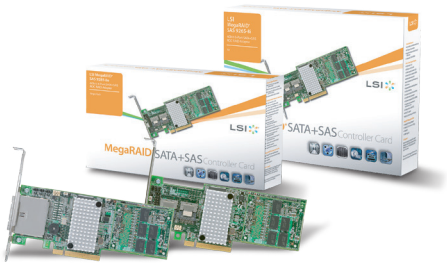
Storage. Networking. Accelerated.

Product Brief

Performance Brief:

MegaRAID SAS 9265/9285 Series



LSI MegaRAID SAS 9285-8e

Performance Summary

- Measured IOPS surpass 200,000 IOPS
- When used with MegaRAID FastPath™ software, IOPS exceed 465,000
- Up to 3X the IOPS of existing industryleading LSI 6Gb/s controllers
- 4X-7.5X the IOPS of next closest competitor
- Up to 67% improvement in RAID 5 and RAID 6 sequential writes over existing industry-leading LSI 6Gb/s controller
- Unmatched RAID 5 and RAID 6 streaming bandwidth performance
- Highest IOPS performance inSSD environment
- 25-35% improvement in 3Gb/s SATA

Executive Summary

LSI® MegaRAID® SAS 9265/9285 series controller cards, powered by the LSISAS2208 dual-core 6Gb/c SAS RAID-on-Chip (ROC), deliver the industry's highest server RAID IOPS and bandwidth, extending the performance leadership offered by the existing family of LSI 6Gb/s SATA+SAS MegaRAID controllers. This second-generation 6Gb/s SAS MegaRAID series includes an 8-port internal controller (9265-8i) and 8-port external controller (9285-8e) to address high-performance storage requirements for both inside and outside the server. The low profile MD2 form factor controllers feature the LSISAS2208 SAS ROC IC with two 800MHz PowerPC® processor cores and 1GB DDRIII cache memory. The cards provide support for up to 240 SATA and SAS hard drives or solid state drives (SSDs), and support hardware RAID levels 0, 1, 5, 6, 10 and 60.

LSI uses the latest technology and features on the second-generation 9265/9285 series designed to deliver significant performance improvements over the existing industry-leading LSI 6Gb/s MegaRAID controllers. Additionally, the 9265/9285 controllers outperform the competition with unmatched RAID IOPS, bandwidth and SSD support. This brief outlines these performance accomplishments with LSI internal benchmark results in a variety of configurations and environments.

Highest Server RAID Performance – Over 465, 000 IOPS

The MegaRAID SAS 9265 and 9285 series controllers drive performance levels up beyond 465,000 I/Os per second (IOPS) to meet the high I/O transaction demands of datacenters, database and cloud applications. Transaction-oriented environments, which have many I/Os operations per second and are dominated by random I/O access patterns, will enjoy impressive performance gains with the MegaRAID SAS 9265 and 9285 RAID controller cards. These applications include email servers, web servers, databases, data warehousing and OLTP (online transaction processing).

LSI internal benchmark testing shows that measured IOPS for these second-generation 6Gb/s SATA+SAS RAID controllers from LSI surpass 200,000, and exceed 465,000 IOPS when used in conjunction with MegaRAID FastPath software in SSD environments (Figure 1). When tested side-by-side with the MegaRAID SAS 9260/9280 series controllers, the 9265/9285 controllers boost IOPS performance up to 3 times (3X) that of these existing industry-leading 6Gb/s RAID controllers based on the LSISAS2108 ROC. Furthermore, the 9265/9285 series provides between four and seven-and-a-half times (4X-7.5X) the IOPS of the next closest competitor (Figure 2).

