Utilizing Cloud Storage for Mainframes

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What? Why? and How? of Cloud Storage

- Cloud Storage and Cloud Computing are changing how IT operates – outside of the mainframe data center
- Trends and Tides
- Use Cases
- CloudTAPE - How it Works
- Questions

Why Cloud Storage?

- Common Concerns and Questions
  - Unintentional storage of confidential data in the Cloud
  - Privacy concerns – who is allowed to access my data?
  - 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

Why Cloud Storage?

- Agility and Scalability drives cloud deployment value more than cost
- Cost is Compelling
  - IT infrastructure is now driven by low margin and capital intensive cloud business models
- *Analysts forecast the Global Software Defined Storage market to grow at a CAGR of 35.2% over the period 2015-2019.*

Trends and Tides

- Current data from analysts and AWS s3 Storage pricing:

- *In 2015, some 72% of enterprises will pursue a hybrid cloud strategy, and the hybrid cloud market as a whole will reach $80 billion by 2018, according to Gartner*

	Standard Storage	Reduced Redundancy Storage	Glacier Storage
First 1 TB / month	$0.0300 per GB	$0.0240 per GB	$0.0100 per GB
Next 49 TB / month	$0.0295 per GB	$0.0236 per GB	$0.0100 per GB
Next 450 TB / month	$0.0290 per GB	$0.0232 per GB	$0.0100 per GB

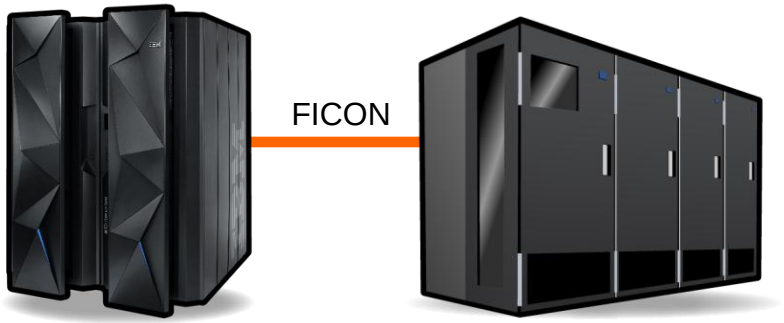
Trends and Tides for Mainframe Virtual Tape

- Infrastructure Changes and Operational Trends
  - Better Disaster Recovery
  - Security and Encryption
  - Multi-site Data Center Operations
  - Shared Storage Infrastructure
  - Virtual for the Masses
  - Big Data meets Big Value Data

