



Dell storage solutions for virtualizing business-critical applications

A comprehensive portfolio delivering innovation, automation and resiliency

The right storage foundation for your business-critical virtual infrastructure

Virtualization has become a foundational technology for modern data centers, enabling lower cost, flexible application architectures, and a path to cloud computing. Having consolidated non-business-critical infrastructure, many organizations are aiming to build flexible, scalable cloud infrastructures. Virtualizing business-critical applications is an important step for organizations on the journey to the cloud. These applications have traditionally been off-limit for virtualization projects due to risks related to performance and availability. However, with significant advances in virtualization technologies and the evolution of IT processes centered on virtualization, virtualizing these critical applications can now lead to higher performance and quality of service, simpler scalability, better availability, more reliable data protection and disaster management, and faster time to market.

Storage is a central component of these virtual deployments and proper storage selection plays a key role in ensuring long-term success of these deployments. Traditional storage platforms come with rigid, antiquated architectures, lack of comprehensive and integrated management tools, disruptive upgrades and maintenance, and expensive software licensing. This can adversely affect application performance, complicate infrastructure management and scaling, and lead to higher total cost of ownership (TCO).

Dell's best-in-class storage solutions, based on the Dell Fluid Data™ architecture, deliver the efficiency, reliability and flexibility required to meet the goals of business-critical virtual deployments. By providing scalable, high-performance storage platforms that integrate with the rest of the stack, helping to improve infrastructure agility and facilitate simpler, reliable protection against data loss and disasters. Dell, a leader in virtualization solutions, offers comprehensive storage, server, networking solutions along with software and services capabilities to simplify the transition from physical to virtual. Dell provides services to help size the entire infrastructure, ensuring adequate performance without massive over-provisioning of infrastructure components. Dell's converged infrastructure family, the Active Systems solutions, pre-integrates servers, storage, networking, infrastructure management and virtualization software into converged systems, resulting in shorter deployment times and lower TCO. With thousands of successful virtualization deployments around the world, Dell is your trusted partner for virtualizing business-critical applications.

The Dell Difference

Dell helps optimize your virtualized business-critical infrastructure with innovative, intelligent, integrated solutions. Dell's comprehensive portfolio of storage, server, networking and infrastructure management products, extensive virtualization expertise, and flexible service offerings can help you virtualize your most demanding business-critical applications with confidence. Dell storage helps maximize efficiency, optimize reliability and enhance flexibility of your entire IT infrastructure.

- **Streamline application deployments, migrations and sizing:** Dell's end-to-end portfolio of infrastructure components, coupled with software and services expertise can vastly simplify new application deployments as well as physical-to-virtual migrations of existing workloads. Dell offers sophisticated tools to size the environment components to help determine the right configuration for the workloads. Additionally, the Active Systems converged infrastructure portfolio reduces deployment and configuration times, expediting time to value.
- **Optimize your application performance and SLA:** The Fluid Data architecture perpetually balances data placements, based on access patterns. This lets highly-accessed data take advantage of higher-performance storage while sparingly accessed data takes advantage of high-capacity, low-cost storage resources, thus delivering outstanding performance while controlling cost. Tightly integrated with leading hypervisor platforms, resulting in superior performance, Dell storage solutions deliver enhanced scalability and stricter service level agreement (SLA) adherence.
- **Protect your business-critical assets from data loss and downtime:** Dell storage solutions include a rich and comprehensive set of integrated data protection and disaster management features designed for the virtual era. Dell also provides software-based solutions for protecting critical data. These solutions are designed to improve the recovery point objectives (RPO) and recovery time objectives (RTO) to meet the needs of business-critical applications. Additionally, the non-disruptive upgrades, maintenance and scaling help reduce planned downtime.

Dell storage: Virtualize your business-critical applications with confidence

Optimize application performance and infrastructure scalability

Applications that interface with customers, transact important data, or are critical to the functioning of the business, often have stringent performance needs. A close attention must be paid while moving these applications from dedicated physical servers to shared virtual servers. Dell storage solutions help ensure adequate performance by perpetually and transparently balancing data placement, ensuring that highly accessed datasets and virtual machines (VM) are on higher-performing tiers of the storage system. Dell SSD arrays, mixed-media hybrid arrays, and host-based caching technology help deliver outstanding I/O performance for transactional database applications. Tightly integrated with leading virtualization platforms, Dell storage solutions help to automate array offloading of data intensive tasks to deliver enhanced performance and scalability for high-density virtual deployments as well as efficient workload migrations. Finally, Dell offers scale-up and scale-out storage solutions that can simply scale without business disruptions.

Protect business-critical virtual deployments simply and efficiently

Enterprise data has become one of the most critical assets for many businesses. Organizations go to great lengths to ensure data availability and accessibility. Traditional data protection approaches were designed for physical infrastructure and can adversely affect your ability to meet service levels, maintain business continuity and scale for large, business-critical application workloads. Dell storage solutions offer reliable, simple and efficient ways to protect your virtualized assets. Dell storage area network (SAN) based virtualization-aware data protection tools enable reliable protection and recovery through snapshot and replica capabilities. Dell storage solutions also integrate native replication with virtualization platforms, resulting in simple failover and failback in the event of a disaster or downtime. These tools are either bundled with the storage arrays or made available through perpetual licensing, helping to stem recurring and ballooning software expenses. Further, through integrations with its software-based data protection capabilities, Dell offers choice for organizations looking to optimize their RPOs, RTOs and data protection results.