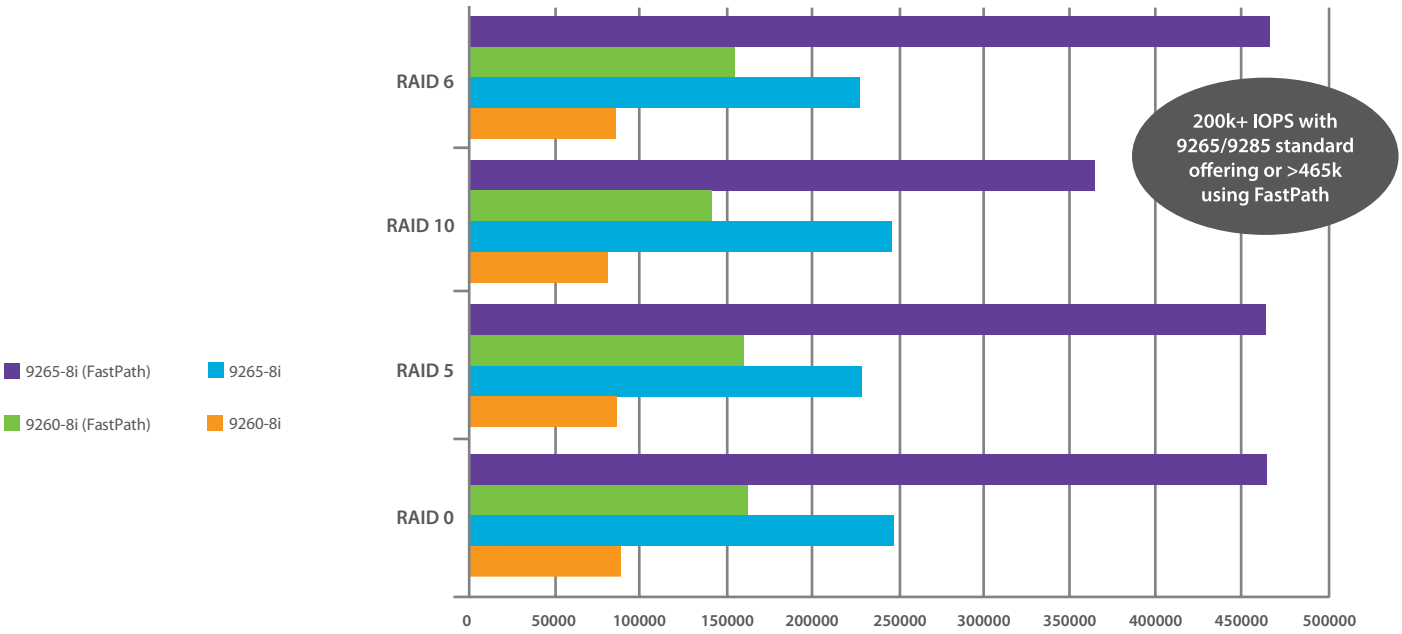


Figure 1: Internal LSI testing comparing Random Read IOPS performance of 1st-generation and 2nd-generation 6Gb/s MegaRAID SAS controllers using 8 solid-state drives (SSDs).

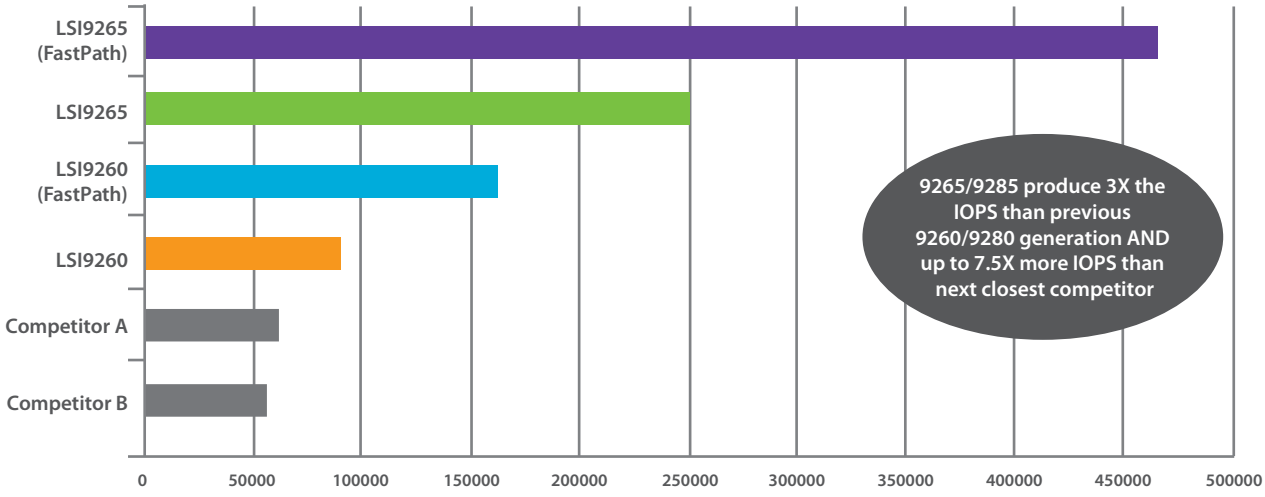


Figure 2: Internal LSI testing illustrating competitive single-block random read IOPS performance using 8 SSDs in a RAID 0 array

