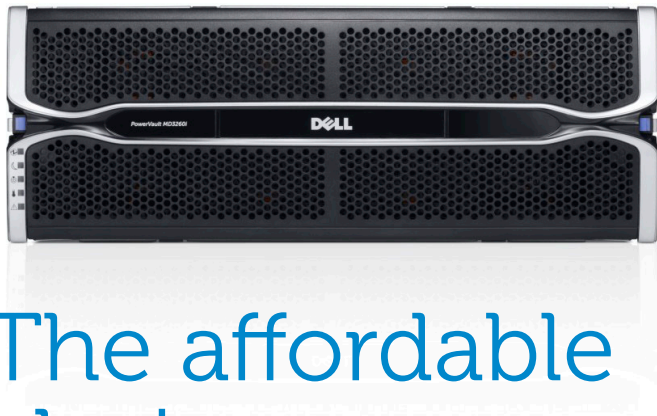




Modular storage

The Dell PowerVault MD
storage family



The affordable choice

The Dell™ PowerVault™ MD Family is an affordable choice for reliable storage, with enhanced software features that provide data protection, improved performance and ease of management. This frees up valuable resources to help reduce costs and make innovation a daily practice.

The Dell Difference:

Simplification is in our DNA

We can help you more simply automate management, optimize resource utilization and achieve seamless scalability across your IT infrastructure.

Open, agile

Unencumbered by legacy technologies, we are focused on providing open, capable and affordable storage solutions designed to preserve your investments over the long term.

Intelligent automation

By automating and optimizing data movement and management, our systems are designed for maximum ease of use, allowing you to spend more time on innovation.

Scale up as your needs grow

Our modular, scalable design supports growth in capacity and performance without replacing hardware or undergoing extensive data migrations.

The affordable choice for reliable storage

IT organizations are being challenged by the need to store and manage rapidly increasing amounts of data with limited resources and budgets. The Dell PowerVault MD Family addresses these challenges with versatile solutions that are optimized for smaller-scale storage consolidation and virtualization projects. PowerVault MD products include a series of high-performance SANs, direct-attached storage arrays and high-capacity dense arrays, all with expansion enclosures. Robust and easy to manage software delivers an affordable, reliable, and versatile storage solution.

Versatile options

The PowerVault MD series is available in a variety of models built to suit your environment or storage needs. The product family includes arrays in SAS, 1 or 10 gigabit iSCSI or Fibre Channel. It is available in a 2U or 4U form factor, and you can mix and match drives as needed, in the solution you need.

Superior performance, functionality and versatility

The PowerVault MD3 10GBase-T Ethernet iSCSI array offers improved bandwidth within the MD Family with added performance and scalability. With 10GbE support, the MD3 10GB iSCSI provides support for up to 64 hosts. The compact, 2U form factor and intuitive MD Storage Manager array management software make the 24-drive MD3620i and the 12-drive MD3600i ideal for entry-level storage solutions for virtualization and storage consolidation projects. The dense array, MD3660i, is a space saving 4U design that holds up to 60 hard drives.

Storage consolidation and virtualization

The PowerVault MD3 1GB Ethernet iSCSI SAN is ideal for network storage consolidation and virtualization deployments with up to 32 host servers. This 1GB iSCSI array series can deliver high capacity and excellent performance with the MD3200i with 12 drives, or the 24 drive MD3220i 2U arrays. To further expand in a small 4U footprint, the MD3260i has the capacity to scale up to 60 drives.

Proven Fibre Channel-based network storage

The PowerVault MD3 Fibre Channel array series is ideal for data intensive applications. With 8GB Fibre Channel, existing investments in FC is protected, with a solution that is scaleable and reliable. The MD3 Fibre Channel arrays follow the same model methodology with the MD3200f 2U array with 12 hard drives, the MD3620f 4U 24 drive array and the MD3660f dense array scaling up to 60 hard drives in just 4U.

High availability storage

The PowerVault MD3 SAS array series incorporates 6Gb/s SAS technology for shared storage and virtualized environments on PowerEdge™ servers. These arrays offer exceptional flexibility, scalability and performance. Similar to the other models, this series has the MD3200 with 12 drives, MD3220 with 24 drives and the 60 drive MD3260 dense array. Dual-controller models can connect up to four high-availability servers or eight non-redundant servers for balanced performance in mixed virtualized environments.

