Understanding Cloud Storage for Mainframes

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Luminex Software, Inc.

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Session #14132

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*
  - "the total cloud storage market is expected to reach $46.8B by 2018 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:

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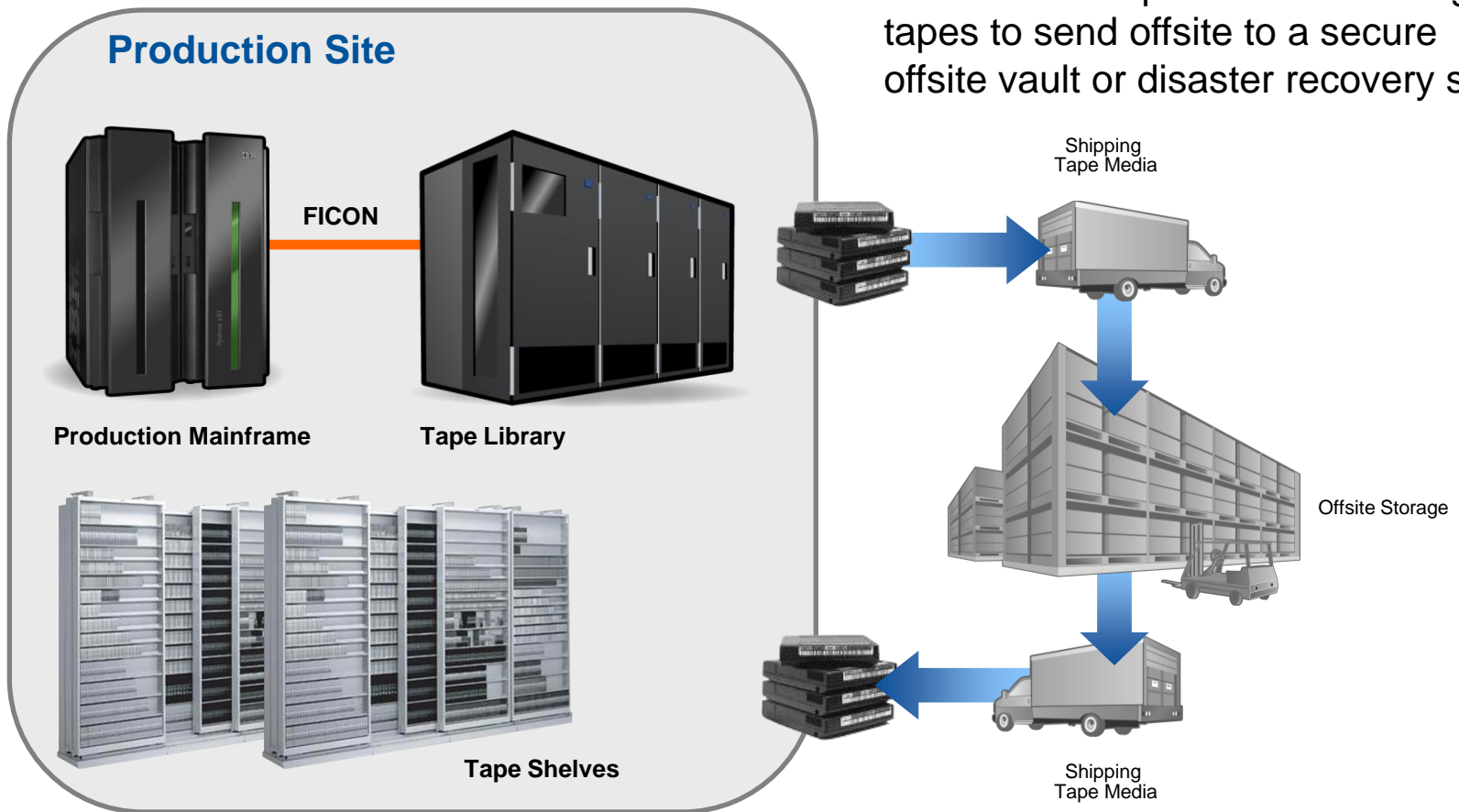- Accessed via the Internet or dedicated network link