Industry-leading Bandwidth for Digital Media, Video, Imaging

In addition to high IOPS performance, the 9265/9285 is equally adept at supporting bandwidth-intensive applications. These MegaRAID SAS controllers, based on the LSISAS2208 ROC, are designed to provide the sustained data transfer rate (SDTF) horsepower and high sequential bandwidth to meet the processing requirements of digital media, video, imaging and high-performance computing environments. High bandwidth applications like these are characterized by large sequentially stored data sets and are measured in megabytes per second (MB/s).

LSI performed a series of internal benchmark tests to confirm the performance of the MegaRAID SAS 9265/9285 RAID controllers under streaming workloads typical of high-bandwidth applications. As shown in Figure 3, the 9265/9285 controller demonstrated up to a 67% improvement over the MegaRAID 9260/9280 series, with RAID 5 sequential writes over 2500MB/s versus 1500MB/s by the previous generation.

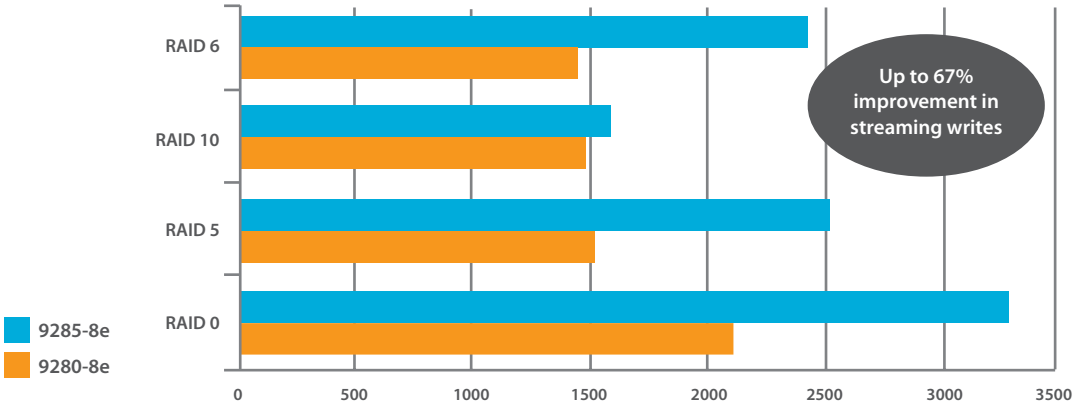


Figure 3: Internal LSI testing comparing Streaming Write MB/s performance of 1st-generation and 2nd-generation 6Gb/s MegaRAID SAS controllers using 24 6Gb/s SAS HDDs

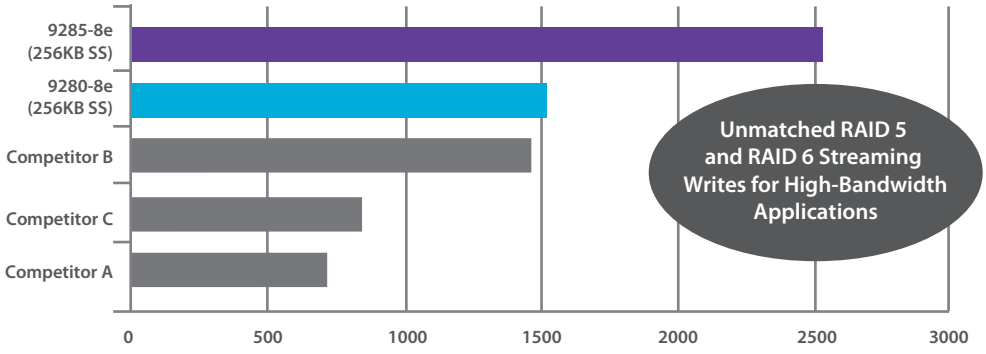


Figure 4: Internal LSI testing illustrating competitive large streaming writes MB/s performance using 24 6Gb/s SAS HDDs in a RAID 5 array

Exploit Performance Potential of Solid-State Drives

As customers look to increase overall performance of their storage infrastructure, SSDs will continue to make inroads into the enterprise server market. Solid state storage accelerates random I/O processing to increase productivity for transaction-intensive applications. Many data centers are implementing SSD tiered storage for applications with the highest IOPS performance requirements. These applications include OLTP servers, email servers, and cloud computing. However, in order to exploit the full potential of the SSDs, the RAID controller in the server must have sufficient performance and throughput to be able to scale with the storage.

