

Luminex Mainframe Virtual Tape Solutions for z/VM and z/VSE Environments

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Discussion Topics

- Luminex At A Glance
- Common Goals and Requirements for z/VM and z/VSE Environments
- Virtual Tape vs. Physical Tape
- MVT Solution Overview



Luminex At A Glance

- Delivering z/OS, z/VM & z/VSE data solutions worldwide for 20+ years
 - Enabling mainframes to leverage distributed systems resources via native I/O channels
 - Renowned for its industry-leading, enterprise-class mainframe virtual tape solutions
- Active Member of the Mainframe Community
 - World Alliance of VSE & VM (WAVV) [2006 – 2014]
 - SHARE
 - IBM zUniversity and Edge
 - Guide Share Europe
- IBM Business Partner
 - Strategic Partner for IBM ProtecTIER Mainframe Edition



Typical Customer Goals and Requirements

Luminex Virtual Tape Solutions Can Improve All Tape Operations



Replace Aging Infrastructure

Improve Disaster Recovery Plan

Improve Data Security

Reduce or Eliminate Physical Tape

Reclaim Data Center Floor Space

Higher Availability

Reduce Costs

**Increase Performance/
Efficiency**

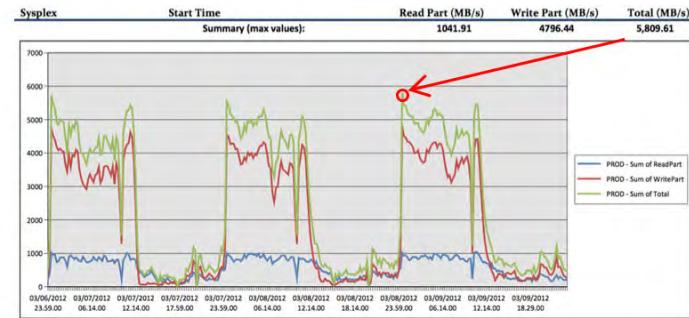
What Else?

Tape Use Assessment for Solution Architecture



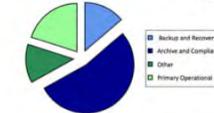
- Determines sizing # of CGXs, storage & network capacity
- Throughput analysis (MBytes/sec)
 - RMF Channel Stats
 - SMF21 Records
- Storage capacity assessment
 - From Tape Management Catalog
 - By Category
 - By Application
 - By Last 45 Days of Activity
 - By Age

RMF (Type 73) Analysis – By Sysplex



TMC Analysis – By Application

Program	Description	Category	Capacity (GB)	Current Volumes	% of Total	Cumulative % of Total	Expected Compression Rate	Compressed Capacity(GB)
ARCTL	IBM DFSMS Hsm migration/backup	Archive and Compliance	3,415,059.59	390,985.00	48.25%	48.25%	3.00	1,138,353.20
SYNCSORT	SYNCSORT Utility	Primary Operational	1,235,381.63	261,230.00	17.46%	65.71%	3.00	411,793.88
IDCAMS	IBM VSAM Utility (Define, Repro, Export, etc.)	Backup and Recovery	416,519.36	91,950.00	5.89%	71.60%	3.00	138,839.79
DSNUTIL	DB2 Utilities (Load/Unload, etc.)	Backup and Recovery	385,168.96	89,011.00	5.44%	77.04%	3.00	128,389.65
CAWABATC		Other	356,893.74	31,766.00	5.04%	82.08%	3.00	118,964.58
CBROAM	IBM OAM Archive/Retrieval	Archive and Compliance	158,500.25	14,629.00	2.24%	84.32%	3.00	52,833.42
ARCMAIN	Teradata DB Backup Utility	Backup and Recovery	120,173.70	12,003.00	1.70%	86.02%	3.00	40,057.90
ARCMOVER	ASG-viewdirect (Infopac) Arcmove tape migration tool	Archive and Compliance	97,390.89	13,622.00	1.38%	87.39%	3.00	32,463.63
INFOPAC	ASG-viewdirect (Infopac) report archiver	Archive and Compliance	93,861.11	29,226.00	1.33%	88.72%	3.00	31,287.04
IKIEFT1B	IBM Batch TSO	Primary Operational	87,994.17	23,865.00	1.24%	89.96%	3.00	29,331.39
Other		Other	710,248.61	265,449.00	10.04%	100.00%	3.00	236,749.54
		Summary:	7,077,191.99	1,223,736.00	100.00%	100.00%	3.00	2,359,064.00