Simplified expansion

For performance

The PowerVault MD1200 and MD1220 are direct-attach 6 Gb/s SAS expansion enclosures that can be connected to the twelve (12) or twenty-four (24) MD3 array models and Dell PowerEdge servers to provide additional capacity for high performance and data-intensive applications.

The PowerVault MD1200 delivers the speed, flexibility and reliability to satisfy data-hungry, performance-intensive applications that store active and frequently changing information. This high performance 2U array can accommodate up to twelve (12) 2.5" SAS HDDs or SAS SSDs to provide up to 48TB of storage when using 4TB hard drives.

For capacity

The PowerVault MD3060e expansion enclosure is designed specifically for the MD3 Dense Array series. Its small footprint takes up less space and saves on power and cooling. Using just 4U, the capacity of a dense array can expand up to 180 HDDs using two expansion enclosures, using 3.5" or 2.5" SAS, Near Line SAS or SSD hard drive capacity.

Optimized for
smaller-scale storage
consolidation and
virtualization projects.



Modular flexibility

The modularity of the PowerVault MD Family enables you to easily upgrade an existing system and evolve current storage infrastructures to meet changing business needs. For example, migrating from a standard, single-controller to a highly available, dual-controller solution simply requires you to slide in a second controller module—no data migration or extended downtime required. Plus, this modularity offers easy and economical expansion for Dell PowerEdge servers and PowerVault MD storage arrays.

Powerful storage management

The PowerVault MD Family is supported by a robust suite of easy-to-use, intelligent storage management software. For the MD3 Array series the Modular Disk Storage Manager combines an intuitive interface, wizard-guided tools and a task-based management structure to significantly reduce the complexity of installation, configuration, management and diagnostic tasks.

For MD1200 and MD1220 systems deployed behind a PowerEdge RAID Controller, Dell OpenManage™ Storage Management provides a comprehensive set of standards-based tools for the proactive management information and control functions needed to optimize deployment, health status monitoring, fault recovery and change management.

Match drive and performance to your needs

The PowerVault MD Family is designed to provide the versatility to match storage drives to different tiers of application data performance and space requirements, in order to maximize capacity at the lowest cost per gigabyte. To satisfy the near-line speed, performance and reliability requirements of mainstream and server applications, 10K and 15K RPM nearline SAS, secure-encrypted disk (SED) and SSD drives can be used in all MD Family arrays. If data protection is priority, any of the MD3 Array series can be equipped SEDs for additional security.

PowerVault storage and PowerEdge server commonalities

The PowerVault MD Family uses the same disk drives as PowerEdge servers, so you only need to stock a single type of spare drive, fan or power supply. PowerVault storage arrays are designed and engineered to pair perfectly with PowerEdge servers, offering a complete solution that enhances usability and can make support and service easier.

Supporting your unique environment

Dell ProSupport* for IT provides tech-to-tech support for IT professionals, database administrators, and internal service desks or help desks. Features such as Fast-Track Dispatch, direct access to Dell Expert Centers, and customer-controlled severity levels were designed with your specific challenges in mind. Dell Infrastructure Consulting helps organizations—from small-to-medium-size companies to large corporations—select the right storage infrastructure to ensure data availability and optimize it with a variety of service options to meet their requirements for backup, recovery and archiving. Dell Global Services incorporates operational excellence, accountability and value to deliver end-to-end service and support solutions designed to maximize your IT investment by simplifying your IT environment.

