STORAGE SWITZERLAND REPORT

HOW VMWARE IS MAKING IMAGE BACKUP A REALITY

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Image backup is a process that uses server images, like those created by VMware, to capture and protect an organization's data. This image includes system state, OS, application configurations and data in a single file. It can be created while the server is in production allowing the backup process to complete without affecting the application, effectively eliminating the backup window. This single image can be copied easily to a remote site for DR and also used to produce different types of restores (full server, file, data object).

The traditional (legacy) backup process involves copying discrete files and application data from client servers using backup servers, client server agents and specific software modules to capture, store, manage and restore these data. This current process has remained mostly unchanged at a large percentage of organizations, even with the advent of technologies like VTL, disk to disk backup and deduplication. These developments mostly just leverage traditional backup and focus on making it easier to live with.

But this legacy process manages, moves and records too much (duplicate) data to be called "efficient". Image-based backup, with products like Vizioncore's vRanger PRO, may be the way to improve this efficiency and bring some real cost reduction to IT through the backup process. A server image (like a virtual machine VMDK file), taken with a snapshot, or point-in-time copy, includes all a system's data. Protecting this comprehensive representation of the system is much faster and easier than the file-based process used by traditional backup software. Those legacy systems have to copy thousands of files and manage these discrete data objects throughout the backup and restore process.

Better BU process

Image backup is a much simpler process, one which takes significantly less 'wall clock time' to capture, reducing the effective backup window. Once complete, the system can be back in production. Contrast this to the legacy backup process which must scan all clients to find files and file changes, then back up each file or changed portion independently. Applications must be essentially frozen while data is copied to the backup server, then they're returned to normal operation. While snapshots can be used to facilitate a traditional backup, the application still must process every file and data object, instead of including the entire backup in a single file, as an image does.

Better Recovery

Traditional backup systems require a multiple-step recovery process to restore a failed server. It includes a rebuild of the server and OS, reinstallation of the applications, recopying of the data files and finally, reconfiguring those applications. Restoring a server with an image backup requires recopying the image back to the server and skips the other steps, saving significant time. Also, image backups can produce recoveries of multiple types from a single image. These include discrete file recoveries, data object recoveries (like email), data base recoveries and full system (Bare Metal Restore or BMR) recoveries. Again, contrast this to traditional file-based backup software (including those using snapshots), which must conduct different specific backup processes to do an email recovery or a full system recovery (BMR) than a regular file recovery. This means additional backup window time, more storage capacity and more overall complexity. It also means specific licenses to do these other backups operations.

Cost Savings - Hardware

Traditional file-based backup applications require servers to control the backup process itself (backup master server) and servers to actually take the data as it comes in from client servers (physical or virtual) and transfer that data to the target backup storage device, whether it's disk or tape. Since the data is pulled off each client server, sent to the backup server and then often sent to a networked storage device (as opposed to direct attached disk or tape), there needs to be enough network bandwidth to accommodate the backup process. As backups get larger, this bandwidth can be a choke point and dedicated network hardware is often implemented to keep the backup process from impacting the organization's other IT operations.

Some image backups go directly from the client server to the storage device, eliminating the backup and media servers. The snapshot process that image backups use leverages a 'delta-block' based architecture, which records only data blocks that have changed from one backup to the next. Compared with full or incremental backups done by traditional backup software, images require much less storage capacity. This in turn consumes less network resources.

Cost Savings - Software

These traditional systems include software licenses for the backup servers, plus agents for each client server (physical and virtual) and some of the storage components in the system. They can also require licenses for applications (like databases) and special operations, like open files and BMR restores. Image-based backup can eliminate the cost of buying this complex suite of licenses by requiring no backup server or media servers and no special software to do bare metal restores or backup open files.

Cost Savings - Administration

The overall complexity of the traditional file-based backup system drives a lot of IT administrative cost. Maintaining backup servers and additional network resources takes time and the 'care and feeding' of multiple software licenses across platforms adds to admin workload. From an operational perspective, backup jobs must be monitored to load balance backup/media servers and storage and keep the process in compliance with backup windows. Software for clients, backup servers and storage devices must be patched and updated as OS and firmware revisions come out. The simplicity of the image backup process eliminates much of this activity. With less hardware and fewer software licenses to deal with, it takes significant workload off the backup admin.

Virtual Machine Backup

Implementing a virtual server infrastructure can lead to a decrease in traditional backup efficiency. Due to the ease with which VMs are created most enterprises see an overall increase in the number of server instances they have when a physical-to-virtual server project is completed. Most legacy systems back VMs up as they do physical machines, using agents and scheduling backups within windows, etc. The result is that although creating VMs can make administering each server instance easier, it can make backing them up harder, the net of which reduces backup efficiency. Image backup is better suited to virtual machines, since it essentially copies the entire machine image in a single file, reducing complexity and costs.

VMware Consolidated Backup (VCB) is a software product released by VMware to improve the traditional backup process for VMware, using the VM images or VMDK files. Unfortunately, it requires these VMDK files to be copied to a proxy server and then to the backup system. And, restores require the same extra step in reverse, adding cost and complexity.

Backup has stayed largely unchanged for years. Even with new developments like deduplication, D2D and VTLs, this legacy process is still mostly intact. Image-based backup represents a real departure from traditional backup by consolidating all system state, OS, application configurations and data files into a single image file. By leveraging snapshot technology and the drastic simplification that this one-file consolidation provides, image-based backup can eliminate the concern over backup windows, provide multiple restore options and finally give IT an opportunity for a real reduction in data protection costs.

Traditional BU applications are trying to keep pace with backup's next era. A few of these applications have begun to add some form of image based BU. In our next article we'll explore the functionality of these modules and how they compare with software designed specifically for the task.