3590 Tape Drive End of Support: Transitioning from 3590 Physical Tape to Virtual Tape

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Discussion Topics

- 3590 Physical Tape Timelines
- Key Considerations
- What Can Virtual Tape Do For You?
  - TCO Considerations
- Virtual Tape Technologies Enable More Possibilities
  - Customer Examples
- Summary & Additional Q&A

3590 Physical Tape Timelines




May 1999
3590-E1A, & E11
General Availability

July 2002
3590 H1A & H11
General Availability

September 2006
Marketing (Sales Availability)
Withdrawal

January 2015
U.S. Services Withdrawal
(End of Support)

1995 2000 2005 2010 2015

Key Considerations

Replacing 3590 Tape with Current Generation Physical Tape Requires:

- 3592 (Gen 1-5) tape drives
- New 3592 tape media
  - 3590 media is not compatible with 3592 drives
- Tape migration tools and services to transition from old, to new tape cartridges
- Stacking software to fill the space on the higher capacity cartridges
- A 3592 Compatible Mainframe Control Unit/Controller

3590

3592

Physical-to-Physical Tape Transition

- Still requires resources for
  - Media
  - Handling
  - Shipping
  - Off site storage
- Risk of lost, missing or damaged tapes remains
- Limits DR preparedness, RPO and RTO
- Limits access to the latest storage innovations (i.e. cloud)

What Can Virtual Tape Do For You?

Future-Proof 3590 Virtual Tape

- Reduce or eliminate physical tape
  - Save $ on maintenance, media, handling, shipping and off site storage
- Reduce security concerns and cost related to lost or missing physical tapes
- For HSM, reclaim CPU Cycles
  - Skip ML1 (DASD) and migrate from ML0, to ML2 (virtual tape)
- Improve disaster recovery preparedness by replicating tape data over the WAN
  - Tape data immediately available for use at the remote DR site
- Improve performance for all tape operations

TCO Considerations

Physical vs. Virtual Tape Replacement

Mainframe Virtual Tape (MVT)	3592 Generation 1-5
• 2x MVT systems • (1 @ Prod, 1 @ DR) • MVT Replication • MVT tape migration tools and services	• Multiple 3592 Tape Drives (x @ Prod, x @ DR) • 2x 3592 Tape Controllers (1 @ Prod, 1 @ DR) • Purchase new tape media • Continued expenses for tape handling, shipping and warehousing • Tape migration services to migrate from 3590 to 3592 tape cartridges • TS Tape library required? • Stacking software?

TCO Considerations

Physical vs. Virtual Tape Replacement

Mainframe Virtual Tape (MVT)	Third Party Services
▪ 2x MVT systems (1 @ Prod, 1 @ DR) ▪ Or 1 MVT and 1 MVT Vault • MVT Replication ▪ Network bandwidth ▪ MVT tape migration tools and services	▪ Long term access to 3590 and 3590 CU parts that are no longer manufactured by IBM ▪ Continued cost of physical tape media (long term availability?) ▪ Continued cost of tape handling, shipping and warehousing (offsite vault) ▪ Cost to business operations for frequent or extended repair times ▪ Cost of travel 1 – 2x times per year for DR tests

Virtual Tape Technologies Enable More Capability & Possibilities

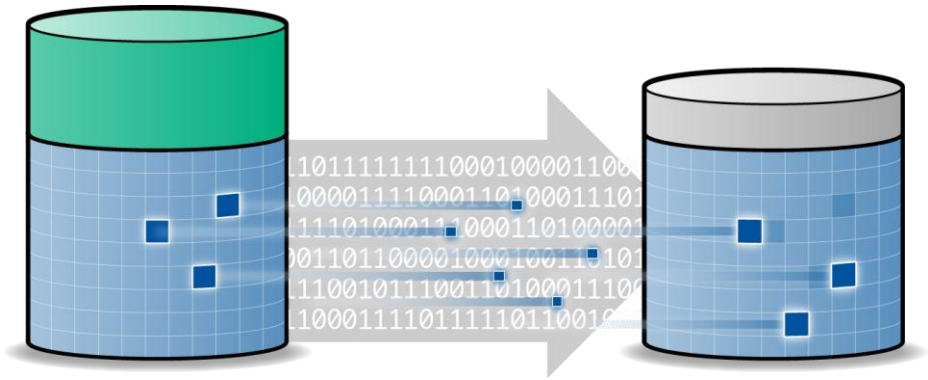
- Emulate 3590 tape drives
- Remote Replication and Monitoring
- Simplified DR Testing and Execution
- Data Deduplication
- Continuous Availability
- CU Based Encryption & Key Management
- Unique Tape Migration Tools and Services

