

## Green Storage

### Leverage Green Storage to Drive Data Center Efficiencies



*As information growth continues unabated and the costs associated with managing, storing, and protecting information continue to rise, green initiatives are driving the efficiencies that will be needed for future storage management. Today, floor space in most metropolitan areas continues to be a scarce commodity and the cost per square foot continues to escalate. In addition, the cost of power for systems and IT environmental cooling continue to be a concern, and in many parts of the US are also becoming a scarce commodity. Couple these factors with IT budget pressures brought on by the tightening economic conditions during 2008 and 2009, and the need for denser and more efficient information storage has become a top priority of many IT professionals.*

Technological advances continue to help address these issues from several perspectives:

#### Hard Drive Technology

Hard Drive technology continues to advance on a similar path as processor technology, with improvements every 18 months.

- Hard drive density has been increasing approximately 100 percent every 18 to 24 months. The earlier 500 GB 3.5" disk drives are being replaced by 1 TB 3.5" drives and early versions of 2 TB 3.5" drives are just emerging. The result is that the effective cost per GB is being reduced by 50% or more with each step up in drive capacity.
- The power consumption for these larger SATA drives has remained constant or decreased slightly. However, they are 60% to 70% more efficient than typical 15K RPM Fibre Channel drives, which reduces both power and cooling costs.
- Advances in SSD (solid state disk) technology are also impacting the storage of information by delivering low power consumption (recent data shows up to 20% less) and highly reliable storage with extremely fast I/O processing. The price per GB is dropping as adoption rates and technical advances occur. Current SSD implementations are in Tier 0 storage with limited scalability due to cost factors — but as the costs align more closely with existing magnetic disk drive technology, adoption rates will increase rapidly and the impact on power reduction will be realized quickly.

#### Deduplication Technology

Implementation of deduplication technology is also one of the most significant factors in improving the green impact on today's IT environments. By eliminating duplicated data, the amount of physical disk required to store the same amount of information can be reduced by 2x to 10x or more. This has an immediate impact not only on raw storage costs, but also by the reduction in power consumption and cooling requirements.

- Deduplication comes in many forms: in-line and post process are the most prevalent today. In-line is the most efficient approach, while post-process proves to be a less efficient method due to the incremental storage consumption required to cache data and additional processing cycles.
- Early deduplication deployments have been primarily used in backup-to-disk environments (known as Dedupe 1.0).
- Dedupe 2.0 is evolving as the next generation of applied deduplication, with implementations spreading across both primary and secondary storage, whether SAN, NAS, value tier, or archive. The resulting effect of Dedupe 2.0 is a broad reaching, ubiquitous implementation of deduplication across the entire IT environment, delivering storage reduction impact in every IT process.

*"Companies that want to deliver on green IT strategies can begin with some simple but highly effective steps that would include aggressive data deduplication and storage optimization, leading to reductions in the amount of storage needed. This combined with effective use of high capacity drives will provide immediate reductions in the energy costs related to power storage."*

— George Crump  
Storage Switzerland

#### The Green Way to Store Data

- Increase hard drive density, and improve disk efficiency for reduced power consumption.
- Apply data deduplication to reduce physical disk space.
- Optimize primary storage to make use of high capacity second tier storage.

#### Permagit Delivers Green Storage

- 1 TB SATA drives provide high storage density and power efficiency.
- Advanced Dedupe 2.0 enables the best data reduction rates to lower storage footprint.
- Value Tier Storage optimizes data storage to dramatically reduce data center footprint.

## Optimization

Primary storage Optimization also has a substantial impact on storage utilization:

- Primary storage is typically comprised of Fibre Channel Disk drives that run at 15K RPM and have smaller capacities than similar SATA drives, with 60 to 70% higher power consumption than similar SATA drives on a per-GB basis. Migrating data from primary storage to a lower tier (comprised of SATA drive technology with 7200 RPM speeds and higher capacities) can meet data growth without requiring additional investment in less efficient drive technology.
- Migrating static (less active) data to primary storage contributes substantially to storage optimization. Typical static data ratios in enterprises range from 60% to 80 % of primary storage according to industry analysts such as ESG, IDC and Taneja Group. If 60% of the data on primary storage can be migrated to a value tier (less costly to acquire and run, and leveraging deduplication) then the impact on IT efficiency (footprint, power, and cooling) will increase rapidly. In addition, processing performance will be positively affected by smaller, more agile primary data stores.

## The Permabit Solution

Permabit implements each of the above technologies as an integral part of our green initiative:

- Permabit uses 1 TB SATA drives that run at 7200 RPM. The combined performance and density increase delivers a one-two punch on green initiatives, providing higher storage density with significantly better power efficiency (typical SATA power consumption is 60%-70% less than 15K Fibre Channel drives on a per-GB basis).
- Permabit delivers Dedupe 2.0, which combines more efficient in-line deduplication combined with compression to enable the best storage reduction. This saves storage initial costs and dramatically reduces footprint and power/cooling factors.
- Permabit's Value Tier Storage implementation enables the migration of static data from primary storage to the most cost-effective tier of storage – the Value Tier. The Value Tier delivers high efficiency drive technology (as mentioned above) along with deduplication and compression that substantially reduces overall storage requirements. The result is less floor space and power/cooling because there is more data being stored in a much smaller data center footprint.

## Additional Information

### On-site Storage Assessment Service

Permabit offers a detailed professional assessment service that can help quantify the impact of our solution in your specific environment. Permabit's Professional Services team will gather information about your primary data storage environment and operating costs in order to show you a complete ROI and TCO analysis for implementing a Permabit Enterprise Archive solution. Let us take the guesswork out of planning.

### ROI Calculator

Permabit has developed an ROI calculator that you can use to measure a return on investment and 4-year total cost of ownership based on your unique parameters. You input details specific to your environment into the model and the ROI calculator automatically computes ROI and TCO values. The ROI calculator can be found on Permabit's web site at <http://www.permabit.com/products/roi-calculator.asp>.

## Find out More

Contact Permabit today to discover how the Permabit Enterprise Archive can help you meet your critical storage and archiving challenges. Call us at 617.252.9600, contact your local Permabit partner, or view our solutions at [permabit.com](http://permabit.com)

*"With Permabit, 75% of our static data, including document images, are archived to the Permabit Enterprise Archive, which has resulted in tremendous cost savings, and the ability to meet our green technology initiatives."*

— Jack McLaine  
VP/IT  
VIST Financial Corp

## About Permabit

Permabit delivers next-generation disk-based archiving solutions that dramatically reduce primary storage costs. With patented technology, the Permabit Enterprise Archive™ provides a massively scalable disk archive that costs a fraction of what it takes to manage tape or optical, with advanced data protection and reduction technologies that offer decades of reliable information access. Permabit is Gartner's 2009 "Cool Vendor of the Year" in Archiving.



Ten Canal Park  
Cambridge, MA 02141  
Phone: 617.252.9600  
FAX: 617.252.9977

[info@permabit.com](mailto:info@permabit.com)  
[www.permabit.com](http://www.permabit.com)

