LSI
Storage. Networking. Accelerated.

Product Brief

LSI® MegaRAID® FastPath™ Software

An IO Accelerator for Solid State Drive Arrays

Key Features

- Up to 150,000 IO reads per second for small, random block-size IO activity
- Up to two times faster than solutions not using MegaRAID FastPath software
- LSI SSD Guard™ preventative failure protection for SSDs

LSI MegaRAID FastPath software is a high-performance IO accelerator for Solid State Drive (SSD) arrays connected to a MegaRAID controller card. This advanced software is an optimized version of LSI MegaRAID technology that can dramatically boost storage subsystem and overall application performance – particularly those that demonstrate high random read/write operation workloads – when deployed with a 6Gb/s MegaRAID SATA+SAS controller connected to SSDs.

Why SSDs?

There is so much buzz about SSDs because of the read performance and power advantages that they provide. Individual SSDs can reach up to 45,000 or more read IOPs compared to the fastest enterprise hard disk drives that can only reach up to a few hundred IOPs. Also, power consumption per IOP in SSDs is a fraction of that required for hard disk drives.

MegaRAID FastPath Software Applications and Performance

Application workloads that will benefit most from MegaRAID FastPath software with SSD volumes are those with small and random IO patterns requiring high transactional throughput, such as OLTP.

Software License Ordering PN	LSI00266
Physical Key Ordering PN	LSI00247
Supported RAID Controllers	MegaRAID SAS 9260-4i MegaRAID SAS 9260-8i MegaRAID SAS 9261-8i* MegaRAID SAS 9260-16i MegaRAID SAS 9280-4i4e MegaRAID SAS 9280-8e* MegaRAID SAS 9280-16i4e MegaRAID SAS 9280-24i4e
Supported Operating Systems	All supported operating systems
Supported SSDs	No restrictions. Please visit www.lsi.com/channel/support/marketing_resources for a complete list of tested SSDs.

* These controllers will accept only a software license and are not compatible with the physical hardware key

RAID 0 Random Workload Performance

With MegaRAID FastPath software enabled, SSD configurations tuned for small, random block-size IO activity – typical of transactional database applications – can sustain over 150,000 IO reads per second in RAID 0 configurations. This is two times the transactional performance of identical configurations when the MegaRAID FastPath software is disabled. This is particularly evident in 4K random reads and random writes; as well as 4K and 8K OLTP transaction-oriented benchmarks.

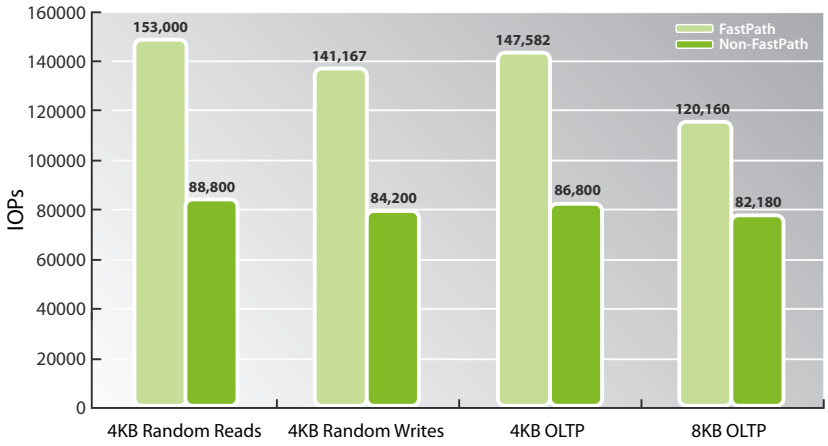

Figure 1: RAID 0 Random Workload Performance

Test Specifications

Release Package

- FastPath – MegaRAID Release 4.3 with MegaRAID FastPath Software Enabled
- Non-FastPath – MegaRAID Release 4.3

RAID Adapter

- MegaRAID SAS 9260-8i

SSDs

- Eight Intel X25E SSD Drives

Benchmark Configuration

- RAID 0/64KB Stripe Size/Write Through/Direct IO/No Read Ahead/Disk Cache Enabled

Benchmark Profile(s)

- 4KB Random Reads/Writes
- 4KB and 8KB OLTP

In Figure 1, note that in the standard mode where MegaRAID FastPath software is not enabled, arrays are able to reach more than 80,000 IOPs. This is due to additional performance tuning optimizations over previous 6Gb/s MegaRAID SATA+SAS generations. However, with the MegaRAID FastPath software enabled, users can experience more than 70% increase in IOPs throughput.

RAID 5 Random Workload Performance

In Figure 2, read performance in RAID 5 configurations demonstrate similar IOPs performance as RAID 0. When comparing RAID 5 write performance, MegaRAID FastPath software demonstrates 2.5 times the IOPs performance over an identical configuration with this feature disabled shown in Figure 3.

