OceanStor Dorado V3
Lightning Fast, Rock Solid

Highlights

Purpose-built for enterprise-class mission critical business, equipped with comprehensive SAN and NAS features. Ideal for use with databases, virtual desktop infrastructure (VDI), virtual server infrastructure (VSI)and file sharing. Facilitates the transition to all-flash for customers in the finance, manufacturing, telecom, and other sectors.

3x increase in application performance

- Up to 7,000,565 SPC-1 IOPS™
- Up to 0.3 ms latency
- Intelligent chips for end-to-end data acceleration
- Firstly support NVMe architecture both in high-end and mid-range AFA
- FlashLink® intelligent algorithms

99.9999% field-proven availability

- World's most reliable SSD, MTBF up to 3 million hours
- Full-redundancy architecture and hot plugging of key components, eliminating single points of failure
- Certified magnitude-9 earthquake resistance capability
- RAID-TP technology tolerates simultaneous failures of three SSDs
- Gateway-free active-active solution, upgradable to a 3DC solution
- Converged Data Management solution, efficient storage protection in multi-cloud environments

75% OPEX savings

- Inline deduplication and compression, supporting a data reduction ratio up to 5:1

Outstanding Performance

Enterprises are finding accurate decision-making more challenging with today's complex and rapidly changing data. They are in urgent need of high-performance IT infrastructures that support fast analysis for massive amounts of data and the quick extraction of valuable information from the data. Huawei's OceanStor Dorado V3 all-flash storage is able to achieve end-to-end optimizations and deliver 0.3 ms latency with intelligent chips, NVMe architectures, and Huawei's FlashLink® intelligent algorithms. This helps improve online transaction volumes threefold and reduces report-generation time to one third. It can scale out to 16 controllers and 7,000,565 SPC-1 IOPS™ to meet growing business requirements in the future.
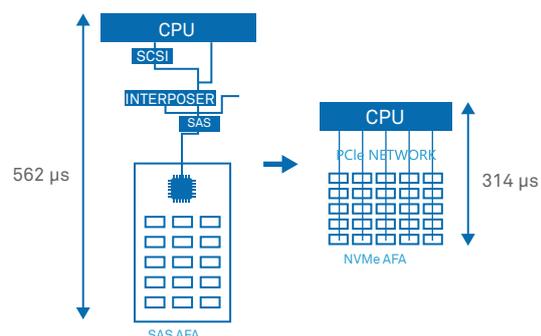
Intelligent chips

Huawei uses three types of intelligent chips to enable end-to-end data acceleration: intelligent multi-protocol interface chip, intelligent SSD controller chip, and intelligent BMC management chip. The intelligent multi-protocol interface chip supports 32 Gbit/s FC and 100 GE front-end protocol, leading the industry. In addition, it supports protocol parsing to help accelerate the front-end access speed by 20%. The intelligent SSD controller chip hosts the core Flash Translation Layer (FTL) algorithm, accelerating data access within SSDs at an 80 µs read latency — the shortest in the industry. The intelligent BMC management chip manages CPUs, memories, and PCIe modules in a unified manner, expediting fault locating and diagnosis. The fault recovery time is shortened from 2 hours to 10 minutes.

| Intelligent multi-protocol interface chip | Intelligent SSD controller chip | Intelligent BMC management chip |
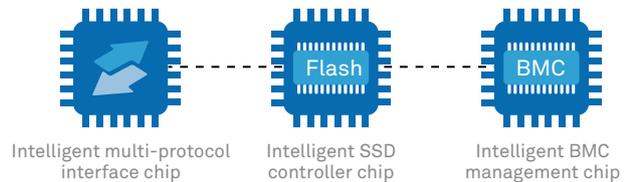
Firstly support NVMe both in mid-range and high-end all-flash storage

Compared with SAS all-flash storage architectures, NVMe all-flash storage architecture is not only more advanced, but also the fastest in the storage field. It implements direct communications between CPUs and SSDs and shortens transmission paths. NVMe architecture also increases the number of concurrent users by more than 65,536 times. At the same time, it reduces the number of protocol interactions from four to two, doubling the write request processing efficiency. Huawei is a pioneer of adopting NVMe architecture both in mid-range and high-end all-flash storage, and the OceanStor Dorado V3 (NVMe version) enjoys 0.3 ms latency— 50% shorter than SAS All-Flash Arrays (AFAs). Equally important, the OceanStor Dorado V3 supports both NVMe and SAS versions, and the SAS version supports the intermixing of SAS and NVMe SSDs. This enables smooth upgrades from SAS all-flash storage systems to NVMe ones, protecting customer investments.