Technical Specifications

	MD3200	MD3220	MD3260	MD3200i	MD3220i	MD3260i	MD3600i
Drives	12	24	60	12	24	60	12
Drive type	3.5" SAS, NL SAS and SSD	2.5" SAS, NL SAS and SSD	3.5" and 2.5" SAS, NL SAS, SSD	3.5" SAS, NL SAS and SSD	2.5" SAS, NL SAS and SSD	3.5" and 2.5" SAS, NL SAS, SSD	3.5" SAS, NL SAS and SSD
Drive capacity	3.5" 15K RPM SAS drives available in 300GB and 600GB; 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB	3.5" 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; 2.5" 15K RPM SAS drives available in 146GB and 300GB; 10,000 RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 15K RPM SAS drives available in 300GB and 600GB; 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; 2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 15K RPM SAS drives available in 300GB and 600GB; 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)
Expansion capabilities ¹	Up to 192 drives using the MD1200 or MD1220	Up to 192 drives using the MD1200 or MD1220	Up to 180 drives using the MD3060e	Up to 192 drives using the MD1200 or MD1220	Up to 192 drives using the MD1200 or MD1220	Up to 180 drives using the MD3060e	Up to 192 drives using the MD1200 or MD1220
Connection	6GB SAS			1GB iSCSI		10GBASE-T iSCSI	
Controllers	Single or Dual 2GB or 4GB cache ²		Dual 2GB or 4GB cache ²		Dual 2GB or 4GB cache ²		Single or Dual 2GB or 4GB cache ¹
Maximum cache	8GB (4GB per controller)						
Maximum host	8				32		64
Maximum HA host	4				32		64
Form factor	2U Rack Enclosure		4U Rack Enclosure	2U Rack Enclosure		4U Rack Enclosure	2U Rack Enclosure
Management software	MD Storage Manager						
Standard features	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, High Performance Tier, SSD Cache, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, High Performance Tier, SSD Cache, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, High Performance Tier, SSD Cache, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives
Optional features	Snapshot, Virtual Disk Copy, High Performance Tier	Snapshot, Virtual Disk Copy	Snapshot, Virtual Disk Copy	Snapshot, Virtual Disk Copy, Remote Replication, High Performance Tier	Snapshot, Virtual Disk Copy, Remote Replication, High Performance Tier	Snapshot, Virtual Disk Copy, Remote Replication	Snapshot, Virtual Disk Copy, Remote Replication, High Performance Tier
Server support	Dell servers			Industry Standard Servers			
OS support	Microsoft® Windows®, VMware®, Microsoft Hyper-V® Citrix®, XenServer®, Red Hat® and SUSE®						
RAID levels	Support for RAID levels 0, 1, 10, 5, 6; Up to 180/192 physical disks per group in RAID 0, 10; Up to 30 physical disks per group in RAID 5, 6; Up to 512 virtual disks; Dynamic Disk Pooling - no limit on number of drives (256 TB max. usable capacity for iSCSI arrays; 1024 TB for SAS and FC arrays) ¹						
Physical dimensions (height x width x depth)	MD3200— 8.68cm (3.42") x 44.63cm (17.57") x 56.1cm (22.09")	MD3220 — 8.68cm (3.42") x 44.63cm (17.57") x 50.8 (20")	MD3260— 17.780mm (7.01") x 482.60mm (19") x 825.50mm (19")	MD3200i — 8.68cm (3.42") x 44.63cm (17.57") x 56.1cm (22.09")	MD3220i — 8.68cm (3.42") x 44.63cm (17.57") x 50.8 (20")	MD3260i— 17.780mm (7.01") x 482.60mm (19") x 825.50mm (19")	MD3600i— 8.68cm (3.42") x 44.63cm (17.57") x 56.1cm (22.09")
Weight	MD3200 — 29.3kg (64.59 lbs.) (maximum configuration)	MD3220 — 24.2kg (53.35 lbs.) (maximum configuration)	MD3260 — 105.24kg (232 lbs) (maximum configuration)	MD3200i — 29.3kg (64.59 lbs.) (maximum configuration)	MD3220i — 24.2kg (53.35 lbs.) (maximum configuration)	MD3260i— 105.24kg (232 lbs) (maximum configuration)	MD3600i — 29.3kg (64.59 lbs.) (maximum configuration)

¹*Availability and terms of Dell Services vary by region. For more information, visit Dell.com/servicesdescriptions.

²*Expansion over 120 disks is a premium feature option.

³*Cache listed is per controller; 4GB cache controller only available as dual controller option.

Exceptional flexibility, scalability and balanced performance for mixed virtualized workloads.

Technical Specifications (continued)

