

## 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 SAP HANA.

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™
- ◆ Low to 0.5 ms consistent latency (with inline compression, inline deduplication, and snapshot enabled)
- ◆ Intelligent chips for end-to-end data acceleration
- ◆ NVMe architecture for all models
- ◆ 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, able to tolerate 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

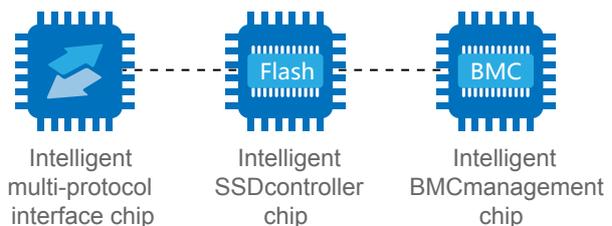
- ◆ Inline deduplication and compression, supporting a data reduction ratio up to 5:1

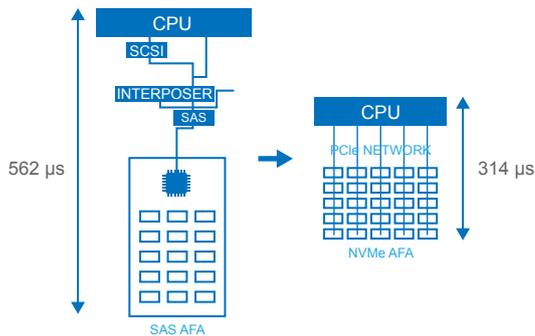
### Outstanding Performance

Enterprises are finding accurate decision-making more and more challenging in the face of today's massive, complex, and rapidly changing data. They are in urgent need of high-performance IT infrastructures to support the quick analysis of massive amounts of data and the extraction of valuable information. Huawei's OceanStor Dorado V3 all-flash storage is able to deliver 0.5 ms consistent latency by incorporating intelligent chips, NVMe architectures, and Huawei's FlashLink® intelligent algorithms to achieve end-to-end optimizations from SSDs and controllers, which help improve the application performance threefold and reduce report generation time to one third. It can scale out to 16 controllers and 7,000,565 SPC-1 IOPS™, making it capable of meeting 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 100GE front-end protocols, leading in the industry. In addition, it supports protocol parsing that used to be completed by general-purpose CPUs, which helps accelerate the front-end access speed by 20%. The intelligent SSD controller chip bears the core Flash Translation Layer (FTL) algorithm, accelerating data access within SSDs at 80 μs latency for data reads, the shortest in the industry. The intelligent BMC management chip manages CPUs, memories, and PCIe modules in a unified manner, expediting fault diagnosis and locating. The fault recovery time is shortened from 2 hours to 10 minutes.

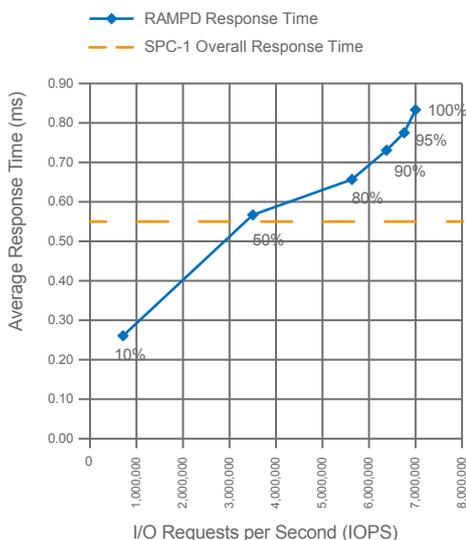




NVMe architecture for all models

### NVMe architecture for all models

Compared with SAS all-flash storage architectures, NVMe all-flash storage architecture is more advanced and 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 65,536 times. At the same time, it reduces the number of protocol interactions from 4 to 2, doubling the write request processing efficiency. Huawei is a pioneer in adopting NVMe in all-flash storage and is the first vendor that applies NVMe architecture for all all-flash storage product models in the industry. The OceanStor Dorado V3 (NVMe version) enjoys an end-to-end latency (200 μs) of 45% lower than that of SAS all-flash storage. More importantly, the OceanStor Dorado V3 (SAS version) supports intermixing of SAS and NVMe SSDs. This enables smooth upgrades from SAS all-flash storage systems to NVMe ones, protecting customers' investment.



OceanStor Dorado18000 V3  
SPC-1 benchmark test

### Intelligent algorithms

Most all-flash storage products in the industry are optimized based on traditional storage systems. They cannot take full advantage of the capabilities of SSDs. Huawei OceanStor Dorado V3 incorporates FlashLink® intelligent algorithms to empower intelligent chips and other key components, and accordingly adjusts the data layout between SSDs and controllers. This design enables it to provide outstanding performance at a consistently low latency (0.5 ms). In addition, the redirect on write (ROW) technology used on flash-oriented operating system keeps performance uncompromised after snapshot is enabled. It adjusts LUN granularities based on application needs to better match performances of different applications. The operating system also provides diverse QoS strategies, which ensure high performance for mission-critical applications and excellent user experience.