Luminex Solutions vs. Physical Tape

Enterprise-class Solutions for All Aspects of Mainframe Tape Use



- Less floor space required
- Less cost for physical tape maintenance, media, shipping and off site storage
- Less time required to test and restore during disaster recovery
- Less complexity for security, encryption and key management
- Less time and fewer IT resources to manage

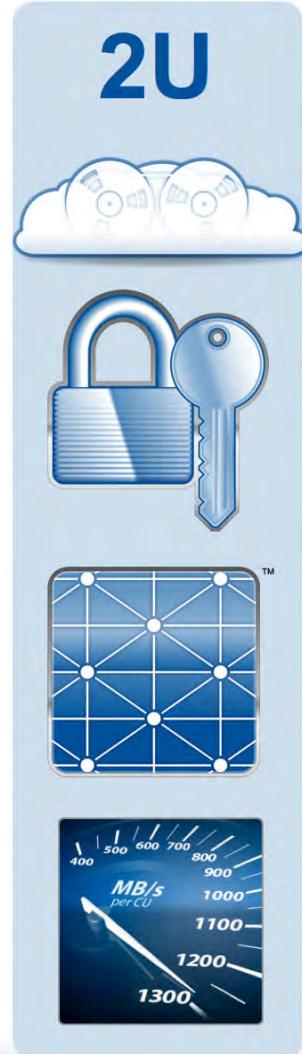


Luminex Solutions vs. Physical Tape

Enterprise-class Solutions for All Aspects of Mainframe Tape Use

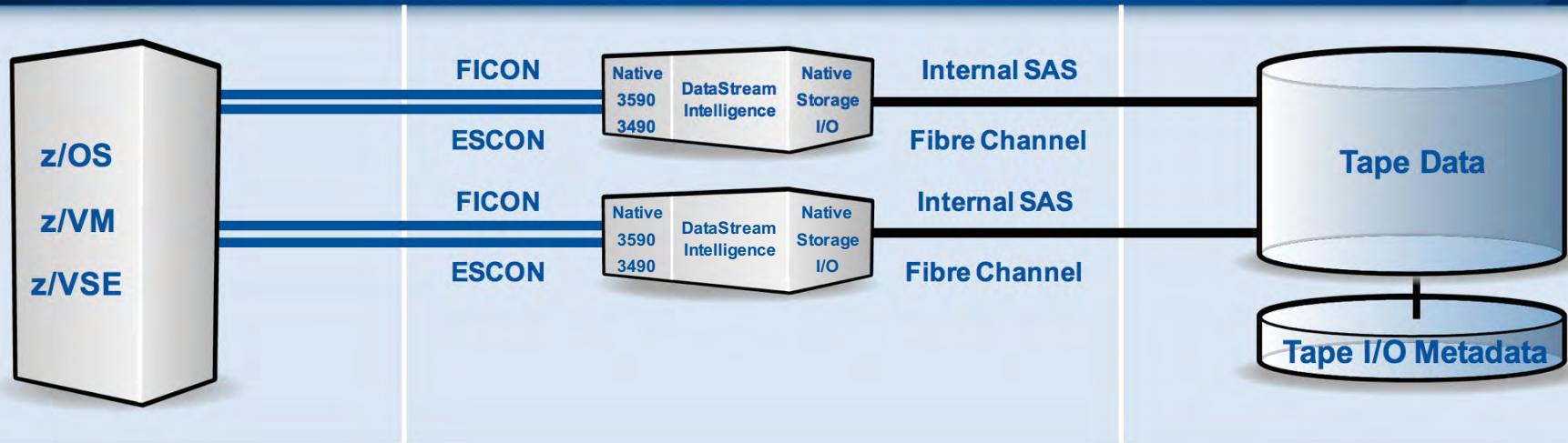


- More capability in a smaller footprint
- More storage options (including internal, external storage, cloud and remote vaulting)
- More security (no physical tapes to ship)
- More of the industry's leading disaster recovery options
- More powerful continuous availability options
- More value, efficiency and capability



