Enterprise power with everyday simplicity

IT BRAND PULSE
MARKET LEADER
Voted by IT Pros
iSCSI Disk Arrays
2014

The Dell difference

Ease of use
- Integrated tools for centralized monitoring and management
- Scale-out capacity and performance with automated tiering and workload balancing
- Strategic integration with the VMware®, Microsoft® and Linux® products you use most

Investment protection
- Industry-leading TCO savings for midrange storage[1]
- All-inclusive software model
- Continuous feature enhancements extend the life of your investment for no additional charge

Storage for virtual environments
- Virtualized storage for virtualized servers
- Simplified VDI deployments
- Tight integration with industry-leading hypervisor
- Integration and management of multiple storage groups from a central, single VMware vCenter® console

Performance and efficiency simplified for the real world

Simplified, unified, virtualized Dell Storage PS Series, the #1 iSCSI worldwide vendor[2], is ideal for companies and organizations with growing data and performance needs. The PS Series features the industry-leading capabilities of the EqualLogic line with a frameless, IP-based peer storage architecture that enables live, non-disruptive firmware upgrades and maintenance, as well as linear scaling of capacity and performance with each array added to the group. Streamline operations, optimize resources, and protect data through advanced integration with leading operating system, hypervisor and application platforms.

A groundbreaking, all-inclusive software model allows access to the latest product features, and enables multiple generations of EqualLogic PS Series arrays and FluidFS NAS appliances to work seamlessly to provide file and block data services from a single, virtualized pool.

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[1] Source: ESG Lab Report, "Dell EqualLogic PS Series Storage and TCO Analysis- Delivering Lasting Value with Streamlined Management and Improved Performance Scalability," a January 2014 report sponsored by Dell. For the full report see http://en.community.dell.com/techcenter/extras/m/white_papers/20438150/download.aspx.

[2] #1 iSCSI storage vendor worldwide in 26 out of 28 quarters by revenue and market share based on information from the IDC Worldwide Quarterly Disk Storage Systems Tracker Q4 2014 (2008Q1-2014Q4).

Scale-out virtualized storage

Exceptional ease of management

Dell Storage PS Series is designed to provide rapid deployment, simple management and seamless expansion. All PS Series storage products include host integration tools to simplify host configuration and administrative tasks in Microsoft Windows®, Linux and VMware environments. A browser-based Group Manager interface helps streamline management, while application-layer integration helps simplify storage operations supporting industry-leading virtualization, operating system and application platforms. An in-depth reporting, performance and event monitoring system lets you automatically transmit diagnostic data to Dell Support.

Enterprise-class performance

A breakthrough, scale-out architecture gives the PS Series storage performance and scalability once reserved for top-tier data centers, enabling best-practice storage for every size organization. PS Series' hybrid-flash arrays provide automated storage tiering and migrate data automatically across storage tiers to optimize performance, while sophisticated load balancing optimizes performance across storage pools.

Unified, virtualized storage

With its unified, virtualized architecture, EqualLogic enables organizations to manage both block- and file-based storage in a group — through a single GUI instance — that can seamlessly grow to up to 509TB in file capacity and over 8PB in block or total capacity, providing flexibility and operational ease for any mix of structured application data and unstructured file data. The EqualLogic FS7600 and FS7610 NAS appliances support Fluid File System v3, which features powerful policy-based deduplication and compression that can be used to minimize the data footprint and maximize an organization's return on investment in EqualLogic storage.

> *"Our engineers spend less time dealing with maintenance and managing the network because the EqualLogic storage arrays deliver excellent I/O performance."*
>
> — Ryohei Nago, Cloud Services Engineer, Cloud Service Division, TOSYS Corporation

Exceptional lifecycle economics

PS Series solutions represent an evolution in storage economics — from purchase to operation and upgrades. A cornerstone of Dell Storage solutions, the PS Series gives you the power to do more by helping you get the most from your data across its entire lifecycle. The innovative implementation of a virtualized, scale-out storage architecture enables both extensive virtualization and excellent return on investment. PS Series storage scales easily, on-demand and online, enabling storage growth without costly application disruptions, lengthy service engagements, or forklift upgrades. The all-inclusive EqualLogic software package lets organizations of all sizes reap the benefits of enterprise functionality, and enables multiple generations of hardware to run the latest firmware in a single storage pool. As a result, PS Series storage provides exceptional flexibility at a low total cost of ownership.

