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# VTL or storage pools?

Comparison of VTL products with TSM basic functions.
Do you need VTL in TSM?

Peter Pijpelink
Tivoli Storage Manager Consultant
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# TSM - VTL

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- TSM basic functions
- What is a VTL?
- How does a VTL work?
- Technical details
- Performance figures
- Physical tape and VTL

# TSM history


- TSM is a product which concept was designed in 1990. At that time TSM was already using storage pools and not individual tape volumes, you could say this was a early way of virtual working.
  - Prior names for this product are:
    - Workstation Data Save Facility/MVS (WDSF)
    - Adstar Distributed Storage Manager (ADSM)
    - Tivoli ADSM
    - Tivoli Storage Manager - without the IBM prefix (TSM)
- **Major releases**
  - IBM Tivoli Storage Manager 5.4 2007
  - IBM Tivoli Storage Manager 5.3 2005
  - IBM Tivoli Storage Manager 5.2 2003
  - IBM Tivoli Storage Manager 5.1.5
  - IBM Tivoli Storage Manager 5.1.0
  - IBM Tivoli Storage Manager 4.2.1 August, 2001
  - IBM Tivoli Storage Manager 4.2.0 May 7, 2001
  - IBM Tivoli Storage Manager 4.1 2000
  - IBM Tivoli Storage Manager 3.7 1999
  - ADSTAR Distributed Storage Manager 3.1.2 September 3, 1998 (with DRM)
  - ADSTAR Distributed Storage Manager 3.1.1
  - ADSTAR Distributed Storage Manager 3.1 1997
  - ADSTAR Distributed Storage Manager 2.1 1995
  - ADSTAR Distributed Storage Manager 1.2.1 1995 for AS/400 (EZADSM for OS/2 released)
  - ADSTAR Distributed Storage Manager 1.2 1994 for OS/2 and AIX
  - ADSTAR Distributed Storage Manager 1.1 July 29, 1993
  - Workstation DataSave Facility (WDSF40 for VM) September 9, 1990

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- TSM uses a storage pool, all volumes that are used are managed on pool level.
- In a way TSM uses pools to virtualize volumes below. A set of data is not fixed to a set of tapes. TSM uses free space on tapes, or tapes which are in a collocation group, or a set of tape to be used by a specific backup client.
- TSM can be set to dynamically expand and address capacity.
- TSM offers with the devclass file, dynamic expansion and and capacity on demand.
- What TSM offers is a device class to a set of disks where files are created in a sequential format.
- TSM 5.4 can separate active and not active data on storage pool level.

# Concept of Virtual tape

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- A VTL is in simple way of looking a huge box of disks which are acting as sequential tape volumes and drives. TSM uses this in the same way as physical tape.
- A VTL product offers more then a library in some ways, but can also be limited in comparison to a physical library.
- VTL products all offer the same idea, backup to disk speed with idea of tape usage.
- Many vendors offer movement of backup data from disk/VTL cache to physical tape. (destaging).
- Some offer de-duplication of data… (future TSM)

# Technical details

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- You can setup a VTL as a physical library and virtual tapes as volumes.
- The amount of drives and slots, is in theory limited to the library type and model you setup: meaning, 700 slots and 20 drives.
- In some VTL you can also set more drives and slots, actually make the library virtual up to thousands of slots and around 512 drives.

# VTL and tape destage

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- VTL does the work of “pseudo migrate” the data to physical tape.
- TSM has no clue about physical tape drives.
- TSM volume barcode is same a physical tape (link). So a virtual volume is linked to a physical tape for destage actions.
- If destage does not happen, TSM “thinks” tapes which were set to a initial size of 25GB are not filling anymore.. but are FULL..
- If destage works again, the cleanup can only be done with a move data… good luck with 100+ volumes.
- For restore TSM can not access the data without the administration of the VTL volumes… TSM did not write the data and has also not a path (SCSI/SAN) to the physical tape drives.
- True drive sharing is not supported with all VTL products and TSM.
- Resource sharing between VTL like drives and physical tapes is not supported also in most configurations.

# TSM - sequential

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- TSM does support different type of sequential devices.
- If you look at backup methods in TSM then backup to random access disk (RAD) is the most common way.
- When you use a VTL product it looks like your transaction is going to tape from the viewpoint of a backup client. So you need to keep an eye on how many sessions are possible, and limits like: drive mount limits and equipment behind VTL as physical tape (destaging).

# Do you still need RAD?.

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- Do you still need random access disk?
  - Some vendors say no, fact is that on VTL the overhead on small files below 1 megabyte is large. (some say tape is dead…)
  - With VTL drives and volumes you do not really have a easy multi session, with random access disk pools you can work with both multi session and next storage pools.
  - We have done testing and lots of small files perform very slow (4 Gigabyte/hr, avg. file size 37kb)
  - We used the same amount of data and did the same test to a random access disk pool, result was 16 GB/hr.

# Tape pools and capacity

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- Add virtual tape volumes ?
  - A library has a physical size based on slots and based on drives.
- Using a VTL you get the same, almost… entering new scratch tapes sometimes means to stop your activity on a VTL.
- Expand virtual volumes gave a error on a VTL: sorry VTL is busy, try again later…

# What about devclass file?

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- Define devclass file devtype=file mountlimit=(max 4096) maxcap=?? Directory=d:\tsmdata\server1\filepool, g:\....
- Automatic scratch management / volume creation
- Can be shared for lanfree (storage agents) (sanergy required)
- Virtual filedrives and libraries

# Compare

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- Excel sheet
- Do you need a VTL in TSM ?
  - Order disk capacity, make RAD pools, use devcl file, concurrent copy pools…
  - Storage pools are virtual since years ago


# Thank you!

## Questions?

Peter Pijpelink
P.L.C.S. BV
support@plcs.nl
http://www.plcs.nl