Luminex MVT Environment

How the Solution Works



Mainframe

- Application transparent
- No MIPS required
- z/OS, z/VM and z/VSE supported
- Supports all major tape management systems
- SMS via MTL or esoterics can be used
- Optional host-based software for management
 - Admin+
 - TMACS

Control Unit

- CGX control unit software emulates 3490 or 3590 mainframe tape drives
- “Wire Speed” up to 8 Gb/s FICON
- Hardware compression with software failover
- DataStream Intelligence™ maximizes compression
- Replication for backup/DR with VOLSER-level monitoring
- Modular design makes adding additional capabilities easy and cost effective
- CloudTAPE ready

Storage

- Internal or Fibre Channel attached
 - NFS and other major storage system support available via CGX
- Mainframe tape volumes stored as standard files
- RAID 6 data protection

No TMS? No Problem!

Features for Manual Tape Operations



- Browser-based GUI
- Manually load/unload virtual tape volumes on any available device
- Add/modify volume attributes
 - Add notes to create a virtual "sticky note"
 - Toggle a volume between "write" and "write-protect" mode
- Statistical information on individual virtual tape VOLSERs
 - Volume label and metadata information
 - i.e. storage pool, size, last access time, compression ratio, dsn, scratch status, user notes
- Audit logs for replication status
- Four levels of functionality for different users
 - Admin, Operator, User, Support

The screenshot shows the CGX CHANNEL GATEWAY X ADMIN GUI interface. The left sidebar has tabs for 'cgx1' and 'cgx2', with 'cgx1' selected. The main menu includes Home, Operator, User, Support, Security Officer, and Administration. Under 'View Volume', it says 'Volser Information for PT0100'. The details pane shows:

Storage Pool	= SPrecalltest	
Size	= 327600240	
Compress Ratio	= 1.0	
Modified	= Thu Oct 9 09:45:49 2014	
Accessed	= Thu Oct 9 09:45:49 2014	
Dataset	= .E51K32SC.VXD901X	
Scratch	= no	
Notes:	Customer Information Details	
Date	Fully Qualified DSN	
Programmer Name		
Job Name		
Pgm Name		
Retention Period		
Expiration Date		
Other		

Below the details pane are fields for 'Volume:' and a 'Search' button. At the bottom, a copyright notice reads: Copyright © 2015 Luminex Software, Inc. - All rights reserved.