PS Series arrays

		PS arrays	Description	Drive types	Drive capacities	Array capacity
Mainstream arrays	**10GbE**	PS6210S	High performance and low latency for demanding enterprise applications	24 x 2.5" SSD	400GB, 800GB SSD	Up to 19.2TB
		PS6210XS	Speed of flash with automated tiering for demanding applications such as VDI, OLTP	7 x 2.5" SSD and 17 x 2.5" 10K RPM SAS	400GB, 800GB SSD; 600GB, 1.2TB SAS	Up to 26TB
		PS6210XV	Highest-performance HDD system in the PS6210 Series for critical applications	24 x 2.5" 15K RPM SAS	300GB SAS[4]	Up to 7.2TB
		PS6210XV 3.5"	High-performance storage optimized for the most critical applications	24 x 3.5" 15K RPM SAS	600GB SAS[4]	Up to 14.4TB
		PS6210X	Great balance of cost, performance and capacity	24 x 2.5" 10K RPM SAS	600GB, 900GB, 1.2TB[4] SAS	Up to 28.8TB
		PS6210E	High-capacity configuration for data-intensive applications in highly consolidated environments	24 x 3.5" 7.2K RPM NL-SAS	2TB, 3TB, 4TB[4] NL-SAS	Up to 96TB
	1GbE	PS6100S	All-flash array with high performance and low latency for demanding applications	24 x 2.5" SSD	400GB, 800GB SSD	Up to 19.2TB
		PS6100XS	Speed of flash with automated data tiering for demanding applications	7 x 2.5" SSD and 17 x 2.5" 10K RPM SAS	400GB, 800GB SSD; 600GB, 1.2TB SAS	Up to 26TB
		PS6100XV	High-performance system for critical applications	24 x 2.5" 15K RPM SAS	300GB SAS[4]	Up to 7.2TB
		PS6100XV 3.5"	High-performance storage optimized for the most critical applications	24 x 3.5" 15K RPM SAS	600GB SAS[4]	Up to 14.4TB
		PS6100X	Great balance of cost, performance and capacity	24 x 2.5" 10K RPM SAS	600GB, 900GB, 1.2TB[4] SAS	Up to 28.8TB
		PS6100E	High-capacity configuration for data-intensive applications in highly consolidated environments	24 x 3.5" 7.2K RPM NL-SAS	1TB, 2TB, 3TB[4], 4TB[4] NL-SAS	Up to 96TB
Dense arrays	**10GbE**	PS6610ES	Hybrid-flash configuration maximizing high performance and high capacity in one array	14 x 2.5" SSD + 70 x 3.5" 7.2K RPM NL-SAS	400GB, 800GB SSD; 2TB, 4TB NL SAS	Up to 291.2TB
		PS6610X	Balances performance and high capacity for consolidating mixed workloads	42 or 84 2.5" 10K RPM SAS	600GB, 900GB, 1.2TB[4] SAS	Up to 100.8TB
		PS6610E	Cost-efficient dense array with the highest capacity in the PS Series	42 or 84 3.5" 7.2K RPM NL-SAS	2TB, 4TB[4], 6TB NL-SAS	Up to 504TB
		PS6510ES	Hybrid-flash array maximizing capacity and performance in a 10GbE array	7 x 2.5" SSD + 41 x 2.5" 7.2K RPM NL-SAS	400GB SSD, 2TB NL-SAS	Up to 84.8TB