Firstly support NVMe architecture

OceanStor Dorado18000 V3 SPC-1 benchmark test
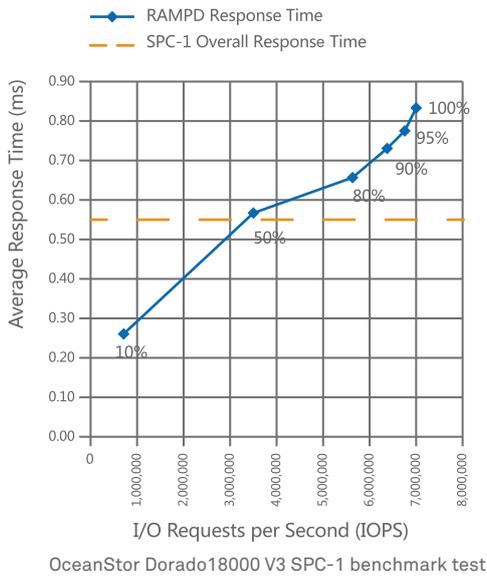
Intelligent algorithms

Most all-flash storage products in the industry are optimized based on traditional storage systems and cannot take full advantage of SSD capabilities. Huawei OceanStor Dorado V3 incorporates FlashLink® intelligent algorithms to empower intelligent chips and other key components. Accordingly, the OceanStor Dorado V3 adjusts the data layout between SSDs and controllers. This design enables it to provide a consistently low latency. In addition, Redirect On Write (ROW) technology used in flash-oriented operating systems keeps performance uncompromised after enabling snapshots. The operating system also provides diverse Quality-of-Service (QoS) strategies to ensure high performance for mission-critical applications and excellent user experiences.

Linear performance and capacity expansion

Future business growth requires a predictable, scalable, and powerful storage infrastructure. The scale-out architecture of the OceanStor Dorado V3 supports linear expansion to 16 controllers and 7,000,565 SPC-1 IOPS™ as more controller enclosures are added, ready to meet unpredictable business growth.

Stable and Reliable

The adoption of cloud and flash technologies has fueled explosive growth in data volume and increased the demand for data reliability. The OceanStor Dorado V3 ensures reliability from components, products, and solutions to cloud layers, achieving 99.9999% availability for mission-critical business, and satisfying even the most strict enterprise-class reliability requirements.

World's most-reliable SSD

As the carrier of data, SSD reliability has always been of primary concern to users. Huawei SSDs leverage global wear-leveling technology to balance SSD loads and extend their duration. In addition, Huawei's patented anti-wear leveling technology prevents multiple SSDs failures and improves the reliability of the entire system. As a result, Huawei SSDs achieve a Mean Time Between Failure (MTBF) of 3 million hours.

## Comprehensive reliability hardening

The flash storage system has been hardened at both the hardware and software layers. At the hardware layer, the full-redundancy architecture supports dual-port NVMe and hot plugging of key components to eliminate single points of failure. Having passed the China Telecommunication Technology Labs' magnitude-9 earthquake resistance test, the OceanStor Dorado V3 can tolerate vibrations in device transport and installation. The high-end Dorado series is delivered in cabinets, ensuring smooth transport and simplifying deployments.

At the software layer, the OceanStor Dorado V3 supports comprehensive enterprise-grade SAN and NAS features such as second-level snapshots, writable clones, and LUN copies, ensuring storage system reliability. More important, it incorporates RAID-TP technology, which can tolerate the simultaneous failures of three SSDs, guaranteeing the highest reliability level in the industry. In addition, RAID-TP shortens the reconstruction time for 1 TB of data to 30 minutes, effectively protecting data from the risks posed by large-capacity SSDs. Customers can enjoy the benefits of large-capacity SSDs without worrying about risks to data reliability.

