



# Inside the Dell EqualLogic PS Series iSCSI storage arrays

Built on patented peer storage architecture, the Dell™ EqualLogic™ PS Series Internet SCSI (iSCSI) storage arrays offer high performance, reliability, intelligent automation, and seamless virtualization of storage to enable simplified enterprise storage deployment and management, and comprehensive data protection.

Simple and efficient storage management is critical to addressing the increasingly complex IT challenges from trends such as server virtualization, and exponential growth of application data. Applications, whether they are running in physical or virtual environments, continually demand more from their storage systems—as performance, capacity, availability, backup, and disaster recovery needs intensify, so do expectations of the servers and storage that support them. As a result, IT professionals need a storage solution that integrates a full complement of high-end management capabilities, includes data protection, and operates intelligently. They need a reliable storage system that expands transparently and provides consistent data availability regardless of the server configuration, operating system, or application.

Dell EqualLogic PS Series iSCSI storage arrays offer a fundamental change in the way enterprises think about purchasing and managing storage. Built on a patented peer storage architecture, these solutions offer enterprise-class performance and reliability, intelligent automation, and seamless virtualization of storage for simplified storage management. The PS Series combines an intelligent, automated management framework and a comprehensive set of enterprise data services with a fault-tolerant hardware architecture that supports many major operating systems. It delivers a modular and cost-effective solution that can be deployed in appropriate increments for small and medium businesses, while also being cost-effective for large enterprises requiring scalable capacity and high-end performance.

### Peer storage architecture

The EqualLogic PS Series is based on a unique, peer storage architecture. In this context, peer describes the collaboration and equal partnership of a single, simple architecture; components and arrays function as peers, working together to share resources, evenly distribute loads, and collaborate to help optimize application performance and provide comprehensive data protection.

The result is an intelligent storage array that can deliver rapid installation, simple management, and seamless expansion. Using patented, page-based data mover technology, members in a storage area network (SAN) work together to automatically manage data, load balance across resources, and expand to meet growing storage needs. Because of this shared architecture, enterprises can use PS Series arrays as modular building blocks for simple SAN expansion (see Figure 1).

This architecture provides the basis for numerous features and capabilities, including peer deployment, control, provisioning, protection, and integration (see Figure 2).

**Peer deployment** is a SAN configuration technology that can sense network topology, automatically build RAID sets, and conduct a system health check to help ensure that components are fully functional. Peer deployment enables IT staff to potentially install, configure, and deploy most EqualLogic arrays in minutes.

**Peer control** offers virtualized storage management with a single view. PS Series arrays are designed to be self-managing; systems are designed to continuously monitor storage resources and automatically load balance data across controllers, network connections, and disk drives to help deliver optimal performance. Peer control automates key functions for configuration, management, storage pooling, and data distribution, helping minimize the complexity of storage administration.

**Peer provisioning** enables administrators to dynamically provision resources to meet application requirements—including not only disk space, but also connectivity, security, performance, and data protection. When application requirements change, the storage configuration can change seamlessly. Peer provisioning is designed to simplify expansion while systems remain online; new arrays can be automatically added to the group and automatically connect to the SAN.

Expansion is linear, enabling administrators to scale not only disk drives but also controllers, ports, cache, and performance as the environment grows. Peer provisioning enables enterprises to purchase storage on demand, which facilitates efficient use of both capital and storage resources. Advanced thin provisioning capabilities are included, giving administrators additional flexibility in providing storage to applications. Administrators can also allocate virtual storage to volumes up to preset limits and add physical capacity on demand. In both physical and virtual server environments, cloned volumes can be rapidly assigned to different servers to help meet changing needs.

**Peer protection** starts with a robust design that avoids single points of failure and is designed to provide greater than 99.999 percent availability. It also includes built-in features such as application-aware snapshots for quick recovery and remote replication for disaster protection. These features enable administrators to quickly create end-to-end solutions that can help provide comprehensive protection against multiple types of failure or outage.

**Peer integration** provides a comprehensive software toolkit to facilitate the deployment, ongoing management, and protection of EqualLogic SANs in Microsoft® Windows® OS environments and VMware® environments. As a Microsoft® Windows® Simple SAN-designated solution, the EqualLogic PS Series is proven, interoperable, and easy to set up and manage.