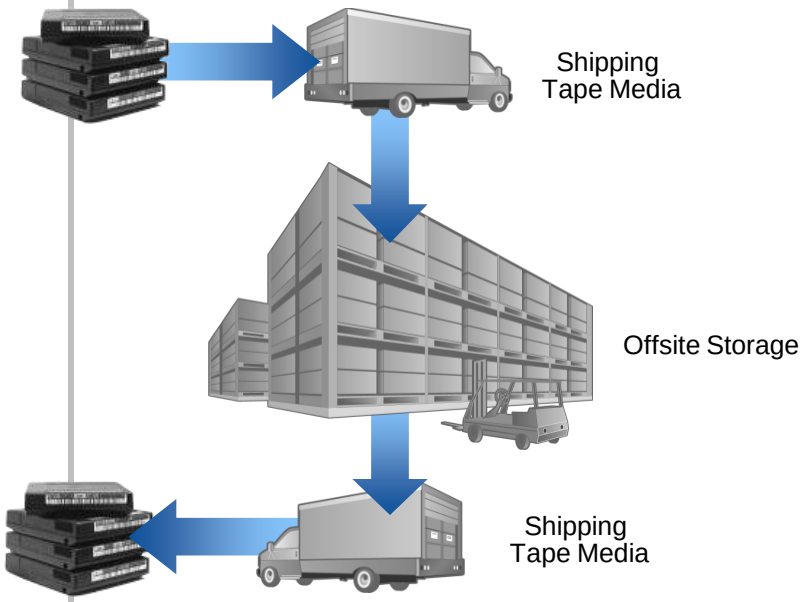
Traditional Physical Tape

Vaulting and Recall

Production Site



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



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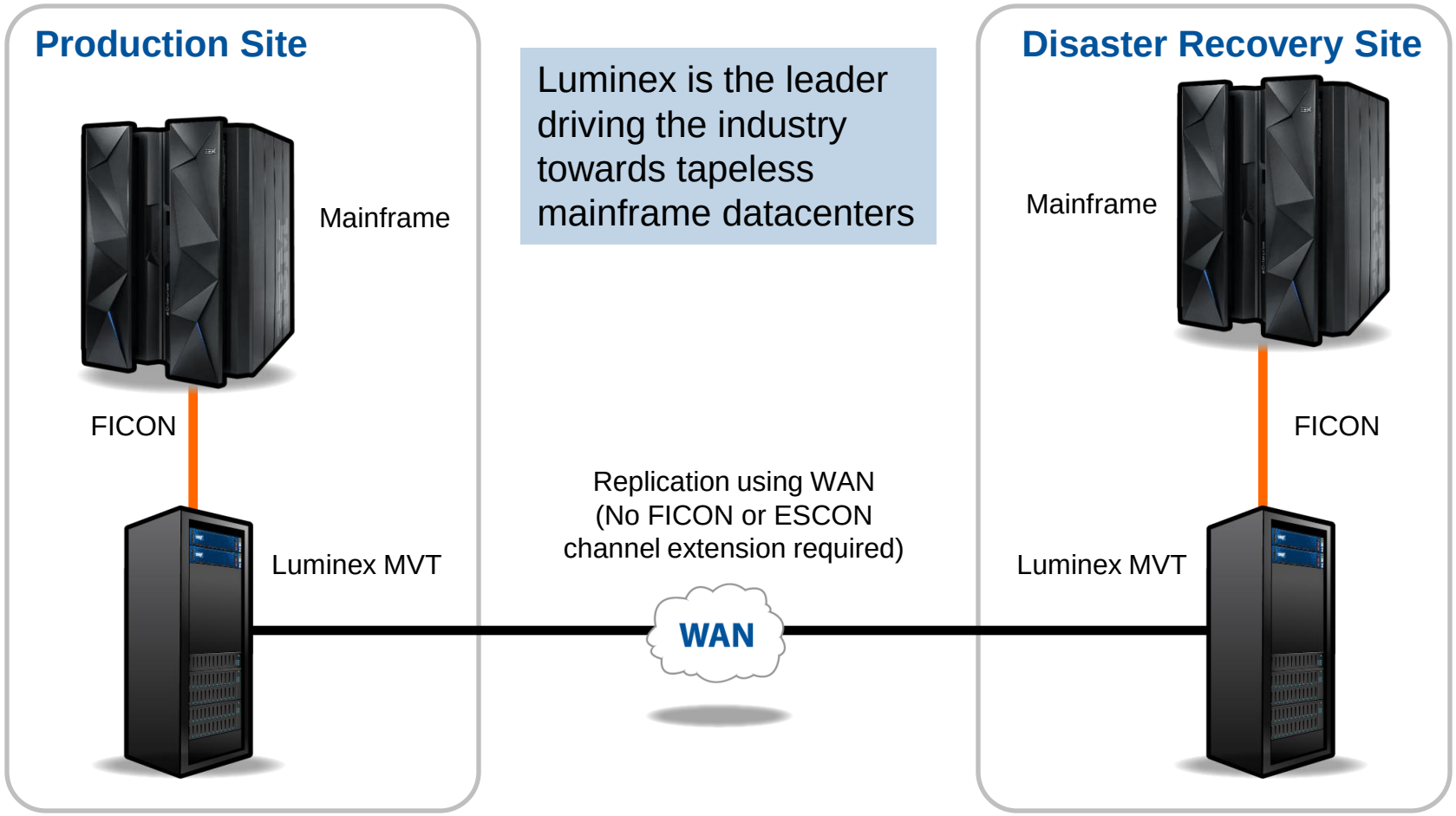
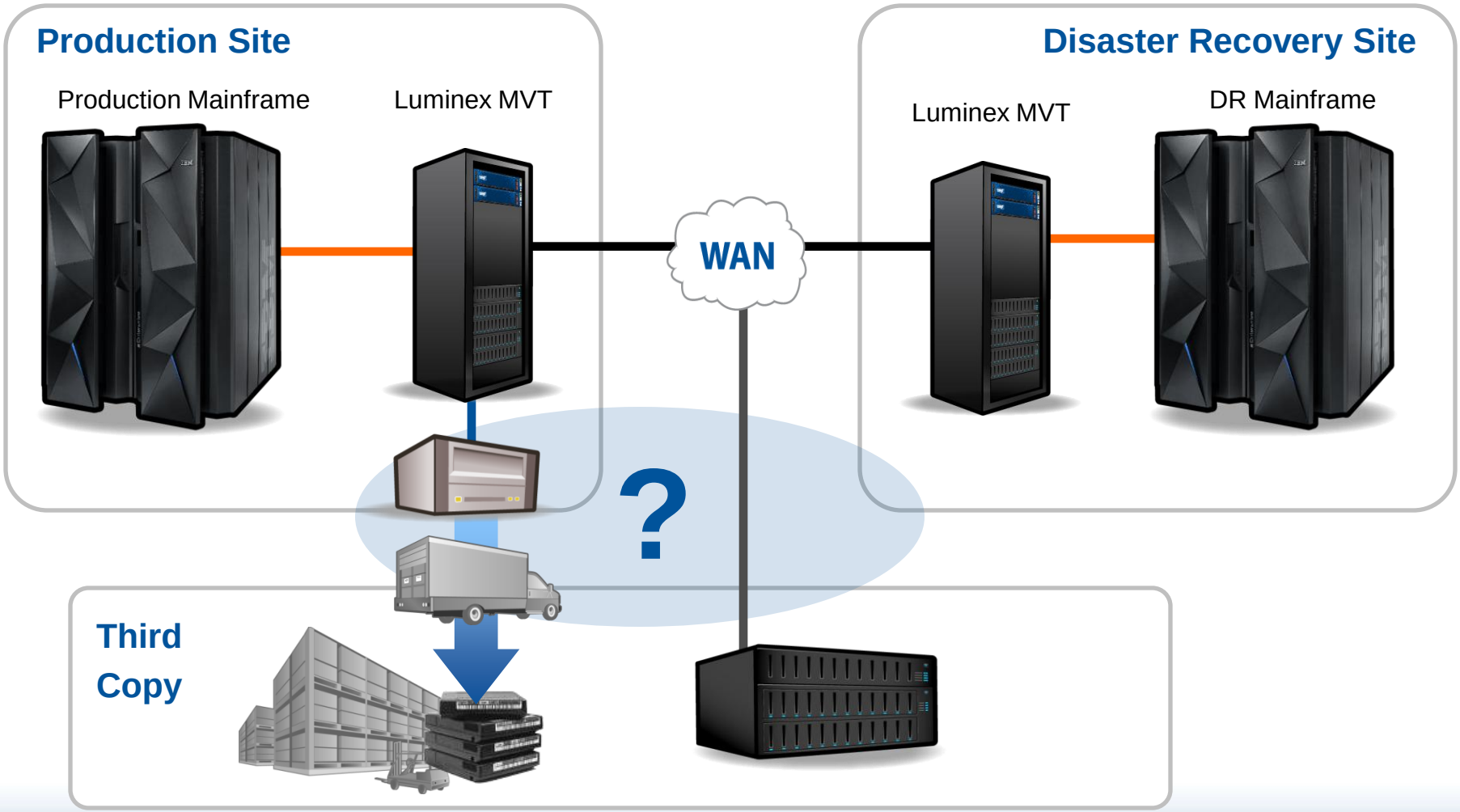
Data Centers and Disaster Recovery without Physical Tape



