

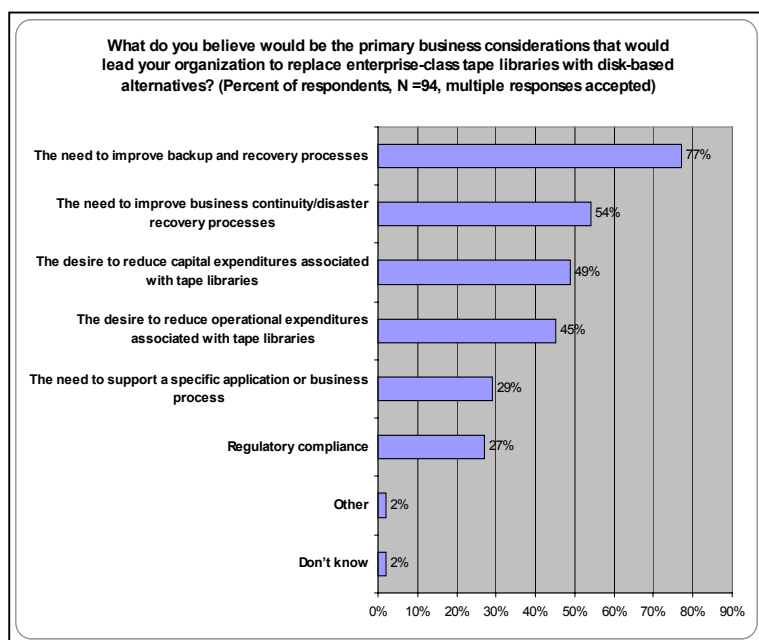
The Many Benefits of VERITAS' FlashSnap Solution

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Author: Nancy Hurley
Title: Senior Analyst

Abstract: According to ESG research, end users top storage management issue continues to be meeting the backup window. While many users have moved to disk based technologies to alleviate the problems, a majority of users have not taken advantage of technologies such as snapshot that can not only help address the backup window issue, but also provides a number of other benefits. VERITAS offers a myriad of data protection technologies including FlashSnap which can help users enhance overall data protection. This paper focuses on the capabilities of VERITAS Storage Foundation, the market leading Volume Management and File System solution and how the services embedded in Storage Foundations can address many data protection issues.

Data Protection Options

With all the technology advances over the past decade, one would think that users would have licked the backup and recovery problem long ago. But surveys, including one recently conducted by the Enterprise Strategy Group (ESG), continually show that while users are increasingly implementing disk-based technologies, such as virtual tape libraries



(VTL) and near-line disk, to boost backup and recovery performance, the backup window is still the number-one pain point among organizations of all types and sizes, with the recovery window a close second (Figure 1).

The reality is that while disk-based backup products can help users shrink backup windows and even improve recovery point and recovery time objectives (RPOs/RTOs), they alone don't solve the backup/recovery window problem, nor should they be expected to. An effective backup and recovery architecture should include a variety of technologies, such as mirroring, replication, tape- and disk-based backup, and snapshot, all of which should be looked at in the context of their larger role in an information life-cycle management (ILM) strategy.

[0] In fact, an effective ILM strategy is likely to leverage two or more of these technologies simultaneously. The idea is not to use snapshots exclusively or, conversely, to back up all data to tape but rather to

leverage technologies that match the specific data protection requirements of an organization's various data types (e.g., structured and unstructured, mission-critical and non-mission-critical).

Just as users would be ill-advised to store terabytes of non-mission-critical data on high-end primary disk storage, they should be cautioned about backing up mission-critical data solely to tape; recovery of that data could be a very slow, highly costly exercise. A better option might be to take periodic snapshots, or point-in-time copies, of certain data and/or to back up to near-line disk or VTL. The tighter the integration of backup services (e.g., snapshot, disk- and tape-based backup, replication, etc.), the better positioned users will be to meet data protection requirements dictated by service-level agreements as their data demands increase and evolve over time.

ESG believes that vendors, such as VERITAS, that integrate these services have a decided leg-up over competitors that offer point backup products that have little, if any, integration among them. A grid-computing environment necessitates that these services interact at the disk, system, and application-level.

However, ESG research reveals that while users are regularly using mirroring and are increasingly implementing disk-based backup products to supplement traditional tape-based environments – a significant number of users are not taking advantage of the varied uses of snapshots, which extend beyond backup and include data migration/tiering, archival, and data analysis, testing, and reporting, among others (Figure 2).

Why snapshot?

Traditionally, snapshots, which create “virtual” point-in-time (PIT) copies of data, have been reserved for backup purposes, primarily of mission-critical data. Often users would use a snapshot to create a copy, and then perform a backup from that snapshot in order to eliminate downtime for the application. However, there are many other uses for this technology. Their appeal is simple: snapshots allow users to make periodic copies of their data (the frequency of the snapshots is determined by the user according to data protection requirements), which can be readily accessed in the event of a logical error (e.g., user corruption, virus, etc.).

This compares to mirroring techniques (either locally or over extended distances), which make an immediate physical volume copy of the data as it is being written, and to replication, which, like mirroring, is also a “block-for-block” replica of the primary disk volume but is generally reserved for disaster-recovery (DR) purposes over long distances (e.g., between primary and an off-site DR location).