Industry-leading gateway-free active-active solution

Flash storage is designed for mission-critical businesses that cannot tolerate loss or interruption, and the active-active solution is the inevitable choice. Gateway-free active-active technology simplifies deployment and reduces the total number of possible points of failure, ensuring 99.9999% availability and protecting core applications from breakdown. Meanwhile, the solution balances the load between active-active mirrors and permits

non-disruptive cross-site takeover. The system supports two physical quorum servers to prevent single points of failure. The active-active option can smoothly upgrade to a 3DC solution without gateways, protecting business continuity and data availability.
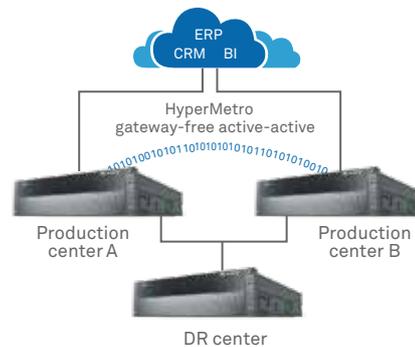
Gateway-free active-active solution upgradable to 3DC solution
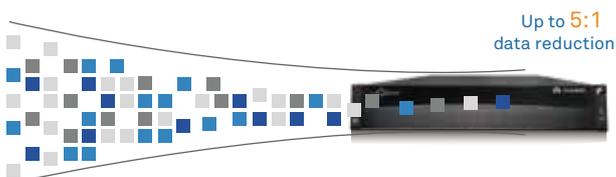
Converged Data Management (CDM) solution

Backup is a common way for enterprises to protect data, however, traditional backup solutions are slow and expensive. The backup data cannot be directly used, making it difficult to match the development trends of massive data sets. The OceanStor Dorado V3 provides a CDM solution that enables efficient storage protection in multi-cloud environments such as HUAWEI CLOUD, Huawei jointly-operated cloud. The solution utilizes second-level snapshot technology to achieve industry-leading 10-second backup intervals, improving the backup frequency by 30 times. Disaster Recovery (DR) and backup integration is implemented in the storage array, which means that backup copies can be directly used for development and testing, reducing the Total Cost of Ownership (TCO) by 50%. The OceanStor Dorado V3 works with HUAWEI CLOUD, Huawei jointly-operated cloud to implement cloud-enabled gateway-free DR and minute-level service recovery on the cloud*.

Converged and Efficient

The core mission of any IT system is to help enterprises improve efficiency, which is more critical than ever. The transition to flash-oriented IT architecture helps enterprises increase their revenue and decrease their expenditures with added value and simplified management.

Data reduction

Inline deduplication and compression technologies release the storage capacity occupied by redundant data. In addition, the OceanStor Dorado V3 supports a data reduction ratio up to 5:1. This effectively improves utilization and reduces power consumption, cooling, and maintenance fees, cutting end-to-end OPEX by 75%. This helps customers lower their costs while achieving higher ROI. Deduplication and compression can be separately enabled or disabled to better suit specific application requirements.

Up to 5:1
data reduction

SAN and NAS unified storage

The OceanStor Dorado V3 supports both SAN and NAS storage, and offers comprehensive SAN and NAS features to meet high-performance SAN (with inline compression and duduplication enabled)and NAS all flash storage demands at the same time. Besides, you can manage SAN and NAS through a unified management software, simplifying operation and maintenance.

Interconnection

Deploying all-flash systems at both active and passive sites increases costs for data centers. To solve this problem, the OceanStor Dorado V3 can interconnect with OceanStor converged storage series, helping users build cost-effective disaster recovery schemes and protect their investments.

Wide compatibility

Upgrading existing storage systems to all-flash storage involves migrating data between different storage models using different operating systems and application software. This brings critical challenges to system compatibility. The OceanStor Dorado V3 is compatible with more than 300 mainstream storage systems and 98% of IT infrastructures, enabling smooth upgrades without affecting business transactions, and helping data centers transition easily to flash.

Working with hybrid cloud

Huawei OceanStor Dorado V3 builds a hybrid storage cloud solution for enterprises. It replicates or backs up storage snapshots to the cloud and stores historical snapshots on the public cloud to reduce local storage space usage. In addition, the OceanStor Dorado V3 interacts with HUAWEI CLOUD to restore services on the cloud and help enterprise data centers evolve toward the cloud.

