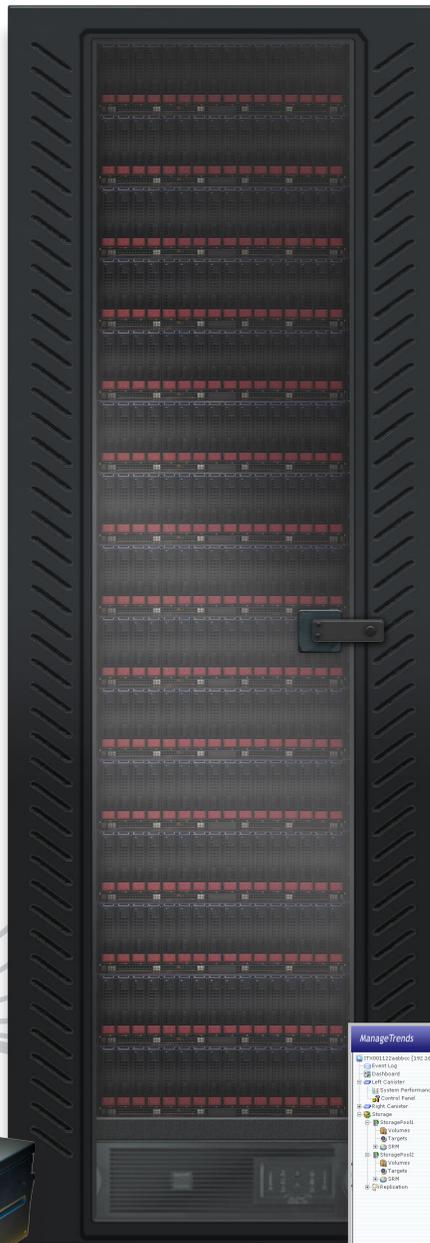


StorTrends® Whitepaper: Introduction to the StorTrends 3400i Dual Controller SAN



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Introduction

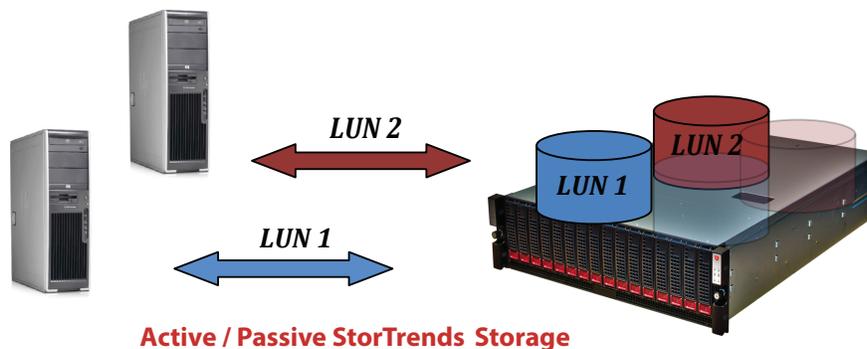
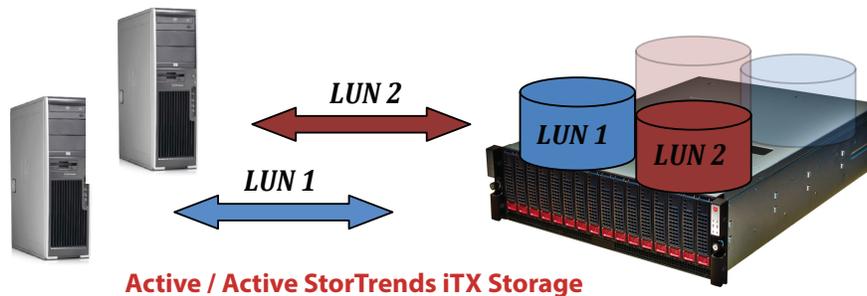
The dual controller StorTrends® 3400i represents the pinnacle of AMI's StorTrends network storage technology. It is powered by the latest version of our flagship StorTrends iTX Network Storage Software – StorTrends iTX 2.8 - which is optimized for this dual controller platform. StorTrends iTX 2.8 is a full-featured storage management suite designed to leverage the power of dual controller SAN appliances for peak performance, efficiency and reliability. This new, 64-bit version of StorTrends iTX network storage software is intended to be equally at home in a data center or server room as front-line storage for high-volume transactions or as part of a tiered storage solution.

