

Virtual Tape System and Disaster Recovery Plan

Basics,
Concepts
And
Disaster Recovery Planning

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Basics of a Virtual Tape System

- Simply:
 - replace physical TAPE/CARTRIDGES with disk storage.
- Programs/System should not know the difference.
- Combination of emulation software and hardware are used to intercept cartridge requests.
- These requests are redirected to DASD (somewhere) to files that emulate cartridges.

Basic Virtual Tape Options

1. All will have some way of connecting via FICON or ESCON to the Z system.
 1. FICON is normally standard.
 2. If not now, then in the next quarter.
2. All have disk storage.
 1. Various locations.
 - a) Included with the system.
 - b) Storage within your own company.
 - c) Scalable and Flexible storage requirements
3. Support for multiple Operating systems
4. Automatic response to mount messages.
5. Manual response and control.
 1. Operator and JCL control.
6. Standalone access from the Z systems
 1. IPL-able Virtual tape control
7. Emulates tape/cartridge devices.
 1. 3422/3480/3490 , some have 3590
 2. Typically 16 devices but more are available.

Benefits

- 1) Eliminate cartridge drives from the Computer room.
 - a) Power and space requirements will be less for a VTS.
 - 1) Current 3490 A01 with two 3490 B01 attached
 - 2) Foot Print of Controller / Tape Drives –
 - a) 35" Deep, 87" Across Front, 77 ½" High
 - 3) VTS have 1-2 U to 4-6 U in a normal server rack.
 - b) Environmental cost should be lower.
 - c) Power requirements are lower.
 - 1) Example from one VTS vendor.

Power Source
110 / 240 VAC, 48 to 63 Hz
1.2 KVA to 4.5 KVA
4 KBTU to 15 KBTU per hour
 - e) Air Conditioning requirements should be lower.

Benefits

- 2) Eliminate the physical cartridges.
 - a) Space for racks for storing cartridges will be eliminated.
 - b) Cartridge life is only 7 years.
 - c) Can lower the amount of off-site storage required.
- 3) I/O performance will be enhanced.
 - a) Cartridge drives have a low transfer rate compared to:
 - 1) channel speed
ESCON channel versus FICON.
 - 2) DASD transfer speeds.
3490 typical was 3MB/sec and 6.8 MB/sec with compression.
 - b) Manual Tape Mount requests should be eliminated.
 - 1) Not all but a large percentage.
 - 2) Each Vendor has a job/process that monitors the console for specific mount messages. The mount is answered with the correct volume mount.
- 4) Lower Operator intervention for cartridge using job streams (again a percentage).
 - a) Mount request will be answered by the system.
- 5) VTS backup can enhance the Disaster Recovery procedure.

Benefits

- 6) CPU will run at higher utilization.
 - a) IO bottlenecks cause lower throughput.
 - b) VTS IO rates are much higher, therefore the CPU will be at a higher utilization rate.
- 7) Secure/encrypt the data as it is being backed up and before being moved to remote site.
- 8) Output files can be compressed.
- 9) It is not what people expect; therefore, the old standards do not apply. New processes will be invented.

Costs/Downside

- 1) VTS can be an issue with the Disaster Recovery procedure.
 - a) second VTS device is required at the DR site.
- 2) There are no tapes. Each virtual tape is disk file on DASD.
- 3) Transferring tapes between systems will be a very different process.
- 4) CPU will run at higher utilization.
 - a) IO bottlenecks removed.
 - b) VTS IO rates are much higher, therefore the CPU will be at a higher utilization rate.
- 5) It is not what people expect.
 - a) Some retraining/thought processes will be required.
 - b) Old ways of doing things may not apply.
- 6) Hardware may not support what you want.
 - a) FICON versus ESCON.
 - b) Open available connections.
- 7) Cost of the Virtual Tape systems.

