OceanStor Dorado V3
Lightning-Fast, Rock-Solid

Highlights

Purpose-built for enterprise-class, mission-critical applications, OceanStor Dorado V3 offers a comprehensive set of SAN and NAS features — ideal for use with databases, Virtual Desktop Infrastructure (VDI), Virtual Server Infrastructure (VSI), and file sharing scenarios. It facilitates the transition to all-flash storage for enterprises in finance, manufacturing, telecom, and other sectors.

3x increase in application performance

- Up to 7,000,565 SPC-1 IOPS™
- Latency down to 0.3 ms
- Intelligent chips for end-to-end data acceleration
- Industry's first support for NVMe architecture in both high-end and mid-range models
- FlashLink® intelligent algorithms for efficient SSD usage

99.9999% field-proven availability

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

75% OPEX savings

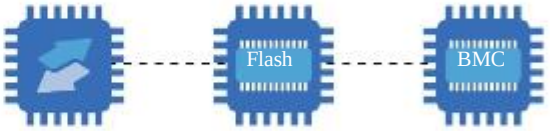
- Inline deduplication and compression support data reduction ratio up to 5:1.

Lightning-Fast

For accurate decision-making based on today's complex and rapidly changing data, enterprises urgently need high-performance IT infrastructures that support fast analysis for massive amounts of data and the quick extraction of valuable insights. Huawei's OceanStor Dorado V3 all-flash storage provides a key piece of that infrastructure with 0.3 ms latency based on intelligent chips, NVMe architecture, and Huawei's FlashLink® intelligent algorithms. These end-to-end optimizations help improve online transaction rates threefold and reduce report-generation times by two-thirds. Dorado can scale out to 16 controllers and 7,000,565 SPC-1 IOPS™ to meet growing business requirements as needed.

Intelligent chips

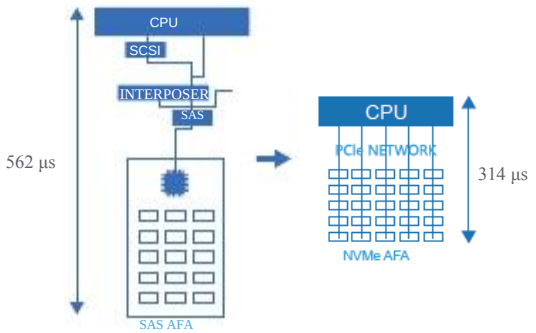
Huawei uses three types of intelligent chips to enable end-to-end data acceleration: an intelligent multi-protocol interface chip, intelligent SSD controller chip, and intelligent Baseboard Management Controller (BMC) chip. The intelligent multi-protocol interface chip supports 32 Gbit/s FC and 100 GE front-end protocols. This industry-leading interface combines with protocol parsing that helps accelerate the front-end access speed by 20%. The intelligent SSD controller chip hosts a core Flash Translation Layer (FTL) algorithm that accelerates 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 diagnosis to shorten fault recovery times from 2 hours to 10 minutes.



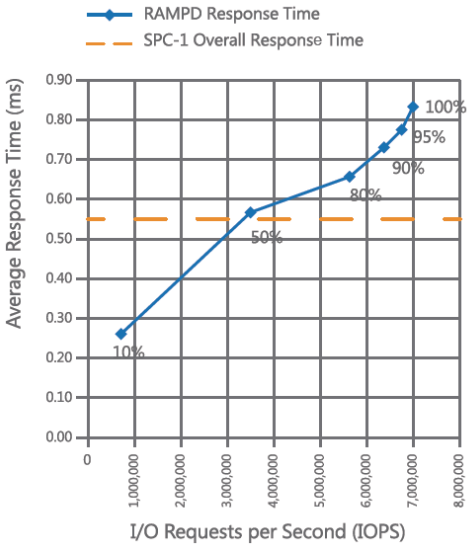
Intelligent multi-protocol interface chip | Intelligent SSD controller chip | Intelligent BMC management chip