Simple and efficient storage management is critical to addressing the increasingly complex IT challenges from trends such as server virtualization, and exponential growth of application data

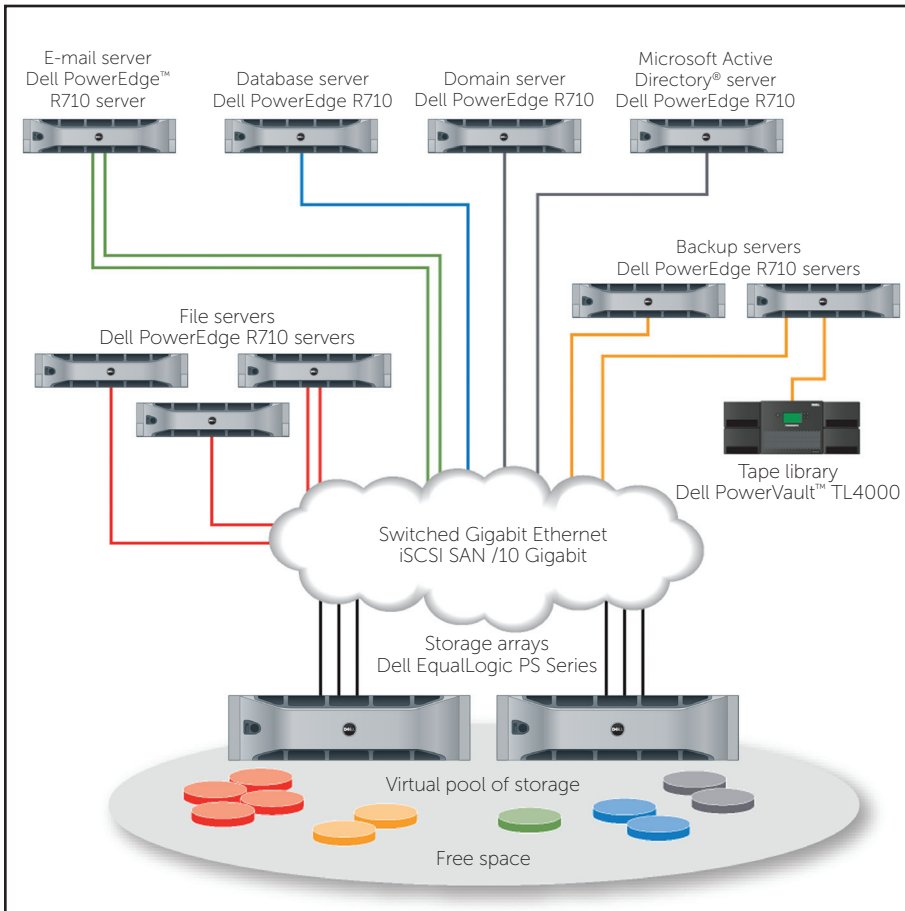


Figure 1. Grouping multiple Dell EqualLogic PS Series arrays helps increase capacity and performance linearly—without increasing management complexity

Peer protection is designed to provide greater than 99.999% availability<sup>1</sup>

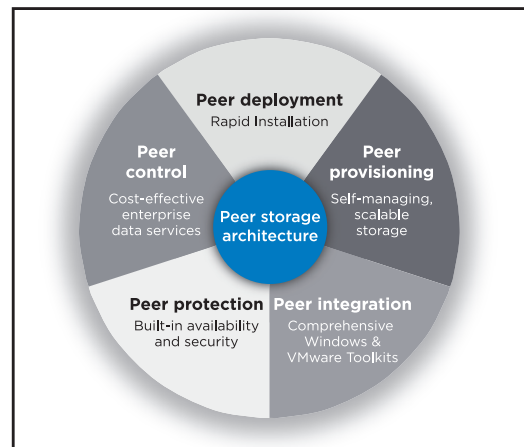


Figure 2. Dell EqualLogic PS Series enterprise-class features are based on the patented peer storage architecture

for Windows® platforms. EqualLogic Auto-Snapshot Manager/ Microsoft® Edition provides a feature-rich tool to help protect and recover data for Windows® applications and Hyper-V™ virtual machines. The EqualLogic PS Series is VMware HCL-certified and also includes advanced integrated tools including Auto-Snapshot Manager/VMware Edition and Site Recovery Manager Adapters to optimize data protection and disaster recovery in the VMware environment.