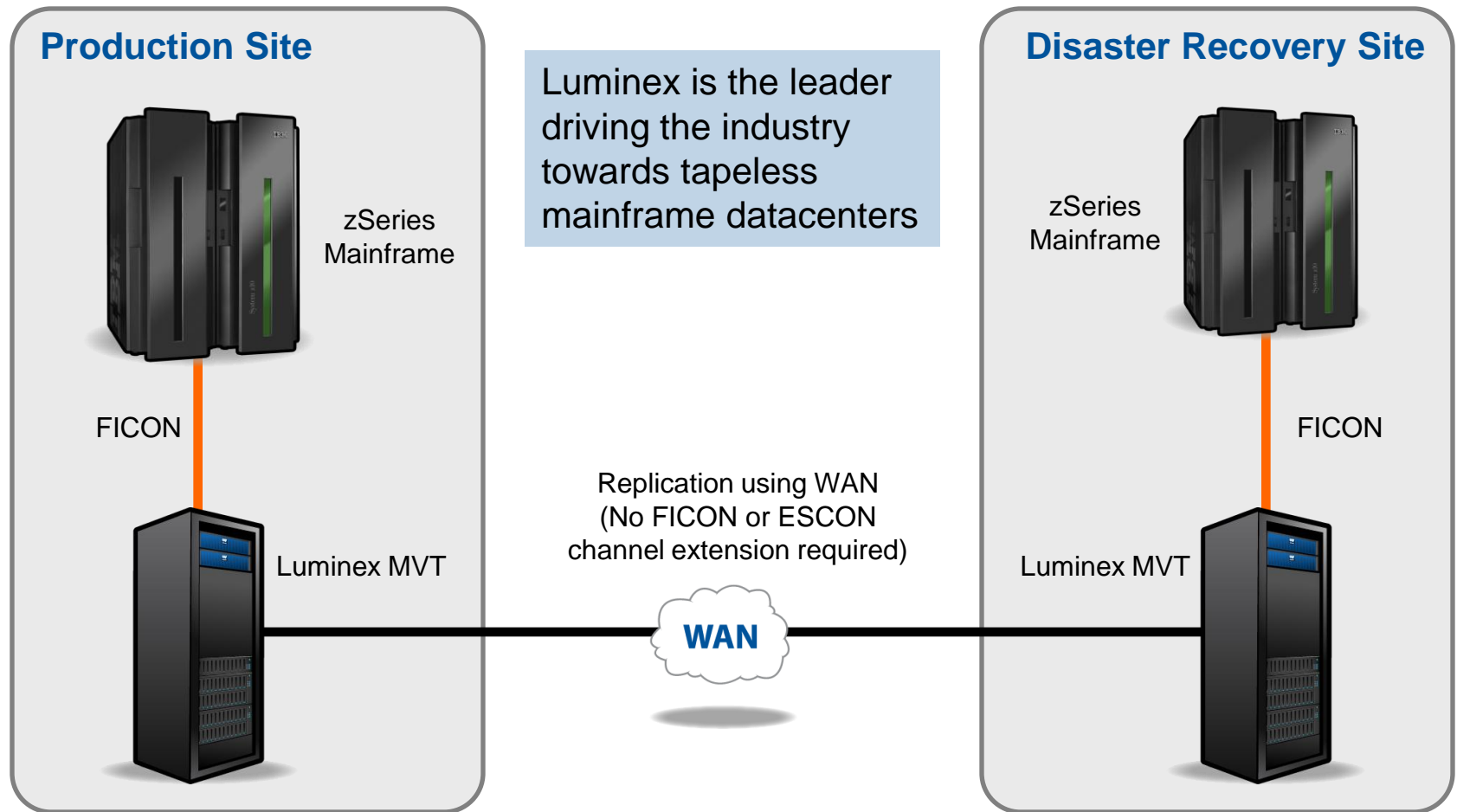# Why Cloud Storage for Mainframe?

- Replace Remaining Physical Tape Infrastructure and Processes
  - Equipment
  - Consumables
  - Transportation
  - Warehousing
  - Floor Space
  - Additional Data Centers
  - Management

