Faster backups using Virtual Tape

Virtual Tape versus Physical Tape
Backup comparison

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Typical Tape Performance

A quick comparison of raw performance numbers of virtual tape vs. physical tape can often lead to the wrong conclusions. At first glance it might seem that virtual tape backups are bound to be slower than physical tape backups, since the physical tape devices themselves are rated at a very high transfer speed. Once allowances are made for the way that virtual tape drives are used, it becomes clear that virtual tape backups are faster than standard tape library backups.

It's hard to compare apples-to-apples when dealing with virtual tapes because tape virtualization provides great advantages which allow data centers to shrink the amount of time required for a set of backup data. This is typically done by creating a virtual tape drive dedicated to each server being backed up. By creating a large number of tape drives, more backups can be run *concurrent* to each other thus shrinking the amount of time spent for the total backup job.

As an example see Figure 1. In this case a data center is backing up 6 servers to a physical tape library with two tape drives. Each physical tape drive is delivering about 80 MB/s average throughput. The backup window in this case runs from 2 am to 5 am, and the first tape drive, backing up servers A through C, finishes just within the backup window. The second tape drive, backing up servers D through F, finishes just before 4:30 AM.

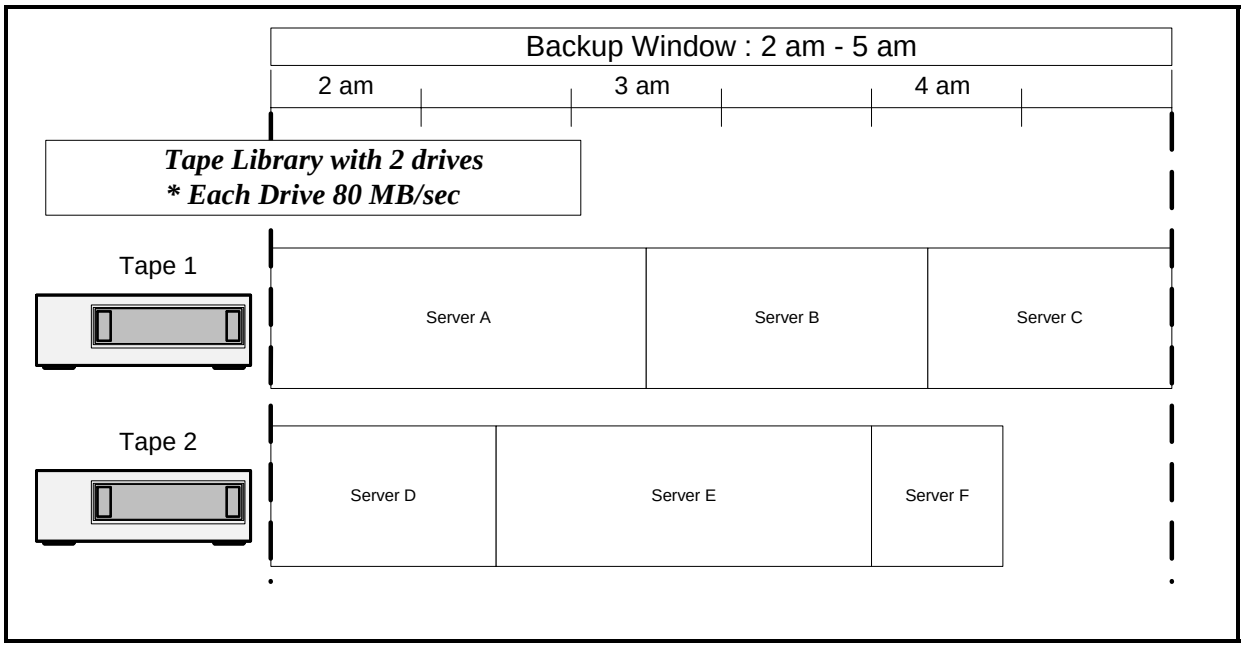

Figure 1 : Backup of 6 servers to two tape drives

Virtual Tape Comparison

Figure 2 shows how this can be configured using virtual tape. In the following diagram, six virtual tape drives are created within the single virtual tape appliance, each dedicated to the backup of one server. On this virtual tape unit, each drive is delivering about 60 MB/s average throughput. Even at that rate, all the backups complete by 3:45AM – shaving 40% off of the previous backup time.