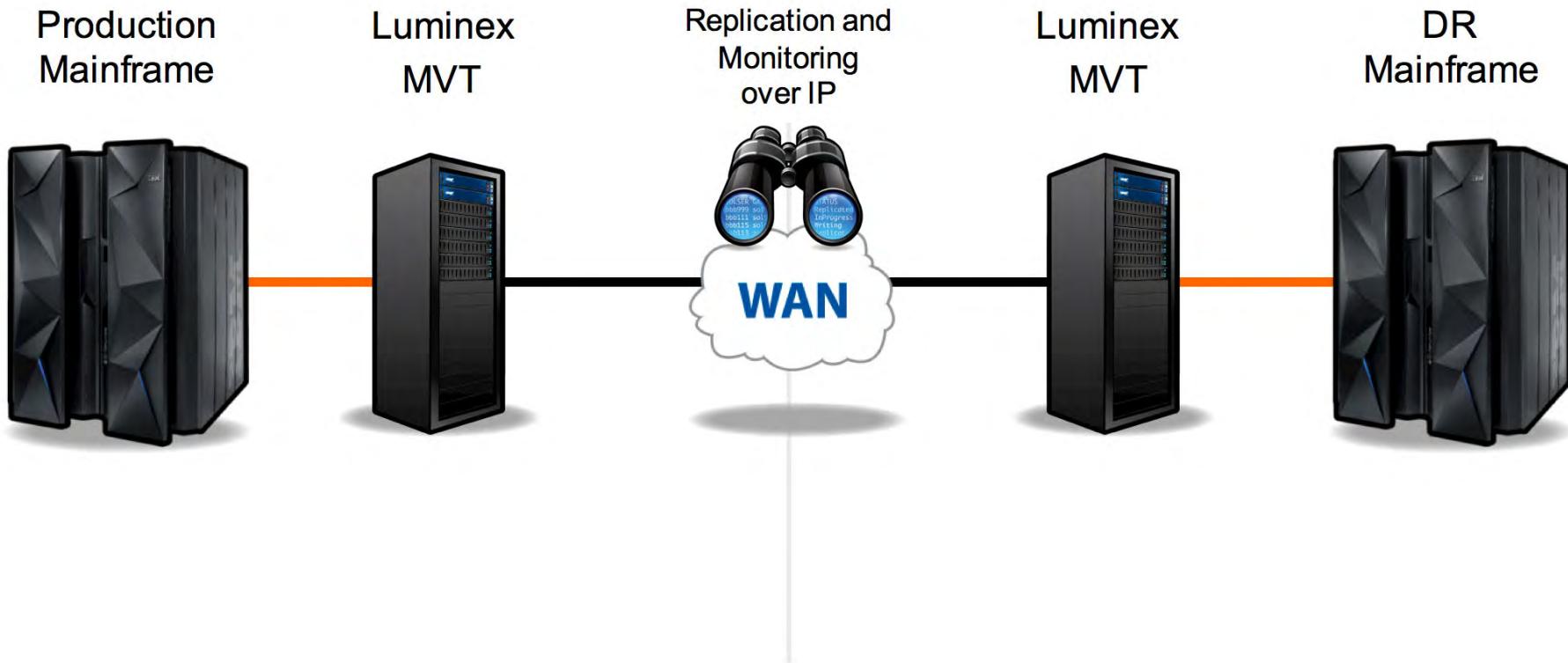
Luminex MVT Environment

Production and DR Site Configuration



Production Site

Disaster Recovery Site





A Better Fit Makes A Better Solution

MVTi Series

- 2 FICON or ESCON channels
- Up to 60 TB host capacity (with 3:1 compression)
- 2U rack mount footprint

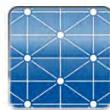


MVTe Series

- 2 or 4 FICON or ESCON channels
- Virtually unlimited capacity – PBs and beyond



Optional Features



Synchronous Tape Matrix

Continuous availability with 1+n mirrored writes and non-disruptive auto failover/restore



P2V

Off-host physical-to-virtual and physical-to-cloud conversion of 3490 and 3590 archive tapes



Luminex Replication with RepMon

Improve your disaster recovery plan with remote replication to one or more DR sites and VOLSER-level replication monitoring and auditing



Push Button DR

Disaster recovery and testing with “push button” ease



CGSafe

Encryption and key management

Data Vaulting and Archive Options



CloudTAPE

Cloud-based tape vaulting solution for mainframes



MVT Vault

Cost-effective virtual tape vaults for remote, off site storage



Luminex WORM

Data immutability for archiving and compliance

Professional Services



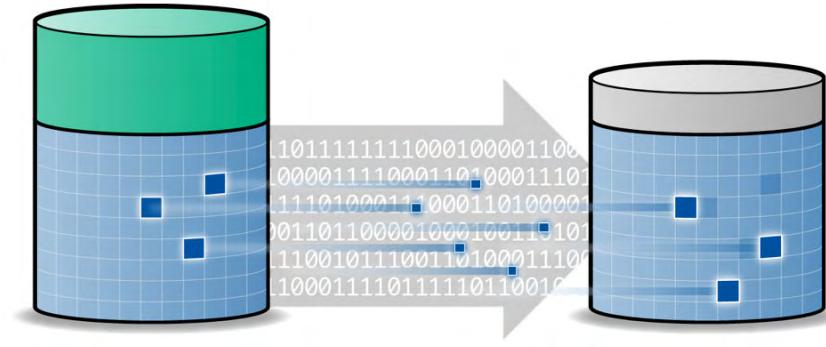
Tape Migration Software and Services

Seamlessly transition physical and virtual tapes with exact copies of original VOLSER numbers and labels



