Virtual Tape: What’s New with the EMC Disk Library for Mainframe?

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Session: 13003
Traditional

- Batch, HSM, Archive, Backup
- Traditional virtual tape environment
- Large SYSPLEX, multiple LPARs
- Guaranteed replication (sync)

Mission-Critical

- Critical operational tape data (HSM)
- Very short RTO
- Synchronous/Asynch replication
- Consistency between primary and tape data
- Automated recovery

Backup

- Data dedupe for efficient storage utilization
- Mixed support for mainframe, IBM-i and open systems
- Incremental delta guaranteed replication (async)

Data Domain

- DLm1000, DLm6000
- DLm2000, DLm6000
- DLm8000

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Evolution of DLm for mainframe tape

- **March 2008**
  - DLm4020 & DLm4080 debut as “tapeless” MF tape & superior DR

- **Sept. 2009**
  - DLm120 & DLm960 Gen-2 with highly scalable storage and GR v2

- **June 2010**
  - DLm960 with Data Domain dedupe option

- **Aug. 2011**
  - DLm6000 Gen-3 with massive scale, integrated dedupe and GR v3

- **Aug. 2012**
  - DLm8000 Gen-3 based on EMC VMAX, and SRDF,
Today’s DLm Product Line

Primary Storage
- DLm6000 w/ VNX7500
- DLm8000 w/ VMAX

Dedupe Storage
- DLm6000 w/ DD890

Combined Dedupe and Primary Storage
- DLm6000 w/ VNX7500 & DD890

Small to Medium
- DLm2000 w/ VNX5300
- DLm1000 w/ DD 600/800/900

Enterprise
DLm: 2012 Deliverables

- DLm2000 and DLm v3.2 software (Feb.)
  - Follow on for DLm120
- DLm1000 and DLm v3.2 software (Apr.)
  - 2 new models
  - Added VM/VSE support
  - DLm1020 tape import/export
- EzSM v4.1 (May)
  - DLm plug-in (ISPF/TSO)
- Virtuent 7 for DLm960 (DLm v3.3 software (July))
  - Investment protection commitment
- DLm8000 and DLm v3.4 software (Nov.)
  - VMAX-based featuring SRDF replication
Customer Workload Trends

**BACKUP**
- True synchronous replication
- Remote vaulting
- Faster backup (smaller windows)
- Tight SLAs
- Avoid data movement through mainframe
- Non-proprietary
- Data deduplication
- No data loss

**SPACE MGMT**
- Eliminate ML1 costs
- No data loss
- Eliminate host CPU cycles for compression
- ML2 with ML1 performance
- Consistent high performance on recalls

**DATA ARCHIVE**
- Unpredictable access patterns
- Performance oriented recalls
- Must be accessible (online) always
- Active archive versus inactive
- Need better integration with applications
- No data loss

**WORK TAPES**
- Reduce CPU overhead
- Reduce elapsed time (e.g., sorts)
- Reduce batch windows
- Tight SLAs
- Log files key to recovery

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in San Francisco 2013
Data Deduplication

- Virtual tape On disk is the mechanism for bringing data de-duplication to the mainframe
- As the mainframe writes data to the virtual tape the storage performs de-duplication on the data
- Reducing Local and Remote Storage Footprints
- Reduces the data sent across DR Links
- Repetitive backup data will achieve the highest benefit from this technology
  - Daily FDR / DSS Dumps of static DASD volumes
DLm6000 Supports Both Traditional and Dedup Storage

Traditional Environments

- Most Virtual Tape Systems support a single type of storage
- Introducing De-duplication requires separate virtual tape solutions requiring more mainframe resources
- DLm6000 concurrently supports both traditional and de-duplicating storage
- Allowing Tape and FICON resources to be shared
- Directing individual VOLSERs to the most appropriate storage

DLm6000 w/ VNX and DD Storage
Individual Tapes Directed to Appropriate Storage

- DLm6000 supports multiple concurrent storage classes (types)
- TMS tape pools (DRTAPE, DDTAPE, LOTAPE) allocate individual tapes to a specific storage class
- Storage classes are configured based on use case (Backup, Archive, Work, HSM)
- Simplifying management and administration of the library

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Product Overview – DLm8000

• Designed to meet the tape processing needs of customers with requirements for ultra high data resiliency

• Features:
  • VMAX as the backstore
  • SRDF for synchronous and asynchronous replication
  • Tape and DASD in the same consistency group

• Competitive advantages over IBM, Oracle and HDS
  • VMAX
  • Scale
  • Replication
  • Automated Restart
DLm8000 Features
Unprecedented scale, resiliency

- High-availability (HA) DLm architecture
- 56TB – 1,792TB per VMAX
- 700MB – 2.8GB/second throughput
  - Up to 8 VTE’s
- 512 – 2,048 virtual devices
- 4 –16 FICON attachments
- SRDF/S and SRDF/A replication for tape
- GDDR for automated recovery
- Universal Data Consistency™ DASD & tape
- Transparent to mainframe
- 3-13 cabinets footprint
DLm8000 Offering Synchronous Replication