The EqualLogic peer storage architecture makes enterprise-class performance, scalability, and reliability possible in an intelligent, automated management framework that helps eliminate tedious administrative tasks while enabling easy best-practices storage management.

### Modular design with enterprise reliability

EqualLogic PS Series arrays have a modular design that allows enterprises to purchase only the storage they need, when they need it—helping prevent both underutilization and over-provisioning. Its peer storage architecture uses industry-standard protocols, disk drives, and network interfaces to provide cost-effective connections and high-performance access to data across heterogeneous environments, including VMware®, Microsoft® Windows® (including Hyper-V™), Novell® NetWare®, Novell® SUSE® Linux® Enterprise Server, Red Hat® Enterprise Linux, Oracle® Solaris™, HP-UX®, Mac OS® X, and IBM® AIX® environments.

Designed to meet and exceed the rugged requirements of the data center, EqualLogic engineered fault tolerance into the PS Series hardware design. Its components are fully redundant and hot swappable with dual controllers, standard dual fan trays, and standard dual power supplies. The hot-swappable controller module features high-performance 64-bit processors with a high-speed I/O bus. Each control module is equipped with 2 GB of high-speed battery-backed DRAM. Each disk drive is interconnected with its own independent, hot-swappable serial channel and secured mechanically with an inertia-dampening chassis that helps eliminate drive vibrations. Self-tuning controller caches are battery-backed and mirrored across controllers to help protect these components without compromising performance.

EqualLogic PS Series arrays support Serial Attached SCSI (SAS), and Serial ATA (SATA) disk drives with a variety of performance and capacity options. The PS Series also has an option for low-latency, high-performance Solid State Disk (SSD) drives. Available drive offerings may vary by system configuration.

Enterprise-class RAID protection governs hot-swappable disk drives, including RAID-5, RAID-6, RAID-10, and RAID-50 support; hot sparing; automatic rebuilds; accelerated rebuild times; advanced stripe integrity algorithms; online RAID set expansion; geometry transformation; and patent-pending predictive media-error detection and correction. Not only can administrators service the arrays without taking them offline,

<sup>1</sup> Based on redundant components, hot swappable hardware components, automatic raid configuration and other advanced storage features.

The Dell EqualLogic PS Series has built-in storage features previously available only to top-tier data centers, enabling enterprise-class storage for organizations of all sizes.

but the PS Series array isolates faults to help prevent cascading failures or loss of protection during service. The result is a high level of data protection and performance even during service procedures. The redundancy of the design eliminates single points of failure, helping to provide greater than 99,999 percent availability.

**Peer deployment: Rapid installation**

EqualLogic PS Series arrays can be fully functional within minutes of opening the shipping box. Built into the array is an automatic sensing and configuration technology that helps eliminate complex and cumbersome manual tasks, enabling a quick start. Once it identifies the network topology, this intelligence checks component functionality and automatically builds RAID sets. With a few simple steps and without special expertise, administrators can deploy an enterprise-class SAN seamlessly, without downtime. This capability helps eliminate the complex manual configuration of other SANs, allowing administrators to focus on servers and applications.

**Peer control: Cost-effective enterprise data services**

The PS Series has built-in storage features once relegated solely to top-tier data centers, enabling enterprise-class storage for virtually every size organization. EqualLogic PS Series arrays include enterprise software features such as automatic load balancing, automatic snapshot management, automatic replication, volume cloning, volume management, storage virtualization, thin provisioning, SAN boot capability, roles-based administrative management, historical performance trending and reporting, tiering and pooling, and multi-path input/output (MPIO) with no additional licensing fees.

**EqualLogic Group Manager**

Administrators can manage PS Series arrays in a SAN through a single interface—the EqualLogic Group Manager (see Figure 3). This Web browser-based Graphic User Interface (GUI) helps eliminate

the need for a dedicated management workstation or server and allows administrators to remotely manage virtually any aspect of their EqualLogic iSCSI-based SAN. In addition to using the Web interface, administrators can manage PS Series arrays using a scriptable command-line interface over Secure Shell (SSH) and Telnet. Built-in monitoring and notifications provide e-mail, syslog support, and comprehensive Simple Network Management Protocol (SNMP) monitoring and traps—all standard features.