	MD3620i	MD3660i	MD3600i	MD3620f	MD3660f	MD3060e	MD1200	MD1220	
Drives	24	60	12	24		60	12	24	
Drive type	2.5" SAS, NL SAS and SSD	3.5" and 2.5" SAS, NL SAS and SSD	3.5" SAS, NL SAS and SSD	2.5" SAS, NL SAS and SSD	3.5" and 2.5" SAS, NL SAS and SSD	3.5" and 2.5" SAS, NL SAS and SSD	3.5" SAS and NL SAS	2.5" SAS, NL SAS and SSD	
Drive capacity	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB	3.5" 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; 2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 15K RPM SAS drives available in 300GB and 600GB; 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; 2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; 2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	3.5" 15K RPM SAS drives available in 300GB and 600GB; 7.2K RPM Near-line SAS drives available in 500GB, 1TB, 2TB, 3TB, and 4TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB (available with 3.5" HDD carriers)	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB	2.5" 15K RPM SAS drives available in 146GB and 300GB; 10K RPM SAS drives available in 300GB, 600GB, 900GB and 1.2TB; 7.2K RPM Near-line SAS drives available in 500GB and 1TB; SSD available in 200GB and 400GB and read-intensive SSDs in 800GB and 1.6TB
Expansion capabilities ¹	Up to 192 drives using the MD1200 or MD1220	Up to 180 drives using the MD3060e	Up to 192 drives using the MD1200 or MD1220	Up to 192 drives using the MD1200 or MD1220	Up to 180 drives using the MD3060e	Up to 2 dense expansion enclosures per MD3260, MD3260i, MD3660i, or MD3660f array	Up to 192 drives behind the MD3 2U array series		
Connection	10GBASE-T iSCSI	10GBASE-T iSCSI		8GB Fibre Channel	Dual 2GB or 4GB cache ²	Dual 2GB or 4GB cache ²	7GB SAS	8GB SAS	
Controllers	Single or Dual 2GB or 4GB cache ²	Dual 2GB or 4GB cache ²	Single or Dual 2GB or 4GB cache ²				Single or Dual Expansion Management	Single or Dual Expansion Management	
Maximum cache	8GB (4GB per controller)						Controller dependent		
Maximum host	64								
Maximum HA host									
Form factor	2U Rack Enclosure	4U Rack Enclosure	2U Rack Enclosure		4U Rack Enclosure		2U Rack Enclosure		
Management software	MD Storage Manager						Controller dependent	OpenManage™ Storage Management	
Standard features	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, Self-Encrypting Drives	Dynamic Disk Pools, Thin Provisioning, VAAI, vCenter Plug-in, VASA, SRA, High Performance Tier, SSD Cache, Self-Encrypting Drives		Controller dependent		
Optional features	Snapshot, Virtual Disk Copy, Remote Replication, High Performance Tier	Snapshot, Virtual Disk Copy, Remote Replication	Snapshot, Virtual Disk Copy, Performance Tier	Snapshot, Virtual Disk Copy, Remote Replication, High Performance Tier	Snapshot, Virtual Disk Copy, Remote Replication		Dell PowerEdge only		
Server support	Industry Standard Servers						Dell PowerVault MD3 Dense Array series only	Dell PowerEdge only	
OS support	Microsoft® Windows®, VMware®, Microsoft Hyper-V®, Citrix® XenServer®, Red Hat® and SUSE®						Controller dependent		
RAID levels	Support for RAID levels 0, 1, 10, 5, 6; Up to 180/192 physical disks per group in RAID 0, 10; Up to 30 physical disks per group in RAID 5, 6; Up to 512 virtual disks; Dynamic Disk Pooling - no limit on number of drives (256 TB max. usable capacity for iSCSI arrays; 1024 TB for SAS and FC arrays) ¹								
Physical dimensions (height x width x depth)	MD3620i—8.68cm (3.42") x 44.63cm (17.57") x 50.8 (20")	MD3660i—177.80mm (7.0") x 48.260mm (1.9") x 82.550mm (1.9")	MD3600i—8.68cm (3.42") x 44.63cm (17.57") x 56.1cm (22.09")	MD3620f—8.68cm (3.42") x 44.63cm (17.57") x 50.8 (20")	MD3660f—177.80mm (7.0") x 48.260mm (1.9") x 82.550mm (1.9")	MD3060e—177.80mm (7.0") x 48.260mm (1.9") x 82.550mm (1.9")	MD1200—8.7cm (3.43") x 48.2cm (18.98") x 59.4cm (23.39")	MD1220—8.7cm (3.43") x 48.2cm (18.98") x 54.1cm (21.30")	
Weight	MD3620i—24.2kg (53.35 lbs.) (maximum configuration)	MD3660i—105.24kg (232 lbs) (maximum configuration)	MD3600i—29.3kg (64.59 lbs.) (maximum configuration)	MD3620f—24.2kg (53.35 lbs.) (maximum configuration)	MD3660f—105.24kg (232 lbs) (maximum configuration)	MD3060e—105.24kg (232 lbs) (maximum configuration)	MD1200—28.39kg (62.6 lbs.) (maximum configuration)	MD1220—23.31kg (51 lbs.) (maximum configuration)	

*Availability and terms of Dell Services vary by region. For more information, visit Dell.com/servicesdescriptions.

¹Expansion over 120 disks is a premium feature option.

²Cache listed is per controller; 4GB cache controller only available as dual controller option