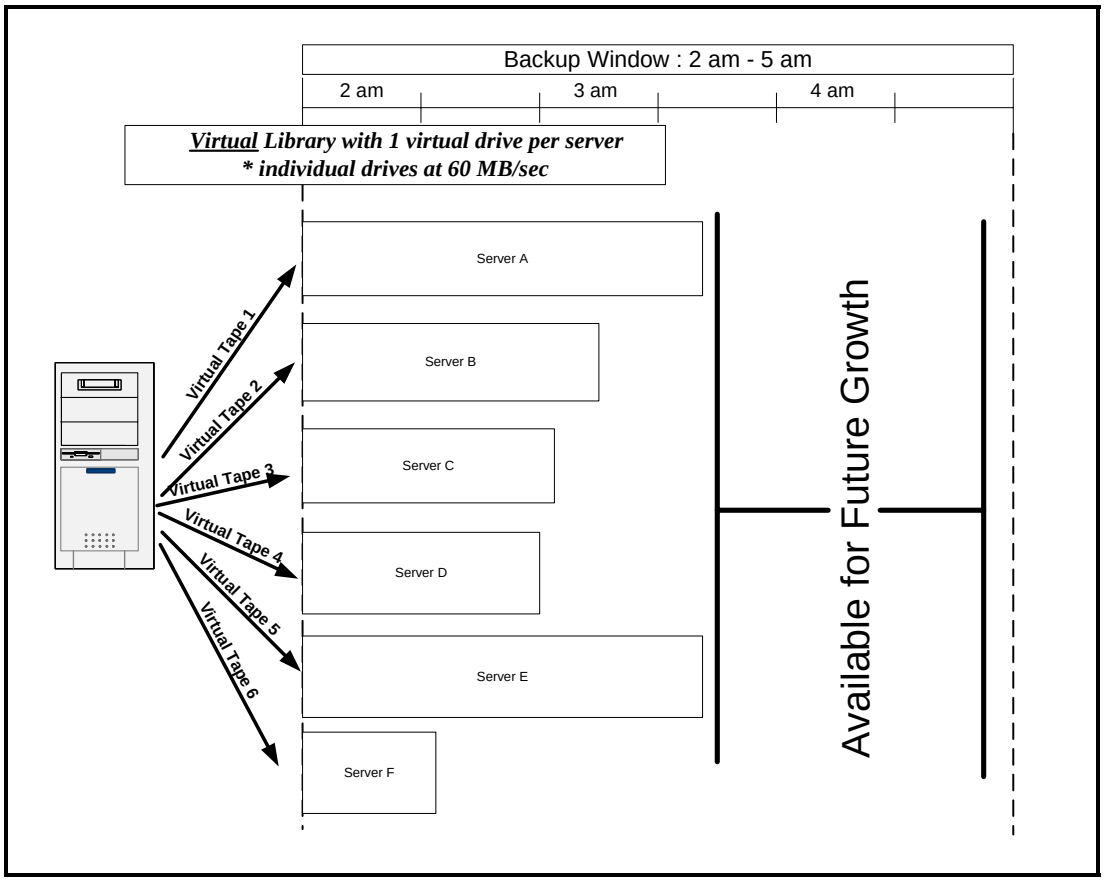

Figure 2 : Same backup set with virtual tape

Room to Grow

How much can the data set grow and still meet the required backup window? With physical tape (Diagram 1) there are about 35 minutes left in the backup window, with one tape idle. Servers D-F can grow by about 170 GB before the backup will take longer than the available backup window. In this scenario Servers A-C have no room to grow without extending the backup window.

With virtual tape each server has room to grow within the existing backup window. Server A, with the largest amount of data, can grow about 320 GB without reconfiguring the VT library. The data on Server F can grow 500 GB and stay within the current backup window. In all, there is room for 2 TB more data – almost double the entire backup amount – in the backup window allotted.

No More Server Bottlenecks

Typical backups often run slower than native tape speed due to bottlenecks at the server. In these situations virtual tape can show a dramatic performance improvement due to the concurrency described above. Figure 3 shows the same backup set as figure 1, except that all backups are limited to 35 MB/s by the servers themselves.

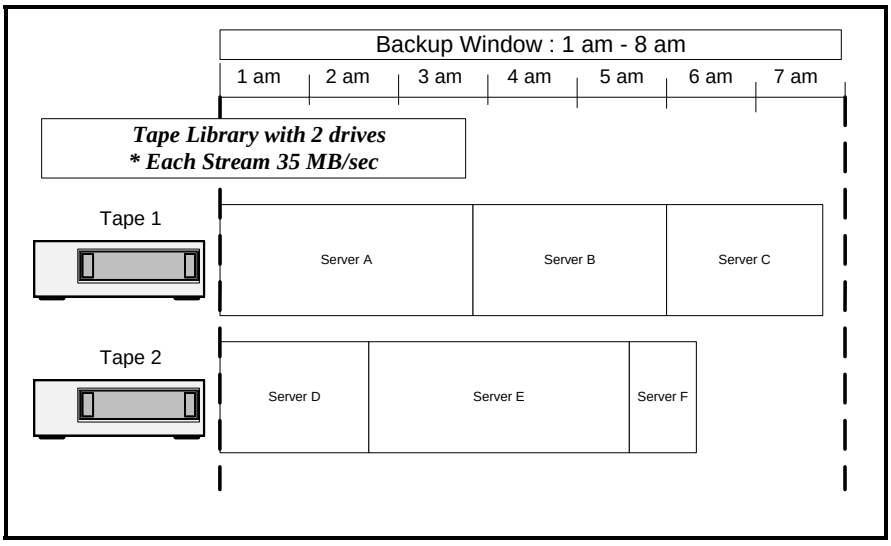

Figure 3

At this rate it takes nearly 7 hours to complete the backup set using a standard tape library. The virtual tape library shown in figure 4 completes the backup in under 3 hours – the same backup set in less than half the time.

