High-performance, cost-effective storage for mixed workloads

By Chhandomay Mandal

Flash-based storage delivers the speed that performance-hungry applications need. The latest generation of Dell EqualLogic arrays unlocks the power of flash to provide cost-effective, high-performance storage for data-intensive virtual environments.

As applications become increasingly complex and the servers they run on are virtualized, organizations need to up the ante on storage performance. In particular, large, virtualized environments require storage that can handle a mix of application workloads with differing I/O demands. But even as enterprises seek to heighten storage performance, budget limitations require them to achieve a low total cost of ownership (TCO).

The latest generation of Dell EqualLogic PS Series storage area network (SAN) arrays provides a scalable, cost-effective solution designed to help organizations meet these demands. Twelfth-generation EqualLogic PS6210 arrays combine flash storage and 10 Gigabit Ethernet (10GbE) to deliver high I/Os per second (IOPS) and high throughput.

Driving down storage TCO

To reduce TCO, organizations must consider capital costs associated with hardware and software, as well as operational costs associated with management, migration, support, power and cooling. EqualLogic PS6210 arrays help lower costs in several ways.

Streamlined storage software and support processes lead to operational cost-savings. For example, Dell SupportAssist functionality in EqualLogic SAN Headquarters v3.0 monitoring and analysis software enables automated support case creation and delivery of diagnostic logs to Dell technical support, as well as case tracking views. Also, EqualLogic FS Series network attached storage (NAS) appliances deduplicate and compress redundant data, helping decrease the storage capacity needed — which leads to reduced power and cooling costs.

Additionally, the ability to support multiple hardware generations in the same EqualLogic SAN helps increase the return on an EqualLogic storage investment. The EqualLogic PS6210 array is designed to function seamlessly in a group comprising any combination of EqualLogic PS Series arrays.

Third-party analysis drives home the TCO advantage. Industry analyst firm Enterprise Strategy Group (ESG) recently compared the total cost of storage

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ownership of an EqualLogic Internet SCSCI (iSCSI) SAN solution to solutions from two other storage vendors.[1]

ESG analyzed models for two theoretical medium-sized businesses. The smaller company was modeled with a requirement of 112 TB of block-based storage capacity, and the larger company with a requirement of 218 TB. For the smaller storage model, ESG calculated that the EqualLogic solution had a TCO over five years that was 41 percent and 47 percent less than comparable offerings from storage vendor A and storage vendor B, respectively.

In the large storage model, the EqualLogic solution had a TCO that

was 44 percent and 58 percent less than similar competitive offerings from storage vendor A and storage vendor B (*see figure*). The difference can be primarily attributed to a combination of cost-savings in hardware for EqualLogic, the fact that EqualLogic arrays include software licensing at no additional charge, and the ease of management and support for the EqualLogic arrays. In fact, ESG determined that management costs associated with comparable configurations from storage vendor A and storage vendor B were up to 28 percent more than those associated with the EqualLogic solution.

Boosting storage performance and capacity

In addition to low TCO, many organizations also require excellent performance for data-intensive workloads combined with high-capacity storage for less frequently accessed data. EqualLogic PS6210 arrays feature a controller reengineered with higher-performance hardware than the previous-generation controller, including more powerful processors, more 10GbE ports and enhanced software that optimizes flash performance. The arrays also are designed with faster memory to minimize latency and four times more

[1] "Lab Report: Dell EqualLogic PS Series Storage and TCO Analysis," by Aviv Kaufmann and Mike Leone, Enterprise Strategy Group, January 2014, dell.to/1b27HJa.
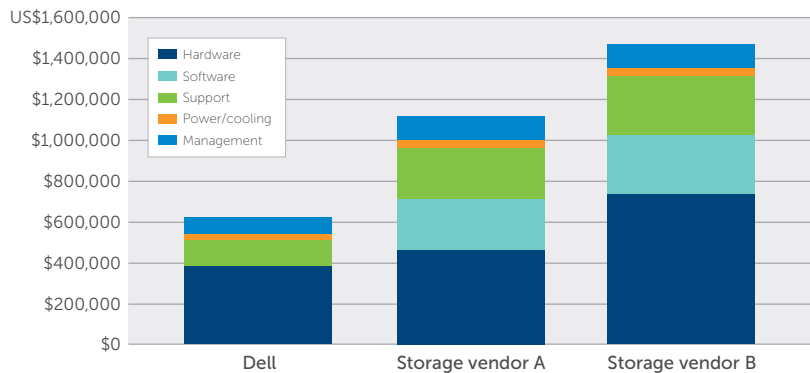
memory to increase capacity compared to the previous-generation arrays.

EqualLogic PS6210 arrays provide exceptional storage performance and capacity for online transaction processing (OLTP) environments. The EqualLogic PS6210 family includes a hybrid option that combines both solid-state drives (SSDs) and traditional hard disk drives (HDDs) in the same chassis. The automated data tiering capability of the hybrid array balances the performance of the SSD tier and the capacity of the HDD tier to meet the mixed requirements of an OLTP environment. In fact, the EqualLogic PS6210XS hybrid array provides up to two times the OLTP workload performance with less than half the latency when compared to the EqualLogic PS6110XS array.[2]

EqualLogic PS6210 arrays are also well suited for virtual desktop infrastructure (VDI) environments. The EqualLogic PS6210XS hybrid array can host 2,000 VMware® Horizon™ View desktops, a 2.4 times improvement over the EqualLogic PS6110XS.[3] They provide the capacity to store not only desktop virtual machines, but also the associated end-user application data. In addition, EqualLogic PS6210 arrays are designed to deliver the performance required for handling utilization spikes such as I/O storms generated when large numbers of virtual desktops are booted simultaneously.

Solving real-world challenges

Many organizations must meet the storage performance and capacity needs of data centers running a variety

Source: "Lab Report: Dell EqualLogic PS Series Storage and TCO Analysis," Enterprise Strategy Group, January 2014, dell.to/1b27HJa.

TCO comparison over five years for a theoretical medium-sized business requiring 218 TB of storage

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of workloads in a cost-effective manner. But traditionally, meeting requirements for high performance and high capacity meant moving to a flash solution, which has been cost-prohibitive for many organizations.

Dell is helping to change that paradigm with the latest-generation, high-performance EqualLogic PS6210 storage arrays. A study conducted by ESG demonstrates that EqualLogic PS6210 storage is easy to configure and manage, and it offers significant cost-savings compared to alternative approaches. After careful analysis, organizations may find that EqualLogic PS6210 all-flash or hybrid arrays meet capacity and performance requirements even more affordably than HDD solutions — helping them attain a high-performing, efficient data center. PS

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[2] Performance may vary depending on the workload and drive type. Based on September 2013 Dell performance testing comparing the EqualLogic PS6210XS and EqualLogic PS6110XS arrays with 4 KB block and 70/30 read/write random I/O operations. "OLTP With Dell EqualLogic Hybrid Arrays: Comparing the EqualLogic PS6210XS With the EqualLogic PS26110XS," by Principled Technologies, commissioned by Dell Inc., November 2013, dell.to/1evE5F4.

[3] Performance will vary depending on the VDI workload. Based on October 2013 Dell performance tests using LoginVSI VDI workload generator tool. "Desktop Virtualization with VMware Horizon View 5.2 on Dell EqualLogic PS6210XS Hybrid Storage Array," by Paul Wynne and Chhandomay Mandal, Dell Inc., December 2013, dell.to/1hn3fJc.

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