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VDURA Data Platform V5000

AI-Optimized All-NVMe Performance with Petabyte-Scale Expansion

V5000 Key Features

- DirectFlow® high-performance client
- NFS/SMB/S3 protocol support
- VeLO™: Velocity Layered Operations
- VPODs™: Virtualized Protected Object Devices
- Strict cache coherency
- Filesystem erasure coding
- Dynamic Data Acceleration
- Distributed sparing
- User/group/volume quotas
- Non-disruptive capacity expansion
- Adaptive Capacity Balancing
- Scalability to thousands of certified nodes
- Ethernet and InfiniBand™ support
- Data reduction
- End-to-End Encryption
- CSI driver

The VDURA® Data Platform V5000™ is an all-NVMe flash appliance engineered for multi-tenant AI and HPC pipelines that demand relentless GPU feed rates. Built on industry-standard servers, V5000 pairs flash performance with optional HDD capacity expansion, giving organizations a cost-balanced path from pilot to petabytes.

V5000 runs VDURA V11, VDURA's flash-tuned parallel file system, streaming multiple terabytes per second from a single global namespace. Working with the DirectFlow client, VDURA offers parallel redundant data paths that scale linearly, safeguard data with enterprise-class durability, and keep day-to-day management simple.

V5000 Director Nodes

V5000 Director Nodes anchor the VDURA control plane, running the flash-optimized VeLO metadata engine that coordinates billions of file operations and keeps AI pipelines saturated. Each compact server combines high-core CPUs, plentiful DRAM, and dual 200 Gb/s links for ultra-low-latency orchestration. Instant secure-erase and optional end-to-end encryption safeguard data, while toolless service and redundant power maximize uptime for demanding AI and HPC deployments.

V5000 Flash Nodes

Flash Nodes form the performance-driven foundation of the data plane, dedicated exclusively to storing user data. Available in configurations of either all-NVMe flash for extreme performance or NVMe flash with HDD capacity expansion for high-performance, economical bulk storage, Flash Nodes deliver versatile and optimized infrastructure.

Figure 1. V5000 Flash Node.

V5000 Capacity Expansion Enclosures

Figure 2. V5000 capacity expansion enclosure.

The VDURA V5000 system has two capacity expansion enclosure options: high-density enclosures containing 78 HDDs or ultra-dense enclosures with 108 HDDs. Both are 4U, 19" rackmount encloses that come fully populated with HDDs. The 4U78 storage enclosure is ideal for one-meter deep racks, while the 4U108 fits 1.2-meter deep racks. V5000 storage enclosures support a wide range of HDDs, as detailed below. Both enclosure types also include two Titanium-level redundant power supplies.

DATASHEET

VeLO: Velocity Layered Operations

VeLO is a new key-value store used within the platform's Director layer for handling high-performance metadata operations. Optimized for flash, VeLO supports the diverse range of workloads found in AI by supporting an infinitely scalable number of VeLO instances in the same global namespace. Data is triplicated across each instance for superior durability.

VPOD: Virtualized Protected Object Device

VPODs are discrete, virtualized, and protected storage units that form the foundation of data storage. VPOD architecture ensures linear scalability and consistent parallel performance, accommodating thousands of nodes seamlessly within a single cluster.

VDURA Data Platform V11 Data Reduction

VDURA V11 includes data reduction at the Storage Node level. This option can be toggled at any time via either the graphical user interface (GUI) or command-line interface (CLI).

Surprising Simplicity

All VDURA V5000 nodes are managed as part of the VDURA solution. No matter how many V5000 nodes you add, all nodes in the realm are managed from one GUI or CLI.

42U Rack Configuration Options (not including switches)	
1U Director (x3)	
VCH-5000-D1N	Director Node
1U Storage Server (x7)	
VCH-5000-F1N	Flash-only support
VCH-5000-F1N	Standard HDD support
4U JBOD, 78 or 108 Drive (x7)	
VCH-5000-J108-3456	108x 32 TB HDDs
VCH-5000-J108-3240	108x 30 TB HDDs
VCH-5000-J108-2592	108x 24 TB HDDs
VCH-5000-J108-1728	108x 16 TB HDDs
VCH-5000-J78-2496	78x 32 TB HDDs
VCH-5000-J78-2340	78x 30 TB HDDs
VCH-5000-J78-1872	78x 24 TB HDDs
VCH-5000-J78-1248	78x 16 TB HDDs