**Volume snapshots**

PS Series arrays provide space-efficient snapshots that support up to 512 snapshots per volume, thousands of snapshots per array, and read-only as well as read/write snapshots. Snapshots can be used for quick recovery and offloading backup operations. PS Series arrays are designed to implement safe snapshot recovery in which data is not discarded unintentionally, helping provide the flexibility to implement true enterprise storage.

**Automatic load balancing**

The EqualLogic approach to optimizing performance is simple: maximize the horsepower of all available components in the SAN. Because of the unique peer storage architecture used by EqualLogic PS Series arrays, instead of relying solely on individual components to deliver high performance, peer control leverages all relevant components. It automatically load balances to seamlessly spread data across active storage resources, helping maximize performance by intelligently optimizing the available network connections, cache, controllers, and drives. Through this optimization, each PS Series array can support high transactional workloads and database applications. When multiple arrays are added together the PS Series quickly scales, and performance grows linearly with each additional array.

**Tiering and pooling**

The EqualLogic tiering capability enables administrators to prioritize applications within a SAN by placing them on separate storage resources, each optimally configured for the required service level of the application. Administrators can configure

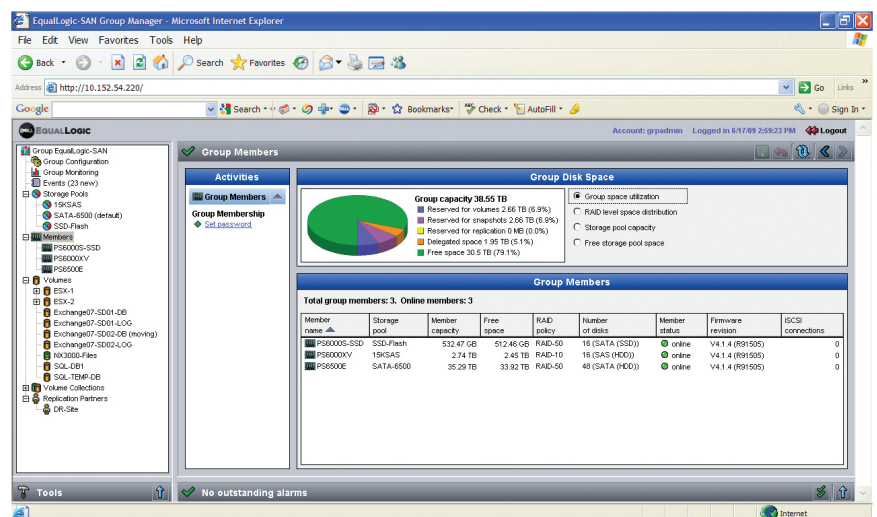


Figure 3. The EqualLogic Group Manager interface helps simplify storage management across PS Series arrays



separate storage pools within a single SAN to help build an efficient, flexible, easy-to-manage storage environment. Using this “SAN within a SAN,” administrators can gain the advantages of consolidation, but can also easily separate workloads as needed: by application, service level, disk type, cost, or even by department within the organization. For example, large, high-density SATA PS Series arrays can be placed in dedicated pools to provide capacity-oriented tiers of storage for files, near-line applications, archiving, and de-duplicated backups. At the other end of the performance spectrum, SAS and SSD arrays can be dedicated to high-transaction applications such as Exchange®, Oracle® or SQL OLTP, or consolidated, virtual desktop deployments. Because online data movement is built into all PS Series arrays, administrators can adjust application resources and move data between different pools of storage without downtime or disruption.

### EqualLogic SAN Headquarters

Administrators can monitor all EqualLogic PS Series arrays, pools, and groups from a single location using the SAN Headquarters (SAN HQ) multi-group performance and event monitoring tool (see Figure 4). This centralized event and performance monitoring, historical reporting tool can assist with operational planning, trend analysis, and troubleshooting. Using the Simple Network Management Protocol (SNMP), SAN HQ collects performance, alarm, and health status from your PS Series SAN. Flexible viewing options range from high-level group summaries to sophisticated analyses, including detailed statistics on performance, latency, capacity, volumes, and network activity. In addition, both pre-defined and customized views let administrators select their preferred method of accessing information.