Traditional Physical Tape Vaulting and Recall

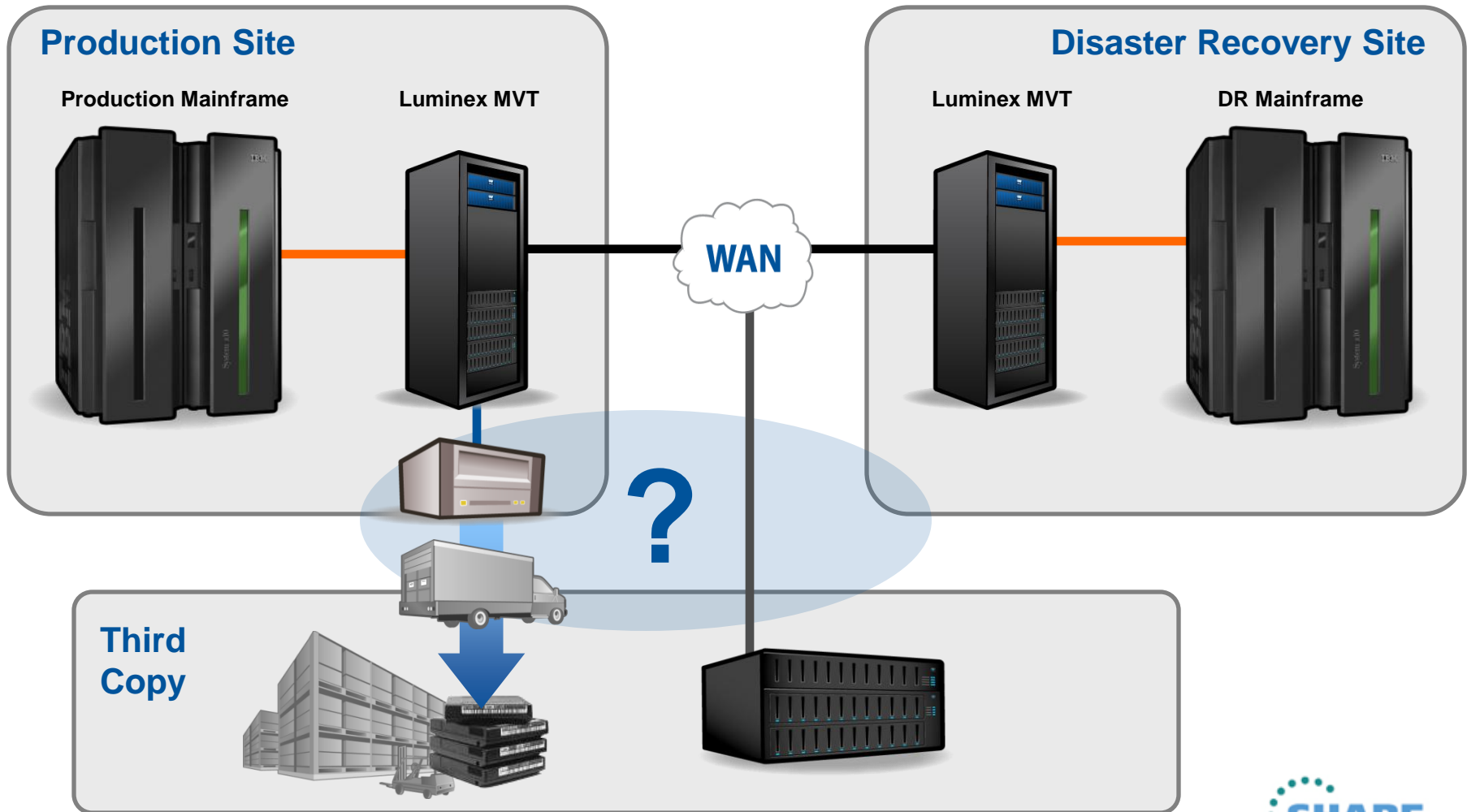**Production Site**

FICON

Production Mainframe   **Tape Library**

Tape Shelves

The traditional process of creating tapes to send offsite to a secure offsite vault or disaster recovery site

Shipping Tape Media

Offsite Storage

Shipping Tape Media

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Data Centers and Disaster Recovery without Physical Tape

Production Site

zSeries Mainframe

FICON

Luminex MVT

Luminex is the leader driving the industry towards tapeless mainframe datacenters

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

WAN

Disaster Recovery Site

zSeries Mainframe

FICON

Luminex MVT

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3rd Site Tape Archive

Production Site

Production Mainframe   Luminex MVT

Disaster Recovery Site

Luminex MVT   DR Mainframe

WAN

?

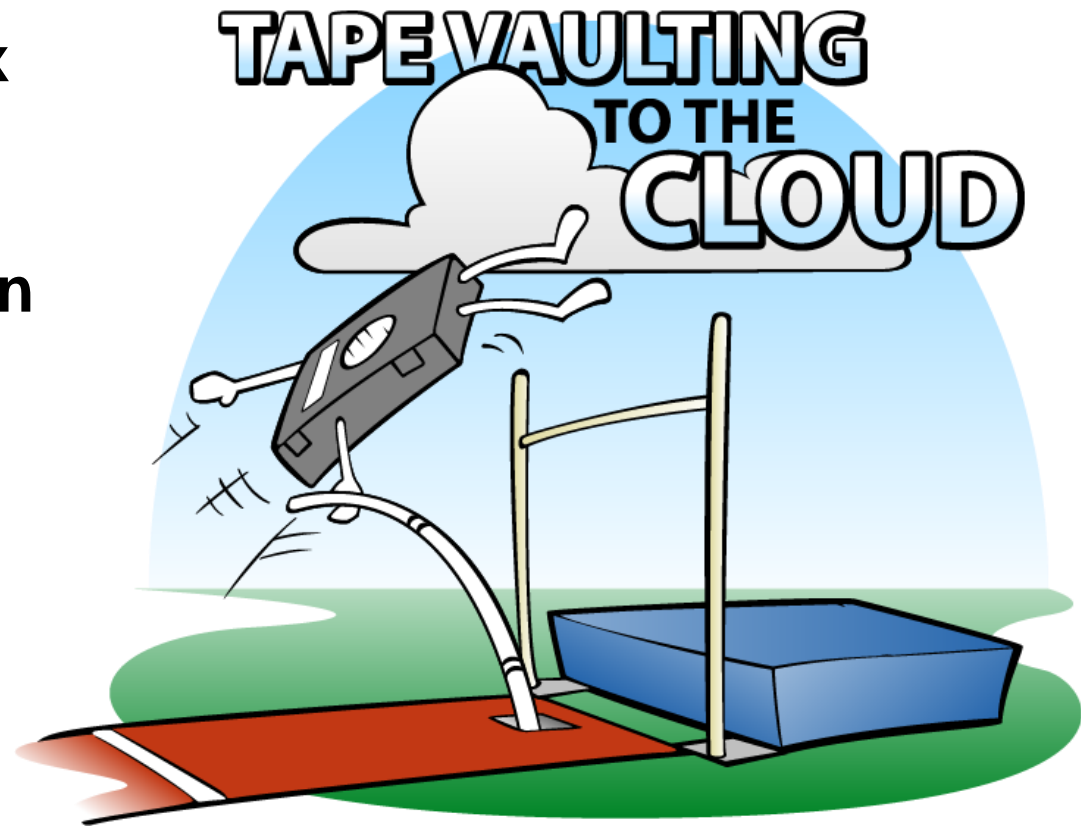Third Copy

"Luminex and Nirvanix Introduce World's First Cloud-based Tape Vaulting Solution For Mainframe Environments"
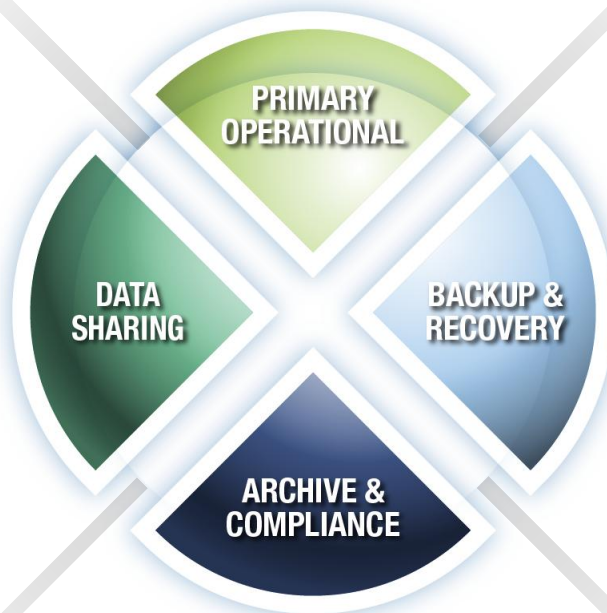
August 8, 2012, at SHARE IBM Mainframe User Group

Mainframe Tape Performance Characteristics

LOCAL SITE
- Fast Read/Write Critical
- Frequent Activity

LOCAL SITE
- Fast Write Critical
- Read Speed Not 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

