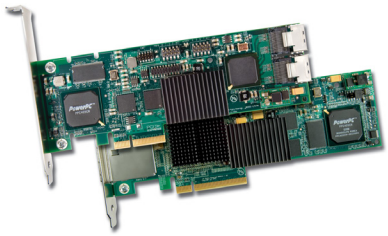
StreamFusion™ +



LSI 3ware 9650SE and 9690SA

STREAMFUSION + HIGHLIGHTS

- Improves multi-stream read and write performance
- Significantly reduces rebuild and initialization times
- Increases read performance for data recently written
- Drive performance monitoring helps diagnose drive performance issues
- Minimizes latency during background tasks

STREAMFUSION+ MARKETS

- **Video Streaming**
  Video data transfer technique to allow steady and continuous processing: capture, on-demand, and editing
- **Web Hosting**
  Provide capacity, data protection, and fast performance to meet your client's expectations
- **Disk-to-Disk Backup and Near-line Storage**
  Disk-based multi-streamed storage environments that rely on rapid data recovery
- **Security and Surveillance**
  Security video storage on disk for quick and easy searches for security events

3ware's advanced processes allow for optimized reads and writes in multi-stream environments and superior throughput even in degraded modes to provide a higher standard of data protection and performance.

Building on the powerful StreamFusion firmware, 3ware's StreamFusion + brings performance and usability to an entirely new level for 9650SE and 9690SA series RAID controllers. StreamFusion + is the result of countless hours of engineering to deliver performance breakthroughs in high-load applications and provides enhanced features and functionality in all environments.

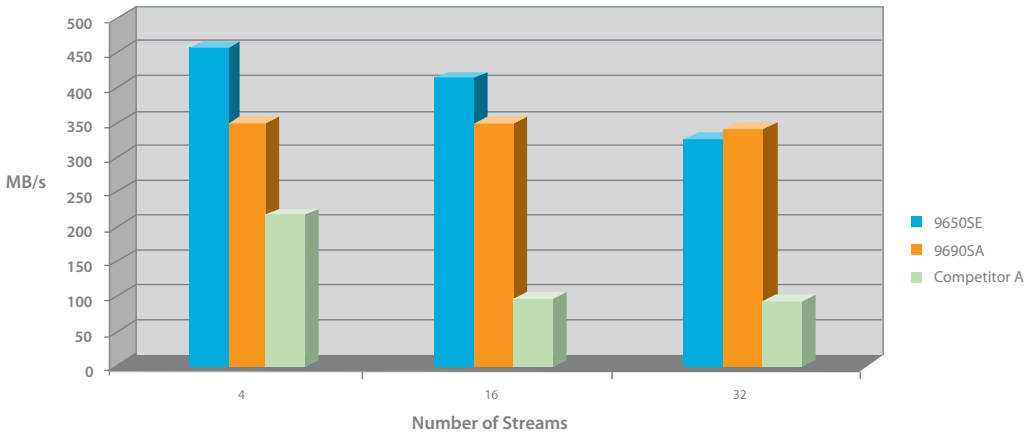
Focusing on the latest technology trends and customer requirements, the new features described below reaffirm our commitment to customer success and market leadership. StreamFusion + boosts performance by adding support for multiple streams and workloads with multiple simultaneous writes to disk through the 96XX series' write caching layer.

StreamFusion + Performance Enhancements

Advanced Content Streaming

Streaming efficiency characterizes how competently a controller writes streams as data loads become heavier. StreamFusion + enables LSI 3ware 96XX controllers to excel by efficiently processing all outstanding streams. As the number of streams increases, the total bandwidth is divided equally among the various streams. Many simultaneous applications may therefore be seamlessly sustained without the RAID controller becoming the performance bottleneck.

Fig. 1 – 9650SE vs. 9690SA vs. Competitor A
Multi-Stream RAID 6 Write Performance*



Advanced Content Streaming (ACS) provides increased speeds for streamed data, such as video capture and editing, through improved caching algorithms. This technology can result in up to a 50% increase in performance, equally balanced among all data streams (see figure 1). It does this by maximizing sustained write throughput in very complex multi-stream environments while minimizing latencies.