### Peer provisioning: Self-managing, scalable storage

The intelligence of peer provisioning combined with the modular design of PS Series arrays enables administrators to quickly and easily expand storage capacity without affecting data availability. They can start with a single storage array—then, when storage, performance, and network requirements grow, they can add more arrays to the group to scale the environment with more capacity, performance, and network bandwidth automatically. While scaling guidelines may vary by model, administrators can combine any EqualLogic arrays together in the same SAN. Configuring one or more EqualLogic PS Series arrays as a PS group enables administrators to manage the arrays as a single system with a shared pool of storage. EqualLogic peer provisioning automates the key functions needed to configure, manage, and scale storage, helping eliminate much of the complexity of storage administration. Each group member is automatically configured and participates in balancing the load, distributing data, and tracking host access to data, without requiring user intervention—helping keep storage management simple, regardless of scale.

The intelligence of peer provisioning combined with the modular design of PS Series arrays enables administrators to quickly and easily expand storage capacity without affecting data.

The power of peer provisioning also enables a key feature: on-demand growth. Because capacity expansion in PS Series arrays is non-disruptive, administrators can add storage resources while applications remain online. As a result, you can purchase only the storage you need, when you need it — helping to prevent both underutilization and over provisioning and avoiding future downtime. With a PS Series SAN, enterprises can purchase the storage capacity they need today, and plan for future storage growth knowing that when they need to expand, they can do so easily and without taking the system offline. In addition, PS Series arrays are designed to fully integrate with Microsoft Virtual Disk Service (VDS), enabling application-level provisioning by supporting applications.

Thin provisioning is an important advanced feature of peer provisioning that enables the automatic addition of physical capacity on demand up to preset limits. Advanced

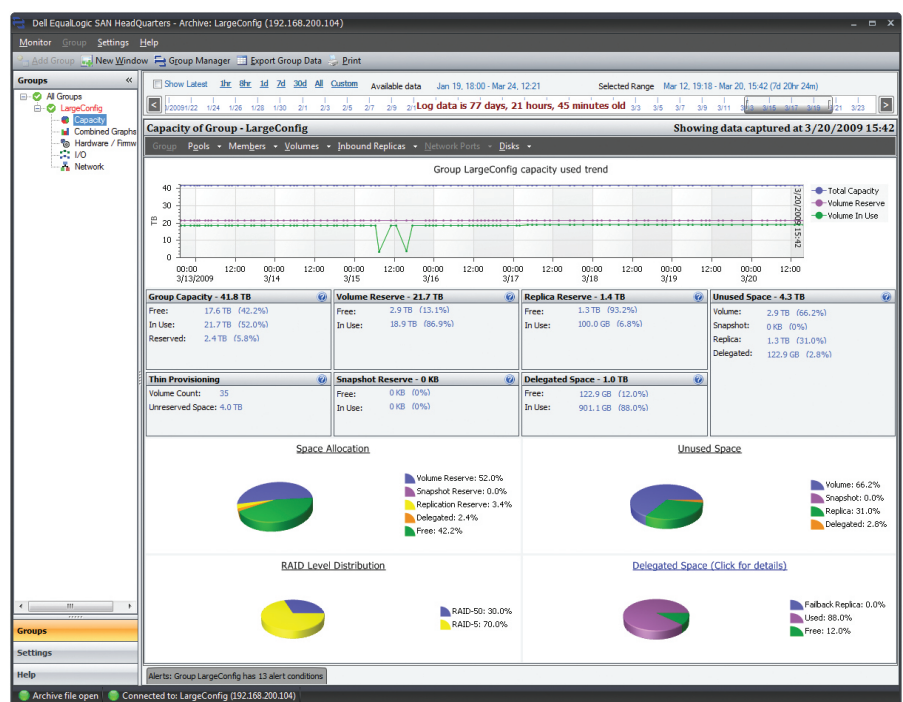


Figure 4. EqualLogic SAN Headquarters (SAN HQ) screenshot

thin provisioning helps make buy-as-you grow storage management and virtualization seamless for servers and applications. When administrators create a volume, they can size it for the long-term needs of the application without initially allocating the full amount of physical storage. Instead, as the application needs additional storage, capacity is allocated to the volume from a free pool. The EqualLogic implementation of thin provisioning provides enhanced flexibility and safety controls—with proactive, user-defined threshold alarms and controls, administrators can depend on automatic space allocation without worrying about reaching allocation limits or unexpected depletion of physical storage.