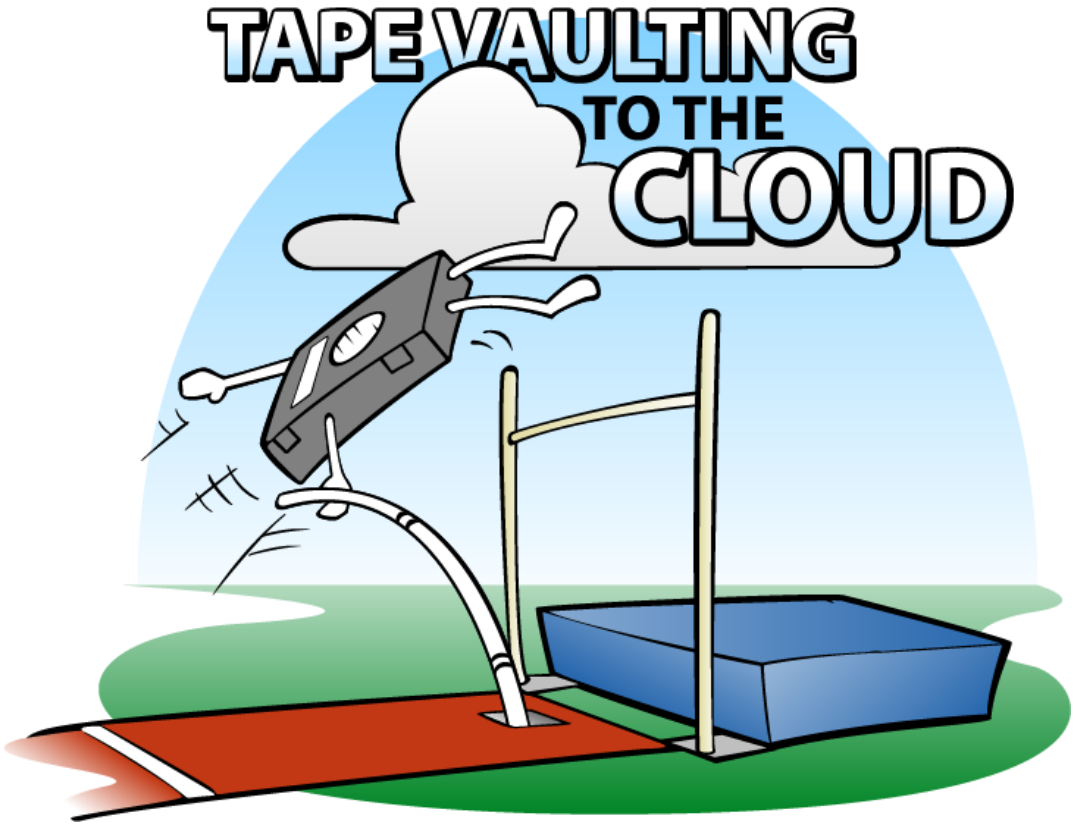
3rd Site Tape Archive



What? And How? Of Cloud Storage

“Luminex Introduces World’s First Cloud-based Tape Vaulting Solution For Mainframe Environments”