Emulate 3590 Tape Drives

- Transparent to mainframe applications and IOGEN definitions
  - Maintain “UNIT=3590”
- Stores tape VOLSERS on disk
  - Escape the limitations of the laws of physics
  - RAID protection from media failures
- Faster mounts
- Faster to first byte
- No capacity penalty for unfilled cartridges

Remote Replication Options

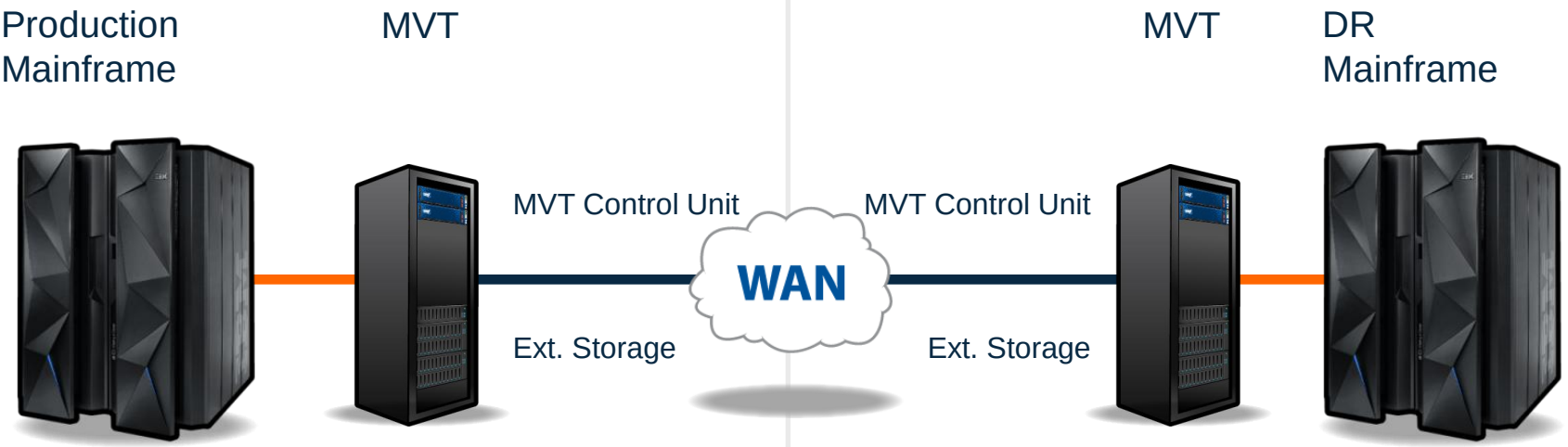
- Replication engine
  - Control unit-based
  - Storage-based
- Data synchronization
  - Asynchronous
  - Synchronous
- Flexible policies for number of copies and locations
  - Including vaulting to the Cloud
- Monitoring



Remote Replication (Prod. to DR)