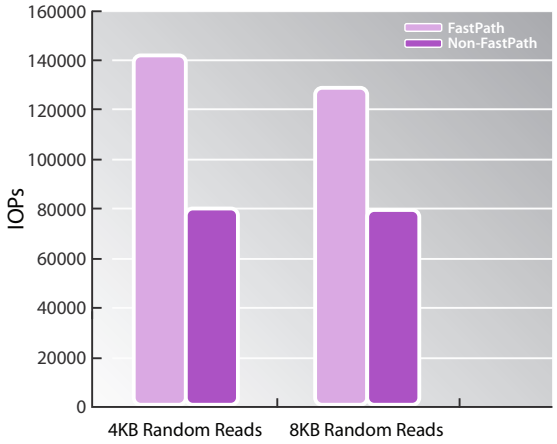

Figure 2: Read Performance in RAID 5 Configurations

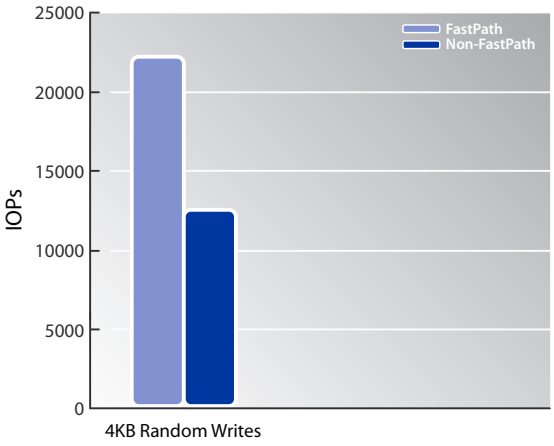

Figure 3: Write Performance in RAID 5 Configurations

Test Specifications

Release Package

- FastPath – MegaRAID Release 4.3 with MegaRAID FastPath Software Enabled
- Non-FastPath – MegaRAID Release 4.3

RAID Adapter

- MegaRAID SAS 9260-8i

SSDs

- Eight Intel X25E SSD Drives

Benchmark Configuration

- RAID 5/64KB Stripe Size/Write Through/Direct IO/No Read Ahead/Disk Cache Enabled

Benchmark Profile(s)

- 4KB Random Reads/Writes
- 8KB Random Reads/Writes

RAID 0 Real World Performance

MegaRAID FastPath software significantly boosts server application performance levels for real-world workloads as well. MegaRAID controllers with MegaRAID FastPath software disabled are limited to 80,000 IOPs, while application performance improves by up to 45% with MegaRAID FastPath software enabled shown in Figure 4.

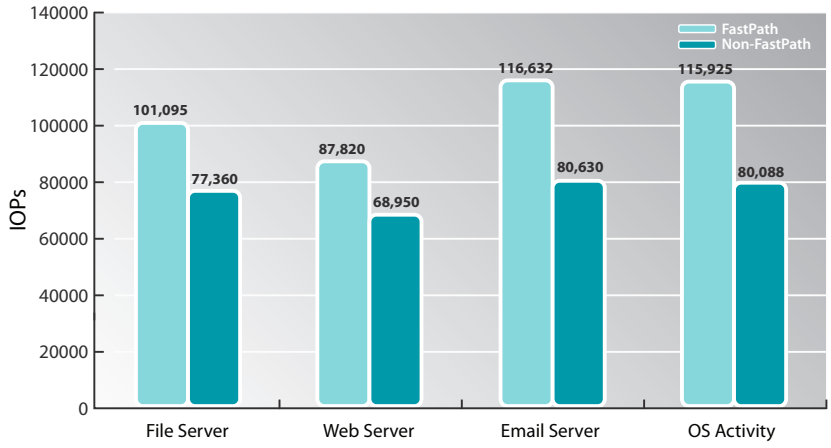

Figure 4: FastPath vs. Non-FastPath Real Work Performance

Test Specifications

Release Package

- FastPath – MegaRAID Release 4.3 with MegaRAID FastPath Software Enabled
- Non-FastPath – MegaRAID Release 4.3

RAID Adapter

- MegaRAID SAS 9260-8i

SSDs

- Eight Intel X25E SSD Drives

Benchmark Configuration

- RAID 0/64KB Stripe Size/Write Through/Direct IO/No Read Ahead/Disk Cache Enabled

Benchmark Profile(s)

- File Server, Web Server, E-Mail Server, OS Activity

LSI SSD Guard™ Technology

SSDs are known for their reliability and performance. The LSI SSD Guard technology, that is unique to MegaRAID controllers, increases the reliability of SSDs by automatically copying data from a drive with potential to fail to a designated hot spare or newly inserted drive. A predictive failure event notification, or S.M.A.R.T command, automatically initiates this rebuild to preserve the data on an SSD whose health or performance falls below par. If a hot spare is not present or not assigned, MegaRAID Storage Manager (MSM) will recommend that the user insert a hot spare drive into an available slot.

Because SSDs are very reliable, non-redundant RAID 0 configurations are much more common than in the past. SSD Guard technology offers added data protection for RAID 0 configurations by actively monitoring the status of the SSDs. SSD Guard, together with MegaRAID FastPath software, allows users to take full advantage of the reliability and performance attributes of SSDs.

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