LSI MegaRAID controllers provide the most comprehensive offering of SSD software and support features in the industry. The 9265/9285 series is able to complement SSD adoption and exploit their potential with unmatched IOPS performance, SSD Guard™ technology protection and MegaRAID CacheCade™ and FastPath software options. Figure 5 shows that the 9265/9285 series controllers outperform the competition in real-world SSD environments by up to 250%. Figure 6 expands on the performance improvements seen in multiple real-world applications using SSDs as compared to the previous generation 9260/9280 series. These benchmarks are shown as a percentage improvement from one generation to the next, with up to 164% improvement in RAID 5 arrays.

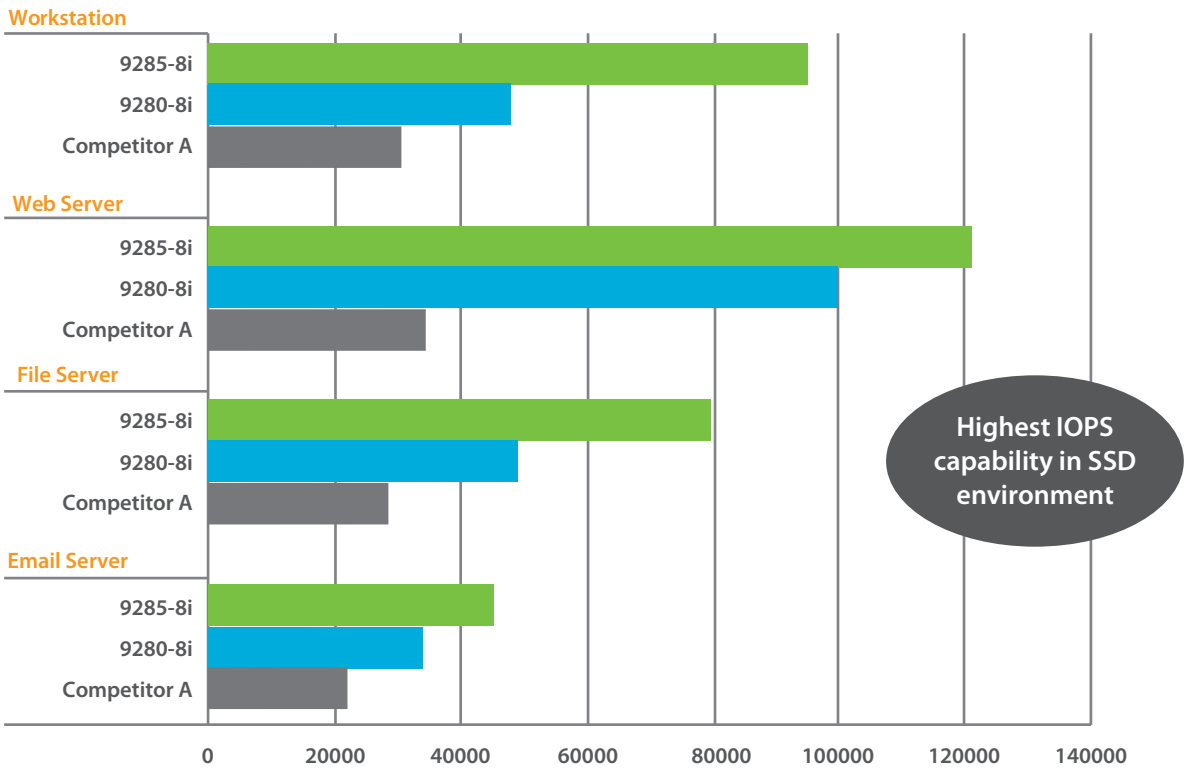


Figure 5: Internal LSI testing illustrating competitive real-world workload performance using eight SSDs.