Production Site

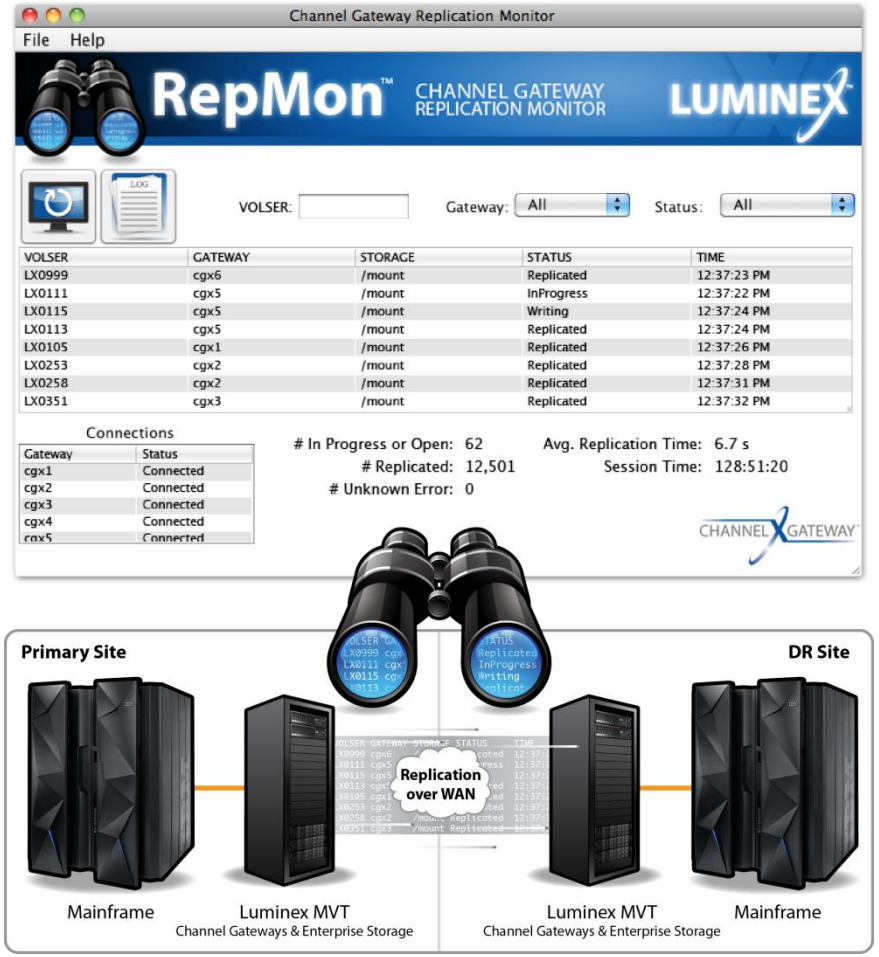
Disaster Recovery Site



RepMon: Replication Monitor

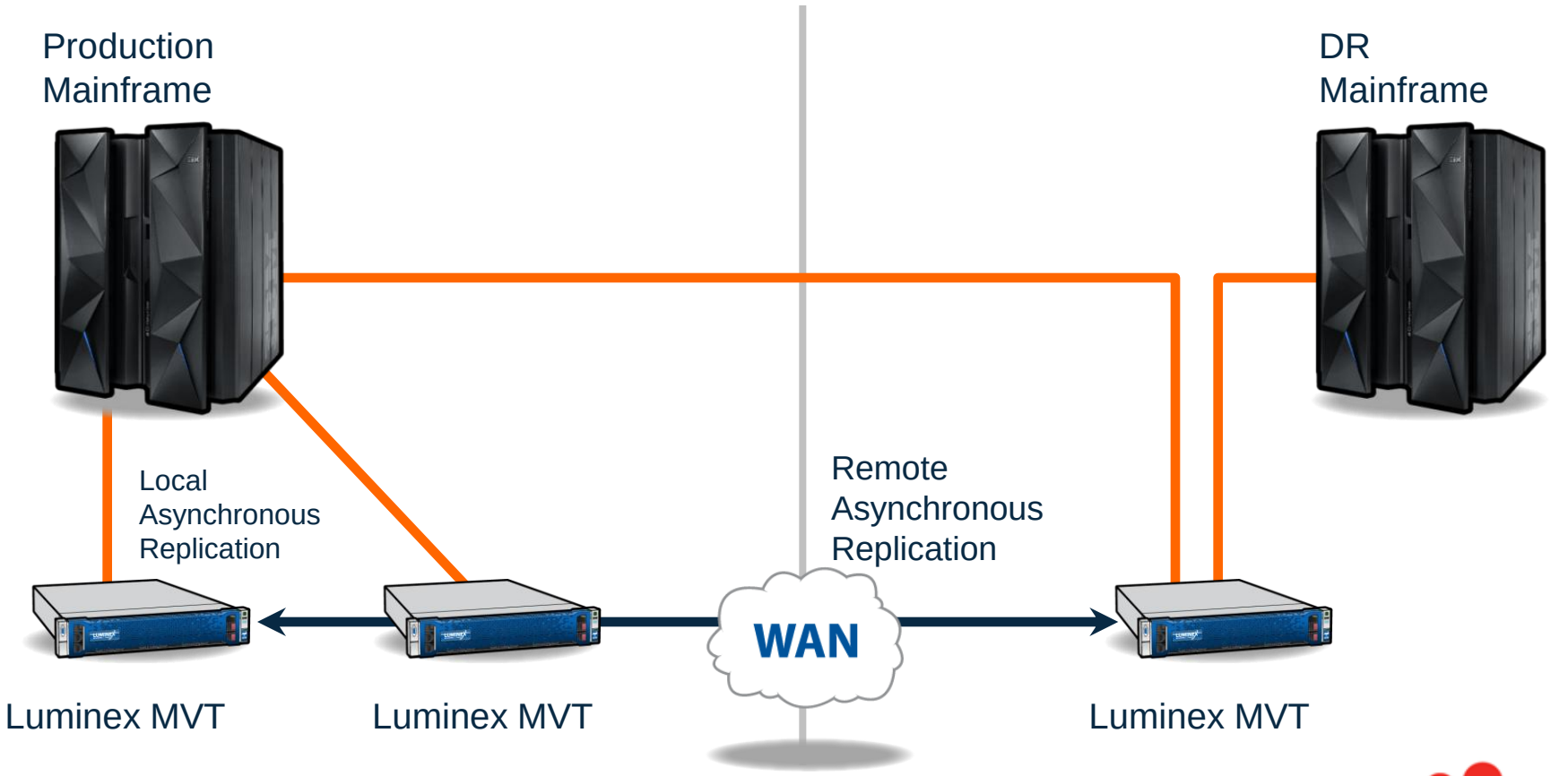
Provides **real-time status monitoring and logging** of virtual tape data writes and replication to a remote disaster recovery site at the VOLSER level

