Understanding Cloud Storage for Mainframe Virtual Tape

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Why Cloud Storage?

- Cloud Storage and Cloud Computing are changing how IT operates – outside of the mainframe Data Center
  - According to 2013 Symantec report 94% of enterprises are now discussing cloud storage
  - “A majority of respondents (80%) already have some sort of cloud storage in place” Study by Avere released this week
  - “the total cloud storage market is expected to reach $46.8B by 2108 with a CAGR of 40.2%” Markets and Markets report

- Concerns and Questions
- Use Cases
- CloudTAPE - How it Works
- CloudTAPE Advantages
Why Cloud?

• Concerns and Questions (from Symantec study)
  • Unintentional storage of confidential data in the Cloud
  • Multiple storage strategies are complicated to manage
  • Slow to recover data from the cloud
  • Fear of losing data out of enterprise control
  • No easy way to implement a cloud tier
  • Privacy concerns – who is allowed to access my data?
Cloud Storage: Customer Feedback as reported by Nirvanix

Cloud Storage: Aggregation of multiple storage resources into a single universally accessible pool

- Deployed as a Service
- Usage-based Pricing
- No Maintenance/Tech Refresh Fees
- Help in Eliminating CapEx
- Elastic Flexibility
- Web-based Access
- Guaranteed SLAs
- Accessed via the Internet or dedicated network link
Traditional Physical Tape Vaulting and Recall

The traditional process of creating tapes to send offsite to a secure offsite vault or disaster recovery site.
Data Centers and Disaster Recovery without Physical Tape

Production Site

zSeries Mainframe

FICON

Luminex MVT

Disaster Recovery Site

zSeries Mainframe

FICON

Luminex MVT

WAN

Replication using WAN (No FICON or ESCON channel extension required)

Luminex is the leader driving the industry towards tapeless mainframe datacenters
3 Site Backup and Archive

Production Site
- Production Mainframe
- Luminex MVT

Disaster Recovery Site
- Luminex MVT
- DR Mainframe

Third Copy

Complete your sessions evaluation online at SHARE.org/SFEval
## Tape Analysis by Age

<table>
<thead>
<tr>
<th>Category</th>
<th>Capacity (GB)</th>
<th>Current Volumes</th>
<th>% of Total</th>
<th>Cumulative % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5+ Years</td>
<td>117,655.34</td>
<td>69,929.00</td>
<td>8.47%</td>
<td>8.47%</td>
</tr>
<tr>
<td>3+ Years - 5 Years</td>
<td>179,092.39</td>
<td>64,788.00</td>
<td>12.89%</td>
<td>21.35%</td>
</tr>
<tr>
<td>1+Years - 3 Years</td>
<td>260,912.72</td>
<td>94,375.00</td>
<td>18.77%</td>
<td>40.13%</td>
</tr>
<tr>
<td>181 Days - 1 Year</td>
<td>227,960.98</td>
<td>84,509.00</td>
<td>16.40%</td>
<td>56.53%</td>
</tr>
<tr>
<td>91-180 Days</td>
<td>153,766.02</td>
<td>57,078.00</td>
<td>11.06%</td>
<td>67.60%</td>
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<tr>
<td>61-90 Days</td>
<td>65,719.32</td>
<td>24,592.00</td>
<td>4.73%</td>
<td>72.32%</td>
</tr>
<tr>
<td>31-60 Days</td>
<td>61,356.24</td>
<td>20,044.00</td>
<td>4.41%</td>
<td>76.74%</td>
</tr>
<tr>
<td>0-30 Days</td>
<td>323,259.88</td>
<td>140,785.00</td>
<td>23.26%</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Summary</strong></td>
<td>1,389,722.89</td>
<td>556,100.00</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