PRIMARY OPERATIONAL

DATA SHARING

BACKUP & RECOVERY

ARCHIVE & COMPLIANCE

Understand Your Data
Tape Analysis by Age Report

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

- ~68% of Tape data is more than 90 days old
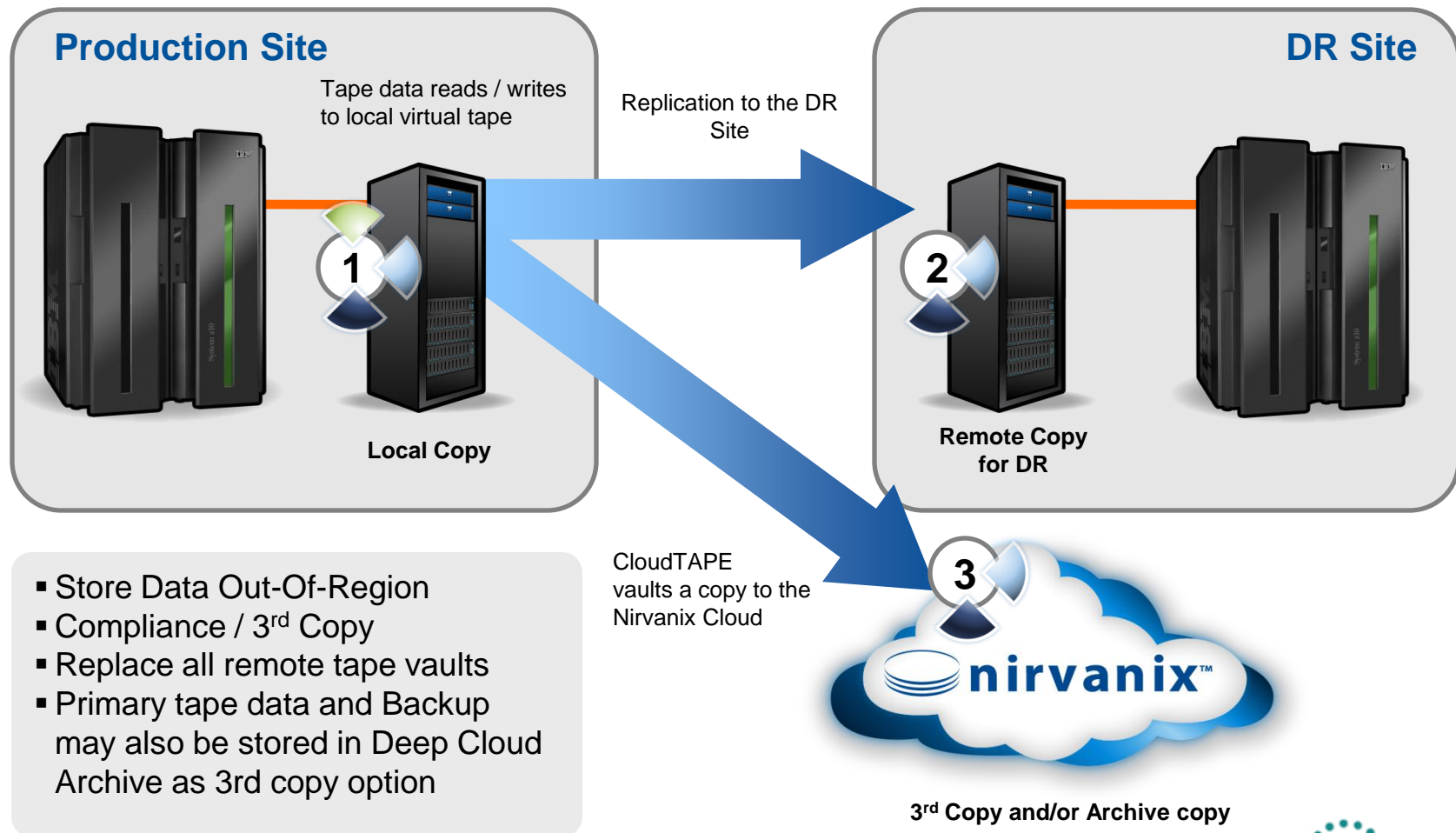
Understand Your Data
Tape Analysis by Age Report

Category	Capacity (GB)	Current Volumes	% of Total	Cumulative % of Total
5+ Years	611,116.17	39,465.00	41.09%	41.09%
3+ Years - 5 Years	304,034.82	10,697.00	20.44%	61.53%
1+Years - 3 Years	437,680.34	41,195.00	29.43%	90.95%
181 Days - 1 Year	40,843.12	6,671.00	2.75%	93.70%
91-180 Days	38,887.56	10,059.00	2.61%	96.31%
61-90 Days	9,564.28	3,242.00	0.64%	96.96%
31-60 Days	11,030.01	3,815.00	0.74%	97.70%
0-30 Days	34,238.84	13,431.00	2.30%	100.00%
Summary:	1,487,395.13	128,575.00	100.00%	100.00%

