



StorTrends 3500i Dual Controller SAN with Solid State Drives (SSD)

Introduction

High performance demands are becoming more difficult for IT professionals to accommodate and are increasing in number. To meet these demands in the past, methodology would be to add disk spindles to an array. This introduces unneeded capacity, uses additional rack space, pulls additional power, as well as introduces additional hardware costs. Consider the need for 20,000 IOPS in an environment using traditional spinning hard drives. This would require over sixty 15k SAS drives or almost one hundred and fifty 7.2k SATA drives, thus largely increasing a company's CAPEX and OPEX. Today, this performance demand can be addressed by a few Solid State Drives (SSD). The next upgrade to performance for storage would be utilizing SSD to meet your read and write performance requirements. StorTrends does this by utilizing the StorTrends Advanced Caching Module (ACM) newly integrated with SSD.

SSD Caching

Many companies are moving towards Virtual Desktop Infrastructures (VDI). These environments often times produce "boot storms" where many clients access the storage server simultaneously. This procedure creates a heavy I/O load and overburdens traditional storage arrays. In scenarios where such high read IOPS are required, the same set of data blocks will be accessed repeatedly. StorTrends ACM notes this, and higher-accessed blocks will be reserved in SSD cache to ensure that the user receives the highest performance possible when it's needed most. StorTrends SSD Caching gives intelligence to stored data, therefore increasing performance considerably.

SSD tiering is an extension of the StorTrends Auto-Tiering feature. Auto-Tiering gives users the flexibility to manage high performance requirements and reduce cost for current and future capacity needs. Auto-Tiering brings intelligence with StorTrends Workflow Management by ensuring that stale data is not moving while I/O is at its peak giving the best performance to the user from all of the spindles.

StorTrends will use the SSD as both read and write cache. To protect against data loss, the written data is mirrored. Mirrored data will be flushed down to spinning hard drives during off-peak times based on the I/O workload, as gauged by the StorTrends Workflow Management. In regards to read cache, SSD space is efficiently managed through a proprietary hash table which eliminates duplicated blocks within the SSD cache space and the SSD tiering space.

SSD Tiering

In addition to caching, StorTrends provides SSD as a storage tier, and has for years. SSD tiering is an extension of the StorTrends Auto-Tiering feature. Auto-Tiering gives users the flexibility to manage high performance requirements and reduce cost for current and future capacity needs. Auto-Tiering brings intelligence with StorTrends Workflow Management by ensuring that stale data is not moving while I/O is at its peak giving the best performance to the user from all of the spindles. To accommodate the inevitable data growth, StorTrends arrays can scale seamlessly with live data expansion. Users can scale capacity and/or IOPS, depending on their current need.

QoS

Within StorTrends' web interface, ManageTrends, users will be able to setup Quality of Service (QoS) to volumes with access to the SSD tier. QoS allows StorTrends users to tune their performance to their specific needs. For extreme performance, a user can enable the entire volume to be in the SSD tier. To efficiently utilize the SSD tier, Auto-Tiering and QoS allow for users to configure volumes to reside in the SSD tier and the higher density tiers. QoS is an extension to the current StorTrends Auto-Tiering function that continues to increase storage efficiency for our customers. Going a step further, volumes can be selected for SSD Caching to improve highly randomized performance.

TRIM/Wear Leveling/UNMAP

Common concerns for storage systems are increasing lifespan and maintaining performance. In order to increase the lifespan of the SSD, StorTrends utilizes Wear Leveling. To mitigate performance concerns, TRIM and UNMAP commands are efficiently run to ensure that the StorTrends array is operating at its peak level. All of these techniques combine to increase the lifespan of the SSD within the StorTrends storage system and allow the system to run at optimal performance.

Conclusion

StorTrends has taken SSD to the next level. The SSD market is crowded with several also-ran SSD storage appliances without much thought to providing innovative engineering or functionality. StorTrends, through extensive patents, is utilizing caching and tiering with workflow management and QoS to surpass the competition. StorTrends iTX has truly separated itself by integrating caching technologies with preexisting tiering technologies.

Why StorTrends for SSD?

StorTrends advantages include:

- StorTrends SSD Caching gives intelligence to stored data to increase performance efficiency
- Auto-Tiering gives users flexibility to manage high performance requirements and reduce cost
- Quality of Service allows StorTrends users to tune their performance to their specific needs
- StorTrends Workflow Management gauges I/O workload to ensure stale data is not moving at peak times
- TRIM and UNMAP ensure the StorTrends array is operating at its highest level
- StorTrends arrays can scale seamlessly with live data expansion
- Volumes can be selected for SSD Caching to improve highly randomized performance



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