- ~68% of Tape data is more than 90 days old
## Tape Analysis by Age

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<th>% of Total</th>
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</tr>
</thead>
<tbody>
<tr>
<td>5+ Years</td>
<td>611,116.17</td>
<td>39,465.00</td>
<td>41.09%</td>
<td>41.09%</td>
</tr>
<tr>
<td>3+ Years - 5 Years</td>
<td>304,034.82</td>
<td>10,697.00</td>
<td>20.44%</td>
<td>61.53%</td>
</tr>
<tr>
<td>1+ Years - 3 Years</td>
<td>437,680.34</td>
<td>41,195.00</td>
<td>29.43%</td>
<td>90.95%</td>
</tr>
<tr>
<td>181 Days - 1 Year</td>
<td>40,843.12</td>
<td>6,671.00</td>
<td>2.75%</td>
<td>93.70%</td>
</tr>
<tr>
<td>91-180 Days</td>
<td>38,887.56</td>
<td>10,059.00</td>
<td>2.61%</td>
<td>96.31%</td>
</tr>
<tr>
<td>61-90 Days</td>
<td>9,564.28</td>
<td>3,242.00</td>
<td>0.64%</td>
<td>96.96%</td>
</tr>
<tr>
<td>31-60 Days</td>
<td>11,030.01</td>
<td>3,815.00</td>
<td>0.74%</td>
<td>97.70%</td>
</tr>
<tr>
<td>0-30 Days</td>
<td>34,238.84</td>
<td>13,431.00</td>
<td>2.30%</td>
<td>100.00%</td>
</tr>
<tr>
<td><strong>Summary:</strong></td>
<td><strong>1,487,395.13</strong></td>
<td><strong>128,575.00</strong></td>
<td><strong>100.00%</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>
“Luminex and Nirvanix Introduce World’s First Cloud-based Tape Vaulting Solution For Mainframe Environments”

August 8, 2012, at SHARE IBM Mainframe User Group
Mainframe Tape Performance Characteristics

LOCAL SITE
- Fast Read/Write Critical
- Frequent Activity

REMOTE SITE
- Fast Read during DR event/test Critical
- Infrequent Activity

LOCAL SITE
- Write & Read Speed Not Critical
- Infrequent Activity

REMOTE SITE
- Write & Read Speed Not Critical
- Infrequent Activity
CloudTAPE vaults a copy to the Nirvanix Cloud

3rd Copy and/or Archive

- Store Data Out-Of-Region
- Compliance / 3rd Copy
- Replace all remote tape vaults
- Primary tape data and Backup may also be stored in Deep Cloud Archive as 3rd copy option
CloudTAPE vaults a copy of all Archive Data to the Nirvanix Cloud

Replicate Backups to the DR Site

1. Local Copy
   - Tape data reads / writes to local virtual tape

2. Remote Copy for DR
   - 2nd Copy Archive Data not stored at DR

Reduce or eliminate requirement for Archive data at DR site
Primary tape data and Backup may also be stored in Deep Cloud Archive as 3rd copy option
Offsite / Compliance / Deep Archive Stored Only in Cloud

Production Site

- Tape data reads / writes to local virtual tape
- Local Copy

DR Site

- Replication to the DR Site of Backups
- Recover Archive Data at DR

- Replace tape on shelves or managed in remote vaults
- Prepares for Data Center relocations
- Primary tape data and Backup may also be stored in Deep Cloud Archive as 3rd copy option

CloudTAPE vaults a copy of all Archive Data to the Nirvanix Cloud
Off Site Copy

- Provide remote storage and redundancy without the cost and overhead of a dedicated DR or bunker site
How it Works
CloudTAPE Intelligent Storage Management

**Production Site**

**Data Use Case**
- Data that must remain local to Production and DR
  - Fast Reads/Writes
  - Fast Read during DR event/test Critical
- Data that must remain local to Production and, optionally, DR
  - Fast Reads/Writes
  - Frequent Activity
- Data that can be offloaded to the Cloud after X days
  - Write & Read Speed Not Critical
  - Infrequent Activity