August 8, 2012, at SHARE
IBM Mainframe User Group



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

Trends and Directions

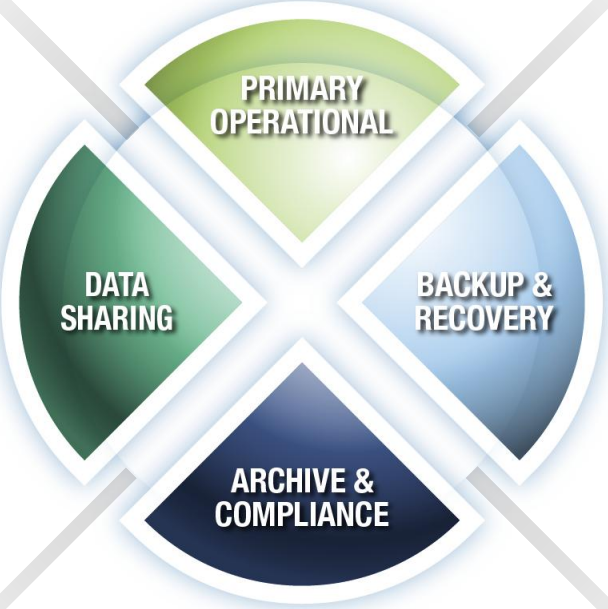
Security and Encryption

- Increased Customer Focus on Mainframe Data Security
  - Data-At-Rest and Data-in-Flight
- Inline data encryption options with key management
  - Luminex – CGX-based or KMIP appliance
  - EMC – RSA
  - IBM and Oracle for physical tape media only
- Drive-based encryption does not protect against logical access or in-flight during replication
- Security requires encrypting data at its earliest point of creation and decrypting closest to when/where it is used

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

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

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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%**

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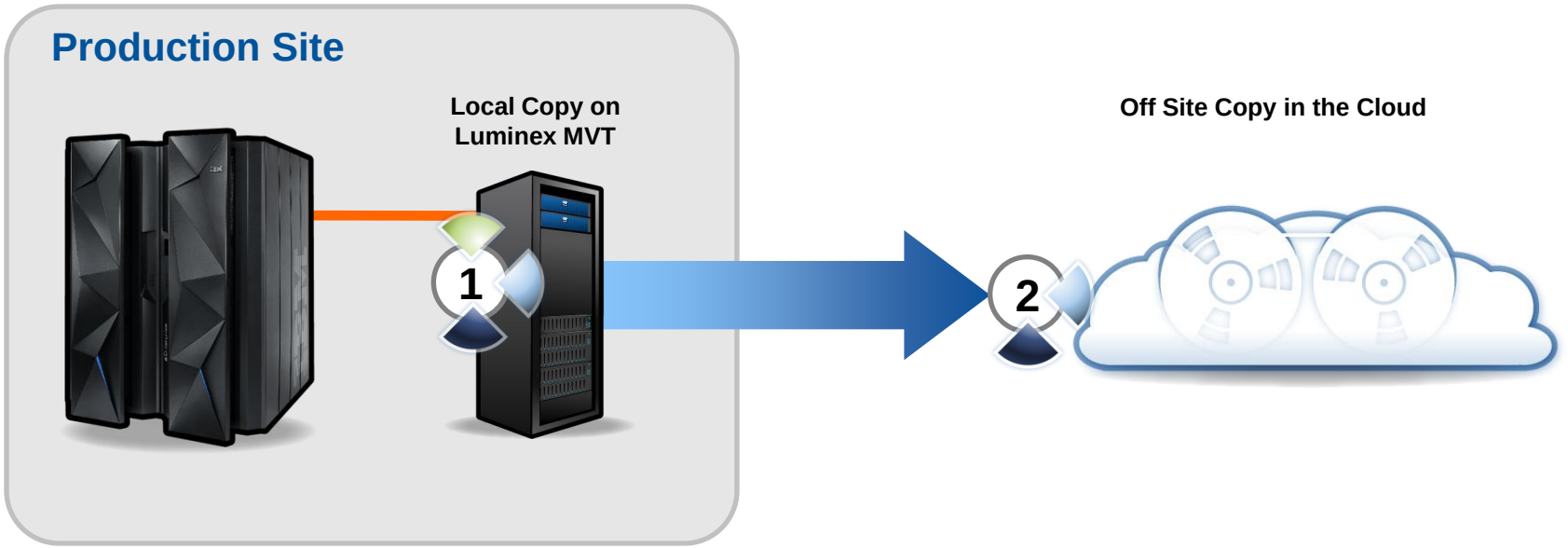
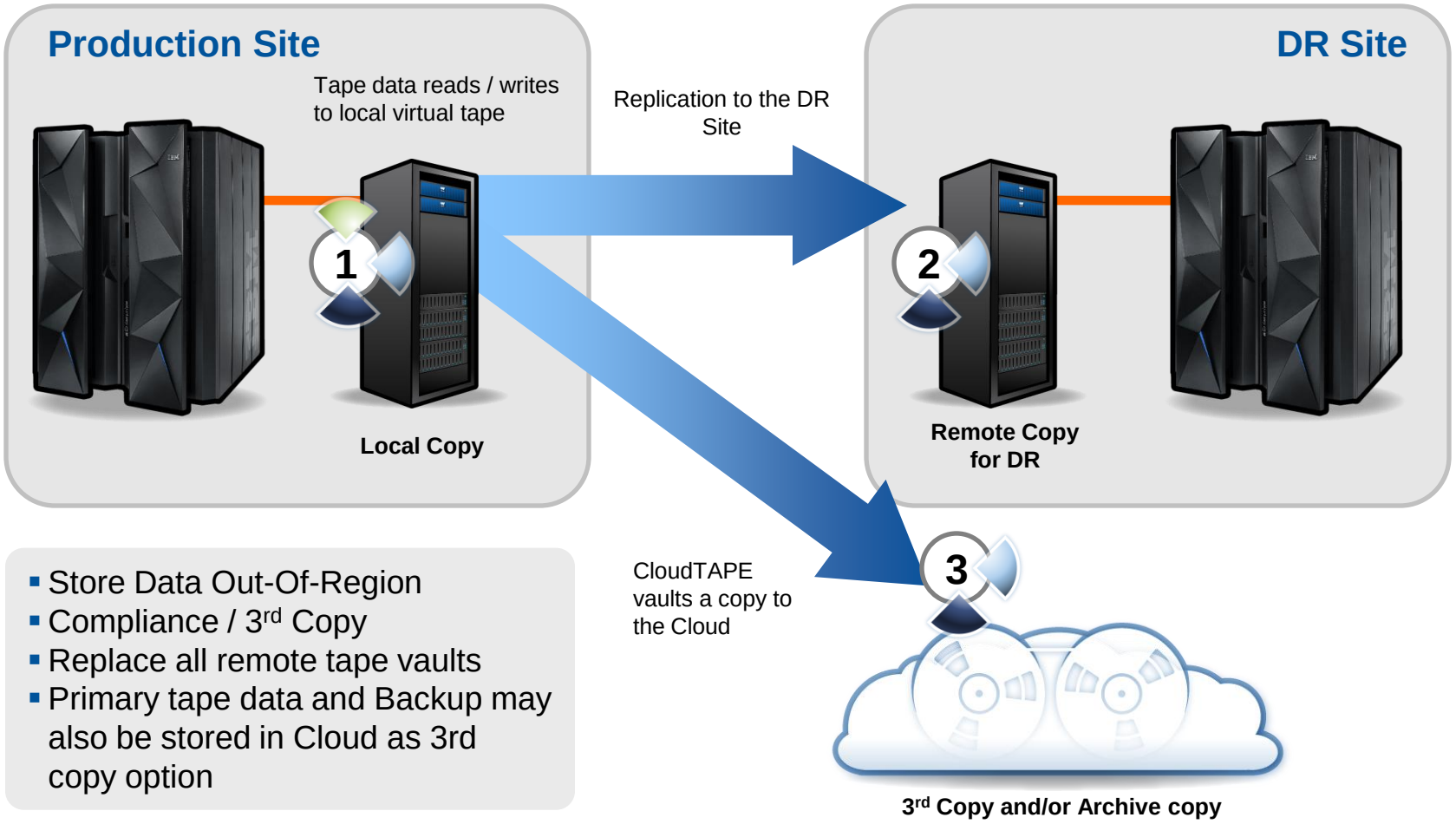
Off Site Copy



