NetApp®
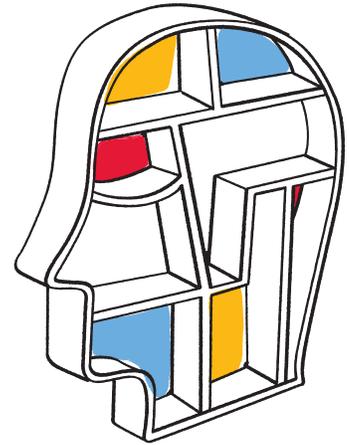
Solution Brief

NetApp Virtual Storage Tier

Optimizing storage efficiency and performance
based on the business and time value of data

The Challenge

The momentum in shared IT infrastructure and the need for always-on application availability have motivated a rethinking of traditional storage tiering models. Today's IT departments are constantly challenged to increase efficiency and improve service levels while reducing costs. Compounding this challenge are the dramatic growth in enterprise data and the need to align specific technologies to the business value of this data. With the emergence of promising new storage technologies such as flash memory, there is an increasing challenge to balance the cost of deployment with actual business results.

Although flash technology offers significant performance advantages versus traditional storage media such as SATA and SAS disk drives, these advantages come at a relative price premium. The objective therefore is to use this technology as selectively and as efficiently as possible—in other words, match the business value and demand level of the data to the performance and cost of the storage.

This means that frequently accessed data (which typically represents between10% and 20% of the total data) should be easily identified and aligned with the highest-performance media tier.

Given the above challenges, enterprises are looking for ways to automate the storage tiering process to achieve a more dynamic and cost-effective infrastructure.

The Solution

The right data at the right time at the right cost

The NetApp® Virtual Storage Tier offers a unique approach to automated storage tiering. Enabled by our foundational strengths in storage efficiency and intelligent caching, the Virtual Storage Tier provides:

- A real-time, data-driven response to your most demanding application workloads
- The ability to consolidate your data onto fewer storage tiers
- Industry-leading efficiency through integration of data deduplication and thin cloning
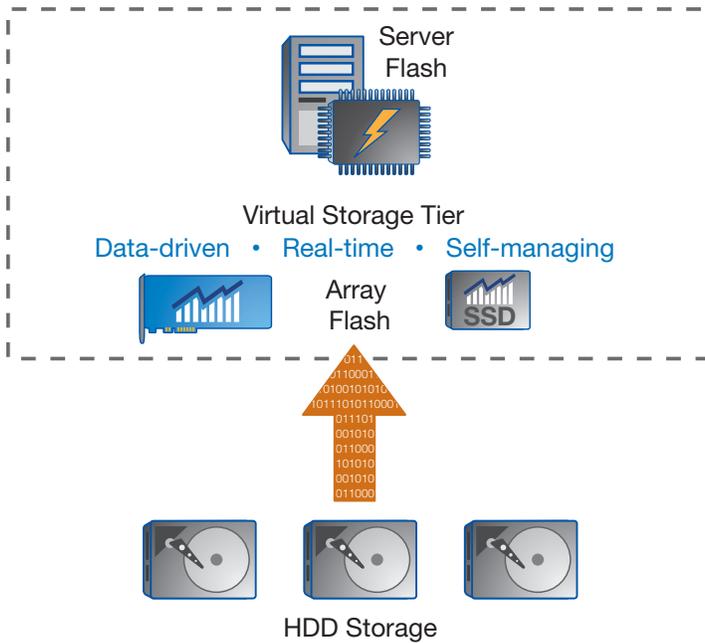
Figure 1) The NetApp Virtual Storage Tier.

- Out-of-the-box operation
- Automated support for PCI-e flash and SSD technologies

The NetApp Virtual Storage Tier is a self-managing data-driven service layer for storage infrastructure. It provides real-time assessment of workload-based priorities and enables I/O data requests to be optimized for cost and performance without requiring complex data classification. Because only hot data blocks are promoted (not large chunks of data that may include both hot and cold blocks), flash technology can be used sparingly without the need for excessive data movement. This reduces the processing burden on system resources and reduces traffic in the disk subsystem. Data promotion is done on demand based on actual usage patterns, enabling an immediate response to changing workload demands. Additionally, the Virtual Storage Tier is fully integrated with the NetApp Unified Storage Architecture, providing full compatibility with both SAN and NAS environments and related data protection, business continuity, and storage efficiency features.

Choice of Flash Technology for Improved Efficiency Without Compromise

The NetApp Virtual Storage Tier provides fully automated use and optimization of flash technology, both controller-based PCI-e–based flash and solid-state disk.

- NetApp Flash Cache™ PCI-e modules improve performance for workloads that are random read intensive, reducing latency by a factor of 10 or more compared to hard disk drives. Flash Cache modules are available in capacities up to 2 terabytes and provide controller-based caching.
- NetApp Flash Pool™ provides caching of both random read and write operations through automated use of SSD drives, enabling the use of capacity optimized hard disk drive technology across the majority of application workloads. Flash Pool enables the creation of a Data ONTAP® software RAID-protected aggregate that is comprised of a combination of hard disk drives (HDDs) and solid-state disk drives.

With Flash Cache and Flash Pool™ you can significantly decrease the cost of your disk purchases and make your storage environment more efficient. Specific workload testing showed the following.

- **File Services Workload:** Combining Flash Cache with SATA disks can significantly improve I/O throughput and response time (compared to high-performance HDD configurations) while lowering the cost per terabyte of storage by 34% and saving 40% on power.
- **OLTP Workload:** Combining Flash Pool with SATA disks can match the performance of high-performance HDD configurations (Fibre Channel or SAS) while providing up to 350% more capacity, lowering the cost per terabyte of storage by 68% and saving 25% on power.

"The NetApp Virtual Storage Tier offers us automated, simplified management; efficiencies that reduce our power-cooling-storage footprint; and storage management costs while improving performance."

Chris Rima
Supervisor, Infrastructure Systems, Tucson Electric Power

Easy to Deploy and Simple to Manage

The NetApp Virtual Storage Tier works with your existing data volumes and LUNs. It requires no complicated or disruptive changes to your existing storage environment. There is no need to set policies, thresholds, or time windows for data movement. To deploy the NetApp Virtual Storage Tier, you simply install flash technology in your storage systems. Once this is accomplished, the Virtual Storage Tier becomes active for all volumes managed by the storage system.

Partner for Success

When you partner with NetApp, you get the benefits of a fully tested solution, the expertise of our Professional Services and Global Support teams, access to our innovative technologies, and the assurance of best practices. You can accelerate the return on your infrastructure investments and get the most business benefit from them.

We respond quickly to your problems, no matter where in the world they occur, and since we have one of the most flexible support programs in the industry, you always get exactly the support you need for your unique IT and business requirements.

About NetApp

NetApp creates innovative storage and data management solutions and services that deliver outstanding cost efficiency and accelerate business breakthroughs. The world's leading companies rely on our solutions to achieve better economics, speed and scale of business. Discover our passion for helping customers around the world go further, faster at *www.netapp.com*.

Go further, faster ®

NetApp®

www.netapp.com

Follow us on: