

Virtualization

By Joseph Marion

Here's a little secret. You probably are only using about 10% of the capacity of your tape drive. Over the past 15 years new magnetic tape technology has increased the density of data which can be written to tape. These days, it is not uncommon to see high-density tapes with physical volumes as high as 120 GB. This new technology has reduced the costs of tape hardware and has simplified handling and management tasks.

Who is using it?

A recent survey of IBM customers shows that, on average, more than 30% of tape cartridges contain fewer than 50 MB of data. The average volume size of data on tape cartridges is less than 300 MB. As an example, the average content of extended capacity 3490E is as low as 10% of the maximum capacity of the tape cartridge.

The lack of utilization of tape drives is due to the fact that the practices used in archiving, backup and data recovery has not changed very much at all over the last 15 years. IT Managers want to use their tried and true applications for long term storage of their data. IT Managers still rotate their tape cartridges with each data backup rather than combining multiple backups on one tape. The concept of combining multiple backups on one tape is called data set stacking or "virtualization." In short, the use of tape drives has not kept up with technology.

A Virtual Megatrend?

The IT research firm, Gartner Group calls virtualization one of the most important emerging technologies in the data center. At a recent Gartner Symposium, Gartner vice president John Enck called virtualization a "megatrend," and said it doesn't really matter what kind of server you run it on, as long as you're running it. Enck insisted virtualization technology will have an enormous impact on server evolution in the next five years as a driving force for box efficiency.

While the concept of virtualization may be a "megatrend" on the server side, it really is a new concept when it comes to tape and disk storage. In April of 1995, IBM announced the IBM Magstar 3590. At that time, IBM made it clear that some means of using the high-capacity tapes would also be required. In fact IBM expressed this requirement as a statement of direction for at the same time it announced the Magstar.

Currently, more than 80% of S/390 sites have a tape management system. These tape management systems include some type of hierarchical storage management software. However, software solutions to take advantage of the increased capacity of tape drives are seriously lacking. Market research companies estimate that only around 15% of S/390 installations have any type of data set stacking. Bottom line is that we now have big tape drives with large capacities being under utilized.

On “solution” which most IT Managers are NOT using is data set stacking. Data set stacking products are products which take many tape volumes and write them to one tape volume. Data set stacking has not seemed to have achieved mass acceptance in the marketplace. IT Managers don’t like the fact that most tape set stacking solutions usually requires some sort of post-processing activity such as the remounting of tapes. They say that the software eats up additional resources of the host system. And they feel that tape set stacking software is too complex to use. Probably the biggest reason for the lack of acceptance is that tape stacking solutions are too expensive to implement.

The Virtual Tape Server Solution

The IBM Virtual Tape Server (VTS) is IBM’s solution. The VTS can emulate up to 256 tape drives on a direct access storage device (DASD). And it can access up to 12 physical IBM 3590 tape drives to move data onto and off the physical 3590 cartridges.

This solution lets users of cartridge tapes maximize the storage potential of each tape and at the same time improves performance and reduces the number of tapes required.

VTS improve access to recently written virtual tape volumes because the “DASD volumes” are available for immediate access. On a real tape drive you would have to mount the physical tape before being able to access the data.

VTS is transparent to the host software, feature rich, readily supported and easy to use.

But VTS boxes are a bit expensive.

One way to drive the cost of VTS boxes is to look to the secondary market, a list of whom can be found at www.ascdi.com. Due to its complexity, there are only a few companies that sell used VTS systems. One such company is ASCDI Member, DV Trading (www.dvtrading.com), based just north of Copenhagen in Denmark. From its Frankfurt, Germany facility, DV Trading custom-configures IBM S/390 VTS systems, ships them worldwide and guarantees that IBM will accept the systems for IBM Maintenance anywhere in the world.

Data center managers looking to utilize the capacity of high capacity tapes in order to create a more powerful, cost-efficient data center need to look at changing their old tape backup practices and implementing a VTS.