Industry's first support for NVMe in both mid-range and high-end models

Compared with SAS, NVMe brings far faster performance to an all-flash storage architecture. In fact, NVMe is the fastest in the storage field. The NVMe-based OceanStor Dorado V3 achieves 0.3 ms latency — 50% shorter than SAS All-Flash Arrays (AFAs). NVMe implements direct communications between CPUs and SSDs and shortens transmission paths. The NVMe architecture also increases the number of concurrent users by more than 65,536 times, while reducing the number of protocol interactions from four to two. That doubles the write request processing efficiency. Huawei is a pioneer in adopting the NVMe architecture in both mid-range and high-end all-flash storage. 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 versatility enables smooth upgrades from SAS all-flash storage to NVMe, boosting performance while protecting investments.



Industry's first to 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. FlashLink enables the OceanStor Dorado V3 to adjust the data layout between SSDs and controllers for efficiency and consistently low latency. In addition, Redirect On Write (ROW) technology used in flash-oriented operating systems keeps uncompromising performance after snapshots are enabled. 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, ready to meet the needs of enterprise growth at any time.

Rock-Solid

In a cloud environment, flash technologies must support explosive growth in data volume and increased demand for data reliability. The OceanStor Dorado V3 ensures reliability at levels ranging from components and products to cloud layers. Satisfying the most-strict enterprise-class reliability requirements, the OceanStor Dorado V3 achieves 99.9999% availability for mission-critical applications.

World's most-reliable SSD

As the storage medium, SSD focuses on the reliability that is key for users. Huawei SSDs leverage global wear-leveling technology to balance SSD loads and extend the life of flash components. In addition, Huawei's patented anti-wear leveling technology prevents multiple SSDs failures and improves the reliability of the entire system. With the Mean Time Between Failures (MTBF) of 3 million hours, Huawei SSDs outperform those of other vendors by 20%.

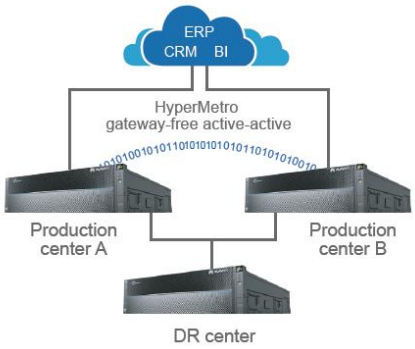
Comprehensive reliability hardening

Huawei's flash storage systems are hardened at both the hardware and software layers. For hardware, 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 to ensure smooth transport and simplify deployment. At the software layer, the OceanStor Dorado V3 supports comprehensive enterprise-grade SAN and NAS features such as periodic snapshots in seconds, writable clones, and LUN copies. These features help ensure storage system reliability. Further, the system incorporates RAID-TP technology, which guarantees the highest reliability level in the industry by tolerating the simultaneous failures of 3 SSDs. RAID-TP also shortens the reconstruction time for 1 terabyte of data to 30 minutes, enabling enterprises to gain the benefits of large-capacity SSDs without compromising data reliability.

Industry-leading gateway-free active-active solution

Flash storage is designed for mission-critical applications that cannot tolerate loss or interruption. Therefore, an active-active solution is the ideal 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. This solution also supports performance by balancing 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 allows smooth upgrades to a 3DC solution without gateways, protecting business continuity and data availability.



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

Converged Data Management (CDM) solution

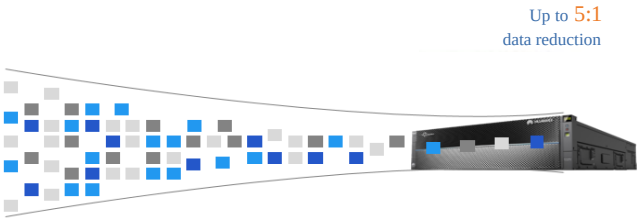
Traditional backup solutions are slow and expensive. Because the backup data cannot be directly used, working with massively big data sets is difficult. The OceanStor Dorado V3 provides a CDM solution that enables efficient storage protection in multi-cloud environments such as HUAWEI CLOUD and Huawei jointly-operated clouds. The solution utilizes fast snapshot technology to achieve industry-leading 10-second backup intervals and improve 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. This feature alone can reduce the Total Cost of Ownership (TCO) by 50%. The OceanStor Dorado V3 implements gateway-free DR and cloud recovery in minutes*.

