



Solution Brief

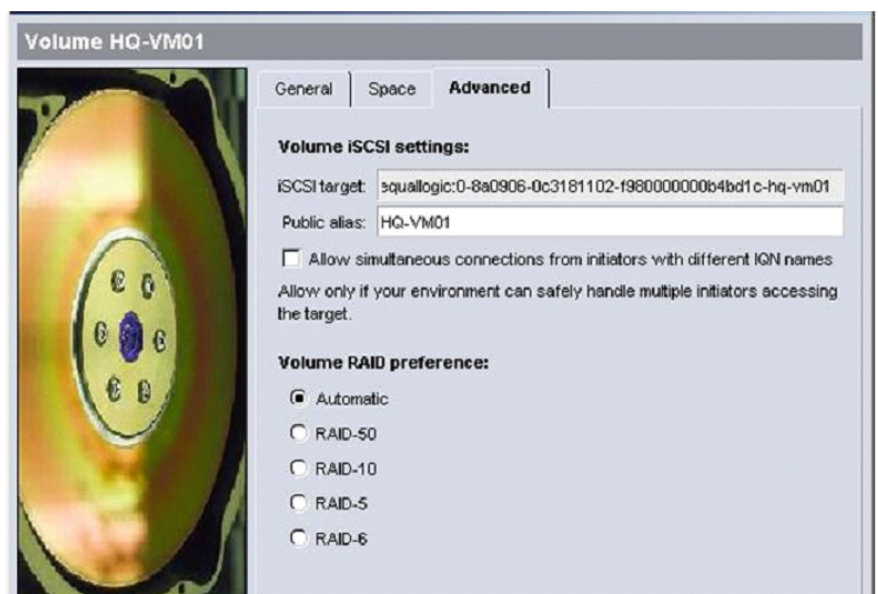
Automate storage tiering simply and efficiently with Dell EqualLogic PS Series virtualized iSCSI SANs

Automated Storage Tiering features provided standard on Dell™ EqualLogic™ PS Series SANs are designed to help organizations to:

- Reduce costs, through the alignment of low-IOPS data with capacity-optimized SATA disk resources
- Improve performance, through the assignment of SSD and SAS resources to high-IOPS data stores
- Optimize SAN storage for multi-tiered workloads such as virtual desktop deployments
- Simplify architecting, implementing and fine-tuning tiered storage settings in live, production environments, with minimal disruption of operations

Storage area networking (SAN) technologies can help enterprises of all sizes manage explosive data growth. The sheer volume of data that IT organizations must manage continues to grow with increasing velocity. SANs help improve data management efficiency by allowing multiple servers and applications to share storage resources, and help protect critical data by centralizing such operations as snapshotting and replication.

The larger a SAN, however, the greater the challenge of meeting myriad storage needs. This is because shared storage systems typically serve a variety of data stores, from highly volatile, “hot” application data to relatively inert, “cool” file data. Thus, for all of its benefits, a SAN that applies a common disk medium across different applications often sacrifices performance or economy. For this reason, growing numbers of enterprises have adopted *storage tiering*, a Best Practices approach that directs application workloads to the storage media with the most suitable performance and cost characteristics.



RAID Preference Configuration offers one of several means by which Dell™ EqualLogic™ PS Series SAN users can tier storage to help improve operating efficiency and application performance.

Tiered storage offers numerous opportunities for improved efficiency

Storage tiering increases efficiency by matching business needs with the most appropriate storage media. By tiering storage, enterprise IT organizations can direct such high input/output (I/O) operations as online transaction processing (OLTP) or certain Web-facing applications to high-performance solid state disk (SSD) and serial attached SCSI (SAS) arrays. Similarly, IT planners can direct more inert file or application data to more affordable serial ATA (SATA) SAN arrays.

Designed from the outset to offer high ease-of-use and low total cost of ownership (TCO), Dell™ EqualLogic™ PS Series virtualized iSCSI SANs provide IT organizations a number of features for automating tiered storage. These features extend the automation at the core of the PS Series design, while allowing customization and control of storage tiers to suit a wide range of business and organizational requirements.

An enterprise runs a mix of applications – each with its own particular set of performance requirements and environmental considerations – in the course of business operations. To support this application mix, storage architects can configure their PS Series SAN as a heterogeneous storage pool with multiple arrays, each running a different RAID policy. EqualLogic Auto-Tiering features monitor volume size and I/O workloads, and then automatically migrate volumes over time to arrays with the most appropriate disk technologies and RAID policies. Expansion requires simply adding an array to the SAN; the PS Series SAN will automatically redistribute workloads across all arrays to best suit the application mix. The new array will add processor and throughput resources, in addition to disk capacity and spindles, all of which will improve overall SAN performance.

IT managers may also find utility in specifying a preferred RAID policy for individual volumes – e.g., RAID 10 for a performance-sensitive data store – within the SAN. As this use case illustrates, different tiering mechanisms may be combined to satisfy the unique requirements of the enterprise, and activated or disabled on the fly.

Tiering can also help simplify the management of storage provided as a secure service, in private or public cloud environments. IT managers can easily create a separate PS Series storage pool – essentially a dedicated SAN within a SAN, consisting of one or more arrays – for each business unit, and then block access to that pool by unauthorized users. EqualLogic pooling features offer IT managers broad flexibility to incorporate other criteria – data protection treatments such as cloning and replication, for example – into tier definitions and policies.

Advanced storage tiering features can also help optimize application performance

By allowing IT managers to keep “cool” data off costly high-performance media, as well as to align performance-sensitive applications with suitable disk media, tiered SAN resources can both reduce costs and improve performance. The uniquely flexible EqualLogic tiering tools allow IT managers to determine both how to apply PS Series intelligence and to what degree. Certain volumes – those associated with business-critical operations, for instance – can be assigned to specific arrays, while others can leverage the intelligent automation of the PS Series SAN. Should the status of these volumes change over time, they can be either migrated onto or off dedicated pools without disruption.

What’s more, the PS6000XVS/6010XVS – a highly specialized SAN array that combines low-latency SSD and 15,000 RPM SAS drives within a single enclosure – further advances EqualLogic Auto-Tiering. Whereas other PS Series arrays operate at the volume level, the XVS performs tiering on data sets at a sub-volume level. Within the XVS, sub-volume workloads are categorized as high I/O, medium I/O, or low I/O, and then placed as appropriate onto either SSD or SAS tiers. The XVS systems can add tremendous value to such multi-tiered workloads as virtual desktop implementation (VDI) and catalogue-oriented database applications, which contain both static and highly dynamic components.

Automated features help simplify tiered storage design and management

As part of its all-inclusive feature policy, Dell 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 visibility and control across virtualized SAN groups, consolidates performance and event statistics on both a real-time and a trended basis, and even provides exportable capacity, input/output per second (IOPS) and networking statistics. Both Group Manager and SAN HQ provide essential tools for designing, implementing and managing tiered storage architectures.

Simplify your Storage at www.dell.com/PSseries

