

Huawei OceanStor Dorado All-Flash Storage NVMe Architecture Guidelines - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

Huawei OceanStor Dorado All-Flash Storage systems represent a paradigm shift in enterprise data infrastructure, engineered from the ground up to exploit the full potential of NVMe (Non-Volatile Memory express) technology. This document provides a comprehensive technical overview of the NVMe architecture guidelines that underpin the OceanStor Dorado family, detailing the hardware design, protocol optimization, and system-level innovations that deliver extreme performance, ultra-low latency, and enterprise-grade reliability. By leveraging a purpose-built, end-to-end NVMe architecture, the OceanStor Dorado eliminates legacy storage bottlenecks, providing a robust foundation for mission-critical workloads such as real-time analytics, high-frequency trading, and large-scale virtualization.



ARCHITECTURE & CHASSIS DESIGN

The OceanStor Dorado NVMe architecture is centered on a fully symmetric, active-active controller design that ensures no single point of failure and maximizes resource utilization. The hardware chassis is meticulously engineered to support the thermal and power demands of high-performance NVMe SSDs, featuring optimized airflow channels and redundant, hot-swappable power supplies. The midplane is designed for PCIe Gen4/Gen5 signaling integrity, enabling direct, high-bandwidth communication between controllers and NVMe drives. This architecture supports scale-out and scale-up configurations, allowing seamless capacity and performance expansion without disrupting ongoing operations. The compact form factor, typically 2U for dual-controller models, houses the controllers, NVMe SSDs, and interface cards in a dense, serviceable chassis.

HARDWARE FEATURES

Key hardware features of the OceanStor Dorado NVMe platform include:

- Purpose-built NVMe Controllers: Multi-core processors with hardware-assisted NVMe protocol offload engines.
- NVMe SSD Support: Enterprise-grade, hot-swappable U.2 NVMe SSDs with high endurance and dual-port capabilities for high availability.
- Front-End Connectivity: Support for 25GbE, 100GbE, NVMe over Fabrics (NVMe-oF) via RoCEv2, Fibre Channel (FC-NVMe), and iSCSI.
- Back-End Connectivity: PCIe Gen4/Gen5 internal fabric for direct drive connectivity, ensuring minimal latency.
- Cache and Memory: Large, battery-backed or supercapacitor-protected cache for write acceleration and data protection.
- Redundancy: Fully redundant, hot-swappable components including controllers, power supplies, fans, and SSDs.
- Management: Dedicated out-of-band management ports for comprehensive system monitoring and control.

COMPLIANCE & STANDARDS

Huawei OceanStor Dorado systems comply with a wide range of international

standards, ensuring interoperability and safety in diverse deployment environments. Key certifications include:

- Safety: UL 60950-1, IEC 60950-1, EN 60950-1, GB 4943.1
- EMC: FCC Part 15 Class A, CE, VCCI, CNS 13438, EN 55022, EN 55024
- Environmental: RoHS, WEEE, REACH
- Protocol Standards: NVMe 1.3/1.4, NVMe-oF, PCIe 3.0/4.0/5.0, FC-NVMe, iSCSI, SNIA SMI-S
- Reliability: Telcordia GR-1089, GR-63

TECHNICAL SPECIFICATIONS

The following table summarizes the core technical specifications for a representative dual-controller OceanStor Dorado NVMe configuration.

Parameter	Specification
Form Factor	2U Dual-Controller Chassis
Switching Capacity	Up to 2.4 Million IOPS (Random Read)
Power Supply	1+1 Redundant AC/DC, Hot-Swappable
NVMe SSD Capacity	Up to 30.72TB per Drive
Max Raw Capacity	Up to 2.4PB per System
Front-End Ports	8 x 100GbE, 16 x 25GbE, or 8 x 32Gb

	FC
Back-End Ports	PCIe Gen4 x8 per NVMe SSD
Cache per Controller	Up to 1TB
Latency	As low as 0.05ms (NVMe over Fabrics)
Availability	99.99999% (Active-Active Controllers)
Protocols	NVMe-oF (RoCEv2), FC-NVMe, iSCSI, NFS, SMB, S3
Management	Web-based GUI, CLI, RESTful API, SNMP

ORDERING OPTIONS

Huawei offers a comprehensive range of ordering options for the OceanStor Dorado All-Flash Storage series to meet diverse business needs. Configurations can be tailored with various controller models (e.g., Dorado 5000, 6000, 8000, 18000), NVMe SSD capacities (from 1.92TB to 30.72TB), and front-end host interface cards (25GbE, 100GbE, 32Gb FC, 16Gb FC). Redundant power supply options include AC and DC variants. Advanced software features such as SmartThin, SmartDedupe, SmartCompression, and HyperMetro are licensed separately. For detailed SKU information and configuration guidance, please consult the official Huawei OceanStor Dorado product catalog or your

authorized Huawei representative.