StorTrends is a highly versatile family of storage appliances with many customers and deployments into numerous environments around the world. As back-end storage, AMI's RAID-RT™ technology gives the RAID protection on the disks and highly available performance through its built-in Advanced Caching Module (ACM). The all-inclusive StorTrends iTX software meets the key expectations for network storage with the added benefit of the integrated ManageTrends™ GUI, Storage Resource Management (SRM), near zero-degradation data snapshots, live capacity expansion, Disaster Recovery with WAN optimization, data archiving with deduplication and so much more. This document will briefly highlight each of these features with the proven value that StorTrends provides to its customers.



Business Continuity

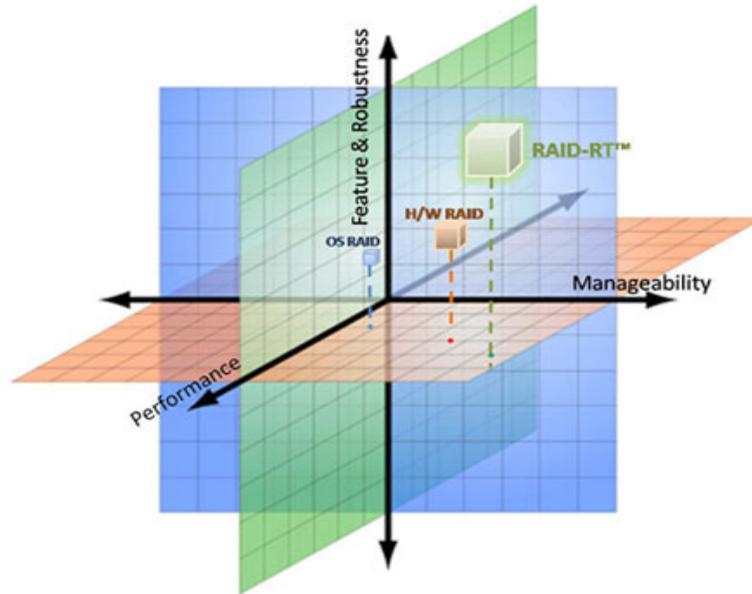
Faced with expanding customer demands for a near infinite variety of business requirements, the StorTrends 3400i dual-controller SAN features multiple options to maximize the end-user's I/O or throughput. The Active / Active configuration provides the most bandwidth possible, as each controller in the SAN comes standard with two network interfaces - for two potential separate I/O paths to two separate volumes when both controllers are used simultaneously. In an Active / Passive configuration, the StorTrends 3400i i has all I/O going directly to a single controller; in the event of a failure (as shown in the figure below, represented by the transparent volumes), the second (or passive) controller picks up right where the lost primary controller left off. This configuration works well for I/O intensive installations requiring the maximum possible IOPS per system. Although the throughput is essentially halved because only a single controller's network interfaces are at work, the StorTrends 3400i SAN can support 6 Gbe or 2-10 Gbe interfaces per controller - in the scenario that both throughput and IOPS are deemed necessary.



Reliable Protection

Proponents of Hardware RAID typically tout its superiority over Software RAID, and until the advent of RAID-RT™, these claims have been easy to justify. Before addressing some of the myths surrounding the supremacy of Hardware RAID, consider just a few of the more obvious disadvantages of Hardware RAID controllers:

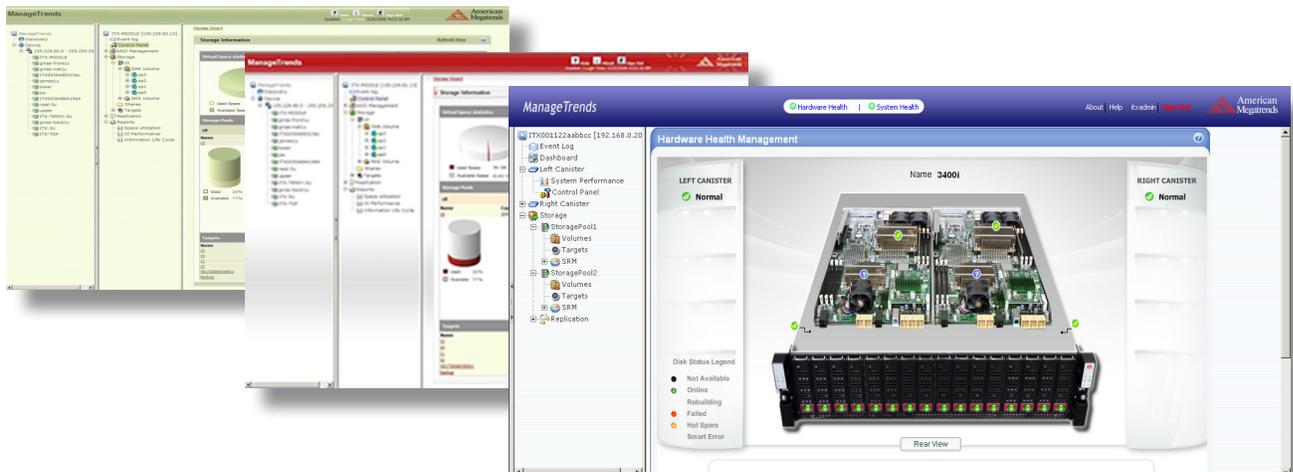
- The dollar cost of the storage server increases when a Hardware RAID HBA is selected
- An additional PCI slot in the storage server for the HBA
- Power consumption increases due to the additional processing power needed
- Addition of hardware components to the storage server expose the array to potential increased component failures, which could affect its availability



StorTrends iTX's RAID-RT™ not only bridges that performance gap between Software RAID and Hardware RAID, but in actuality moves to the forefront, with innovative capabilities such as:

- Off-loading of processing tasks
- Hardware RAID accelerator engines
- Robustness in fault handling
- RAID manageability
- Superior I/O cache
- Enterprise-class clustered RAID for High Availability

Simplified Management



According to IT industry analysts Enterprise Strategy Group (ESG), the cost of storage management and administration is three times the cost of initial hardware acquisition. StorTrends iTX network storage software brings simplicity to management with the integrated ManageTrends web interface, which includes easy-to-use wizards and intuitive design for system status and reporting. System Resource Management (SRM) within the ManageTrends GUI gives extensive data collection for all resources for analysis and management of CPU, memory, performance, capacity and historical workloads. The key storage system management metrics collected and reported by ManageTrends' SRM module include:

Space Utilization and Capacity Outreach

- Storage capacity usage collected at storage pool or volume-level granularity
- Tracks historical capacity use and predicts future usage based on the current load and trends
- Allows the administrator to input possible capacity additions to model the lifespan of capacity reserves

