



Optimized storage for today's virtualized data centers

By Chhandomay Mandal

Dell™ EqualLogic™ PS Series storage with deep VMware vSphere® software integration helps maximize the return on technology investments for virtualization deployments by elevating application performance, data protection and overall IT efficiency.

Across a wide range of industries, organizations have virtualized their IT infrastructures with platforms such as VMware vSphere software to help reduce costs, improve resource utilization and enhance IT flexibility. Now that many enterprises have achieved an initial cost savings by consolidating numerous disparate servers into compact, virtualized environments, they are setting their sights on optimizing those environments.

Organizations can enhance the return on technology investments in their virtualized data centers by integrating the virtualized environment with storage infrastructures designed to support virtualized servers. The right storage solutions can boost the performance of virtualized applications, help ensure data protection and enhance the efficiency of managing the IT infrastructure.

Dell EqualLogic PS Series internet SCSI (iSCSI) storage area network (SAN) arrays offer a comprehensive range of tools and capabilities that enable tight integration with VMware® virtualization. Using Dell EqualLogic storage in VMware

environments helps organizations create an enterprise-class, virtualized server and storage infrastructure designed to deliver high performance and robust resiliency with simplified management.

Dell EqualLogic Host Integration Tools (HIT), available with EqualLogic PS Series arrays at no additional cost, help simplify storage management through close integration with hypervisors, operating systems and applications. EqualLogic HIT for VMware (HIT/VMware) offers a comprehensive set of tools that provide tight integration of EqualLogic PS Series arrays with VMware virtualization for enhanced protection, performance and management.

HIT/VMware includes Dell EqualLogic Virtual Storage Manager (VSM) for VMware, a VMware vCenter™ server virtualization management platform plug-in that incorporates the following tools and features:

- Auto-Snapshot Manager/VMware Edition (ASM/VE) enables data protection with point-in-time snapshots and replication of virtual machines and datastores in vSphere virtualization environments.





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- The datastore management feature helps simplify provisioning and managing datastores.
- EqualLogic VMware vSphere Storage APIs for Storage Awareness (VASA) Provider facilitates communicating EqualLogic storage attributes to the vSphere environment.
- Virtual Desktop Infrastructure (VDI) Tool offers rapid, space-efficient virtual desktop deployment.

Both ASM/VE and the datastore management feature offer management across multiple EqualLogic storage groups. HIT/VMware also includes EqualLogic Multipathing Extension Module (MEM) for VMware vSphere and EqualLogic Storage Replication Adapter (SRA) for VMware Site Recovery Manager (SRM).

Enhancing performance for virtualized applications

VMware vSphere Storage APIs – Array Integration (VAAI) is designed to play a key role in enhancing performance in a virtualized environment. VAAI capabilities offload certain storage operations from

the hypervisor to the array. Dell EqualLogic PS Series storage incorporates VAAI support into its firmware. This integration helps free up host compute resources and network bandwidth by allowing EqualLogic arrays to perform tasks such as data copying, block zeroing and volume locking directly at the array level. Offloading storage tasks also helps improve performance for virtual machines that share volumes and accelerates template-based provisioning of virtual machines.

EqualLogic VASA Provider is another integrated tool that helps optimize performance. Through integration with VMware VASA, EqualLogic VASA Provider enables EqualLogic PS Series arrays to communicate a wide range of storage attributes to the vSphere environment, including drive types, drive speeds, RAID settings and reserve space for snapshots. Using this information, VMware vSphere Storage DRS™ software performs intelligent workload migrations and automated load balancing.

By enabling administrators to place virtual machines on the appropriate datastore, EqualLogic VASA Provider helps reduce storage latency, increase

Best practices

VMware View optimizes the end-user experience in a virtual desktop environment. Download this white paper for comprehensive sizing guidance and best practices to implement View-based desktop virtualization using EqualLogic PS Series storage.

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throughput and improve capacity utilization. Administrators gain an end-to-end view of EqualLogic PS Series storage within the familiar vSphere Client interface, helping them to streamline storage management.

EqualLogic MEM for vSphere, integrated through vSphere Storage APIs – Multipathing, enables deployment of redundant network connections between vSphere and the EqualLogic PS Series arrays, providing multiple paths for load balancing to help increase and optimize performance. Multipathing is designed to ensure availability – if one path fails, the workloads can continue using the other paths. EqualLogic MEM not only provides fault-tolerant load balancing to enhance storage performance and scalability, it also automates end-to-end management of data paths between the host and storage arrays.

Safeguarding vital data in virtualized environments

Dell EqualLogic PS Series arrays provide a range of tools and capabilities to help protect data in a virtualized environment. For example, EqualLogic ASM/VE integrates EqualLogic PS Series snapshot capabilities with VMware vSphere snapshot functionality. Administrators can use context-sensitive menus within vSphere Client to create hypervisor-consistent, SAN-based snapshots, clones and replicas. These snapshots take advantage of EqualLogic PS Series space-efficient snapshot features to help conserve storage capacity and accelerate recovery. Administrators can replicate snapshots to remote sites automatically with the EqualLogic PS Series auto-replication feature. Automation capabilities and an easy-to-use graphical user interface (GUI) that is integrated into vSphere Client help simplify the creation, scheduling and recovery of snapshots, clones and replicas.

EqualLogic PS Series arrays also offer backup and restore capabilities for Microsoft® Windows Server® and Linux® OS workloads running in virtual machines. Auto-Snapshot Manager/Microsoft Edition (ASM/ME) enables administrators to streamline protection of the NT File System (NTFS), Microsoft® SQL Server® database datastores, Microsoft® Exchange Server

datastores and Microsoft® SharePoint® datastores. Auto-Snapshot Manager/Linux Edition (ASM/LE) utilizes the built-in snapshot, clone and replication capabilities of EqualLogic PS Series arrays to enable administrators to create file system-consistent, point-in-time copies of data stored on one or more EqualLogic PS Series groups.