		PS6510X	Performance and capacity for bandwidth-hungry applications	48 x 2.5" 10K RPM SAS	600GB, 900GB[4] SAS	Up to 43.2TB
		PS6510E	Dense array with capacity for data-intensive applications	48 x 3.5" 7.2K RPM SATA and NL-SAS	1TB, 2TB SATA, 3TB[4] NL-SAS	Up to 144TB
	1GbE	PS6500ES	Hybrid configuration maximizing both capacity and performance in one array	7 x 2.5" SSD + 41 x 2.5" 7.2K RPM NL-SAS	400GB SSD, 2TB NL-SAS	Up to 84.8TB
		PS6500X	High-density, high-performance for capacity-intensive primary applications	48 x 2.5" 10K RPM SAS	600GB, 900GB[4] SAS	Up to 43.2TB
		PS6500E	High-density system for huge capacity and scalability at best cost-per-gigabyte in series	48 x 3.5" 7.2K RPM SATA and NL-SAS	1TB, 2TB SATA, 3TB[4] NL-SAS	Up to 144TB
Entry-midrange arrays	**10GbE**	PS4210XS	SSD speed and HDD capacity within one array	7 x 2.5" SSD and 17 x 2.5" 10K RPM SAS	400GB SSD; 600GB SAS	Up to 13TB
		PS4210XV	Highest performance HDD system	24 x 2.5" 15K RPM SAS	300GB SAS	Up to 7.2TB
		PS4210XV 3.5"	High-performance 15K RPM HDD system with higher capacity	12 x 3.5" 15K RPM SAS	600GB SAS	Up to 7.2TB
		PS4210X	Great balance of cost, performance and capacity	24 x 2.5" 10K RPM SAS	600GB, 900GB, 1.2TB SAS	Up to 28.8TB
		PS4210E	Entry-level configurations for affordable capacity	12 x 3.5" 7.2K RPM NL-SAS	2TB, 3TB, 4TB NL-SAS	Up to 48TB
	1GbE	PS4100XV[3]	Exceptional IOPS performance for remote office consolidation	24 x 2.5" 15K RPM SAS	300GB SAS	Up to 7.2TB
		PS4100XV 3.5"	Cost-effective performance and capacity for your enterprise data center	12 x 3.5" 15K RPM SAS	600GB SAS	Up to 7.2TB
		PS4100X[3]	Balance of cost, performance and capacity for remote/branch office data centers	24 x 2.5" 10K RPM SAS	600GB, 900GB SAS	Up to 21.6TB
		PS4100E	High-capacity array for efficiency and cost-effectiveness	12 x 3.5" 7.2K RPM NL-SAS	1TB, 2TB, 3TB NL-SAS	Up to 36TB
Blade arrays	**10GbE**	PS-M4110XS	Hybrid configuration with SSD speed and performance and HDD capacity	9 x 2.5" 10K RPM SAS + 5 x 2.5" SSDs	600GB, 1.2TB SAS; 400GB, 800GB SSD	Up to 14.8TB
		PS-M4110XV	High-performance option for business-critical applications in a consolidated blade chassis	14 x 2.5" 15K RPM SAS	300GB SAS[4]	Up to 4.2TB
		PS-M4110X	Best balance of capacity and performance for storage blade array	14 x 2.5" 10K RPM SAS	600GB, 900GB, 1.2TB[4] SAS	Up to 16.8TB
		PS-M4110E	SAN capacity in a blade chassis at an affordable price	14 x 2.5" 7.2K RPM NL-SAS	1TB NL-SAS[4]	Up to 14TB

