



## Solution Brief

# Optimize storage for multi-tiered workloads with Dell EqualLogic PS6000XVS & PS6010XVS iSCSI SAN arrays

### Benefits of Dell™ EqualLogic™ PS6000XVS and PS6010XVS sub-volume auto-tiering features

EqualLogic Automatic Tiering features unique to the PS6000XVS and PS6010XVS help improve storage performance and efficiency for specialized, multi-tiered workloads, and enable:

- Reduced costs, through the automated tiering of workloads to media appropriate for the required I/O load
- Improved performance, through the intelligent application of low-latency SSD media for both high I/O data stores and advanced write caching
- Automatic Tiering functionality at the sub-volume level, to achieve better optimization of multi-tiered storage workloads and SAN media
- Simplified management of all PS Series SAN arrays via Group Manager and SAN Headquarters graphical management and monitoring utilities

Enterprises of all sizes have implemented storage area networks (SANs) to help improve data management efficiency and protect critical data. SANs allow multiple servers and applications to share storage resources, and help simplify centralized data protection operations such as managing snapshots and replication. Because broad SAN adoption has increased the diversity of the applications requiring SAN support, enterprises in growing numbers have adopted storage tiering, a Best Practices approach that directs application workloads to the storage media with the most suitable performance and cost characteristics.

As a key component of their high ease-of-use and low total cost of ownership (TCO) design tenets, Dell™ EqualLogic™ PS Series virtualized iSCSI SANs provide IT organizations with a number of features for automating tiered storage. The EqualLogic PS6000XVS and PS6010XVS SAN arrays advance these features further, by allowing tiering across SSD and SAS media within a single enclosure.

### Hybrid SSD/SAS design and advanced Auto-Tiering address needs of specialized, multi-tiered application workloads

An enterprise typically runs a varied mix of applications – each with its own particular set of performance requirements and capacity considerations – in the course of business operations. Certain applications – e.g., online transaction processing (OLTP) or certain Web-facing applications – require high-performance serial attached SCSI (SAS) or solid state disk (SSD) arrays. By the same token, more inert file or application data can leverage more affordable serial ATA (SATA) SAN arrays. Flexible Automatic Tiering tools in an EqualLogic PS Series SAN thus allow IT managers to both reduce costs and improve performance.

Other common workloads, however, actually contain both infrequently accessed (i.e., “cool”) data and highly dynamic (“hot”) data within a single volume. Virtual desktop data provides one example of such a multi-tiered workload; data stores associated with virtual desktop implementations (VDI) usually consist of a small number of hot, read-intensive “golden” reference desktop images, along with numerous cool, user-specific data that capture desktop customizations and other user preferences. Similarly, certain database volumes – as may support online college course registration systems or e-commerce sites – may similarly contain both a hot, frequently accessed component (e.g., a fixed list of class offerings, products, or size or color options) and a cool component (including student data, customer records, or credit card information) with sporadic reads and writes.

For multi-tiered workloads, volume-level tiering may provide only limited benefit, since any storage medium choice – SSD, SAS or SATA – can optimally suit only a portion of the volume workload. Moreover, specific workloads within the volume may shift between cool and hot over time, further minimizing the benefits of any single storage medium.

To help optimize storage for multi-tiered workloads, the EqualLogic PS6000XVS and PS6010XVS SAN arrays introduce several hardware and software design innovations that expand the capabilities of EqualLogic Automatic Tiering. The PS6000XVS and PS6010XVS combine low-latency SSD and high-performance 15K SAS drives to provide two tiers of storage within a single EqualLogic member. Moreover, the advanced Automatic Tiering features on the PS6000XVS and PS6010XVS enable them to categorize and operate on data workloads within each volume. These workloads are categorized as hot (high I/O), “warm” (medium I/O), or cool (low I/O), and then placed as appropriate onto either SSD or SAS tiers. The unique hardware and software design innovations of the EqualLogic PS6000XVS and PS6010XVS can thus perform workload optimization even on volumes containing a mix of workload types and storage needs.

### Automated sub-volume tiering provided standard as part of EqualLogic all-inclusive feature set

EqualLogic sub-volume Automatic Tiering capabilities come standard on the PS6000XVS and PS6010XVS SAN array, with no additional licenses or maintenance fees. In addition to these Automatic Tiering capabilities, all EqualLogic PS Series SANs offer such virtualized iSCSI SAN storage benefits as high performance, simplified operations, seamless scalability, and advanced data protection, all of which can help minimize TCO and maximize ROI.

