Dell PowerVault MD1000

Modular disk storage expansion enclosure for PowerEdge servers

Versatile storage expansion

The Dell™ PowerVault™ MD1000, MD3000, and MD3000i are modular disk storage expansion enclosures for PowerEdge servers. The PowerVault MD1000 is capable of housing up to 15 3.5-inch disk drives in a single 3U rackable chassis. The direct-attached storage enclosure supports both Serial Attached SCSI (SAS) and Serial ATA (SATA) disk drives to give customers extensive configuration and optimization flexibility.

Modular expansion flexibility

When used in combination with a host-based Dell PowerEdge RAID controller (PERC) or a PowerVault internal RAID array, the modular enclosure can be daisy chained for scaling disk performance and capacity. The PERC 6/E enables up to three 15-drive SAS disk enclosures—a total of 45 drives—to be daisy chained to a single host connection, delivering an extended total capacity of 90TB when using 2TB disk drives. Alternatively, the enclosure's disk drives can be split between two servers with up to eight drives assigned to one server and up to seven drives assigned to a second server. Furthermore, the enclosure's disk drives, power supplies and cooling modules are hot-pluggable so they can be replaced while the system stays up-and-running.

Mix drive types in an enclosure

The PowerVault MD family enables organizations to mix SAS and SATA drives delivering excellent flexibility to align data requirements with drive capabilities, speed, capacity and cost, to help optimize your storage environment.

SAS for Performance - SAS can deliver the speed, performance and reliability to satisfy mainstream single server applications. SAS performance makes it ideal for demanding server applications such as email or database applications that store active and frequently changing information.

> **Nearline SAS** - Performance of SAS, Capacities of SATA
> The 7.2 RPM SAS drive leverages the performance efficiencies of SAS making it ideal for customer who are looking for the low cost per GB but can't sacrifice performance. In everyday usage situations customers can see up to a 30% performance increase with the 7.2 RPM SAS drive over the 7.2 RPM SATA drives.

SATA for Capacity - SATA disk drives deliver a compelling cost-per-Gigabyte alternative to SAS. SATA drives are ideal high capacity applications where data is accessed and modified less frequently, such as digital imaging, file archiving, audio/video storage, or back-up to disk applications.

> **Energy Efficient SATA** – Superior GB per Watt Solution
>
> The 5.4 RPM SATA drive offers customers a high capacity, energy efficient alternative to traditional SATA drives. Ideal for capacity intensive applications in a power constrained environments. This 5.4 RPM SATA drive can reduce power consumption up to 30% with less than a 10% degradation in random I/O performance over the 7.2 RPM SATA drives.

PowerEdge server commonality

PowerVault disk storage products are designed and engineered for PowerEdge servers, optimized for performance and reliability, then tested and validated to help simplify deployment and management. To help improve serviceability of disk drives, the PowerVault MD1000 is equipped with a common drive carrier that can be used on select Dell servers.

The PERC RAID controller–found in the Dell PowerEdge server–includes Dell OpenManage™ Server Administrator Storage Manager. This management software package provides a complete set of disk configuration and administrative utilities for both internal and external server-resident disk drives.

Dell Services are available to help streamline the installation and ongoing operations of your disk expansion enclosure. These services include Dell Enterprise Support Services, Professional Installation Services and Disk Expansion Training.

Features	Dell™ PowerVault™ MD1000
Drives and Capacity	
Hard Disk Drives	Up to fifteen (15) 3.5-inch SAS or SATA hot-pluggable hard disk drives
Drive Performance and Capacities	15,000 RPM SAS drives available in 73GB, 146GB, 300GB, 450GB and 600GB 10,000 RPM SAS drives available in 300GB, 400GB and 600GB Nearline SAS (7,200 RPM) drives available in 500GB, 750GB or 1TB 7,200 RPM SATA II drives available in 250GB, 500GB, 750GB, 1TB and 2TB Energy efficient SATA II (5,400 RPM) drives available in 1TB and 2TB
Maximum Capacity Per Enclosure	1.1TB using fifteen (15) 73GB 15K SAS disk drives
Maximum Capacity Per Enclosure	30TB using fifteen (15) 2TB disk drives
Host Connectivity	
Unified Mode	Direct connectivity to 15 disk drives and beyond
Split Mode – Dual Host access	Connectivity to drives 0 though 6 to one host; A separate connectivity to drives 7 through 14 to the second host.
Enclosure Management Modules and RAID Levels	
Enclosure Management Modules (EMMs)	1 or 2 hot-pluggable management modules
RAID Levels	PERC 5/E Supports RAID levels 0, 1, 5, 10, 50 PERC 6/E Supports RAID levels 0, 1, 5, 6, 10, 50, 60 Up to 30 physical disks per group Up to 256 virtual disks
Back-Panel Connectors (per EMM)	
Host Connectivity	One x4 3GB SAS (SFF 8470)
Expansion Connectivity	One x4 3GB SAS (SFF 8470)
Service Management	One 6-pin UART mini-DIN connector
LED Indicators	
Front Panel	1 Two-color LED indicator for system status, 2 single-color LED indicators for power and split mod
Hard Drive Carrier	1 single-color activity LED, 1 two-color LED status indicator per drive
EMM	3 two-color LED status indicators: one for each of the EMM SAS ports and one for the EMM status
Power Supply/Cooling Fan Module	3 LED status indicators for power supply status, power/supply/fan fault and AC status
Power Supplies (per supply)	
Wattage	478W (Maximum continuous); 550W (peak)
Maximum Heat Dissipation	1430 BTU/hour (maximum)
Input Voltage Range	100-240V rated (actual 90-26V)
Frequency Range	47-63Hz
Amperage	7.2A at 100V, 3.6A at 200V
Available Hard Drive Power (per slot)	
Supported Continuous Consumption	Up to 1.3A +12V; Up to 1.5A at +5V
Physical	
Height x Width x Depth	13.11 cm (5.16 inches) x 44.63 cm (17.57 inches) x 48.01cm (18.90 inches)
Weight	35.37 km (78 lbs) (maximum configuration)
Environmental	
Temperature	Operating: 10° to 35°C (50° to 95°F), Storage : -40° to 65°C (-40° to 149°F)
Relative Humidity	Operating: 20% to 80% (non-condensing), Storage: 5% to 95% (non-condensing)
Altitude	Operating: -15 to 3048 m (-50 to 10,000 ft), Storage: -15 to 10,668 m (-50 to 35,000 ft)

Simplify your network at www.Dell.com/MD1000

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