Lower the total cost of your virtual infrastructure

Virtualization has further exacerbated the relentless growth in organizational data. As application data growth accelerates, virtualization enables quick deployments of new virtual servers, further adding to growing data. Dell helps organizations cope with the data growth by offering innovative solutions that reduce storage footprint while lowering the total cost of deployment. Dell storage solutions simplify storage management while automating routine tasks, helping improve efficiency. Thin operations eliminate the storage of duplicate data, drastically lowering the storage footprint and the total cost. Perpetual optimization of data placement ensures that infrequently accessed data takes advantage of high-capacity, low-cost storage resources. Innovative, perpetual licensing and bundled software features lower software expenses, while guaranteed backward compatibility eliminates expensive, disruptive forklift upgrades and protects your virtual infrastructure from obsolescence.

Simplify application deployments, migrations, and sizing

When virtualizing business-critical applications, most organizations struggle with planning the physical to virtual migration, and subsequently with proper sizing of the virtual environment. Inadequate infrastructure design can lead to unacceptable performance and inferior SLA adherence. Dell has extensive expertise that can help guide IT organizations through this transition. Dell provides sophisticated tools that can analyze the performance impact of I/O load and data volume changes, and offer optimal configuration recommendations for specific organizational needs. Dell also has a flexible services model to help you customize the services that make most sense for your situation. With an end-to-end solution portfolio, coupled with flexible services offerings and deep virtualization expertise, Dell can help you smoothly and confidently virtualize your most business-critical assets.

Dell storage solutions for virtualizing business-critical applications

Dell Compellent™: Ideal for enterprise data centers



Self-optimizing, multi-protocol enterprise storage seamlessly scales with growth, protecting storage investments against obsolescence and costly, intrusive fork-lift upgrades.

- Improved application and VM performance with Data Progression automated tiering
- Reliable data protection with Replay Manager™ snapshots, thin replication, and Live Volumes™
- Simple scalable virtual deployments with the virtualized storage architecture
- Drastically lower storage with thin provisioning, thin writes, thin clones and automated tiering
- Investment protection from obsolescence with perpetual licensing and no fork-lift upgrades

Dell EqualLogic™: Designed with simplicity in mind



Simple non-disruptive scaling of virtual environments with virtualized scale-out architecture and iSCSI connectivity

- Simple management of virtual infrastructure with integrated storage management tools
- Optimal application performance with multi-tiered hybrid arrays that combine SSD and SAS drives
- Efficient data protection with Virtual Storage Manager™ and built-in thin replication
- Lower total storage expenses with all-inclusive software licensing and iSCSI connectivity

Dell PowerVault™: Optimized for departmental and small business needs



Affordable storage with the reliability and features to efficiently meet the needs of virtual deployments

- Affordable storage platform with essential features
- Flexibility to accommodate iSCSI, FC, FCoE, NFS, CIFS and SAS connectivity
- Reliable data protection with integrated snapshot and replication tools
- Integration with Virtualization platforms for improved performance and manageability
- Choice of SSD, SAS and NL-SAS drives for diverse performance needs

Dell Active Systems



Dell Active Systems offer completely integrated solutions stacks that include storage, server and networking resources along with virtualization software. These converged solutions are available with Compellent and EqualLogic storage options and VMware vSphere® or Microsoft® Hyper-V™ virtualization software. They are available in a variety of configurations to support a wide range of deployment needs and workload profiles. Organizations can choose their initial deployment size and grow over time as their needs grow, simply and seamlessly. Active Systems Manager™ is included to simplify management and monitoring of the entire infrastructure. By providing integrated, converged solution stacks, Dell simplifies solution design, deployment and management while slashing deployment times from months to weeks or days.

Dell Storage Portfolio			
Model	Compellent Storage Center	EqualLogic PS Series	PowerVault MD3xx0 Series
Best for	Multi-protocol, virtualized storage platform designed for enterprise data centers and Cloud infrastructure	Virtualized, iSCSI scale-out storage scales performance and capacity for fast-growing virtual deployments	Affordable, efficient storage for small business, departmental and branch office needs
Connectivity	FC (4Gb, 8Gb, 16Gb) FCoE(10Gb) iSCSI (1Gb, 10Gb)	iSCSI (1Gb, 10Gb)	FC(8Gb) iSCSI (1Gb, 10Gb) SAS (6Gb)
NAS support	Compellent FS8600 (FluidFS) Compellent zNAS (ZFS) PowerVault NX3300 (WSS)	EqualLogic FS76x0 (FluidFS) PowerVault NX3300 (WSS)	PowerVault NX36x0 (FluidFS) PowerVault NX3300 (WSS)
Max drives	960 drives per Storage Center	768 drives per group (PS65x0) 256 drives per group (PS61x0 and PS41x0; maximum of 4 PS41x0 per group)	192 drives (MD3 standard arrays) 180 drives (MD3 dense arrays)
Drives supported	2.5" and 3.5" SSD, 15K SAS, 10K SAS and 7.2K NL-SAS		
Management tools	Storage Center Enterprise Manager Replay Manager	EqualLogic Group Manager SAN Headquarters Host integration Tools for VMware, Microsoft, and Linux	MD Storage Manager

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