

# Network Computing

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## ROLLOUTS

### EqualLogic Amps Up Storage Power

New SAS arrays outperform SATA models BY STEVEN HILL



EQUALLOGIC'S NEWEST ENTERPRISE-CLASS iSCSI storage arrays combine the performance of SAS drives with some tasty features in the company's upgraded PS Series 3.0 firmware. With its move away from the SATA drives of earlier systems, EqualLogic has maintained the PS line's capacity, fault tolerance and management ease, but given a serious performance jolt to the PS3800XV and higher-capacity PS3600X.

The move from SATA (Serial ATA) to the speedier SAS (Serial Attached SCSI) was a natural choice, as these drives have a common backplane interface and complementary protocols. Many first-tier server vendors, such as Hewlett-Packard and Sun, are anticipating the retirement of the legacy parallel SCSI architecture by switching to SAS.

EqualLogic still offers its existing SATA systems, the PS50, 100, 300 and 400E, which provide up to 10.5 TB of storage, for capacity-oriented applications. The company is aiming the new 2.4-TB PS3800XV and 4.8-TB PS3600X SAS systems at the performance market. The arrays are priced at \$65,000 each, but the PS3800XV uses 15,000-RPM drives that hold 146 GB each, while the PS3600X contains 10,000-RPM drives with 300 GB apiece. By comparison, the 10.5-TB PS400E lists for \$66,000.

Physically, the 3000 series is a substantial change from earlier PS systems. The PS3800XV's redundant controller modules have been redesigned, and the unit holds 16 drive enclosures rather than the previous 14. Not changed are the robust architecture and the simple setup and configuration of the iSCSI SAN. The modular design makes it possible to create load-balanced storage pools that can be expanded or reduced dynamically.

Initial setup of the 3800 takes only a few minutes using the serial connection. A new Windows-based Host Integration Toolkit, developed in cooperation with

Microsoft's Simple SAN initiative, contains a GUI Remote Setup Wizard, an Auto Snapshot Manager for Volume Shadow Copy Service integration, software support for multipath IO and Virtual Disk Service provider for companies that use Microsoft Storage Manager for SANs.

#### [ the upshot ]

**CLAIM:** The faster storage processors and Serial Attached SCSI disks of EqualLogic's new PS3000 series of iSCSI arrays provide the performance needed to support transactional applications such as busy databases with steep IO requirements.

**CONTEXT:** For iSCSI to compete in the enterprise market, it must offer scalability, reliability and performance to match Fibre Channel solutions. Adding SAS-based solutions to EqualLogic's iSCSI arsenal should satisfy storage admins who were hesitant to adopt SATA devices for high-performance or critical apps.

**CREDIBILITY:** The 2.4-TB PS3800XV offers practically everything you'd want in a storage device. Its SAS drives outperform earlier-generation SATA models, though the raw throughput of its 16 15,000-RPM drives is still limited by the bandwidth multiple Gigabit Ethernet interfaces offer. Upcoming 10 GbE price reductions and the arrival of 10GBASE-T will eliminate that concern; a simple module replacement is likely to triple the PS3800XV's performance.

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## A MANAGER'S DREAM

EqualLogic's management interface has always been strong, and the improvements found in 3.0's software environment make it even better. All EqualLogic arrays in an iSCSI SAN can be managed from one browser session. The company has added support for multiple RAID levels (RAID 5, 10 or 50) and controls for hot-spare designation.

The software also has tools that enable performance-based, tiered storage. In environments that combine EqualLogic's fast 3000 series systems with its slower but cheaper SATA-based PS modules, the new management interface makes it possible to migrate volumes from the higher-speed SAS systems to the SATA storage. One minor shortcoming: EqualLogic's management tool lacks automated, thin-provisioning capabilities. Many top iSCSI vendors already offer this feature, which lets admins optimize physical storage by allocating volume space based on current needs and allowing the system to automatically increase storage when a preassigned usage threshold is reached. Still, the enhanced granularity and performance-tuning capabilities come without sacrificing basic simplicity and make EqualLogic an excellent choice for environments without dedicated storage personnel.

## SASSIER THAN SATA

We tested the PS3800XV in our Green Bay, Wis., Real-World Labs®. For comparison, we also ran tests on EqualLogic's SATA-based, 10.5-TB PS400E. We used Iometer and four Opteron-based servers with multiple Gigabit Ethernet ports on both arrays. In all cases, the SAS unit outperformed its SATA competition. Overall, the SAS system averaged 48 percent faster in reads and

## PERFORMANCE COMPARISON: PS3800XV (SAS) VS. PS400E (SATA)

TARGET TYPE	SPEC	IOPS	MBPS	PERF. DIFF.*
PS3800XV (SAS)	64k Read	4,964	310	38%
PS400E (SATA)		3,597	225	
PS3800XV (SAS)	64k Write	2,739	171	15%
PS400E (SATA)		2,391	149	
PS3800XV (SAS)	1Mb Read	330	330	46%
PS400E (SATA)		226	226	
PS3800XV (SAS)	1Mb Write	158	158	1%
PS400E (SATA)		156	156	
PS3800XV (SAS)	512b IO/ps	51,559	25	7%
PS400E (SATA)		48,340	24	
PS3800XV (SAS)	NWC Custom	4,402	114	115%
PS400E (SATA)		2,049	53	

\*SAS increase in performance over SATA.

8 percent faster in writes than the high-capacity SATA enclosure. Our 512-byte IOps test showed only a 7 percent difference between the two systems. The PS3800XV also aced our NWC Custom test—a torture test that hammers systems with a mix of small random reads and writes. The SAS array moved more than twice as much data as its SATA counterpart.

The addition of a SAS solution helps round out EqualLogic's enterprise SAN potential and gives customers a choice between capacity-oriented 7,200-RPM SATA and 10,000-RPM midrange or 15,000-RPM high-performance SAS platforms. The respectable 300-Mbps performance is constrained by the three GbE ports, but it's too early to fault EqualLogic for the lack of a 10-GbE solution. ■

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