**Example Data**
- Backup
- Primary Operational
- Archive (temporary copy)

**DR Site**
- 2nd Copy
- Optional 2nd Copy

**Cloud Storage**
- Optional 3rd Copy
- Only Copy (after X days)

A 2 copies
B 1 / 2 / 3 copies
C 1 or 2 copies
CloudTAPE Replication & Vaulting

Integrated with proven RepMon mainframe VOLSER-based replication software

Provides **real-time status monitoring and logging** of virtual tape data writes and replication to the Nirvanix cloud at the VOLSER level

- Provides visual and audit capabilities to confirm when tapes are “in the cloud”
- Satisfy legal and audit concerns
- No chain of custody issues
Mainframe Host-based storage allocation

- Uses Luminex TMACS – Tape Monitoring and Allocation Control Steering
  - Sort / Filter options, including by volser range, dataset names, etc.

- Esoterics

- Additional capabilities for host-based data tiering planned in future releases
Encryption and Security

- It is essential to encrypt data PRIOR to it being sent to the cloud storage
  - Processes and key management in your total control
  - Ensure that any breach of the cloud storage data center does not risk your data
  - Ensure that data cannot be mis-used or subject to government request without your involvement
- Integrates with and leverages CGSafe Luminex encryption and key management
CloudTAPE – How it Works

Production Site

Production Mainframe

Luminex Channel Gateways

FICON

FC/10 GbE

sCloud
100% Local
100% Cloud

FC/10 GbE

pCloud
0 – 100% Local Managed Cache
100% Cloud

DR Site

DR Mainframe

FICON

Nirvanix API

Luminex Channel Gateway

Nirvanix API

Complete your sessions evaluation online at SHARE.org/SFEval
CloudTAPE with private or hybrid cloud

**Production Site**
- Production Mainframe
- Luminex Channel Gateways
- FC/10 GbE
- Local Disk Cache
- Nirvanix API
- FICON

**DR Site**
- DR Mainframe
- Luminex Channel Gateway
- Nirvanix API
- FICON

Deep Cloud Archive

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The Largest IT Services Company in the World Selects Nirvanix for Cloud Storage

- **#1: IBM $37B**
- **Nirvanix and IBM Signed a 5-Year OEM Pact**

- IBM is integrating Nirvanix cloud storage technology into its SmartCloud Enterprise services portfolio
- IBM determined Nirvanix is the only cloud storage suitable for IBM’s global enterprise customer base
Virtual Tape Vaulting and Recall

Production Site

Production Mainframe  FICON  Luminex MVT

Expanded datacenter use of private, hybrid and public clouds will provide new opportunities and implementations that offer tremendous value. Mainframe tape data types can be managed uniquely to meet the business requirements.
Battle-Hardened, Proven Second Generation Cloud Storage Technology

The Cloud Storage Network

- 9 globally distributed nodes under a single namespace
  - Honolulu, LA, Las Vegas, Dallas, New Jersey, Frankfurt, Geneva, Bern, Tokyo
- Fully redundant infrastructure with integrated load balancing
- SAS 70 Type II compliant operations, physical security
- Secure multi-tenant file system, encryption, SSL
- Full directory structure, storage pools, and child accounts
CloudTAPE Advantages

• Better Access
  • Access to a 2\textsuperscript{nd} or 3\textsuperscript{rd} copy of mainframe tape anywhere in the world, at any time

• Save money
  • Eliminate the cost associated with physical tape media, shipping and off-site storage for vaulting

• Simply Secure
  • Eliminate security issues with physical media

• Compliance
  • Geographic Dispersal of Archive Data

• No changes!
  • Non-disruptive to existing tape applications and datacenter operations
Why LUMINEX?

• Luminex is the leader in solving real-world customer issues moving to modern mainframe data centers

• Proven Innovation and Technology Leader

• Proven Customer Advocate