Peer provisioning can offer significant economic benefits to enterprises of all sizes, because they can purchase physical storage when they actually need it. These benefits include increased asset utilization, reduced management costs, reduced floor space footprint, reduced power and cooling costs, and smart, efficient capital expenditures.

### Peer protection: Built-in availability and security

Peer protection encompasses comprehensive system monitoring and high-availability features such as e-mail home, multipath I/O, and auto-replication that help provide comprehensive protection against system failures or outages.

### Comprehensive system monitoring

EqualLogic system monitoring capabilities are designed to provide administrators with a comprehensive view of the health and status of their SANs. SAN HQ provides centralized event and performance monitoring, historical reporting, capacity trending, and detailed analyses for groups, pools, and individual volumes. In addition, within the EqualLogic Group Manager, administrators can view the status of individual SAN components such as drives, power supplies, and controllers, as well as the overall system. PS Series arrays also include the Auto-Stat Disk Monitoring System (ADMS), which proactively scans disk drives in the background to help detect media anomalies and correct them. Combined with automatic sparing and spare utilization, this feature helps enhance protection and ensure optimal disk performance.

### E-mail home

To help ensure the availability of systems and data, PS Series arrays come standard with group event notification methods (e-mail, syslog, and SNMP), but also allow administrators

to enable e-mail home functionality. E-mail home can automatically contact EqualLogic customer support if a hardware component such as a disk, control module, fan tray, or power supply fails, or if the firmware on a PS Series array is updated. E-mail home functionality enables EqualLogic to rapidly respond to issues and assist administrators.

### Multipath I/O

EqualLogic multipath I/O provides high availability and performance load balancing across multiple network ports (host bus adapters and/ or network interface cards) for Windows®, Linux®, UNIX®, and VMware® environments. By leveraging the ease and cost-effectiveness of Ethernet, multipath I/O helps remove single points of failure between the server and the storage.

### Auto-replication

EqualLogic's auto-replication remotely replicates data from one PS group to another over a standard IP network over long distances, helping provide high levels of data protection and disaster tolerance. Auto-replication offers the advantages of geographic isolation—a critical component in any true disaster recovery plan—without the traditional complexity. Administrators can quickly and easily configure volumes for replication, letting the PS Series arrays manage the underlying hardware resource complexity. A catalog of recovery points is maintained at each disaster recovery site, providing multiple points of recovery from which to choose in the event of a disaster—a choice that helps protect against “cascading” failures such as software viruses.

Making a disaster recovery site operational is simple, even if the primary site already stores terabytes of data. EqualLogic PS Series arrays enable administrators to perform an initial manual sync by copying primary site data to transportable media, physically shipping the media to the remote site, unloading the data, and then starting up the automatic replication. Automatic failover and failback functions enable non-disruptive testing of the disaster recovery deployment in addition to facilitating continuous access to data. Auto-replication is completely array based, helping free IT administrators from the arduous task of managing host-based software as well as the economic burden of host software licenses.

### Peer integration: Powerful application data protection

Peer integration facilitates the deployment, ongoing management, and protection of EqualLogic SANs in Microsoft® Windows® environments and VMware® environments.

### EqualLogic Remote Setup wizard

Each PS Series array comes with the EqualLogic Remote Setup wizard, an easy-to-use tool that can transform the way administrators set up their SANs. From a Windows-based system, administrators can potentially have a PS Series array up and running in just minutes. Configuration of Microsoft® Multipath I/O (MPIO) between Windows-based servers and an EqualLogic SAN—a multistep operation with the basic Microsoft® iSCSI driver—can be vastly simplified with the Remote Setup wizard. This tool helps shorten configuration time and ensure that MPIO has been configured properly,

A catalog of recovery points is maintained at each disaster recovery site, providing multiple points of recovery from which to choose in the event of a disaster.

helping maximize availability and performance. When administrators need more capacity or performance, they can also use the Remote Setup wizard to add members to their existing SAN.

