STORAGE SWITZERLAND REPORT

IMAGES DON'T JUST DO BACKUP BETTER, THEY CREATE A BETTER BACKUP

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Traditional backups require a complex collection of hardware and software to identify, capture, organize and store server data. And, they must do so in a finite (usually shrinking) window of time in order to assure that data is protected. This complexity stems from the structure needed to manage these data sets at the file level. Image backups instead capture only a few files for each server instance and don't need a complex infrastructure to accomplish this task. This inherent simplicity brings a number of advantages in efficiency and performance, as well as some advanced functionality that traditional backup systems don't typically provide.

Image backup systems don't usually require a backup server or media servers and proxy servers to collect and transport data to storage devices. There's often no need for software agents in the client to interface with the OS or specific applications that it's running. With less software to install and maintain, and less need for complex schedules of backup jobs, management of an image backup system is much easier.

Fast, efficient backups

When backup images are captured, they're sent directly from the host server to the storage device, bypassing media and proxy servers and delivering the maximum performance that the network and storage resources are capable of. With advancements in image backups, sometimes called block incremental backup (BLI), after the first image has been recorded, subsequent backups involve only changed blocks of data within that server image, greatly reducing the time required to complete each backup. Also, since image files create large, sequential transfers, (instead of potentially millions of smaller files) they're ideal for applying data reduction technologies to improve efficiency, further reducing backup times.

Deduplication (in-line, source side) can be applied to these images before they're sent to the storage device, reducing the volume of data handled by the storage infrastructure. Also, in a virtual environment, this dedupe process can be applied globally, across all server instances on a physical host. In VMware environments, the vStorage API for Data Protection enables backup software to control VM backups without affecting the ESX server and it supports Change Block Tracking. This feature eliminates the need to scan a VM to identify the changed data, a process that typically consumes much of the backup time. Other efficiency methods, including zero-detection and awareness of deleted blocks, can also be applied to further reduce the data actually backed up and improve performance.

Reliable, low cost, non-disruptive backups

Image backups don't impact production systems, using snapshots to capture the image at the point in time for backup. There's no need for special agents to backup applications in real time or to take a server off-line during backup. This effectively eliminates the backup window concept, as the snapshot can be taken in a few seconds and the image prepared for backup transparently. This method enables more recovery points, and faster recovery times, since the amount of data between backups is less. Also, image backups are more reliable than traditional file based backups since they involve fewer files, less data volume and less infrastructure.

When the number of servers or VMs grows, an image backup system scales along with it, without the need to add media servers, client licenses, or the storage and network infrastructure to support them. In the virtual server environment this can be a significant savings, as many organizations backup VMs as they do physical servers, one virtual client at a time, and often have many more virtual server instances because of VM sprawl. This can produce a real savings in hardware, software and administration costs.

Reliable restores

Image backups also offer some advantages for restores over traditional backup methods. With a single backed up image copy, multiple restore options are possible, from full server restoration (think bare metal restore in a traditional backup) to individual file and object level restores. This 'backup once restore many' functionality means the end of having to conduct separate backups to create a 'BMR' copy, since the image contains all information required to rebuild a server instance, not just the data used by its applications. It also means restore times are cut drastically, as the entire server instance can be restarted in the time required to copy the image to another server or set up another VM. There's no need to wait while the OS and applications are restarted and configured, then the data reloaded.

Although traditional backup systems offer some form of image backup, most are not architected to provide all the functionality discussed above. Most require additional proxy or media servers to handle more server instances, physical or virtual. The lack of virtual machine awareness means they aren't able to reduce VM backups by detecting changed or deleted blocks or reduce backup data volume.

Image backup system implementation

However, these advanced features can be added to a traditional backup infrastructure by deploying a system like Vizioncore's vRanger Pro in conjunction with an existing system. The image system uses runtime binaries to affect the backup and restore processes on server instances, so there are no agents to install and implementation is simple and non-disruptive. Also, management can be incorporated into the existing backup console with a few scripts. The image backup application runs on a single server and requires no licenses for client servers, physical or virtual. Physical servers can be included by doing a simple physical-to-virtual conversion to create the server image.

Sometimes referred to as the '8th layer of the OSI model - the political layer', resistance from people used to an existing methodology can stall the introduction of a new technology, or kill it altogether. However, from the administrative point of view, image backup systems usually meet little resistance. They require no special training and complement existing backup systems, bringing a number of unique and valuable features. They're non-disruptive and simple to deploy, and low cost, compared with traditional backup systems.

The simplicity of image backups creates some opportunities for improvements to the backup process and savings in infrastructure and management along the way for many environments. By leveraging the encapsulation of an entire server instance into a few files, image backup technologies also bring additional features that aren't available with traditional backup software solutions. Reduction in backup data volume through tracking changed blocks, dedupe and zero-detection shortens backup windows and reduces infrastructure costs. Snapshot-based image backups are non-disruptive and provide multiple, reliable restore modes from a single file. Images not only make backups better, they create a better backup.