V5000 Performance Specifications	
IOPS Performance	Up to 1.2 M IOPS per Flash Node Up to 3.6 M IOPS for a minimum filesystem Up to 45 M IOPS per rack with a flash filesystem Up to 9 M IOPS per rack with capacity expansion enclosures
Throughput Performance	Up to 2.7 TB/s per rack with all flash nodes Up to 200 GB/s per rack with capacity expansion enclosures
Capacity*	Up to 17.7 PBe per rack with a flash filesystem Up to 26 PBe per rack
Data Durability	5–12 nines, increasing with scale
Data Availability	3–5 nines, increasing with scale
Ease of Use	Enterprise-level usability

* – Effective capacity after data reduction

Predictable and Consistent High Performance

The VDURA V5000 is the industry's best price-to-performance parallel file system solution. The VDURA Data Platform scale-out architecture allows the system's storage capacity, DRAM caching, and network bandwidth all to grow incrementally and linearly as you add more Storage Nodes.

The VDURA Data Platform system delivers data in parallel from Storage Nodes to applications, multiplying the bandwidth an application can achieve to a single file. Data flows directly from Storage Nodes to the application without any hops through intermediate servers or extra network links.

Low Cost to Own and Operate

VDURA V5000 systems have a low cost of acquisition due to their capacity-optimized storage architecture based on commodity hardware. In addition, VDURA reduces operational complexity; only minimal staff are needed to administer and manage the system, with no extensive training required.

V5000 Technical Specifications				
	VCH-5100-D1N	**VCH-5000-S1N**	**VCH-5000-J78-***	**VCH-5000-J108-***
Description	Director Node server	Flash Node server	78-drive JBOD	108-drive JBOD
Performance	N/A	Up to 1.2 M IOPS Up to 60 GB/s	Up to 13.2 GB/s	Up to 17.8 GB/s
Connectivity	NDR/NDR200 or 400/200/100 GbE ports	NDR/NDR200 or 400/200/100 GbE ports	SAS 4 (24 G) to Storage Node	SAS 4 (24 G) to Storage Node
Enclosure Dimensions (W x D x H without bezel)	17.5 x 33 x 1.75 in. 45 x 84 x 5 cm	17.5 x 33 x 1.75 in. 45 x 84 x 5 cm	17 x 32 x 7 in. 43 x 81 x 18 cm	17 x 41 x 7 in. 43 x 104 x 18 cm
Rack Units	1U	1U	4U	4U
Weight with Drives	35 lbs. 15.9 kg	38.8 lbs. 17.6 kg	207.2 lbs. 94.5 kg	263.2 lbs. 119.4 kg
AC Power Input **Frequency** **Inlet Connector Type**	200–240 V 50–60 Hz C14	200–240 V 50–60 Hz C14	200–240 V 50–60 Hz C14	200–240 V 50–60 Hz C14
Power Consumption (typical/max measured at plug)	636 W/981 W	742 W/1158 W	839 W/1155 W	1081 W/1448 W
Thermal Output (typical/max)	2647 BTU/4097 BTU	2532 BTU/3951 BTU	2862 BTU/3940 BTU	3688 BTU/4940 BTU

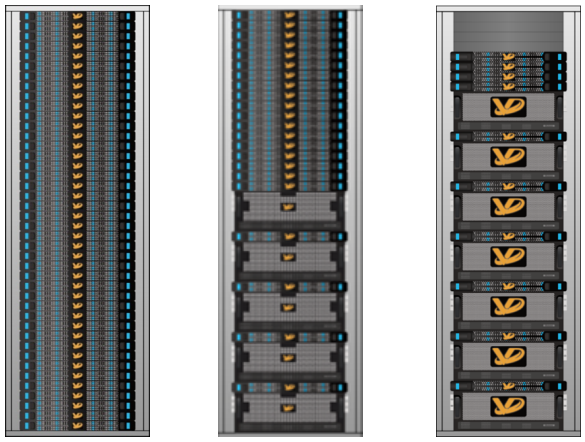

Figure 3. V5000 configuration options, left to right: all flash, 50 percent flash, 98 percent HDD.

V5000 has ultimate configurability from 100 percent flash to 98 percent HDD. Add Flash Nodes to boost throughput and IOPS or attach capacity expansion enclosures for cost-efficient bulk storage.

About VDURA

VDURA is at the forefront of AI and HPC data storage and management, catering to on-premises, public cloud, and hybrid environments. Renowned for its unparalleled blend of performance, durability, and reliability, our Data Platform builds upon our legacy as pioneers and leaders in parallel NAS technology. Offering a unique integration of diverse storage media within a single architecture and global namespace, VDURA empowers customers with unmatched flexibility, simplicity, and cost-effectiveness. Our integrated approach ensures the highest levels of data protection, integrity, and availability, fueling relentless innovation in AI and HPC. Explore more at www.VDURA.com.

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