage system system is also a distributed multi-controller storage system whose controllers can be expanded from 2 to 16 without interrupting services. In total, eight system bays and two disk bays can be deployed. An Huawei Enterprise Storage system system bay can pack a maximum of 192 3.5-inch disks or 408 2.5-inch disks and a disk bay can pack a maximum of 192 3.5-inch disks.
- The Huawei Enterprise Storage system series offers a wide range of disk options including speedy enterprise-class SSDs and 2 TB NL-SAS disks. It also integrates 8 Gbit/s Fibre Channel ports and 10 Gbit/s Ethernet ports used for FCoE and iSCSI connections.



Latency Stably at Millisecond Level, Ensuring Speedy Response to Critical Services

- The OceanStor 18800F has a dedicated ultra-fast cache algorithm designed for SSDs to accelerate data reads and writes. The I/O latency is stably within several milliseconds while the IOPS is as high as 1 million.

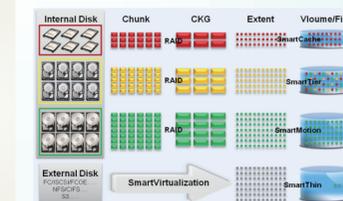
Ground-Breaking Smart Matrix Architecture

- **Smart Matrix Architecture:** The Smart Matrix system architecture is specifically designed for the high-end Huawei Enterprise Storage system series. It throws off the physical shackles of traditional dual-controller architecture, presenting outstanding system scalability and availability that are second to none. The competent specifications include 16 controllers, 3 TB cache, and 7 PB storage capacity.
- **PCIe full-switching network for end-to-end reliability:** The Smart Matrix Architecture is based on the PCIe 2.0 network that interconnects all Huawei Enterprise Storage system controllers to exchange information. The overall system bandwidth reaches up to 192 GB/s. Each controller provides built-in front-end and back-end ports and shares global cache. All controllers concurrently deliver I/O requests to disks, raising I/O processing efficiency.
- **Scale-out:** The Smart Matrix Architecture allows the linear expansion of system resources and online expansion to a maximum of 16 controllers. The controllers can be dispersed anywhere in a data center.



Versatile and Intelligent Fully Virtualized Volumes

- **New-generation disk management technology:** Each disk is sliced into chunks that form chunk groups (CKGs) with chunks from other disks. The storage capacity of the CKGs is further divided into extents of finer granularity. The extents then form LUNs. This way of managing disk space ensures even data distribution onto a number of disks. Advantages of the technology are notably improved performance, eliminated disk hot spots, reduced disk damage rate, and enhanced system reliability. Each disk provides hot spare space that participates in every disk reconstruction in the event of a disk fault. As all disks' hot spare space is engaged, the data reconstruction efficiency soars by 90%, further raising system reliability.



All-Around Smart Functions

- **Smart series functions:** The Huawei Enterprise Storage system provides the Smart series of functions that make the system more productive and flexible.
 - SmartTier: Creates different storage tiers to optimize performance and reducing costs.
 - SmartMotion: Dynamically adjusts data distribution to strike a balance between performance and capacity.
 - SmartThin: Provisions storage space to raise space utilization.
 - SmartQoS: Controls service quality to prioritize resource demands of critical services.
 - SmartPartition: Partitions storage cache to separately protect cache resources of critical services.
 - SmartVirtualization: Integrates heterogeneous storage products to simplify storage management and protecting legacy products.