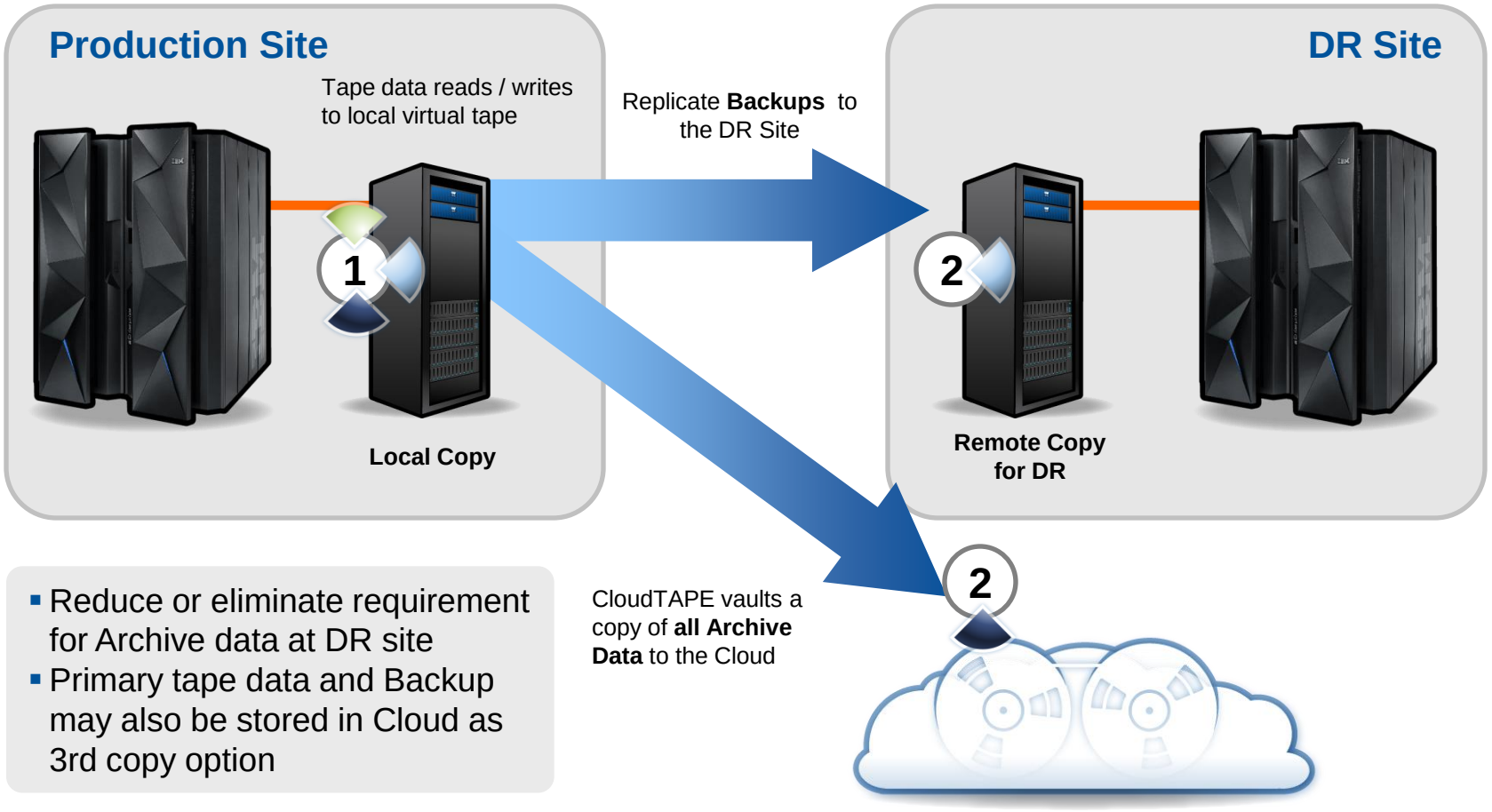
- Provide remote storage and redundancy without the cost and overhead of a dedicated DR or bunker site