Dell also provides two vital management tools with each PS Series array: Group Manager and SAN Headquarters. Group Manager is a centralized SAN graphical management interface that enables secure access and easy provisioning of storage volumes. SAN HQ provides historical monitoring across virtualized SAN groups, consolidates performance and event statistics both on a near real-time and trended basis, and even provides the ability to export the data collected, including capacity, IOPS, and networking statistics. Both Group Manager and SAN HQ provide essential tools for designing, implementing and managing tiered storage architectures.

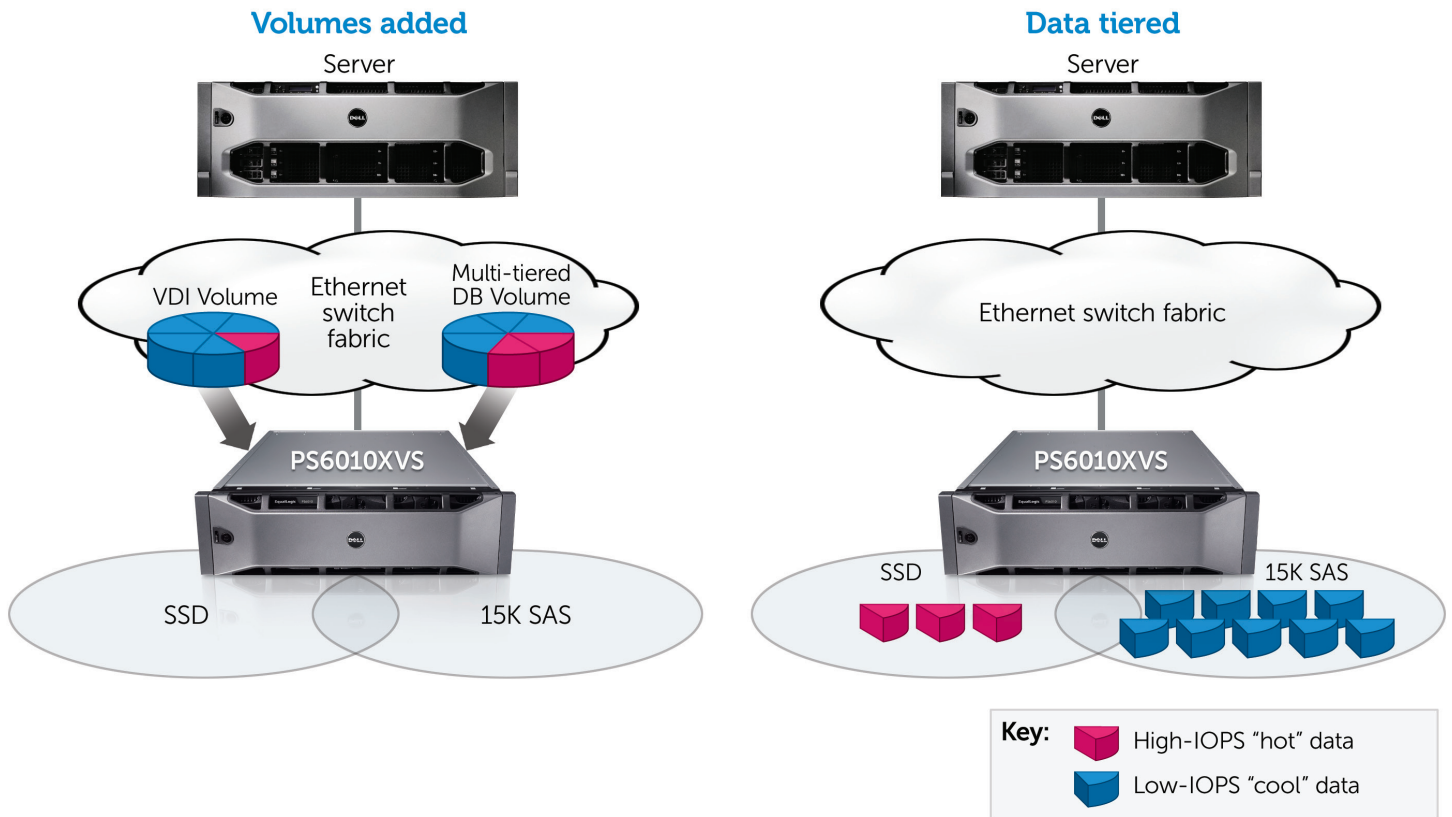


Figure 1. PS6000XVS and PS6010XVS Automated Sub-Volume Load Balancing.

Simplify your storage at [www.Dell.com/PSseries](http://www.Dell.com/PSseries)