### Linear performance and capacity expansion

Unpredictable business growth requires a storage infrastructure that is more predictable, scalable, and powerful. The scale-out architecture of OceanStor Dorado V3 supports linear expansion to 16 controllers and 7,000,565 SPC-1 IOPS™.

## Stable and Reliable

The adoption of the cloud and flash technologies has fueled explosive growth in the volume of data and driven the search for ever-higher levels of data reliability. The OceanStor Dorado V3 ensures reliability from the component, product, and solution 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

SSD is the carrier of data, so its reliability has always been users' greatest concern. Huawei SSDs leverage the global wear-leveling technology to balance the load among all SSDs and extend the duration of each. In addition, Huawei's patented anti-wear leveling technology prevents group failures of multiple disks and improves the reliability of the entire system. Besides, Huawei SSDs employ numerous encryption policies to ensure data security. With the mean time between failure (MTBF) of 3 million hours, Huawei SSDs outperform those of other vendors by 20%.

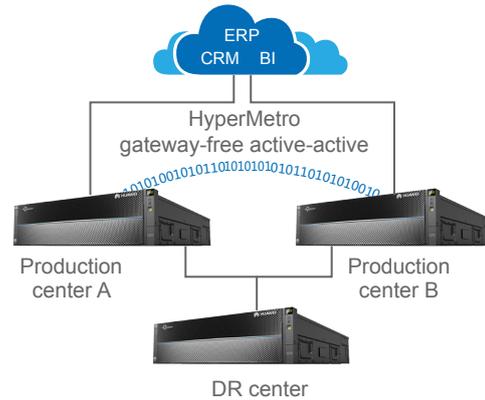
### Comprehensive reliability hardening

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 all key components to eliminate single points of failure. Having passed the magnitude-9 earthquake resistance test of the China Telecommunication Technology Labs, 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, OceanStor Dorado V3 incorporates the RAID-TP technology, which can tolerate simultaneous failures of three SSDs, guaranteeing the highest level of reliability in the industry. In addition, RAID-TP shortens the reconstruction time for 1 TB data to 30 minutes, effectively protecting data from the reliability risk posed by large-capacity SSDs. Customers can enjoy the benefits of large-capacity SSDs without worrying about risks to data reliability. In addition, the system supports comprehensive enterprise-level features such as cascaded snapshot, second-level snapshot, writable clones, and LUN copies. It also supports rich NAS functions such as CIFS, NFS, and WORM. All of them work together to ensure storage system reliability.

### Gateway-free active-active solution

Flash storage is designed for mission-critical businesses that cannot tolerate any loss or interruption, and the active-active solution is the inevitable choice. The gateway-free design of the solution simplifies deployment and reduces the total number of possible points of failure. 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 solution can smoothly upgrade to a 3DC solution without gateways, which ensures 99.9999% availability and protects core applications from breakdown. More importantly, the OceanStor Dorado V3 powers gateway-free active-active solutions at 1 ms latency, ensuring lightning-fast, rock-solid experience for mission-critical applications.



Gateway-free active-active solution upgradable to 3DC solution

### Converged Data Management (CDM) solution

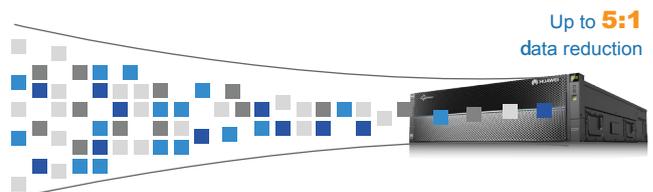
Backup is a common solution for enterprises to protect data. However, traditional backup solutions are slow and expensive, and backup data cannot be directly used, making it difficult to match the development trends of massive data sets. The OceanStor Dorado V3 provides a CDM solution that enables efficient storage protection in multi-cloud environments (HUAWEI CLOUD, Huawei jointly-operated cloud, and AWS). The solution utilizes second-level snapshot technology to achieve industry-leading 10-second backup intervals, improving the backup frequency by 30 times. 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 TCO of DR construction by 50%. The OceanStor Dorado V3 works with HUAWEI CLOUD, Huawei jointly-operated cloud, and AWS to implement cloud-enabled gateway-free DR and backup and minute-level service recovery on the cloud\*.