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 Cloud as 3rd copy option

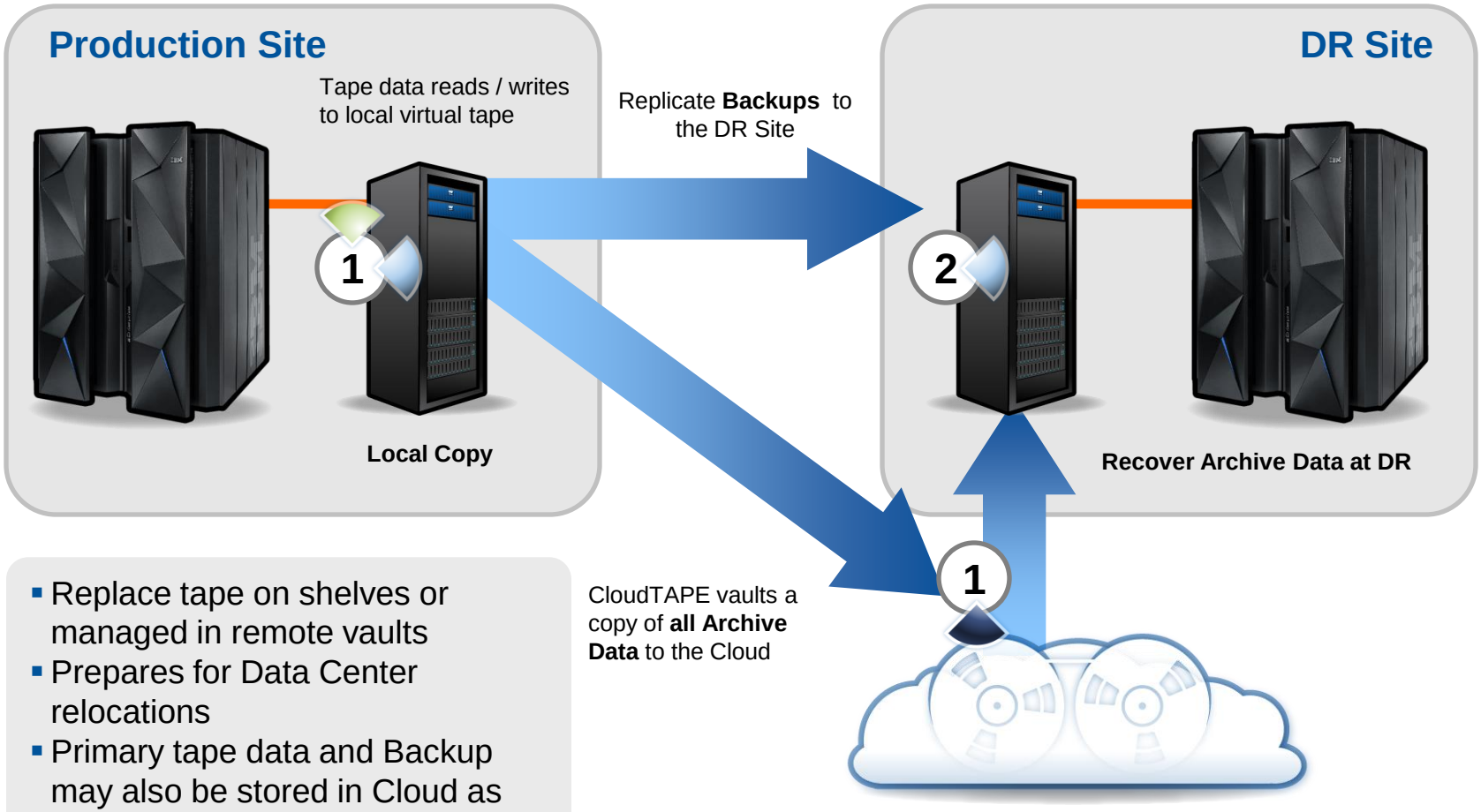
2nd Copy, Archive Data not stored at DR



- Reduce or eliminate requirement for Archive data at DR site
- Primary tape data and Backup may also be stored in Cloud as 3rd copy option