Intelligent Read Prefetch

The Intelligent Read Prefetch (IRP) feature includes a read-ahead caching method which is used to proactively retrieve data from media and store it locally on the controller with the anticipation that it may be requested by the host. With IRP, the controller will read additional blocks of data off the disk and then hold these blocks in its cache in anticipation of these being requested by the application in the future. This increases the efficiency of read throughput in sequential file access.

By loading a larger set of data into the cache, chances are improved that another request can be filled by data that is already in the cache, thereby increasing performance (see figure 2). Additionally, IRP intelligently determines the number of streaming reads in process and insures equal bandwidth for each. This can be helpful with applications that are sequential in nature, such as video on demand, video surveillance playback, and restoring from a disk-to-disk backup.

StreamFusion + Performance Usability Enhancements

Rapid RAID Recovery

Rapid RAID Recovery (RRR) significantly reduces array rebuild and initialization times. This feature increases the speed with which a redundant unit can restored when a rebuild is required. It can also increase the speed of verification or initialization that may occur in the event of an unclean shutdown. During rebuilds only the disk area with data is re-written, instead of the whole unit. The fewer active areas on the disk, the faster the rebuild, initialization or verification. RRR is particularly important when employing large-capacity SATA drives because the longer rebuild period creates a higher probability that an error will occur on another drive, causing data loss.

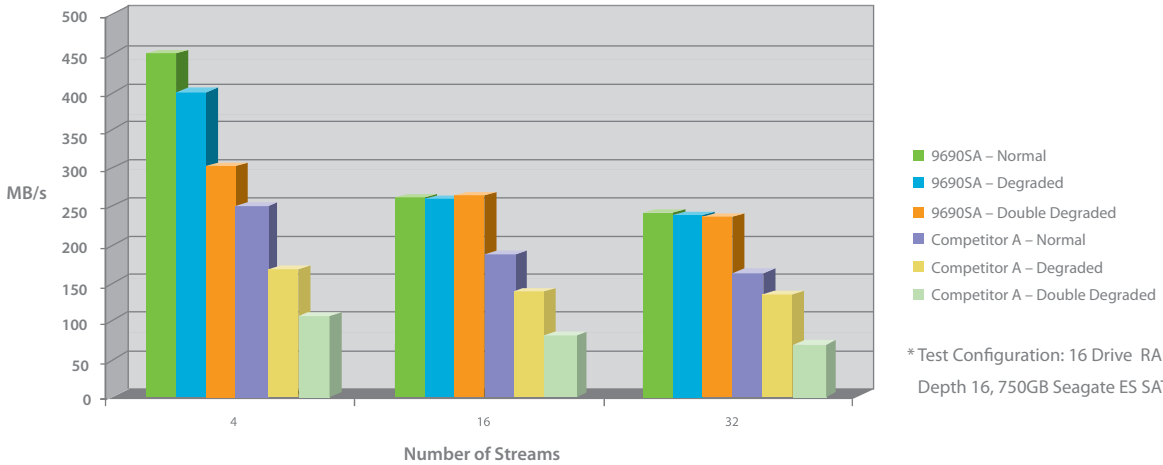
Background Task Activity Policy

Background Task Activity Policy (BTAP) is specifically designed to address the issue of latency. This feature balances the rate of host I/O and controller background tasks in order to efficiently complete them while at the same time minimizing the affects of latency. BTAP can also be tuned to your particular environment by selecting either Adaptive or Low Latency mode. Depending on your needs, BTAP takes action to complete background tasks without interfering with other application requests.

The Complete Package

All of these StreamFusion+ features combine with 3ware's StorSwitch and StorSave architecture to boost overall system throughput, by providing a dedicated channel for each drive, and deliver unique BBU protection for both controller and drive cache. LSI delivers unprecedented power in multi-streamed RAID environments where performance, redundancy, and data protection are most important.

Fig. 2 – 3ware 9690SA vs. Competitor A
Multi-Stream RAID 6 Read Performance in Various Array Modes*



* Test Configuration: 16 Drive RAID 6, 64KB stripe size, Queue Depth 16, 750GB Seagate ES SATA drives

For more information and sales office locations, please visit the LSI web sites at:
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