Luminex Replication for MVT

- Control unit-based replication engine
- Asynchronous
- Flexible policies for number of copies and locations
 - One-to-Many
 - Cascading
- Vaulting to the Cloud
- Advanced DR functionality included
 - RepMon replication monitoring and auditing
 - Push Button DR





RepMon: Replication Monitor

Provides **real-time status monitoring and logging** of virtual tape data writes and replication to a remote disaster recovery site at the VOLSER level

- Identifies Write and Replication Status of Mainframe Tape VOLSERs
- Identifies if virtual tape data at DR is still consistent with the primary datacenter
- Provides visual and audit capabilities to confirm when backups reach DR

Channel Gateway Replication Monitor

RepMon™ CHANNEL GATEWAY REPLICATION MONITOR

LUMINEX

VOLSER: Gateway: All Status: All

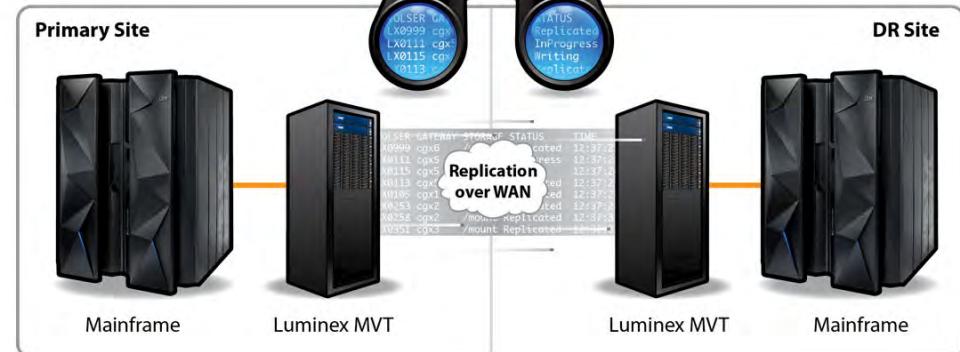
VOLSER	GATEWAY	STORAGE	STATUS	TIME
LX0999	cgx6	/mount	Replicated	12:37:23 PM
LX0111	cgx5	/mount	InProgress	12:37:22 PM
LX0115	cgx5	/mount	Writing	12:37:24 PM
LX0113	cgx5	/mount	Replicated	12:37:24 PM
LX0105	cgx1	/mount	Replicated	12:37:26 PM
LX0253	cgx2	/mount	Replicated	12:37:28 PM
LX0258	cgx2	/mount	Replicated	12:37:31 PM
LX0351	cgx3	/mount	Replicated	12:37:32 PM

Connections

Gateway	Status
cgx1	Connected
cgx2	Connected
cgx3	Connected
cgx4	Connected
cgx5	Connected

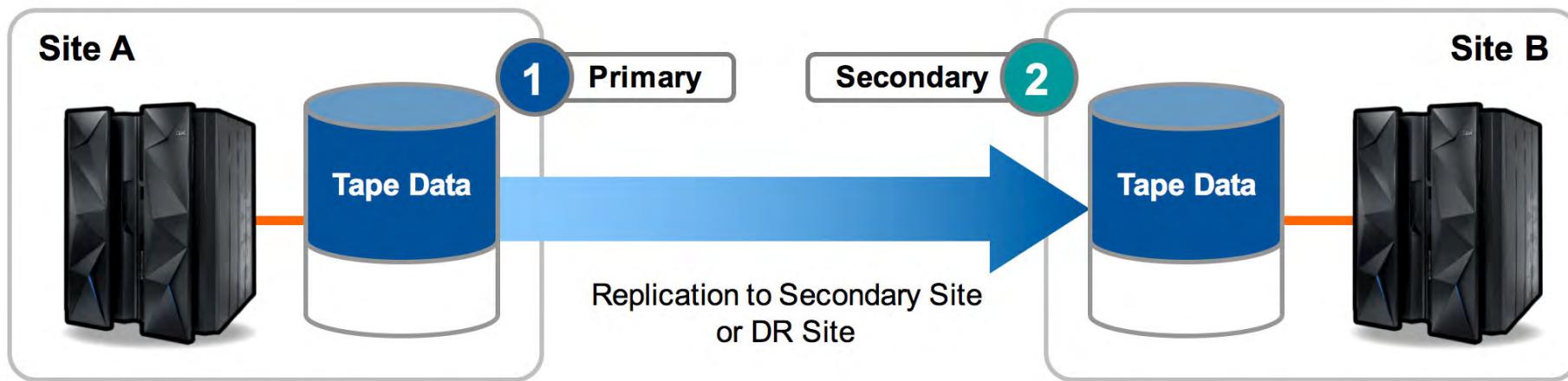
In Progress or Open: 62 Avg. Replication Time: 6.7 s
Replicated: 12,501 Session Time: 128:51:20
Unknown Error: 0