But what users generally forget about are the additional applications of snapshots, which include off-host processing, development and instant recovery. Consider VERITAS FlashSnap, available in VERITAS Storage Foundation 4.0 and as integrated feature of VERITAS NetBackup 5.0

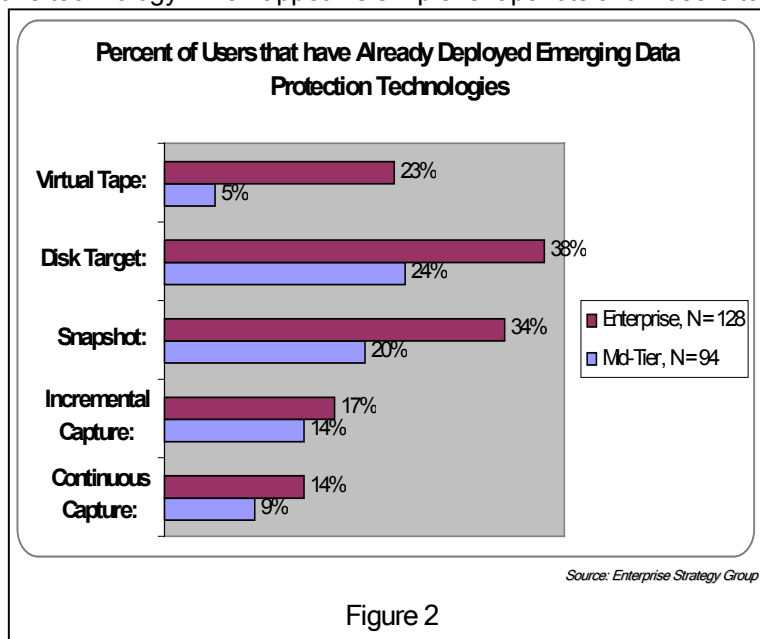


Figure 2

Advanced Client. FlashSnap allows users to create either “split-mirror” or “copy-on-write” (a.k.a. Storage Checkpoints) snapshots of original host file systems at a frequency determined by the user. FlashSnap is an advanced snapshot solution, supporting an unlimited number of “snaps” which only copy the incremental changes to the files from a given point-in-time, thus reducing the total storage capacity consumed by snapshots. Moreover, a “FastResync,” which keeps tracks of changed data blocks between the original host’s snapshot and the split-mirror snapshots, allows users to easily resynchronize the split-mirror snapshot to the original host snapshot.

As previously stated, users often backup to tape from snapshots, as doing so keeps unnecessary backup traffic off the LAN and eliminates the need to back up around the clock. However there are a number of other potential uses for the copied data. Development and testing can be done on the split-mirror snapshots rather from the original data volumes or host snapshot. Doing so allows users to keep production servers on-line during testing processes (making the testing process virtually non-disruptive). The snapshot can be presented to other users on the host that may have alternate uses for the data (perhaps data mining). Of course the snapshots can be maintained on disk and used for

instant recovery as needed. Users determine the frequency of the snapshots based on recovery time and recovery point objectives of backups as well as the needs of their testing environment.

Snapshots can also be an integral part of the DR process. VERITAS Storage Foundation snapshot capability is fully integrated with VERITAS Volume Replicator such that the snapshots can be remotely replicated to multiple sites resulting in consistent point in time replicas at remote sites. Of course the remote replication of the snapshots could also be used to for development purposes as mentioned above at remote sites.

Snapshots could also be used as part of data migration or tiering process in an ILM strategy or as a staging platform for archival. As VERITAS enables snapshots between heterogeneous arrays, the snapshots could be used to incorporate disk based protection strategies in a heterogeneous environment. For example, users could use the VERITAS-enabled snapshots to archive from vendor A's high end arrays off to vendor B's content-addressable storage (CAS) or tape.

Another capability of Storage Foundation is Storage Checkpoints, which enables users to create PIT copies of files within the VERITAS File System (VxFS). Whereas a snapshot copies data to a mirrored LUN (which can be a full-volume copy or space optimized), Storage Checkpoints write only changes to a specialized partition within the file system. Once a checkpoint is initiated, all changes to the file system are written to the dedicated partition. For example, an update is done to a program file, if a Storage Checkpoint is initiated, all changes to the program will be stored; if the upgrade fails in any way the administrator can simply go back to the start of the checkpoint and restore the file. End users can take advantage of this function as well in order to immediately restore files they may have deleted or corrupted. This is a great way to apply PIT functionality- however as there is no media protection (if the media the original file system resides on fails), this is not a substitute for snapshots used for backup purposes.

VERITAS also offers snapshot capabilities with NetBackup 5.0 Advanced Client, as well as a variety of other complementary data protection features, which include Instant Recovery, Zero Downtime (or ServerFree) Backup, and Block-level Backup. The Advanced Client option is also integrated with a variety of third-party array- and software-based snapshot products, as well as VERITAS Volume Replicator [insert support matrix from Advanced Client Datasheet].

As evidence of its determination to offer users a breadth of products and to meet ILM needs, VERITAS announced that it has integrated NetBackup with NetApp SnapVault. Essentially, the integration allows VERITAS customers to do snapshots using NetApp SnapVault from the VERITAS Advanced Client console to a NetApp NearStore storage system. The new option not only gives VERITAS users the option to leverage NetApp SnapVault but also the freedom to recover from NearStore in either .tar (NetBackup) or WAFL (NetApp) format for faster recovery.

The Bottom Line

Data protection is not just about backup, multiple technologies including mirroring, replication, snapshot (PIT) copies and migration are all integral to the data protection process. Yet snapshot technologies can also be applied to assist in development, test, ILM and certainly instant recoveries. VERITAS has one of the broadest, most-integrated data protection strategies available today and is well on its way to providing users with a compelling platform for implementing grid computing in the future. Snapshot plays a key role in this evolution.

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