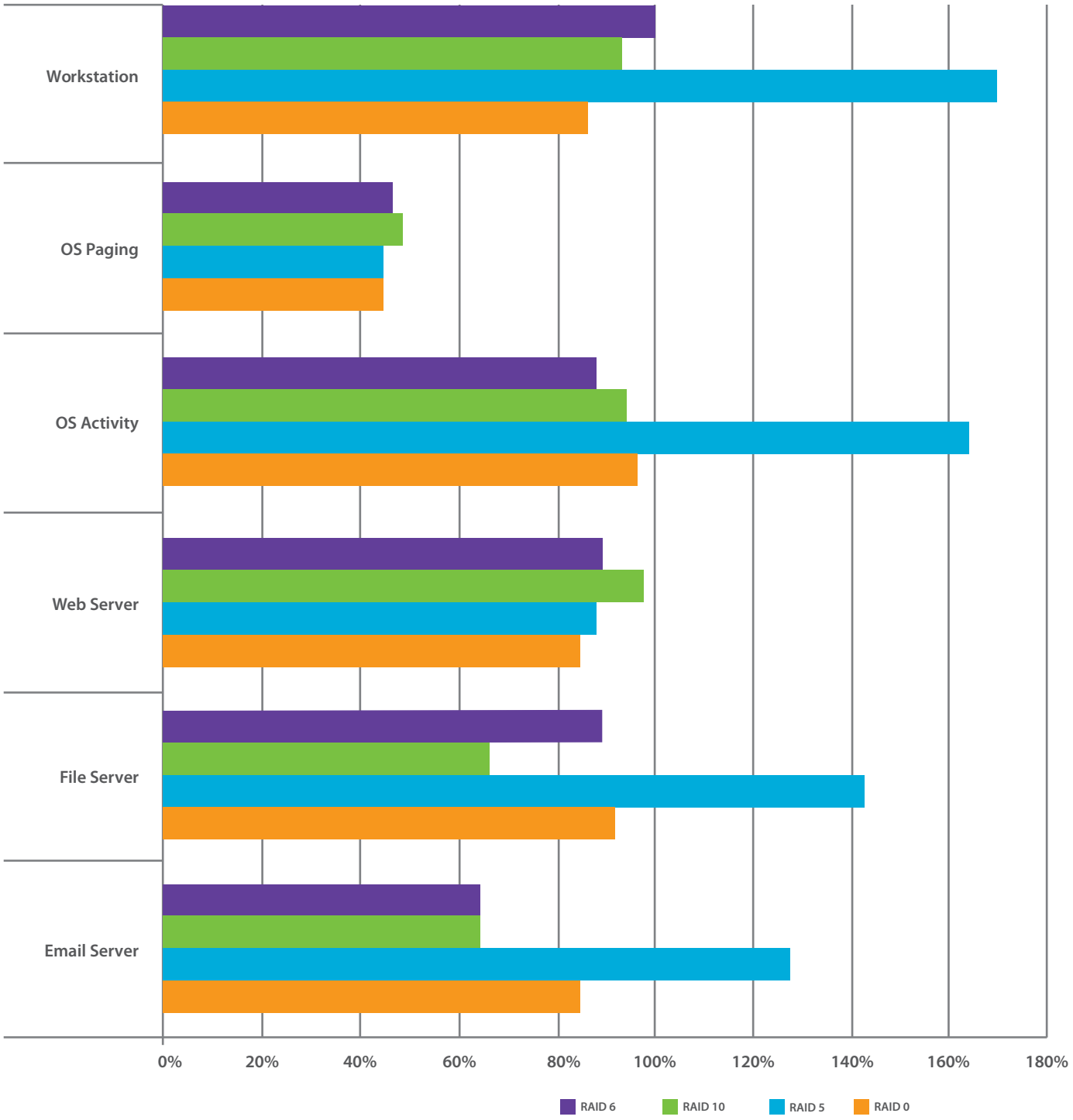


Figure 6: Internal LSI testing showing real-world IOPS performance of 9265/9285 series as percentage improvement over 1st-generation 9260/9280 series; using 8 SSDs.

Improved SAS and SATA performance

In addition to the unmatched SSD RAID performance, the MegaRAID SAS 9265/9285 also demonstrates performance improvements for applications employing SAS and SATA hard drives. During LSI internal testing, the LSI 9265/9285 controllers produced up to 67% better streaming write performance and up to 42% better random write performance using 6G SAS hard drives (Figure 7 and Figure 8). For environments using SATA drives, these 2nd-generation 6Gb/s controllers show a 25-35% improvement in 3G SATA streaming performance (Figure 9).

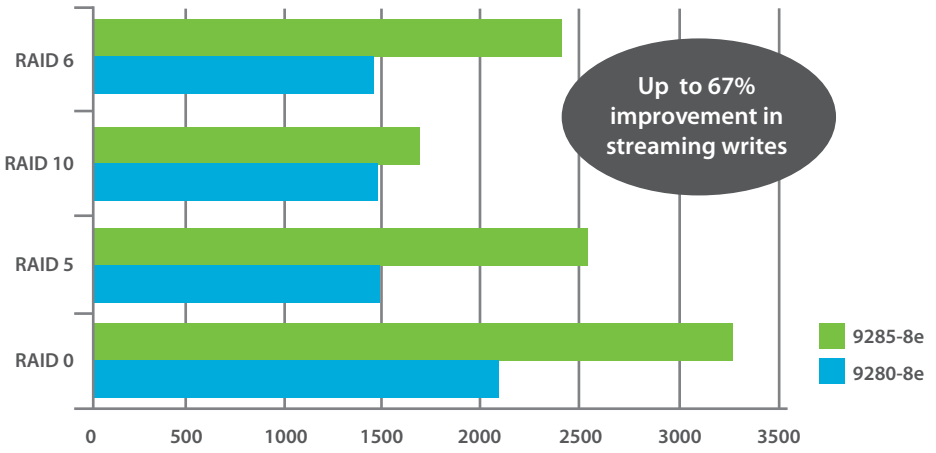


Figure 7: Internal LSI testing comparing sequential write MB/s performance of 1st-generation and 2nd-generation 6Gb/s MegaRAID SAS controllers using 24 6Gb/s SAS HDDs

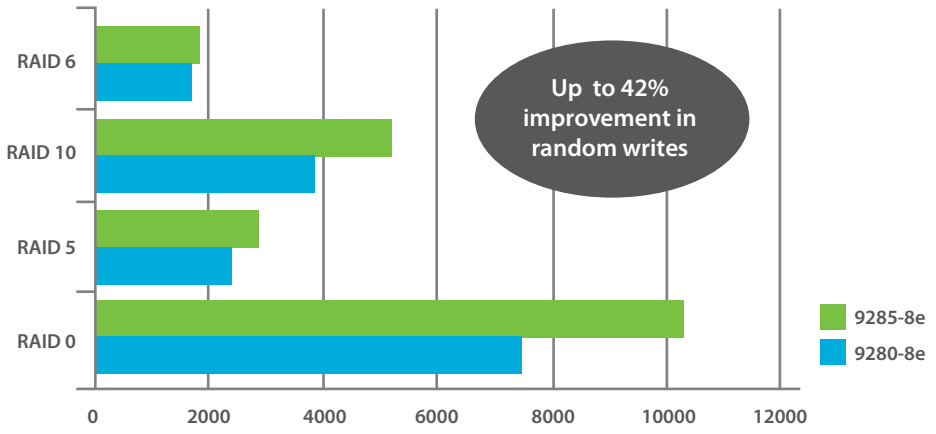


Figure 8: Internal LSI testing comparing random write IOPS performance of 1st-generation and 2nd-generation 6Gb/s MegaRAID SAS controllers using 24 6Gb/s SAS HDDs