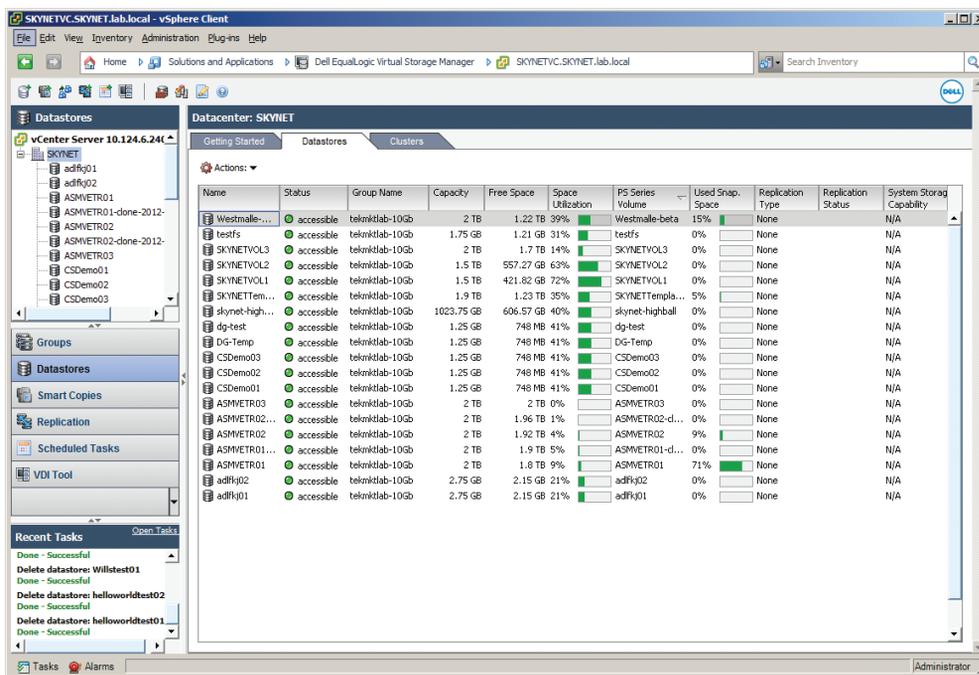
Integration of EqualLogic SRA and VMware SRM in EqualLogic PS Series arrays enables administrators to create robust, comprehensive business continuity and disaster recovery strategies. SRM helps administrators develop, manage, test and execute multisite failover and recovery plans. When EqualLogic PS Series arrays are deployed to support a VMware virtualization environment, SRM uses EqualLogic PS Series SAN-based replication capabilities. Administrators gain built-in replication capabilities that streamline management of failover and fallback while helping improve the speed, security and reliability of processes. In addition, SRM can use EqualLogic ASM/VE for hypervisor-consistent snapshots to be available at the secondary site in the event of disaster recovery.

The storage recovery replica capabilities introduced in VSM 3.5 are designed to improve availability and simplify maintenance. Using storage recovery replicas helps administrators to ensure a hypervisor-consistent backup of primary datastores and virtual machines. Administrators can also selectively restore data from the storage recovery replica and bring the secondary group online quickly if a local group goes offline.

Bolstering IT management efficiency

EqualLogic VSM enables centralized management of multiple EqualLogic PS Series groups from a single interface that is tightly integrated with vSphere Client. The interface offers a highly consistent experience for administrators who are familiar with the vSphere Client interface. Administrators can efficiently allocate and manage storage from a single location, and the interface helps reduce the time spent on storage management.

Integrated directly into vSphere Client, the datastore management feature of EqualLogic VSM helps simplify and accelerate traditionally



Comprehensive datastore management in a vSphere virtualization environment

tedious, time-consuming storage functions such as creating, expanding and monitoring datastores (see figure). The datastore management feature uses a wizard-driven interface to help administrators quickly and easily provision new SAN volumes and assign them to a VMware vSphere cluster – without having to use a separate storage management interface.

Streamlining replication configuration with EqualLogic VSM also helps simplify replication for multiple datastores. Administrators can quickly conduct end-to-end replication configuration from within the vSphere Client itself.

VDI Tool works with VMware View™ VDI to enhance the efficiency of virtual desktop deployments. Using EqualLogic thin-clone capabilities, VDI Tool allows administrators to create space-efficient virtual desktops to minimize storage capacity. It also provides intuitive wizards and automated capabilities that enhance efficiency for key virtual desktop management and administrative operations. This approach allows organizations to accelerate provisioning of desktops without adding significant time or complexity.

Expanding virtualization cost-benefits

Many organizations have already consolidated servers to help achieve the initial cost savings that virtualization is designed to deliver in data centers. Now, optimized storage for virtualized servers helps organizations further increase the return from their investment in virtualization.

Dell EqualLogic PS Series SAN arrays, enriched with capabilities available in EqualLogic HIT, advance storage optimization for virtualized applications and operations, using an expansive portfolio of intelligent features and tools that are deeply integrated with VMware vSphere virtualization. Using EqualLogic PS Series storage to support VMware virtualization environments helps organizations improve the performance of virtualized applications, ensure the protection of vital data and increase overall IT management efficiency. Moreover, EqualLogic HIT software for EqualLogic PS Series storage is easy to deploy and manage, enabling IT administrators to quickly and easily achieve cost-reduction benefits across their virtualized EqualLogic PS Series storage environments. **PS**

Author

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