

**PRODUCT BRIEF | High Density 12 Gb/s LFF HDD Storage Server****NDS-4900****High Performance Enterprise Class High Density 94 Drive Storage Server**

The Viking Enterprise Solutions (VES) NDS-4900 High Density Storage Server combines 90 3.5" hard disk drives (HDD) with four 2.5" solid state disks (SSD) at 12Gb/s. There is no need to sacrifice HDD slots to incorporate SSDs for caching.

The enclosure contains either two single or two dual processor Haswell/Broadwell servers. Each server can power 2x 145W processors and 2x full spec PCIe cards. The servers are specifically designed for data throughput. The VES® NDS-4900 Storage Server offers best-in-class performance and capacity, space-saving density, "green" energy efficiency and 24x7 high-availability redundancy of key components.

The NDS-4900 fits into an industry standard 19" wide by 1.2m deep rack. Its flexible configuration allows it to be deployed in a variety of applications.

**FEATURES**

- ▶ Operation with either single or dual servers or I/O controllers for redundant failover
- ▶ Multiple drive partitioning / split-bus zoning modes
- ▶ Hot-pluggable servers or I/O controller(s), fan modules, & redundant, high efficiency, advanced power modules
- ▶ SFF-8644, 12 Gb/s, SAS 3.0 host and expansion ports or expansion of up to 100 Gb/s network interface with server modules
- ▶ Flexibility to choose SAS or SATA drives to achieve the right performance, reliability & price
- ▶ Modular design increases product configuration flexibility
- ▶ Standard chassis customization & branding available
- ▶ SAS point-to-point connectivity isolates drive failures, increasing reliability & fault tolerance & improving performance
- ▶ SAS daisy-chain expansion to additional storage arrays & other SFF-8644 SAS-compliant host/expansion ports, or add-on PCIe 3.0 HBA

**VES Portfolio of Storage and Storage Server Solutions**

VES offers a broad portfolio of product offerings, including:

- ▶ Leading edge performance SSD arrays, SAS & NVMe
- ▶ Leading edge high performance & high availability solutions
- ▶ Industry leading cold storage & object storage solutions
- ▶ Purpose built compute and storage platforms

Working with VES provides you with an accelerated time-to-market for your server and storage product needs, and allows you to leverage our portfolio of proven product designs.

Customers are backed by an industry leading design team and a world-class Electronics Manufacturing Services organization.

**Very High Density SAS 3.0 Connected Enclosure supports 94 drives in 4U. Provides exceptional performance and scalability for today's high density storage environments. Full-featured robust 12 Gb/s high-performance SAS 3.0 storage enclosure.**



# NDS-4900

## Host/Expansion Interfaces

- ▶ One or two Haswell/Broadwell server modules
  - ▶ Single or dual 145W processors
  - ▶ Up to 3 PCIe 3.0 slots per server module
    - ▶ Two x8 PCIe 3.0
    - ▶ One x16 PCIe 3.0 (with dual CPU only)
    - ▶ Two M.2 boot drives
    - ▶ NVDIMM support
    - ▶ Supercap power fail support
- ▶ One or two VES SAS 3.0 JBOD I/O controller modules, each with six 12Gb/sec SAS 3.0 SFF-8644 ports

## Capacity

- ▶ 94-drive capacity per 4U enclosure
  - ▶ 90 LFF drive slots in main bay
  - ▶ Four SFF drive slots in rear of enclosure
  - ▶ All drives 12Gb/s

## Hot-Swappable Components

- ▶ Two Haswell/Broadwell servers or two JBOD I/O modules
- ▶ Two AC to DC power modules
  - ▶ Each module includes two 1,600 watt power supplies
  - ▶ One +5V regulator per power module provides hard drive power
  - ▶ Optional supercap / battery modules are incorporated into the power modules
- ▶ Four independent AC power inputs
- ▶ Up to 90 Drives in main bay
- ▶ Up to four SSDs in rear bays

## Firmware

- ▶ IPMI 2.0 baseboard management controller
- ▶ SCSI Enclosure Services (SES) 3.0-based firmware

## 4U Rackmount Enclosure

- ▶ Dimensions:  
7.0 in. H x 16.5 in. W x 37.8 in. D (17.7 cm H x 41.9 cm W x 96.0 cm D)

- ▶ Weight with drives: 330 lbs (150 kg) max
- ▶ Standard rackmount rail kit with integrated cable management

## Failure Notifications

- ▶ IPMI fault reporting
- ▶ SCSI Enclosure Services (SES-3.0) over in-band interface and via LEDs

## Disk Drives

- ▶ 94 independent point-to-point connections to each SAS or SATA disk drive with dual-port access and failover by each controller to each drive
  - ▶ 90 3.5" drives in main drive bay
  - ▶ Four 2.5" drive bays at rear of enclosure
  - ▶ SATA drives require optional 2:1 Active MUX (interposer card)
- ▶ Form factor: 3.5" & 2.5" SAS, SATA & SSD drives
- ▶ Rotational speeds up to 15K RPM
- ▶ Interface: 12Gb/6Gb/3Gb SAS; 6Gb/3Gb SATA

## AC Power

- ▶ Input voltage: 180-264V AC
- ▶ Input frequency: 47-63 Hz
- ▶ Power supplies per power module: 2
- ▶ Input current: 9.4 amps max @ 200V AC per power supply
- ▶ Inrush current: 40 amps peak per power supply
- ▶ Maximum system continuous DC output power rating: 3200 watts

## Drive Partitioning/Split-Bus Zoning

- ▶ Controller module can be zoned in two pre-defined zoning schemes for I/O modules & two for server modules
- ▶ Additional zoning schemes can be developed upon request

## Monitoring and Reporting

- ▶ Monitoring for temperature, power, cooling (including fan speed control), disk drives, server & I/O module(s), as well as error rates & quality of service
- ▶ In-band reporting of all serial number,

part number, & revisions of the server & I/O modules, power modules, drives, & chassis

## Performance

- ▶ Up to 48 GB/s (sustained reads) using 12 Gb/s SSD drives
- ▶ Up to 38 GB/s (sustained reads) using 6 Gb/s SSD drives

## Operating Environment

- ▶ Temperature: 5° to 35°C
- ▶ Relative humidity: 20% to 80% (non-condensing)
- ▶ Altitude: -200 to 10,000 feet
- ▶ Shock: 3G at 11ms, 1/2 sine wave pulse
- ▶ Vibration: 0.10G at 5 Hz to 500 Hz
- ▶ Acoustics (declared sound power): 8.4 Bels with server Modules 7.7 Bels with I/O modules; at idle/active operation tested to ISO 7779

## Non-Operating Environment

- ▶ Temperature: -40° to 60°C
- ▶ Relative humidity: 10% to 90% (non-condensing)
- ▶ Altitude: -200 to 40,000 feet
- ▶ Shock: 10G at 11ms, 1/2 sine wave pulse
- ▶ Vibration: 0.5G at 5 Hz to 500 Hz

## Electromagnetic Emissions & Immunity Standards

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

## Safety Standards

- ▶ UL 60950
- ▶ CSA 22.2-950

## Quality Standards

- ▶ Manufactured under an ISO 9002 registered quality system

## Environment Protection

- ▶ RoHS & WEEE compliant