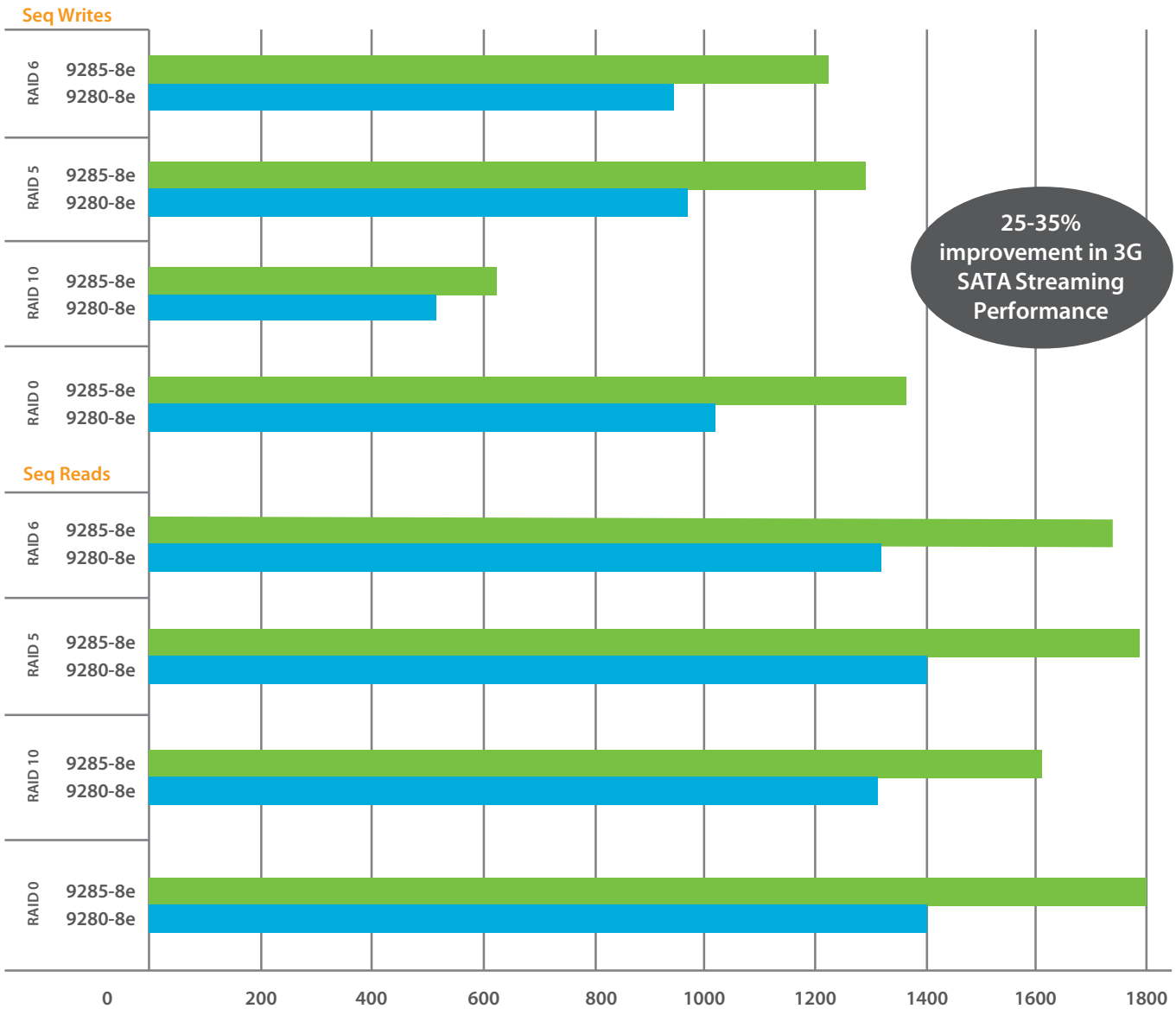


Figure 9: Internal LSI testing comparing sequential MB/s performance of 1st-generation and 2nd-generation 6Gb/s MegaRAID SAS controllers using 24 3Gb/s SATA HDDs

Summary

The LSI MegaRAID SAS 9265/9285 series is equally adept at supporting the high I/O applications, such as databases and cloud, and the bandwidth-intensive applications, such as digital media, video and imaging. Building on the strength of the existing industry-leading 6Gb/s SAS MegaRAID offering, LSI delivers the highest server RAID performance with the second-generation 9265/9285 series. This unmatched performance (in both IOPS and bandwidth), combined with some of the most advanced SSD support and software in the industry make the MegaRAID SAS 9265/9285 controllers a key storage building block for channel partners building high-performance storage solutions for a wide variety of applications

LSI MegaRAID Controller	Ordering Part Number(s)	Internal Ports	External Ports	Processor	Cache Memory	Host Interface
MegaRAID SAS 9265-8i	LSI00277 (SGL) LSI00278 (KIT)	8 (2 x SFF8087)	-	Dual-core LSISAS2208 (ROC)	1GB DDRIII	X8 PCIe 2.0
MegaRAID SAS 9285-8e	LSI00284 (SGL)	-	8 (2 x SFF8088)	Dual-core LSISAS2208 (ROC)	1GB DDRIII	X8 PCIe 2.0

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