### **EqualLogic Auto-snapshot Manager/Microsoft Edition**

EqualLogic Auto-snapshot Manager/Microsoft® Edition (ASM/ME) is a feature-rich application for protecting and recovering Windows® application data, including protection for systems using Windows® NT File System (NTFS), Windows® Server including Hyper-V™, Microsoft® SQL Server® databases, and Microsoft® Exchange Server storage groups. Included with all PS Series arrays is an intuitive, easy-to-use GUI that creates snapshots, clones, and/or remote replicas of file systems, SQL Server databases, and Exchange storage groups. ASM/ME also includes snapshot and recovery for Hyper-V™ virtual machines. Integration with Microsoft® Volume Shadow Copy Service (VSS) provides hardware-based snapshots with full or differential copies. A scheduler with e-mail notification options is included to help simplify maintenance operations. In the event that recovery of a Hyper-V™ virtual machine, file system, SQL Server database, or Exchange storage group is necessary, ASM/ME provides several quick-restore options to help maximize the availability of critical data and applications.

Auto-snapshot Manager/Microsoft® Edition is designed to allow administrators to safely take snapshots of, back up, and restore their Microsoft Windows® Server® based applications (including Hyper-V™ virtual machines) with advanced third-party backup software modules by supporting VSS and VDS interfaces. This capability helps eliminate the extensive system configuration and scripting that other systems may require for snapshot-based backups.

Peer integration helps simplify the deployment of shared SAN storage in Windows-based application environments, helping eliminate the worries of time-consuming storage management and free up time to focus on delivering enhanced Windows-based business solutions.

### **EqualLogic Auto-snapshot Manager/VMware Edition**

EqualLogic Auto-snapshot Manager/VMware® Edition (ASM/VE) is a data management tool designed to simply create and centrally manage online point-in-time copies of VMware virtual machines and VMFS datastores using PS Series SAN-based snapshots. ASM/VE provides an easy-to-use graphical interface that coordinates the creation, recovery, and scheduling of PS Series snapshots with vCenter and VMware's native snapshotting technology, enhancing protection, storage utilization, and performance of VMware-based virtual infrastructures. Integrated directly with standard VMware and EqualLogic application programming interfaces (APIs), ASM/VE understands the relationships and location of virtual machines, VMFS datastores, and PS Series SAN-based volumes. With intuitive SAN-centric and VMware-centric navigation and a built-in scheduler, the VMware administrator can simply and flexibly set snapshot creation schedules of individual virtual machines, groups of virtual machines, or even all virtual machines in a VMware data center, coordinating snapshot creation across all SAN-based volumes upon which the virtual machines reside.

### **EqualLogic Storage Adapter for VMware Site Recovery Manager**

In traditional SAN environments, the cost and complexity of SAN-based replication can be cost- and resource-prohibitive for many businesses. PS Series arrays integrate directly with VMware Site Recovery Manager (SRM) to seamlessly automate disaster recovery management in virtual infrastructures, simply and affordably. VMware® SRM enables non-disruptive, automated testing of recovery plans and automates the recovery process using PS Series SAN-based data volumes replicated to the remote site using EqualLogic auto-replication. Auto-replication provides affordable and easy-to-configure replication over any distance using existing IP networks without requiring the purchase of additional software licenses or complex configurations. iSCSI connectivity allows organizations to use their existing Ethernet infrastructure for disaster recovery instead of a complicated and expensive Fibre Channel network. The EqualLogic Storage Adapter for VMware Site Recovery Manager is one title in the suite of EqualLogic Host Software included with every PS Series array, helping to reduce the cost and complexity of implementing disaster recovery.

### **Flexibility with low total cost of ownership**

The EqualLogic PS Series represents an innovative advancement in storage economics, from purchase and setup to operation and upgrades. Unlike traditional SANs, the EqualLogic PS Series comes complete with the software and applications expected from an enterprise-level SAN, at no additional charge—there is no additional software to install or software maintenance service costs to incur to initiate the data management and protection features for this enterprise-class SAN. EqualLogic arrays scale on demand and online, helping enterprises increase their storage resources without disrupting the application environment or budget. This packaging model, combined with the ease of use and automated intelligence of PS Series arrays, enables EqualLogic systems to provide a significant return on investment.