- Built on EMC VMAX 20K
- Using SRDF/S replication
- Eliminating replication lag between DASD and Tape
- Viable for both EMC and non-EMC DASD customers
DLm Management

- DLm has to be easy to configure, manage
- Must have multiple interfaces to meet different users
- Must be able to manage complete system front to back

Presentation Layer

- Realtime Monitoring
- Operational Management
- Replication Management
- Capacity Planning
- Problem Determination
3.5 GUI Release Features

Features (Q1 2013):
- Realtime statistics (graphic thermals, etc.)
- Enable all VT commands (query, find, initialize, etc. to be called from DLm Console.
- Graphical mapping of tapelibs and mainframe
- Tape volume reporting
- Statistics for most recently mounted tape volumes
- Message filtering
- Mount statistics
- Health check indicators
- Access Storage Configuration
- Log gathering
New Command Tab

**Virtuent Command Interface**

| System: vte1 | Command: QUERY | Options: space |

**Options Format:**

```
[[DEV=]devicename[+]| ALL] | [MOUNTED] | [CHANNEL ADAPTERS] | [COMPRESS] | [CONFIG] | [ENCRYPTION] | [GR] | [LABELS] | [[DEV=]devicename] | [PATHS [ASSIGNED]] | [SCRATCHNAMES] | [SPACE] | [VERSION] | [WARNING] | [RECOVER] | [RECOVERAMT]
```

**Command Output:**

```
Tape library space for drives: EE00-EE1F

<table>
<thead>
<tr>
<th>Path</th>
<th>Size</th>
<th>Active</th>
<th>Scratch / Qty</th>
<th>Free</th>
<th>Filesystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>/tapelibCSE</td>
<td>29.5G</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>/dev/ada4</td>
</tr>
<tr>
<td>/tapelibCSE/V1_CSEPOOL_FS1</td>
<td>2.5T</td>
<td>67.5K</td>
<td>0%</td>
<td>0</td>
<td>celldm2-</td>
</tr>
<tr>
<td>aliases1:/tapelibCSE/V1_CSEPOOL_FS1</td>
<td>2.5T</td>
<td>0</td>
<td>832%</td>
<td>2</td>
<td>celldm2-</td>
</tr>
<tr>
<td>/tapelibCSE/V1_CSEPOOL_FS2</td>
<td>2.5T</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>/dev/ada4</td>
</tr>
<tr>
<td>aliases2:/tapelibCSE/V1_CSEPOOL_FS2</td>
<td>2.5T</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>celldm2-</td>
</tr>
</tbody>
</table>
```

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New Tapelist Tab

EMC Disk Library for mainframe

Tape libraries

Tapes 1 — 100 of 4,332

Tape details

Click on volser for tape detail

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Capacity Statistics Example
Throughput Statistics Example

EMC Disk Library for mainframe

Throughput (MB/s)
Reads (MB/s)
Writes (MB/s)
Tapes mounted
Mount time (1/10 s)

June 2012

Tape library: /tape1ib/B2, /tape1ib/B3, /tape1ib/B4
Channel: vte1, adapter 1, vte1, adapter 2

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### Access to Storage Configuration

**EMC Disk Library for mainframe**

<table>
<thead>
<tr>
<th>Status</th>
<th>Storage</th>
<th>Devices</th>
<th>Network</th>
<th>External</th>
<th>Messages</th>
<th>Configurations</th>
<th>Log out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>vte1</td>
<td>vte2</td>
<td></td>
<td></td>
<td></td>
<td>Management</td>
<td></td>
</tr>
</tbody>
</table>

#### Native Storage GUI

- Manage VNX 1

#### VNX Replication

- VNX Replication Out of Sync Hours
  - 8 Hours
  - Set VNX 1
  - Current value: 6

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DLm V3.5 – Data Encryption

- DLm6000 provides data encryption at rest and uses RSA Data Protection Manager for key management.
- DLm release 3.5 enhances data encryption by implementing RSA BSafe technology.
- Providing Galois/Counter Mode (GCM) encryption.
DLm Key Differentiators

1. Future-Proof Architecture
   - Modular approach with VTEs enable scale-on-demand and seamless storage migration

2. Breakthrough Disaster Recovery
   - Perform complete volser read/write - 100% end-to-end DR testing without losing replication or production data; also great for QA & migration test

3. High Availability – No Single Point Of Failure (No SPOF)
   - The HA architecture means 99.999% RAS in every DLm8000 – no metadata to lose

4. Superior Scale and Throughput
   - Up to 2.7GB/sec. per DLm – greater than 4x faster than alternatives
   - Up to 7X more capacity than competition

5. Universal Data Consistency™
   - Data on DASD and on Tape consistent at same point in time copy

6. Ultra-high Data Resiliency
   - True synchronous replication at the I/O level, not a tape copy

7. Non-Disruptive Code Updates (virtual tape engines and storage)
   - High availability architecture of DLM allows for non-disruptive code updates of virtual tape engines (VTE) and storage
Thank You!