CHANNEL X GATEWAY



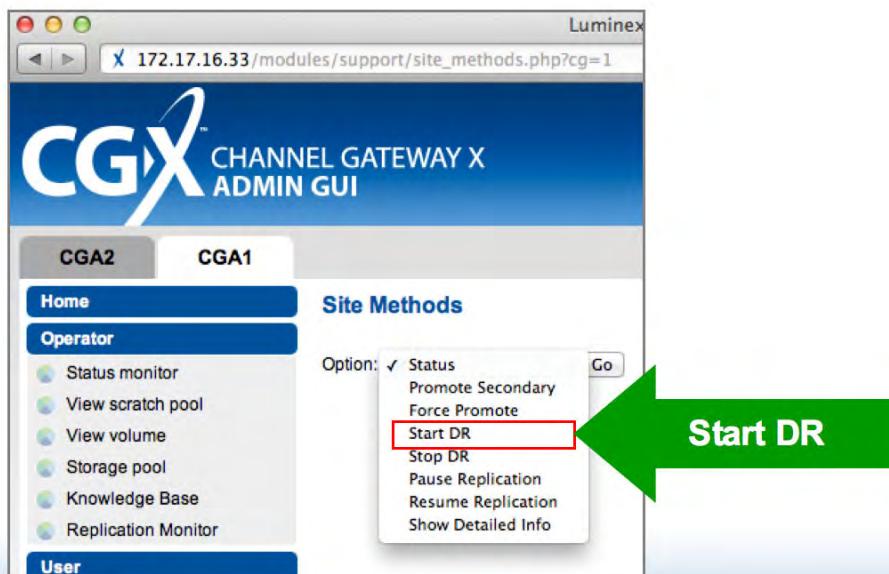
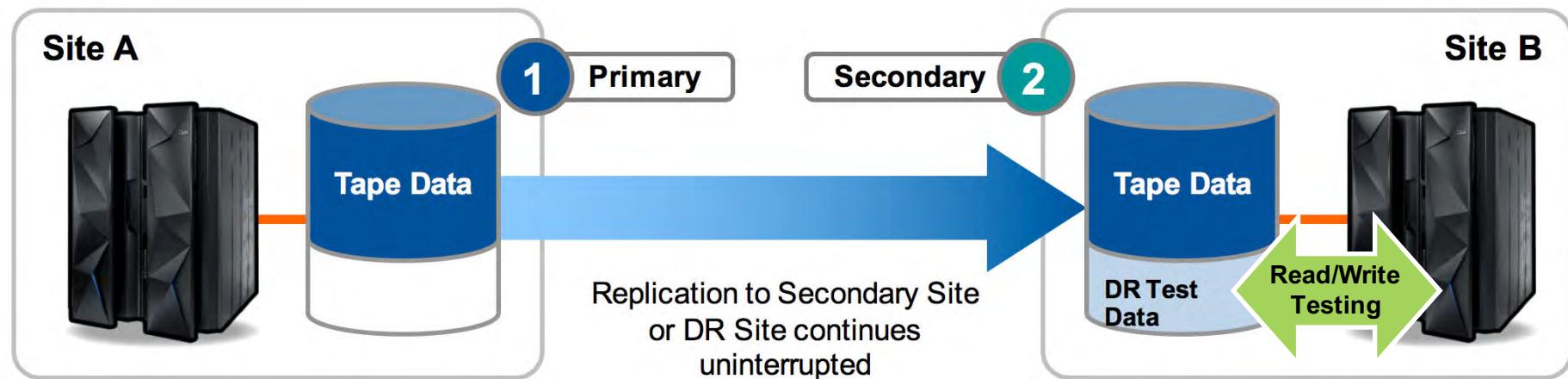
Push Button DR Testing

