![Viking Enterprise Solutions — A Sanmina Division]

PRODUCT BRIEF | NVMe-oF Storage Platform

VDS2249R2

High Performance Enterprise Class Storage Powered by NVMe™ over Fabrics Technology

The Viking Enterprise Solutions (VES) VDS2249R2 fabric enclosure offers twenty-four 2.5-inch U.2 (SFF8639) NVMe SSDs with up to six (6) 2x100 GbE QSFP28 network ports. The enclosure provides access to the high performance of the NVMe drives over the network both RDMA (RoCE v1 and v2) and TCP with virtually no latency or performance penalty. The system is designed to provide high-availability with two I/O fabric modules and each I/O fabric module support up to three (3) PCIe add-in card slots that are compatible with a wide range of Ethernet fabric adapter cards or SmartNIC (half-height, half-length, up to 70W of power). All of the NVMe-oF target protocol occurs in hardware without the need for a host CPU or additional software. This design results in exceptional performance with remarkably low overall latency.

The VDS2249R2 has a full featured management interface that provides status and control of the enclosure as well as the fabric. A consolidated web GUI provides enclosure status such as temperatures, voltages, fan speeds, and installed FRUs. The GUI is also capable of managing the fabric. All fabric management functions are restricted to a secure out-of-band interface between the BMC and the fabric adapters that ensure only permitted hosts have access to specific NVMe subsystems

FEATURES

- Full NVMe performance available over the network
- Operation with either single or dual fabric modules for redundant failover
- The enclosure supports Redfish REST API for management interface to control drive access control & provisioning
- Hot-pluggable fabric modules, power supplies & drives
- SFF-8639, PCIe Gen 4 NVMe (U.2) drive support (up to 25W per drive)
- Dual port NVMe drive support
- Evolves with the market by using standard PCIe add in card adapters for NVMe-oF Ethernet (three x16 Ethernet add-in card slots per fabric module)
- Accommodates NVMe-oF adapters that are half height, half-length and up to 70W in power
- Standard chassis customization & branding available

NVMe-oF (NVMe over Fabrics) is used to extend the high performance of NVMe (Non-Volatile Memory Express) drives across a network fabric. Key use cases include:

- **Shared Storage Pools:** NVMe-oF allows multiple servers to access a shared pool of high-performance NVMe storage, enabling efficient resource utilization and flexibility.
- **High-Performance Computing (HPC):** Applications that demand extremely low latency and high bandwidth, such as AI, machine learning, and data analytics, benefit greatly from NVMe-oF's capabilities.
- **Data Center Scalability:** It provides a way to scale storage independently from compute, enabling data centers to grow efficiently and meet increasing performance demands.
- **Real-Time Applications:** Applications requiring real-time data processing, like financial trading or video streaming, can leverage NVMe-oF for its low latency.
- **Disaggregated Storage:** NVMe-oF supports the disaggregation of storage resources, meaning storage can be managed and scaled independently of compute resources. This increases flexibility and reduces stranded capacity.

VDS2249R2

Interfaces

- Two fabric modules
- Three x16 PCIe 4.0 card slots per fabric module
- Each add-in card slot accommodates up to a half-height, half-length PCIe card
- Up to 70W per add in card
- Six pin PCIe aux power is available for each slot to support one FHHL card per IOM

Hot-Swappable Components

- Two fabric modules
- Two AC to DC power supplies
- Either 1000W or 1600W of power, dependent on add- in card power requirement
- Two independent AC power inputs
- Optional support for DC-input power supplies
- 24 drives in the front of the system

Firmware

- Allocation, access control, & portioning provided over 1Gbe management link
- CLI and GUI control for drive management & status of the enclosure

Drive Partitioning

- Controlled by the management software through the 1Gbe link

2U Enclosure

- Dimensions: 3.2 in. H X 17.6 in. W X 27.0 in. D (87 mm H X 448 mm W X 685 mm D)
- Weight with drives: 56lbs (25.5kg) max
- Rail kit support for 27" and 37" post depths
- Mounts industry standard 19" x 1m deep rack

Electromagnetic Emissions & Immunity Standards

- CE Mark
- EN55022: 2010
- EN61000 3-2:2014
- EN61000 3-2:2013
- FCC Class A
- Canadian IECS-003

Disk Drives

- 24 NVMe drives accessible by either fabric module (active/active with dual port drives)
- Form factor: 2.5" U.2
- Up to 25W per drive
- Interface: x4 PCIe 4.0 or dual x2 PCIe 4.0

Input Power

- Input voltage: 90-264V AC
- Input frequency: 47-64 Hz
- DC Input: -36VDC to -72VDC
- Power supplies: 2 (N+1)
- Input current: 8.5 amps @ 180V AC Inrush current: 40 amps peak per power supply
- Maximum system continuous DC output power rating: 1600 watts

Monitoring & Reporting

- Monitors for temperature, power, cooling (including fan speed control), disk drives, as well as error rates & quality of service
- ►Reporting of all serial number, part number, and revisions of the fabric modules, power supplies, drives & chassis

Safety Standards

- UL 60950
- CSA 22.2-950

Environment Protection

- RoHS and WEEE compliant

Operating Environment

- Temperature: -40° to 60°C
- Altitude: -200 ft to 40,000 ft

Failure Notifications

- Status & fault LEDs on the enclosure, fabric modules & drives

Quality Standards

- Manufactured under an ISO 9002 registered quality system