- 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



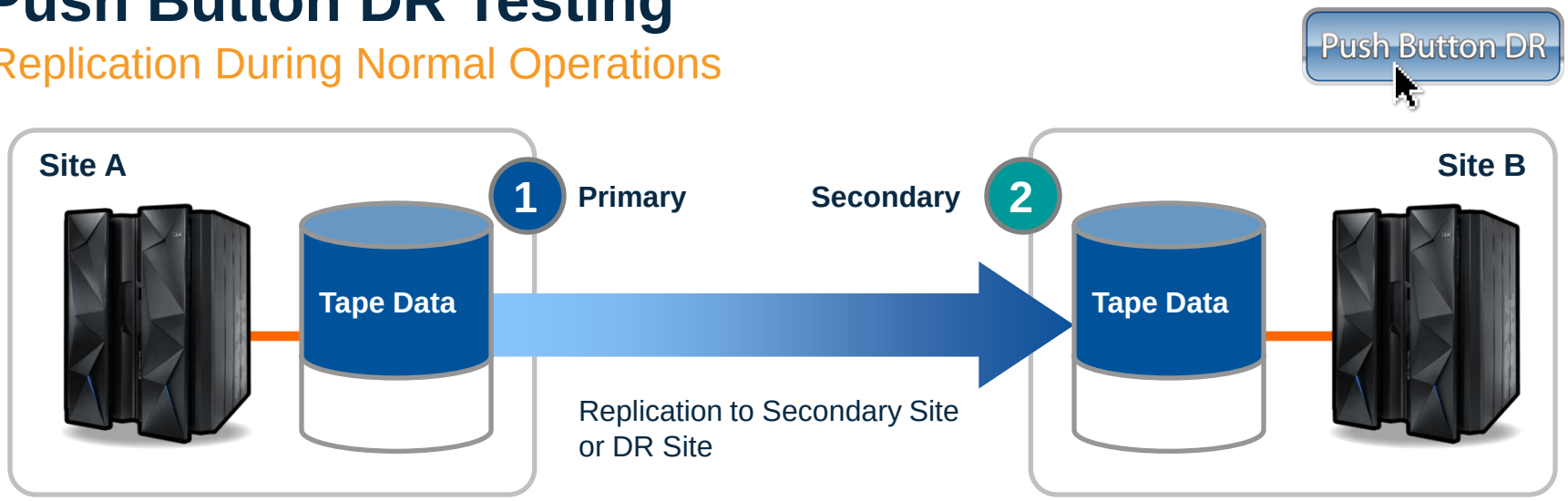
Luminex Replication Customer Example

Multi-National Food Product Manufacturer



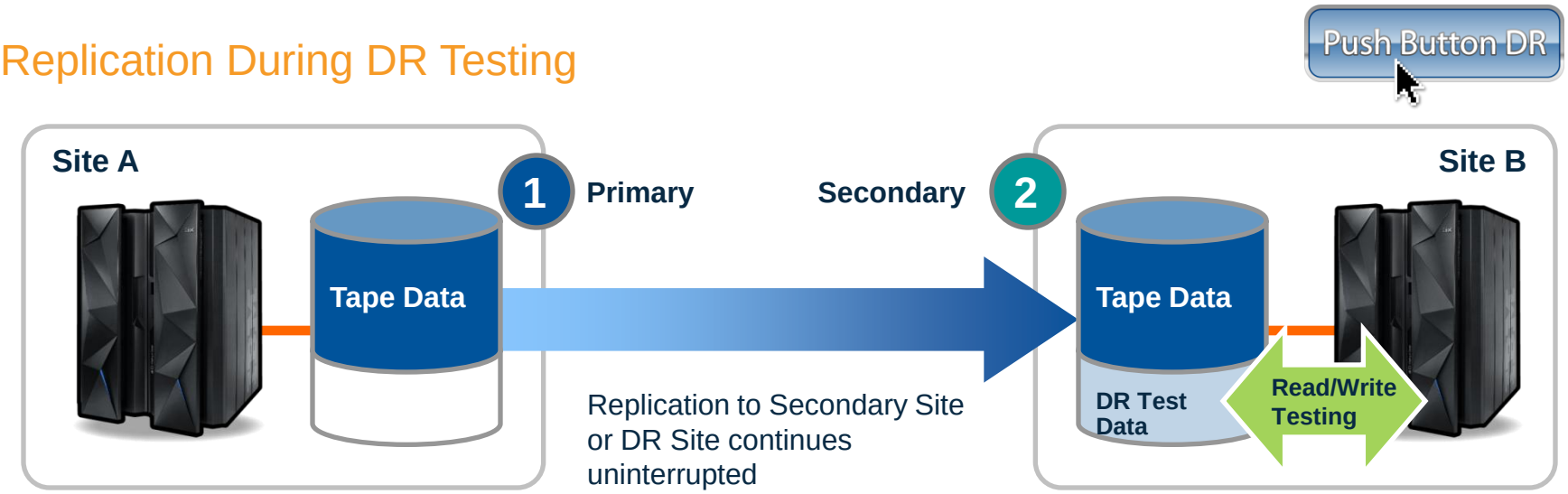
Simplified DR & Execution: Push Button DR Testing