Off Site Copy
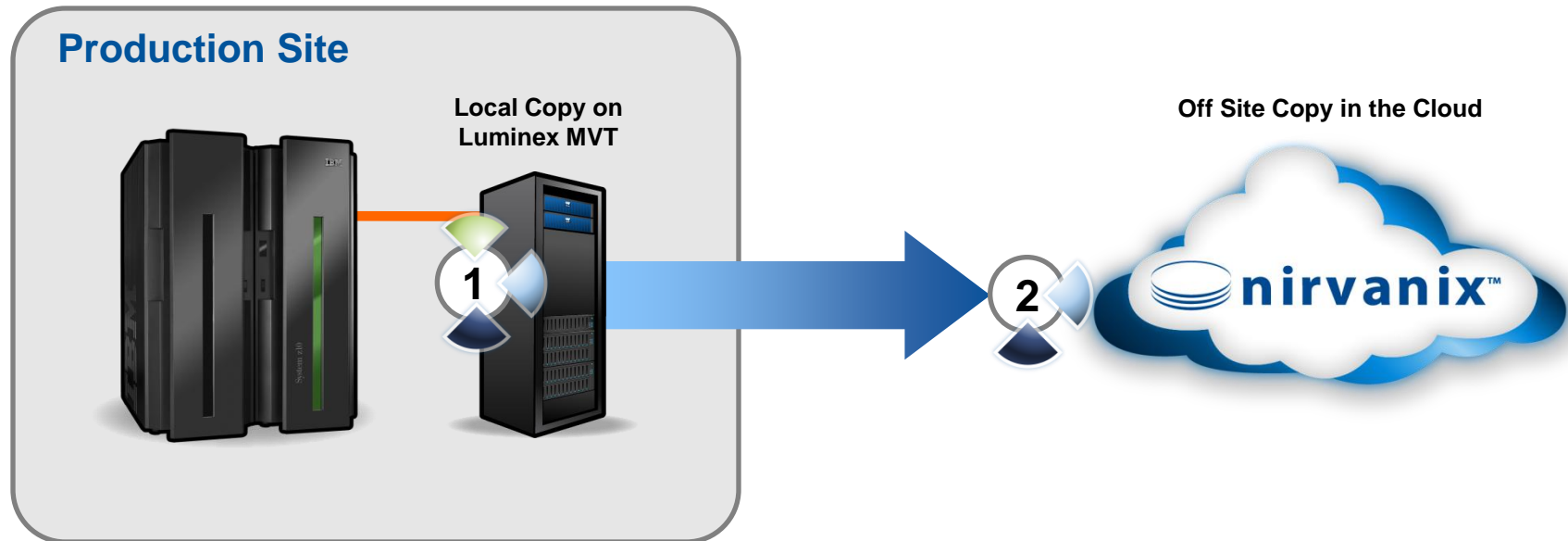
Production Site

Local Copy on
Luminex MVT

Off Site Copy in the Cloud

1

2

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- Provide remote storage and redundancy without the cost and overhead of a dedicated DR or bunker site

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3rd Copy and/or Archive

Production Site

Tape data reads / writes to local virtual tape

1

Local Copy

Replication to the DR Site

DR Site

2

Remote Copy for DR

CloudTAPE vaults a copy to the Nirvanix Cloud

3

- 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

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3rd Copy and/or Archive copy

2nd Copy, Archive Data not stored at DR

Production Site

Tape data reads / writes to local virtual tape

Replicate **Backups** to the DR Site

DR Site

1

2

Local Copy

Remote Copy for DR

2

- 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

CloudTAPE vaults a copy of **all Archive Data** to the Nirvanix Cloud

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Offsite / Compliance / Deep Archive Stored Only in Cloud

SHARE
Technology · Connections · Results

Production Site

Tape data reads / writes to local virtual tape

1

Local Copy

Replicate **Backups** to the DR Site

DR Site

2

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

1

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How it Works
CloudTAPE Intelligent Storage Management

Production Site

Data Use Case

Example Data

Data that must remain local to Production and DR
- Fast Reads/Writes
- Fast Read during DR event/test Critical

(A) Backup

Data that must remain local to Production and, optionally, DR
- Fast Reads/Writes
- Frequent Activity

(B) Operational
(Examples: batch, HSM, test)

Data that can be offloaded to the Cloud after X days
- Write & Read Speed Not Critical
- Infrequent Activity