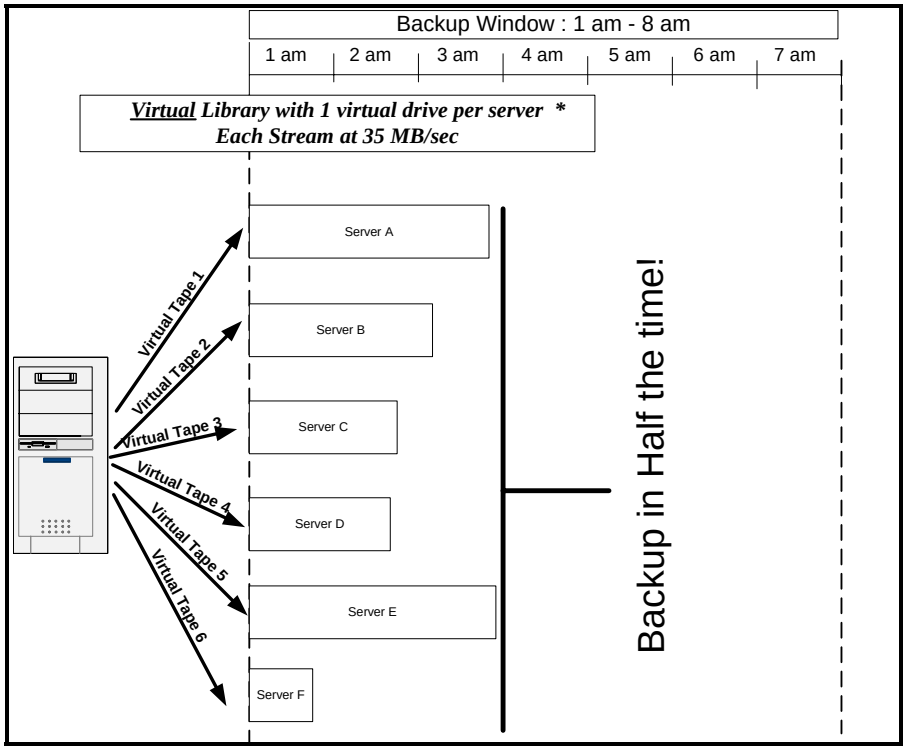

Figure 4

FastStream Virtual Tape Appliances

FastStream Virtual Tape Appliances allow block based disk devices to appear like a tape library to backup and restore software. Virtual Tape is a popular disk-to-disk (D2D) scheme which maintains any existing backup processes and procedures used with traditional tape libraries. Using virtual tape allows businesses to ease transition from tape to disk storage. For SMB to Mid-Range companies, The ATTO FastStream Virtual Tape appliance provides blazing fast performance, parity protected backups paired with simple management and expandability for future growth. Additionally, the FastStream VT appliance line features the added flexibility of multiple host and storage connectivity in a slim 1U rack or desktop form factor.

Key Features of the FastStream VT Product Family:

- Performance of up to 1.89 TB per Hour
- Up to 2 Virtual Tape Libraries per FastStream VT (Independent of each other)
- Up to 30 Virtual Tape Drives and 256 Tape Volumes per library
- Inquiry String / Library type is user definable
- Media changer supported
- Exclusive Advanced VTL Capacity Expansion (AVCE™) technology allows you to add virtual tapes as needed, up to 256 per virtual tape library. Add up to 30 individual disk storage devices which supports future growth.
- SCSI – 3 Support
- RAID Levels 0, 1, 5 and 10
- ISV Applications: CA Brightstor, Symantec Backup Exec, Symantec NetBackup, EMC Insignia Retrospect, BakBone
- Operating systems – OS and platform independent
- SpeedWrite™ feature boosts write performance by efficiently managing writes between the server and virtual tape drives
- ExpressNAV™ Graphical User Interface (GUI) simplifies setup and management
- OEM Configurable Options
- Host Connectivity: 4Gb Fibre Channel
- Device Connectivity: Ultra320 SCSI (FastStream VT 5300)
  4Gb Fibre Channel (FastStream VT 5700)

About ATTO Technology

ATTO Technology, Inc. is a global leader of storage connectivity and infrastructure solutions for data-intensive computing environments. ATTO's vision is to provide a wide range of end-to-end solutions to help customers' better store, manage and deliver their data. With a focus toward markets that require higher performance, ATTO manufactures products in the categories of host adapters, bridging, RAID and virtual tape appliances, and management software. ATTO solutions are based on providing a high level of connectivity to all storage interfaces including SCSI, SATA, iSCSI, NDMP, SAS and Fibre Channel. ATTO distributes its products worldwide directly to Original Equipment Manufacturers (OEMs), systems integrators, VARs and authorized distributors.