Extremely Efficient

Huawei's versatile OceanStor technology unifies SAN and NAS capabilities, along with powerful value-added features, to give enterprise IT the performance and flexibility to meet today's requirements. With the transition to a flash-oriented architecture, enterprises can boost IT efficiencies to increase profits while simplifying management.

Data reduction

Inline deduplication and compression technologies release the storage capacity occupied by redundant data. The OceanStor Dorado V3 supports data reduction ratio up to 5:1. This reduction improves SSD utilization and reduces power consumption, cooling, and maintenance fees, cutting end-to-end OPEX by 75%. Enterprises can reduce costs and achieve higher ROI. Deduplication and compression can be separately enabled or disabled to suit specific application requirements.



SAN and NAS unified storage

The OceanStor Dorado V3 supports both SAN and NAS approaches, and offers a comprehensive set of features to meet high-performance SAN (with inline compression and deduplication enabled) and NAS all-flash storage demands at the same time. IT personnel can manage SAN and NAS through unified management software that simplifies operation and maintenance.

Interconnection

Active-passive disaster recovery setups that include all-flash systems at both sites increase overall costs. To avoid this problem, the OceanStor Dorado V3 can interconnect with the OceanStor converged storage series to build cost-effective disaster recovery schemes and protect storage 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 — a challenge to system compatibility. The OceanStor Dorado V3 is compatible with more than 300 mainstream storage systems and 98% of IT infrastructures. This flexible compatibility enables smooth, rapid upgrades without affecting enterprise transactions.

Working with hybrid cloud

Huawei OceanStor Dorado V3 can implement hybrid cloud storage solutions for enterprises. The system 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 Interface Protocols	FC, iSCSI, NFS, CIFS, HTTP, and FTP			FC, iSCSI
Front-End Port Types	8, 16, and 32 Gbit/s FC; and 10, 25, 40, and 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, and 15.36 TB NVMe SSDs 960 GB, 1.92 TB, 3.84 TB, 7.68 TB, 15.36 TB, and 30.72 TB SAS SSDs			1.92 TB, 3.84 TB, and 7.68 TB SAS SSDs
Software Specifications				
Supported RAID Levels	RAID 5, RAID 6, RAID 10*, and RAID-TP (tolerating simultaneous failures 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			N/A

Value-Added Features	SmartDedupe (intelligent inline deduplication) SmartThin (intelligent thin provisioning) SmartMigration (intelligent LUN migration) HyperCDP (continuous data protection) CloudBackup (backup and recovery between cloud and local data centers) SmartCompression (intelligent inline compression) SmartVirtualization (intelligent heterogeneous virtualization) HyperMetro (gateway-free active-active solution) HyperReplication (remote replication) SmartQoS (intelligent QoS control) HyperCopy (LUN copy) HyperClone (LUN clone) HyperSnap (snapshot)			
	SmartPartition (intelligent partitioning) SmartQuota (intelligent quota management) HyperVault (all-in-one backup) SmartMulti-tenant (intelligent multi-tenant) HyperLock (WORM)			N/A
Storage Management Software	DeviceManager (device management) UltraPath (multi-path management) eService (remote maintenance and management)			
Physical Specifications				
Power Supply	AC: 200V to 240V DC: 192V to 288V	AC: 200V to 240V DC: 192V to 288V or –48V to –60V	AC: 100V to 240V DC: 192V to 288V or -48V to -60V	AC: 100V to 240V DC: 192V to 288V or -48V to -60V
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	5ºC to 40ºC (altitude: < 1,800 m), 5ºC to 35ºC (altitude: 1,800 m to 3,000 m)			
Operating Humidity (Relative Humidity)	5% RH to 95% RH (non-condensing)			

*For projects requiring any specification marked with an asterisk (*), please contact Huawei sales.

For More Information

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

Huawei Enterprise APP

Huawei IT

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