(C) Archive

DR Site

(A) 2nd Copy

(B) Optional 2nd Copy

Cloud Storage

(B) Optional 3rd Copy

(C) Optionally Only Copy after X days

(A) 2 copies

**(B)** 1 / 2 / 3 copies

(C) 1 or 2 copies

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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
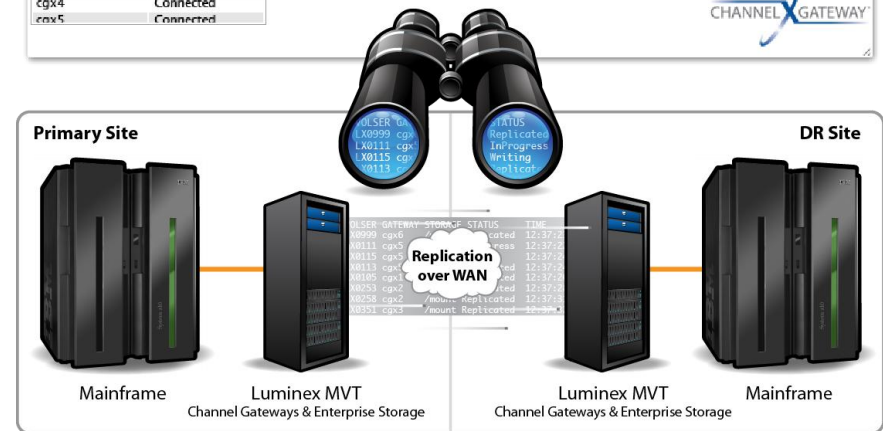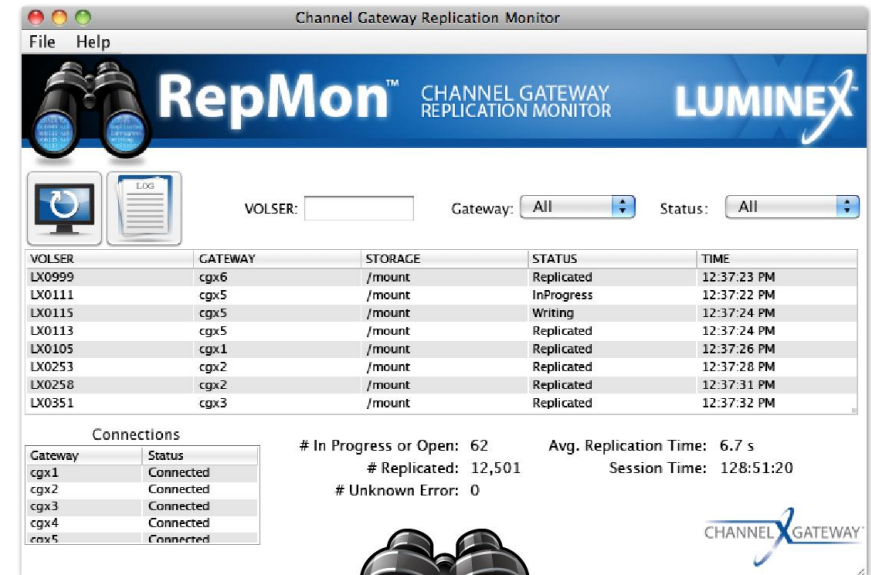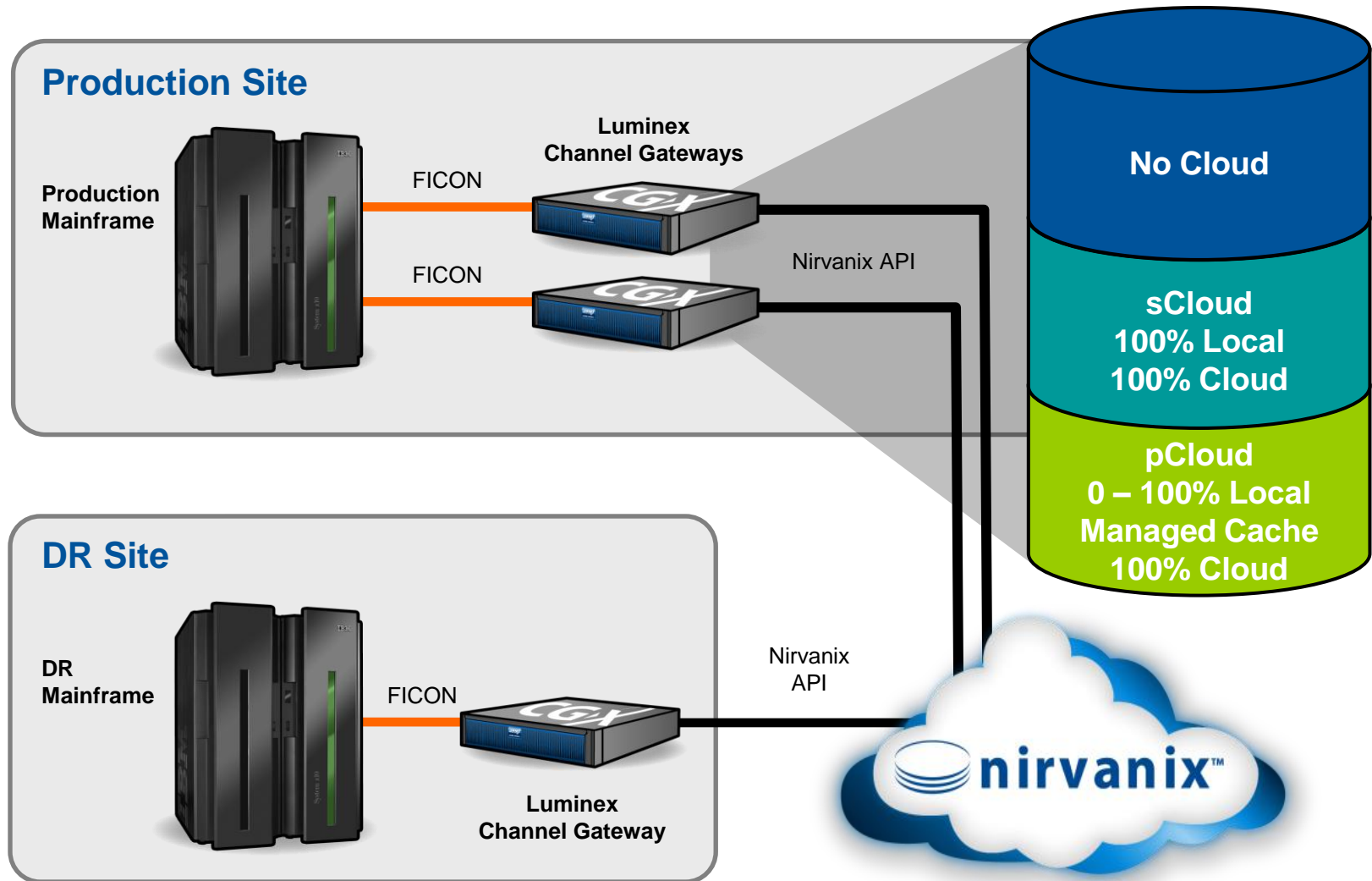
Mainframe Host-based storage allocation