Replication During Normal Operations



Push Button DR Testing

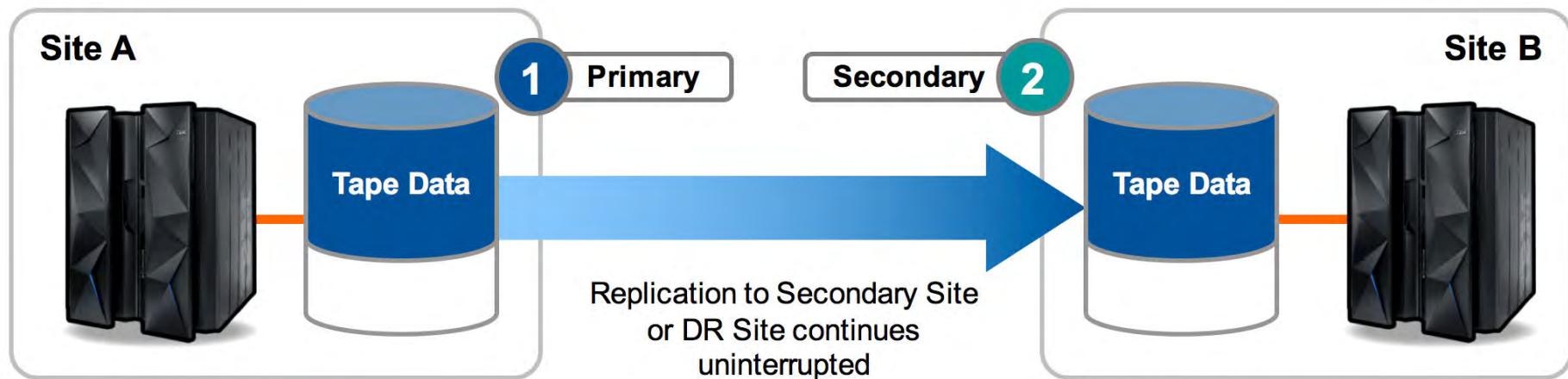
Replication During DR Testing



Prepares DR environment for read/write testing; original Tape Data remains untouched

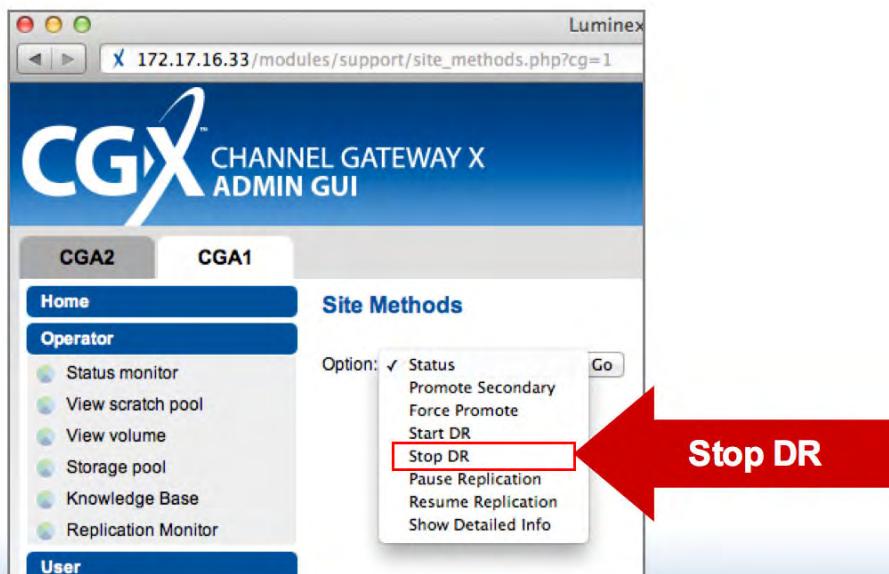
Push Button DR Testing

After DR Testing is Completed



DR Test Data is purged

Optionally, DR Test Data can be automatically replicated back to Site A for auditing purposes