Replication During Normal Operations



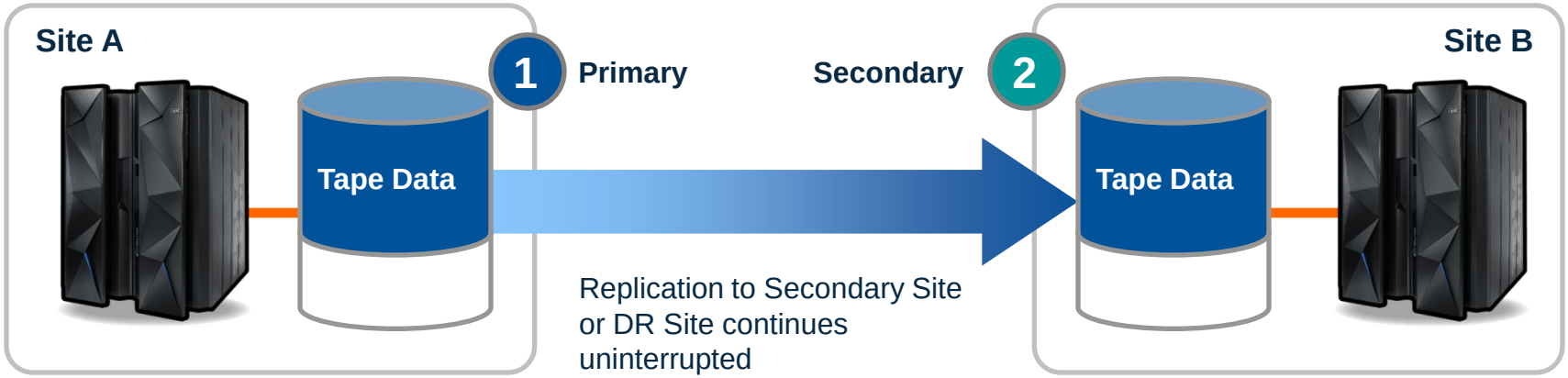
Push Button DR Testing

Replication During DR Testing



Push Button DR Testing

After DR Testing is Completed

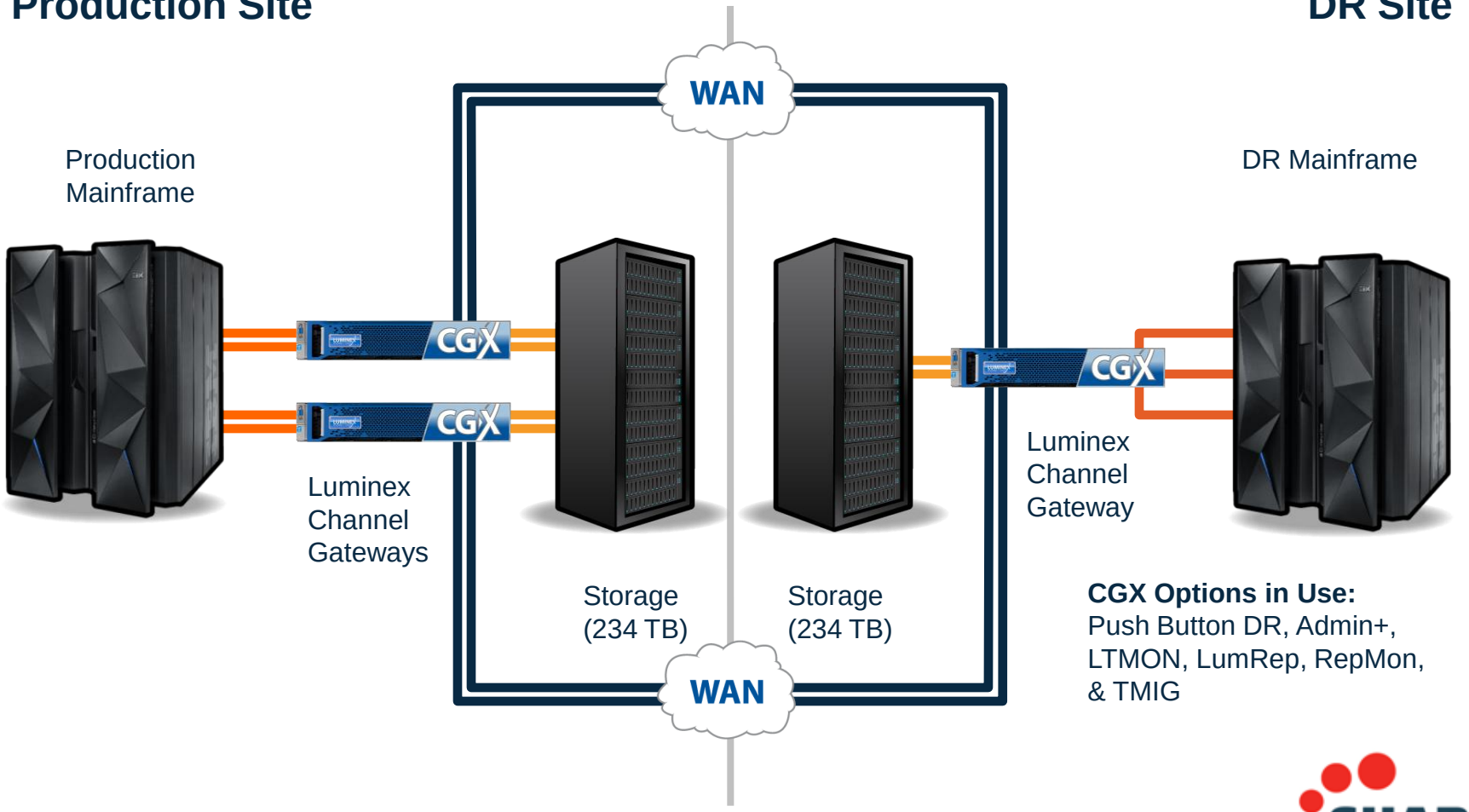


Replication to Secondary Site or DR Site continues uninterrupted