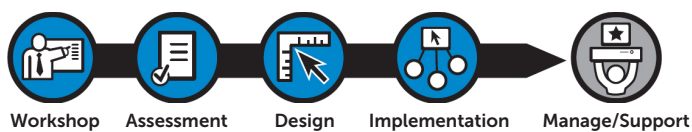
Whether used to consolidate a direct-attached storage infrastructure, migrate data from an existing SAN, streamline data protection processes, or just add capacity, the EqualLogic PS Series offers a family of high-performance, self-managing storage arrays designed to meet the requirements of SAN or

Unlike traditional SANs, the EqualLogic PS Series comes complete with the software and applications expected from an enterprise-level SAN, at no additional charge.

network-attached storage environments for organizations of all sizes. Based on the patented peer storage architecture, the PS Series of storage arrays is designed to be comprehensively interoperable and seamlessly scaling without disrupting application or data availability

### Value-added services

Dell demonstrates its commitment to ensuring customer success not only by simplifying network storage with the EqualLogic PS Series, but also by delivering consistently superb customer and professional services. In addition to basic warranty services that include working-hour telephone support, expedited parts shipping, and access to software/firmware updates, Dell offers optional consulting services to enterprise IT staff and end-users



### Dell ProSupport

Dell ProSupport is a configurable suite of support services that enable you to build a solution that's right for your organization. A break from a traditional tiered structure, ProSupport enables you to choose a support model based on how you use technology and where you want to allocate resources. Do you need full service support or do you have an IT staff? Choose between ProSupport for End-User or ProSupport for IT. Once a model is chosen, you may further tailor your support level by selecting options to address everyday IT challenges, such as unplanned downtime, data and asset protection, support planning, resource allocation, software application management, and more. Both ProSupport models give you access to senior-level phone technicians 24x7x 365, next business day parts & labor, escalation management with a designated Technical Account Manager, and access to Dell's Global Command Centers for monitoring and management of critical situations.

### Data Management Consulting from Dell

Dell offers a comprehensive suite of workshop, assessment, design, and implementation services to help customers get the most from their EqualLogic PS Series infrastructures. Focused on data management, application performance, data protection, and cost of ownership, Dell consultants can provide practical action-oriented plans, to help deliver specific, predictable and measurable outcomes through high-impact, short duration projects. Services include:

- **Data Management & Storage Technology Assessment** analyzes account month-end performance data and recommends consolidation scenarios including iSCSI SAN options. We develop a tailored business case estimating the cost savings gained from the recommended technology options.

- **EqualLogic SAN Solution Design** is an iSCSI SAN solution design, incorporating array, storage area network and integration of key applications.
- **EqualLogic Local Data Protection Design**, focused on leveraging PS Series snapshot and clone capabilities for local data protection and recovery to meet your recovery point and recovery time objectives (RPO/RTOs).
- **EqualLogic Remote Data Protection Design**, focused on leveraging PS Series auto-replication for remote or disaster recovery based on your RPO/RTO requirements.
- **EqualLogic Backup Integration Design**, built to integrate your PS Series snapshot capabilities with your backup application for centralized backup management.
- **Data Migration**, to facilitate a well planned migration from an existing storage entity (DAS, SAN, NAS) to the newly implemented EqualLogic SAN. Dell uses standard tools, a proven methodology and expert consultants to mitigate associated risk and minimize downtime.
- **EqualLogic Quick Start** is a post implementation 2 day, on-site engagement that helps guide customers with best practice recommendations and accelerate the adoption of the feature-rich EqualLogic software portfolio.

### Dell Infrastructure Services

Dell infrastructure services are designed to help customers automate and centrally configure, deploy, and manage their day-to-day end user computing and data center operations. These services extend a customer's existing on-premise IT infrastructure with off-premise cloud services designed to better address challenges with mobility, highly distributed organizations, security, compliance, business continuity, and disaster preparedness.

- **Deploy** – Dell offers on-site installation of all Dell EqualLogic SAN solutions.
- **Operate** – Dell can help optimize your storage, backup and virtual environments by focusing on remote monitoring, reporting and alerts, along with full remote management for storage and backup, freeing up IT resources.
- **Protect** – Dell Data Center Backup Management services are available to assist you with reporting to help refine SLA requirements, to provide monitoring to improve process efficiency or for the full management of your backup environment.

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