## Converged and Efficient

The core mission of any IT system is to help enterprises improve their efficiency, and this mission is now more critical than ever. The transition to flash-oriented IT architecture helps enterprises increase their revenue and decrease their expenditures at the same time with increased 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 series supports 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%, helping customers lower their investment while achieving higher ROI. Inline deduplication and compression can be separately enabled and disabled to better suite specific application requirements.



### 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 protection schemes and protecting their investment.

### 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 the system compatibility. The OceanStor Dorado V3 is compatible with over 300 mainstream storage systems and 98% of IT infrastructures, enabling smooth upgrades without affecting business 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 can cooperate with Huawei clouds to restore services on the cloud and help enterprise data centers evolve towards the cloud\*.

## Technical Specifications

Model	OceanStor Dorado5000 V3	OceanStor Dorado6000 V3	OceanStor Dorado18000 V3
<b>Hardware Specifications</b>			
Product pattern	Both support independent NVMe modules, and intermixing of SAS and NVMe SSDs		
Maximum number of controllers	16*		
Maximum cache (dual-controller, expanding with the number of controllers)	256 GB to 4 TB	512 GB to 16 TB	512 GB to 16 TB
Supported storage protocols	FC, FCoE, iSCSI, InfiniBand, NFS, CIFS, HTTP, FTP		
Type of front-end ports	8/16/32 Gbit/s FC, 10/25/40/100 GE, 10 Gbit/s FCoE, and 56 Gbit/s InfiniBand		
Type of back-end ports	PCIe 3.0/ SAS 3.0		
Maximum number of SSDs	1,400 (9,600*)	2,400 (9,600*)	3,200 (9,600*)
Supported SSDs	960 GB/1.92 TB/3.84 TB/7.68 TB/15.36 TB NVMe SSD 960 GB/1.92 TB/3.84 TB/7.68 TB/15.36 TB/30.72 TB SAS SSD		
<b>Software Specifications</b>			
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	16,384	32,768	65,536
Maximum capacity of a file	256 TB		

Value-added features	SmartDedupe (intelligent inline deduplication) SmartThin (intelligent thin provisioning) SmartVirtualization (intelligent heterogeneous virtualization) SmartQoS (intelligent QoS control) SmartMultitenant (intelligent Multitenant) HyperSnap (snapshot) HyperCopy (LUN Copy) HyperReplication (remote replication) HyperVault (all-in-one backup) CloudBackup (backup and recovery between cloud and local data centers)	SmartCompression (intelligent inline compression) SmartQuota (Intelligent Quota Management) SmartMigration (intelligent LUN migration) SmartPartition (intelligent partitioning) SmartErase (intelligent data destruction) HyperClone (LUN Clone) HyperCDP (Continuous Data Protection) HyperMetro (gateway-free active-active solution) HyperLock (WORM)	
Storage management software	DeviceManager (device management)      UltraPath (multi-path management) eService (remote maintenance and management)		
Operating system compatibility	AIX, HP-UX, Solaris, Linux, Windows		
Supported virtualization environment software	Virtualization platforms: Huawei FusionSphere, VMware, XenServer, and Hyper-V Value-added features: VMware VAAI, VASA, SRM, VVOL, and Hyper-V Integration with VMware vSphere and vCenter		
<b>Physical Specifications</b>			
Power supply	AC: 100 V to 240 V DC: 192 V to 288 V or - 48 V to - 60 V	AC: 200 V to 240 V DC: 192 V to 288 V or - 48 V to - 60 V	AC: 200 V to 240 V DC: 192 V to 288 V
	NAS module: AC: 100 V to 240 V    DC: 192 V to 288 V or - 48 V to - 60 V		
Power consumption	Controller enclosure : ≤ 716 W Disk enclosure: ≤ 240 W	Controller enclosure: ≤ 1002 W Disk enclosure: ≤ 240 W	Controller enclosure: ≤ 1761 W Disk enclosure: ≤ 240 W
	NAS module: ≤ 552 W		
Dimensions (H x W x D)	Controller enclosure: 86.1 mm x 447 mm x 748 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm	Controller enclosure: 130.5 mm x 447 mm x 750 mm Disk enclosure: 86.1 mm x 447 mm x 488 mm	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		
Weight	Controller enclosure: ≤ 40 kg Disk enclosure: ≤ 20 kg	Controller enclosure: ≤ 60 kg Disk enclosure: ≤ 20 kg	Controller enclosure: ≤ 96 kg Disk enclosure: ≤ 20 kg
	NAS Module: ≤ 35 kg		
Operating temperature	5 °C to 40 °C (altitude: < 1800 m), 5 °C to 35 °C (altitude: 1800 m to 3000 m)		
Operating humidity (relative humidity)	5% RH to 95% RH		

\*For projects requiring any specifications marked with asterisks (\*), please contact 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



Huawei IT



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