Workflow Management

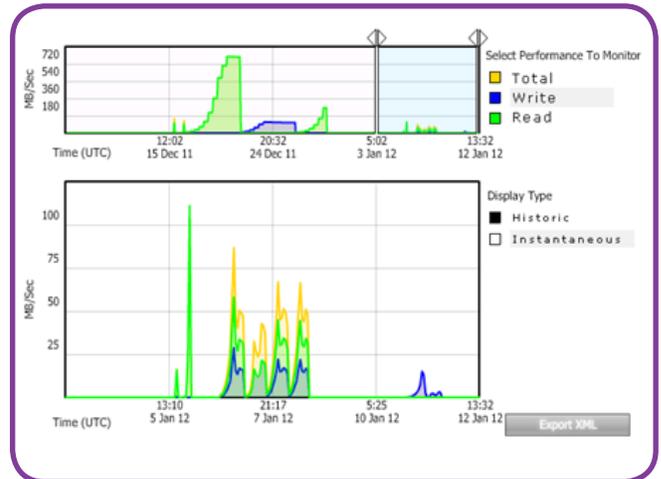
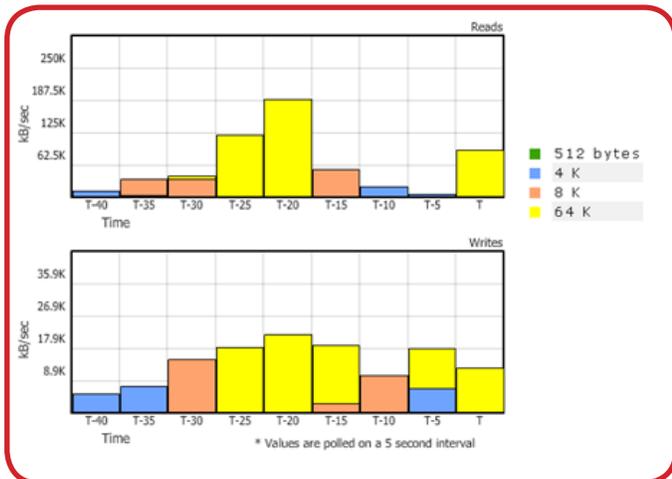
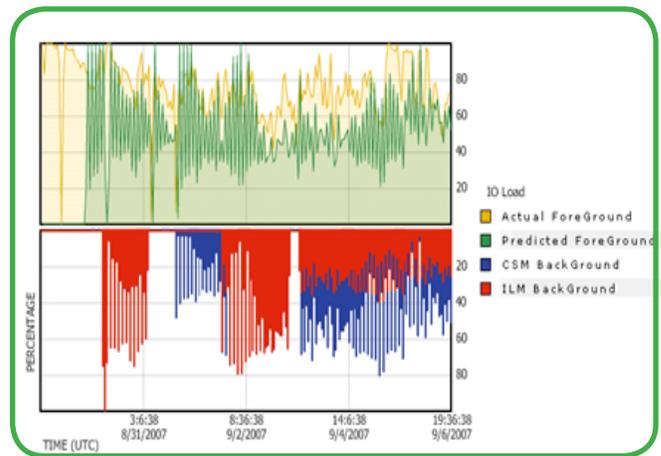
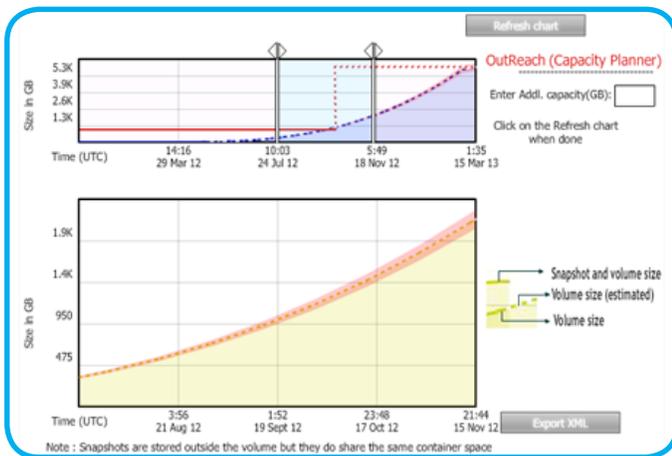
- Reporting of performance statistics - collected on an hourly basis for extremely fine granularity
- Utilizes statistical estimation algorithm to predict the future workload

I/O Performance

- Instantaneous view of incoming and outgoing blocks
- Graphs divided by block sizes of 512 b, 4 K, 8 K, 64 K

Volume Performance

- Displays performance statistics collected on an hourly basis - can also display live performance data
- Historical chart can be sorted to view overall, write and/or read performance
- Live data chart shows realtime throughput of the selected volume



Backup and Recovery

A staple feature in all storage appliances today are data snapshots - and the StorTrends 3400i dual controller SAN does not disappoint in this aspect, thanks to its enterprise-class Advanced Snapshot architecture. Its Redirect-on-Write (ROW) snapshot technology provides significant space savings over traditional Copy-on-Write (COW) snapshots, with instantaneous speed and near-zero performance degradation to the array while snapshots are being taken. StorTrends iTX network storage software also automates snapshot activity with a granularity of five minutes to months, with up to seven different levels available to configure and protect changed data on the SAN appliance. Recovery is simple and painless thanks to the ManageTrends CDT Snapshot Timescape window, for simple mounting, review and instantaneous rollback of snapshots - all while priority incoming I/O remains unaffected.