- 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

FICON

FICON

Luminex Channel Gateways

CGX

CGX

Nirvanix API

No Cloud

sCloud
100% Local
100% Cloud

pCloud
0 – 100% Local
Managed Cache
100% Cloud

DR Site

DR Mainframe

FICON

CGX

Luminex Channel Gateway

Nirvanix API

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

**SERVICES TOP 100** The world's largest IT services companies

- **#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**

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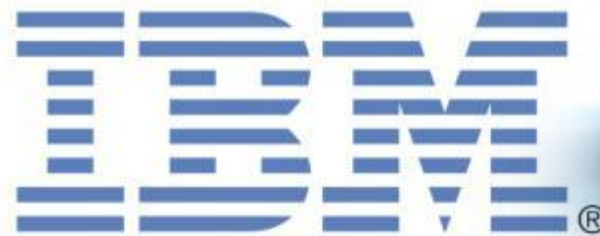
Battle-Hardened, Proven Second Generation Cloud Storage Technology

The Cloud Storage Network

- 10 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
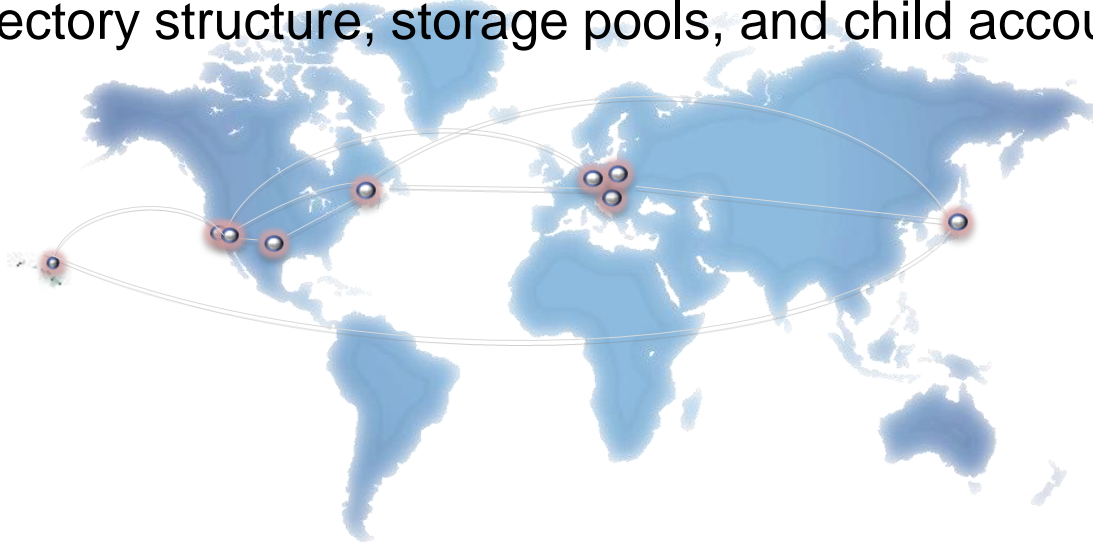
CloudTAPE Advantages

- Better Access
  - Access to a 2nd or 3rd 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