Technical Specifications

Model	OceanStor Dorado18000 V3	OceanStor Dorado6000 V3	OceanStor Dorado5000 V3	OceanStor Dorado3000 V3
Hardware Specifications				
Maximum Number of Controllers	16*			
Maximum Cache (Dual-Controller, Expanding with the Number of Controllers)	512 GB to 16 TB	512 GB to 16 TB	256 GB to 4 TB	192 GB to 1.5 TB
Supported Storage Protocols	FC, iSCSI, NFS, CIFS, HTTP, and FTP			FC, iSCSI
Front-End Port Types	8/16/32 Gbit/s FC, and 10/25/40/100 GE			
Back-End Port Types	PCIe 3.0/SAS 3.0			SAS 3.0
Maximum Number of SSDs	3,200 (9,600*)	2,400 (9,600*)	1,400 (9,600*)	800 (100 per dual controllers)
Supported SSDs	960 GB/1.92 TB/3.84 TB/7.68 TB/15.36 TB NVMe SSDs 960 GB/1.92 TB/3.84 TB/7.68 TB/15.36 TB/30.72 TB SAS SSDs			1.92 TB/3.84 TB/ 7.68 TB SAS SSDs
Software Specifications				
Supported RAID Levels	RAID 5, RAID 6, RAID 10*, and RAID-TP (tolerating simultaneous failure of 3 SSDs)			
Maximum Number of Hosts	8,192			
Maximum Number of LUNs	65,536	32,768	16,384	16,384
Maximum File Capacity	256 TB			NA

Value-Added Features	SmartDedupe (intelligent inline de-duplication) SmartVirtualization (intelligent heterogeneous virtualization) HyperSnap (snapshot) HyperCDP (continuous data protection) CloudBackup (backup and recovery between cloud and local data centers)	SmartCompression (intelligent inline compression) SmartMigration (intelligent LUN migration) HyperClone (LUN clone) HyperMetro (gateway-free active-active solution)	SmartThin (intelligent thin provisioning) SmartQoS (intelligent QoS control) HyperCopy (LUN copy) HyperReplication (remote replication)
	SmartPartition (intelligent partitioning) SmartQuota (intelligent quota management) HyperVault (all-in-one backup)	SmartMulti-tenant (intelligent multi-tenant) HyperLock (WORM)	NA
Storage Management Software	DeviceManager (device management)	UltraPath (multi-path management)	eService (remote maintenance and management)

Physical Specifications

Power Supply	AC: 200 V to 240 V	AC: 200 V to 240 V DC: 192 V to 288 V	AC: 100 V to 240 V DC: 192 V to 288 V or -48 V to -60 V	AC: 100 V to 240 V DC: 192 V to 288 V or -48 V to -60 V
Dimensions (H x W x D)	Controller enclosure: 263.9 mm x 447 mm x 750 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm NAS module: 86.1 mm x 447 mm x 748 mm	Controller enclosure: 130.5 mm x 447 mm x 750 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm NAS module: 86.1 mm x 447 mm x 748 mm	Controller enclosure: 86.1 mm x 447 mm x 748 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm NAS module: 86.1 mm x 447 mm x 748 mm	Controller enclosure: 86.1 mm x 447 mm x 748 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm
Weight	Controller enclosure: 96 kg Disk enclosure: 20 kg NAS module: 35 kg	Controller enclosure: 60 kg Disk enclosure: 20 kg NAS module: 35 kg	Controller enclosure: 40 kg Disk enclosure: 20 kg NAS module: 35 kg	Controller enclosure: 40 kg Disk enclosure: 20 kg
Operating Temperature	5℃ to 40℃ (altitude: < 1,800m), 5℃ to 35℃ (altitude: 1,800m to 3,000m)			
Operating Humidity (Relative Humidity)	5% RH to 95% RH (non-condensing)			

For projects requiring any specifications marked with asterisks (*), please contact with Huawei sales.

For More Information

To learn more about Huawei storage, please contact the local office or visit Huawei Enterprise website http://e.huawei.com.

Huawei Enterprise APP

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