[3] Limited availability in certain regions
[4] Also available in SED

DELL

FS76X0 NAS appliance features

File protocol support

- NFSv3, NFSv4, SMB 1.0, SMB 2.0 and SMB 2.1 (for implementation detail, please refer to the FluidFS support matrix)

Storage arrays supported

- Any EqualLogic group running version 7.0 or later firmware

Cluster capability

- Up to two FS7600/FS7610 appliances (four controllers) in a single NAS cluster

Management

- EqualLogic Group Manager

1GbE configuration options

- Two Intel 1GbE four-port NICs per controller
- Client connectivity over Ethernet, SAN connectivity over iSCSI Ethernet switch is required; direct connect to the SAN is not supported

10GbE configuration options

- Two Intel 10GbE dual-port NICs per controller, copper or optical, SFP+ or 10GBASE-T standards
- Client connectivity over Ethernet, SAN connectivity over iSCSI Ethernet switch is required; direct connect to the SAN is not supported

Data protection

- Redirect-on-write snapshots; max number of snapshots per container/cluster: 1,024/10,000
- Policy based deduplication and compression
- Asynchronous file replication

Array software features

Management

- Browser-based client, or CLI Group Manager user interface
- Roles-based management
- LDAP and Microsoft Active Directory integration
- Powerful, flexible PowerShell scripting (also Perl, Python, CLI)
- Smart Tags that allow users to "tag" volumes with descriptive metadata labels

Data protection

- Space-efficient snapshots
- Point-in-time replication
- Synchronous Replication
- Clones and template-based thin clones
- Consistency groups
- Default daily snapshot
- Space borrowing with replication
- Multiple delegated spaces for a single replication partner

Storage virtualization

- Online SAN expansion and array retirement
- Expand and shrink storage resources online
- Thin provisioning
- Auto-load balancing and tiering
- Storage UNMAP
- SAN Data Copy Offload
- Port virtualization
- Storage pools
- Compression of snapshots and replicas

Maintenance

- Email home/email alerting
- Detailed audit logging
- Enclosure monitoring system
- Integration with Dell SupportAssist via EqualLogic SAN HQ or OpenManage Essentials

Software upgrades

- Dell Storage Update Manager simplifies the process of updating the firmware for EqualLogic PS Series, FS Series and disk drives with guided update management
- Supports PS Firmware 5.0x and FS Firmware 3.0x and later

Host software features

Microsoft integration

- Application-consistent data protection and quick recovery with Auto-Snapshot Manager for Microsoft (Hyper-V®, Exchange, SQL Server®, SharePoint®, and NTFS, ReFS and CSV File Systems)
- Multipathing I/O (MPIO) Device Specific Module (DSM)
- Easy setup of multiple storage arrays with Remote Setup Wizard
- Windows Server storage management
  - PowerShell Tools
  - Storage Management Provider
  - Storage management with System Center Virtual Machine Manager
  - Storage integration with VSS, VDS, HPCC and SMP providers

VMware integration

- Virtual Storage Manager (VSM) for VMware
- ESX MPIO Multipathing Extension Module (MEM) for VMware vSphere®
- Storage Replication Adapter for VMware vCenter Site Recovery Manager (SRA)
- EqualLogic Adapter for vRealize Operations Manager™
- Advanced integration with vSphere Virtual Volumes creates a VM-aware solution for faster VM deployments and snapshot restore
- Global search of snapshots and replicas
- Scheduling templates that can be used for both snapshots and replication

Linux integration

- Auto-Snapshot Manager/Linux Edition
- Host Performance and Configuration Tuning Suite
- Enhanced MPIO
- Remote Setup Wizard Command Line Interface
- On-Demand Volume Re-thinning Facility
- Log Gathering Facility

SAN Headquarters

- Utilization and performance monitoring
- Multi-site, multi-group monitoring
- Events and alerts
- Formatted reports, graphs and archives
- SupportAssist proactive, automated services integration for automated case creation, diagnostic data collection and EqualLogic case viewing
- Model RAID policy choice and RAID protection reliability
- Estimate maximum I/O
- Offline analysis capability

Global services and support

Reduce IT complexity, lower costs and eliminate inefficiencies by making IT and business solutions work harder for you. You can count on Dell for end-to-end solutions to maximize your performance and uptime. A proven leader in Servers, Storage and Networking, Dell Enterprise Solutions and Services deliver innovation at any scale. And if you're looking to preserve cash or increase operational efficiency, Dell Financial Services has a wide range of options to make technology acquisition easy and affordable. Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support are recommended to provide you the right support services for your EqualLogic solution.[5] Contact your Dell representative today for more information.

[5] Availability and terms of Dell Services vary by region. Dell Basic Service is included standard with EqualLogic units. For more information, visit Dell.com/servicedescriptions.

Simplify Your Storage at Dell.com/EqualLogic.