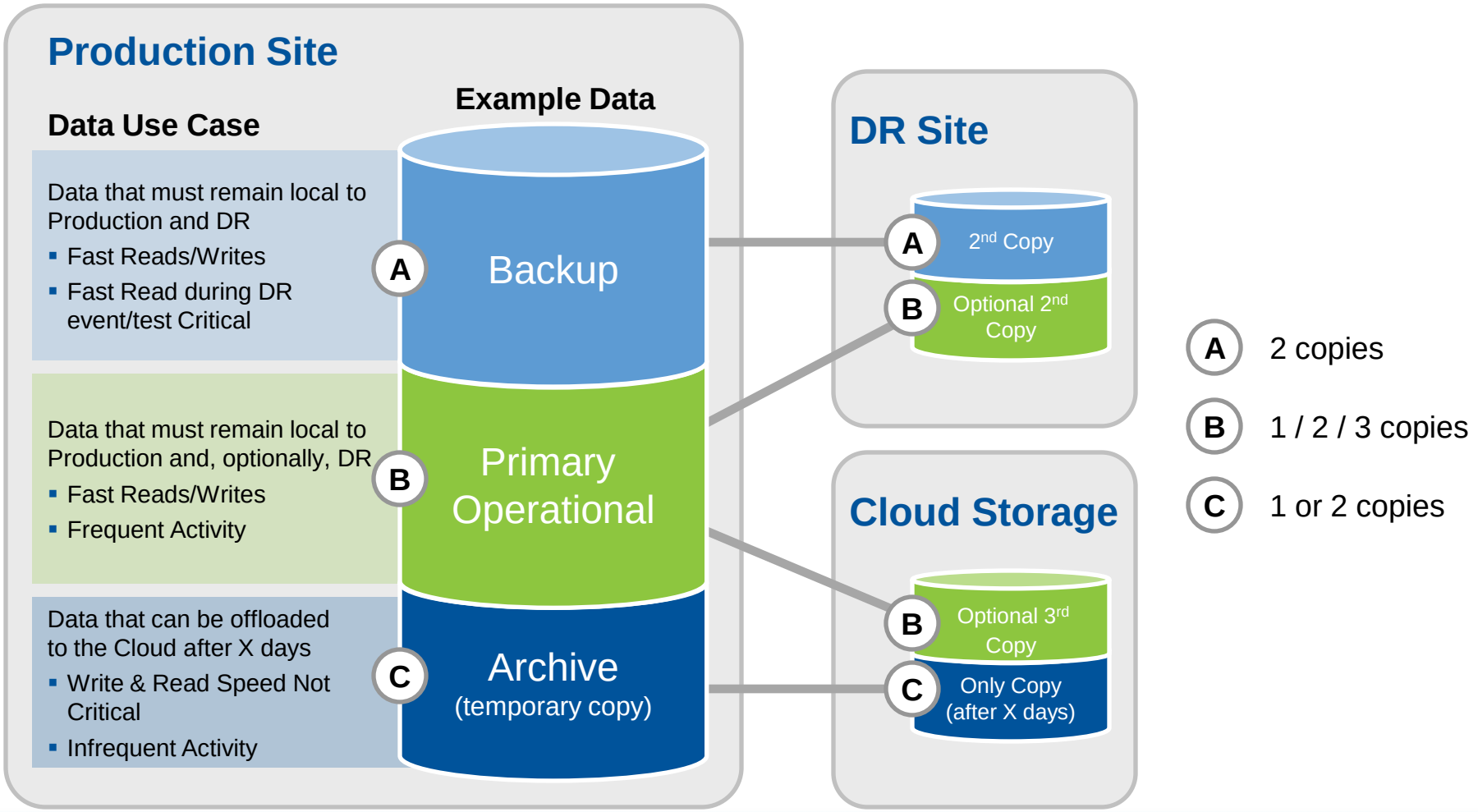
Offsite / Compliance / Deep Archive

Stored Only in Cloud



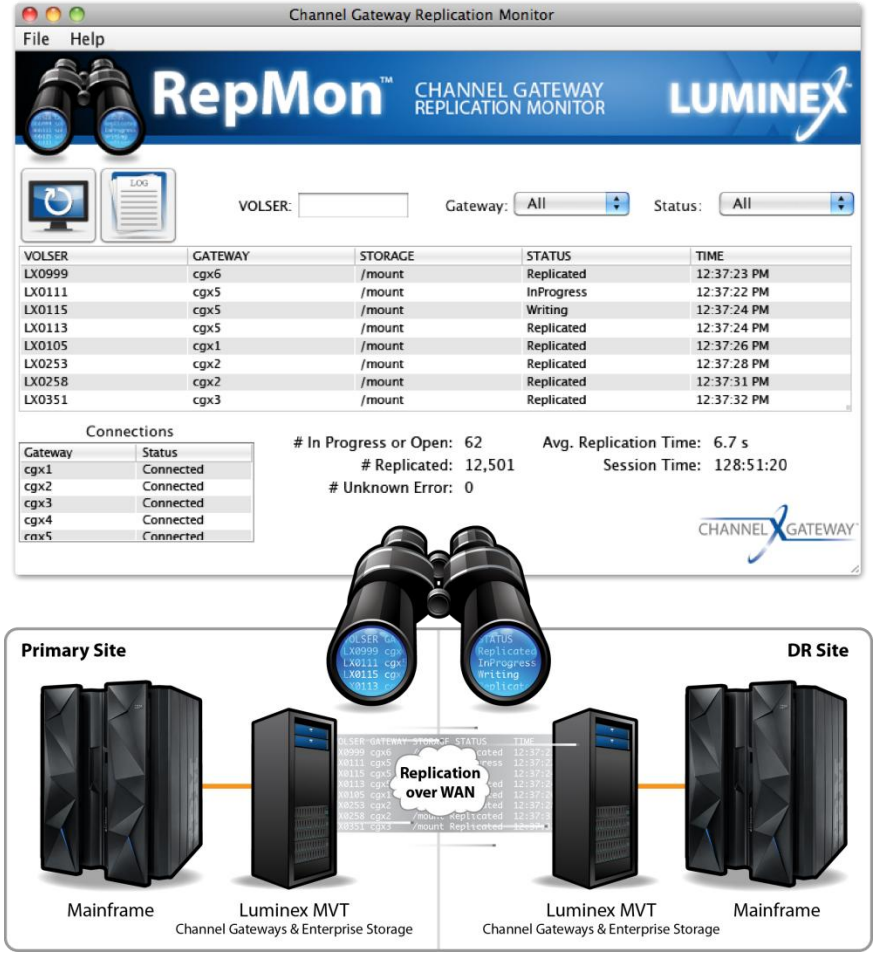
- Replace tape on shelves or managed in remote vaults
- Prepares for Data Center relocations
- Primary tape data and Backup may also be stored in Cloud as 3rd copy option