Features

- Encryption & key management at the control unit level
- Eliminate costly encryption solutions based on mainframe MSUs
- AES 256-bit encryption using GCM
- Compression, encryption, and authentication in a single pass
- Optionally integrates with existing encryption and key management infrastructure

Benefits

- Avoid risk of lost or stolen tapes
- Protection from other data security issues
- Integrates into existing key management infrastructure for a single-point-of-management





Professional Services

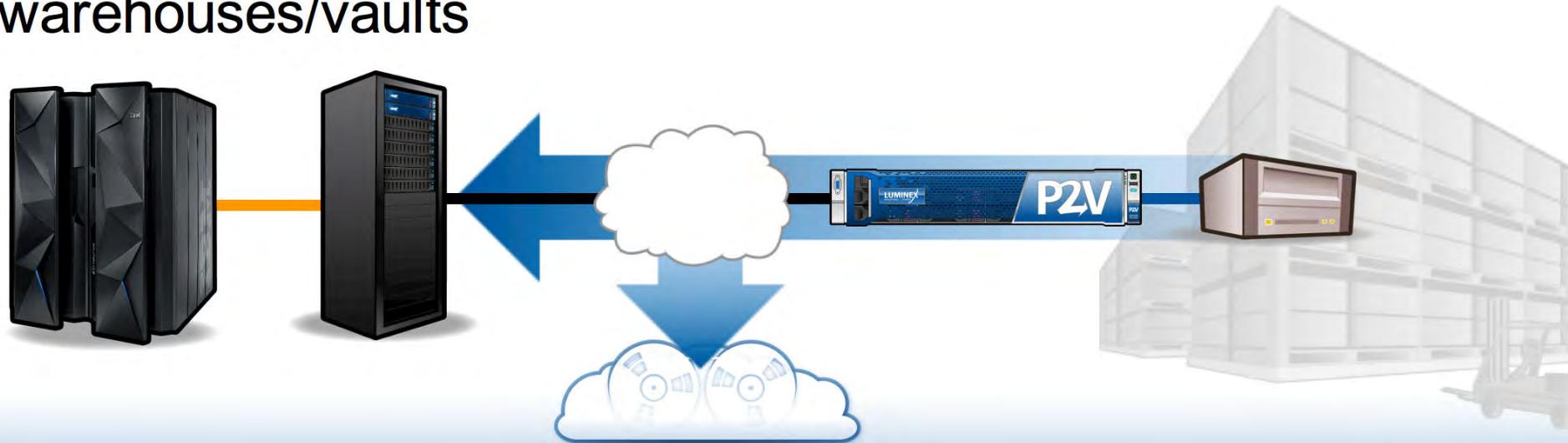
- Tape Migration Services
 - Performed using Luminex-developed software
 - Implemented by Luminex migration specialists
- Tape Migration Software (TMIG)
 - Copies tape data without modifying tape catalogs
 - Current VOLSER #s and all historical information are retained in the new environment as well
 - Supports all existing tape library and virtual tape environments for z/OS, including SMS





P2V: Physical-to-Virtual Tape Conversion

- Convert physical tapes to virtual tapes, on demand
- No mainframe intervention, completely off-host
- Local or remote ingest, anywhere an IP connection is available
- Ideal for bringing physical tape data back from offsite warehouses/vaults





MVT Vault for Mainframe Data Protection

- A better alternative to physical tape vaults, including:
 - Compact, 2U (3.5") Form Factor
 - Unprecedented Price Point
 - RAID Disk Storage
 - Remote Replication & Replication Monitoring at the VOLSER level
 - Inventory Auditing





MVT Vault Series Use Cases

- 3rd Offsite Copy
 - For customers who already have virtual tape at production & DR sites
 - To meet out-of-region, SLA or other requirements
- 2nd Offsite Copy
 - For customers who don't currently have a DR site
- Recovery Center Model
 - DR On Demand and testing at ADRCs





Thank You!

For questions and to get more information, please contact:

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