Scalability and Storage Efficiency

Business growth - and the data growth that goes along with it - is naturally a major concern for IT administrators. The StorTrends 3400i dual controller SAN handles this concern efficiently with its live expansion capabilities up to 256 terabytes of total storage capacity. Most importantly, there is no downtime to incoming and outgoing business-critical data while expansion takes place, ensuring that business continues as usual on the front-end. Redundant cabling - for peak reliability and performance - scales with JBOD expansion thanks to dual SAS cabling ready for as many as seven JBODs.

The Auto Data Tiering and Zoned Bit Recording (ZBR) technology that is built into StorTrends iTX network storage software enables an administrator to simply and efficiently manage the organization's data over its complete lifecycle. With ZBR, the outer tracks on the fastest, high performance disks maintain the most recently accessed data, while older data is pushed down to slower, high capacity disks, while staying available upon any I/O request. Auto Data Tiering is another cornerstone of the StorTrends 3400i dual controller SAN that is simple to manage and tightly integrated within other modules of the all-inclusive StorTrends iTX network storage software.

Disaster Recovery with WAN Optimization

Disasters of both the man-made and natural varieties, including hurricanes, wildfires, floods, "brown-outs" and network failures, all bring home the need for data protection and the ability to quickly recover from outages and site incidents to resume operations. Thanks to StorTrends' Advanced Snapshot architecture, Disaster Recovery is simple to configure and manage through via StorTrends' Snapshot-Assisted Replication (SAR) feature. The ManageTrends Replication Wizard guides the user through each step of setting up a volume on the secondary appliance and creating a snapshot schedule. Once SAR is deployed, incremental data changes are quickly and automatically sent to the secondary throughout the day.

Remote data replication over Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) has become increasingly widespread with the mass adoption and deployment of iSCSI-based storage appliances. Despite its popularity, however, this activity is not without challenges from large daily data change volume, high network latencies and the reoccurring cost of maintaining a WAN. StorTrends' built-in WAN Optimization manages these challenges by reducing the amount of data transmitted over the network during replication by compressing and deduplicating the blocks of data before they are sent to the secondary site. Furthermore, the impact of high network latencies are mitigated by overcoming TCP/IP overhead. By combining the reduction of data and IP overhead the administrator can feel secure that critical data is replicated to and protected at a secondary site as efficiently and quickly as possible.



Data Archiving with Deduplication

Going further than just replicating snapshots to the secondary site, Data Archiving with compression and data-deduplication technology provides significant disk space savings on the replicated StorTrends appliance by writing less data on the unit. Organizations with mountains of data or multiple locations can save their daily changes on fewer disks, and benefit from

- Initial cost savings by purchasing less appliances and drives up front
- Smaller rack space usage with fewer storage enclosures and associated TCO reduction
- Ongoing power utilization savings at the disaster recovery location

Why AMI?

Since 1996, AMI has been a leader in the data storage industry, with the inception of the MegaRAID® RAID Controller. AMI was the largest third party RAID Controller manufacturer in 1997, and by 2001 had reached complete market share. AMI sold its MegaRAID® Division to LSI Logic in 2001, allowing AMI to develop the StorTrends® storage product family. AMI's long and diverse experience in data storage is synthesized in the StorTrends® product family, as AMI clearly understands the industry's needs and requirements for data storage and has used this understanding to develop a complete line of "best in class" IP-Storage products.

AMI offers a wide array of disaster recovery and high availability solutions for your business needs, including the dual controller StorTrends 3400i SAN storage appliance. We provide services that range from storage needs analysis to the design and implementation of a custom disaster recovery solution. We can help your business plan for when things are at their worst while reducing the cost and complexity of your storage environment. For more information on StorTrends solutions from AMI, visit www.StorTrends.com, email to sales@ami.com, or call 1-800-U-BUY-AMI.

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