How it Works
CloudTAPE Intelligent Storage Management

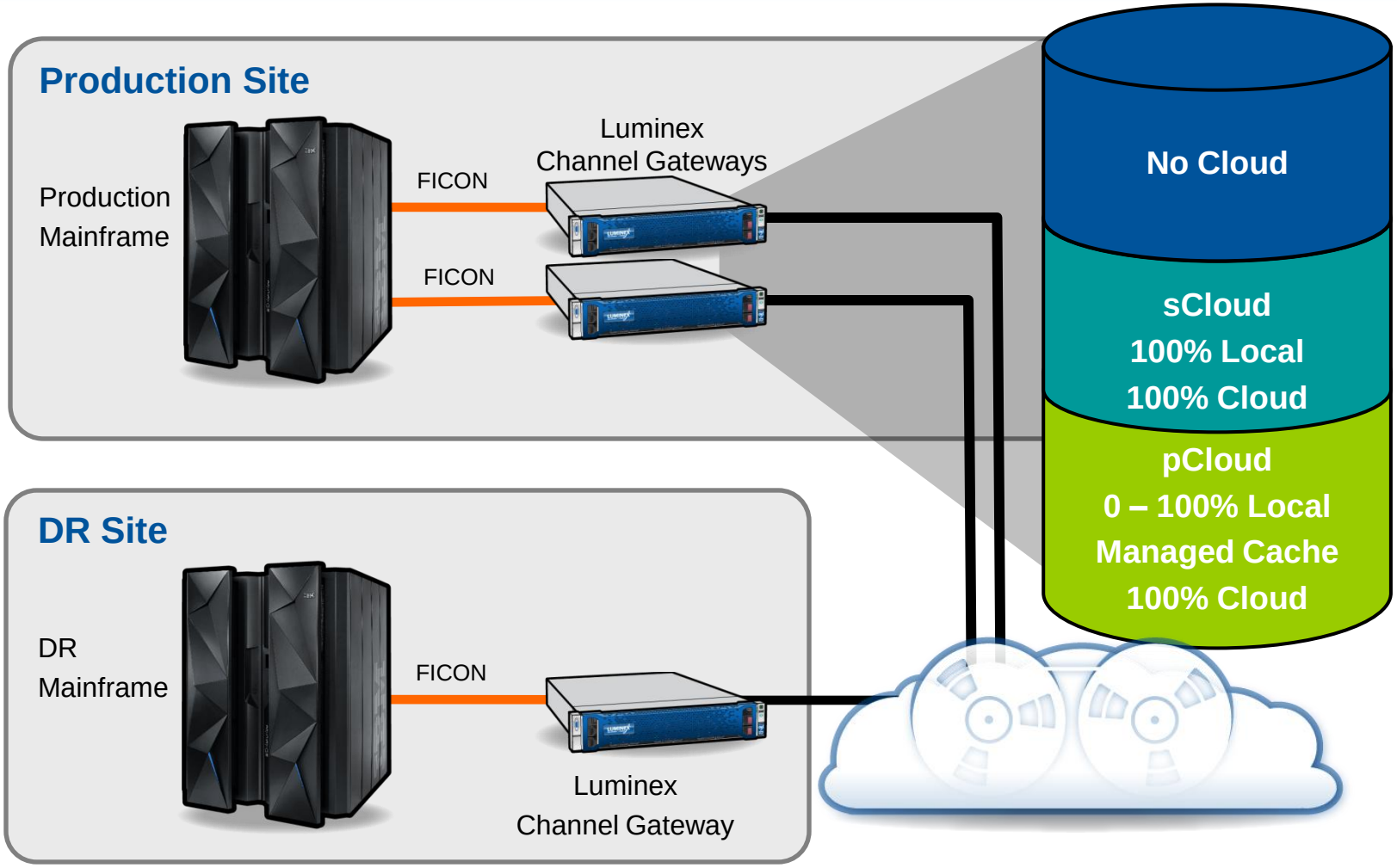


CloudTAPE Replication & Vaulting

- 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 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



CloudTAPE – How it Works



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

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