Aultman Hospital Requirements

- Emulate 3490 devices.
- z/VSE support.
- z/VM support.
- Interface with CA-EPIC on z/VSE systems and Native z/VM system.
 - Shared Virtual Tape system but there is a requirement to separate Virtual Tapes of each VSE/VM system.
 - Manual process for z/VM
 - Automatic and manual support for z/VSE
 - Automatic CA-EPIC catalog synchronization.
- Interface system directly to VTS.
 - Separate manual console support on the VTS hardware.
- FICON connection to Z system.
 - Aultman has ESCON available but plans are to upgrade system.
 - No ESCON planned.
- Encrypted file
 - Secure Interfaces.
 - Adjustment of encryption algorithm.
 - HIPAA will change requirements
 - Must be 128-bit AES which is compliant for FIPS and HIPAA.
- Expansion of storage.
 - Compressed files as an option.
 - Aultman is planning on compressing everything. But need option of no compression.
- Offload of files from VTS.
 - Copy from VTS to separate disk system.
 - Network or external disk.
- Offsite support.
 - 24/7 hardware and software support.
- DISASTER RECOVERY Support

Support

- Reviewed six Vendors.
 - List of Vendors at end.
- All Vendors handled the basic Aultman criteria with some minor exceptions.
- Four Vendors were in the proposal to the Unit Directors and upper management.
 - All had z/VSE and z/VM native support.
 - Host Console Support
 - All allowed for CA-EPIC (BIM-EPIC also).
 - » Using CA-EPIC TSIPOOL macro to all for separating Virtual Tape mounts from real tape mounts.
- 24 by 7 support contracts were available.

Disaster Recovery

- Planning must be based on configuration and Vendor.
 - Each Vendor has their own solutions, processes, and procedures.
- DR Site will require duplicate configuration at the site.
- Vendors have replicating/backing solution.
 - Dependent upon Vendor and configuration of the storage.
 - Main issue: Where is the disk storage located?

Replication or Backup

- All Virtual Tape Systems have replication software or backup software or both available.
- Two Vendors have all encompassing systems.
 - These VTS have their own built-in storage.
 - Replication/backup software is part of the package.
- There are VTS that will use your network drives.
 - The customer must design the backup/replication system.
 - Customer is responsible for the physical DASD.
 - Replication is by third party software.
- The Question will be who will be responsible for the replication/backup of the system?
 - Local network backup or the Virtual Tape System.
 - Do you want to backup locally and restore at the DR site?
- Aultman criteria is automatic replication to system at DR site.
 - Eliminate Operator scheduled functions.

DR Site Selection

- Aultman Criteria.
 - cycle of 70 virtual tapes total 67 Gb over 3-4 hours (batch cycle).
 - With the largest file being 22 Gb.
- 100Mbps (megabit per sec) allows a maximum of 600MB a minute or approximately 35GB an hour.
 - Two hours should allow transferring 70GB of data.
 - Encryption should decrease the physical amount of data being transferred.
- Issue to remember:
 - We contacted some current Virtual Tape users. Most indicated that cycle time decrease by 40-50%.
 - Aultman could be finished with the cycle and still have replication occurring.

DR Site Selection continued

- First Rule: Everything costs.
 - Power and environmental.
 - Cost is based on amount required.
 - Location.
 - Not all but some will charge based on location.
 - Internet connection.
 - Performance will always be charged higher rates.
 - Service level agreements.
 - Equipment requirements
 - Routers
 - Firewalls
 - Cabinet costs
 - Monitoring Services

Virtual Tape Systems Reviewed

- Fischer International
 - TAPESTREAM®
- Bustech
 - MDL-100s, MDL-1000, MDL-2000
- Visara International
 - Vi-4990A, Vi-4990L, Vi-4990S
- Virtual Software Systems, Inc
 - VTAPE
- SecureAgent Software
 - IDG 9483
- Universal Software, Inc.
 - Virtual Tape Systems

Disaster Sites Reviewed

- CDW
- Levi, Ray & Shoup, Inc.
- The Revere Group, an NTT Data Company
- Hosted Solutions
- Baer Consulting, Inc. (BCI)
- SunGard