DR Test Data is purged

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

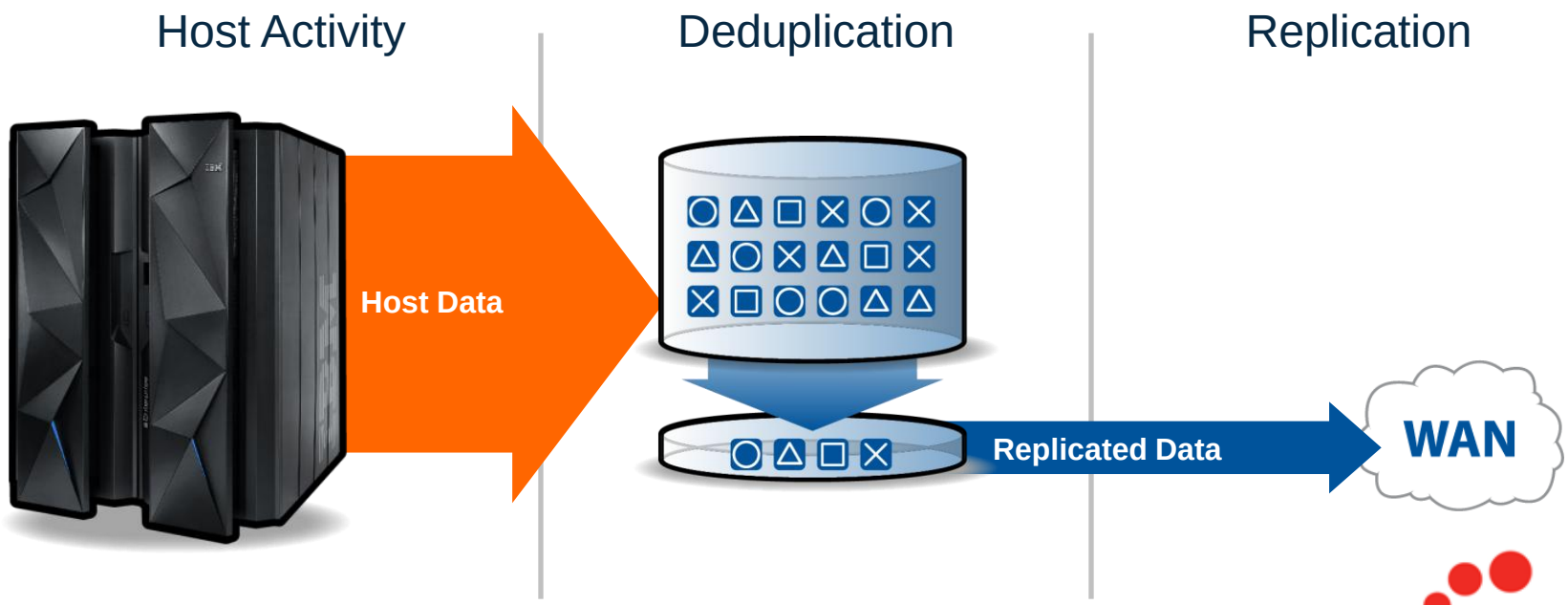
CGX Configuration
Push Button DR Example - Automotive Manufacturer



CGX Options in Use:
Push Button DR, Admin+, LTMON, LumRep, RepMon, & TMIG

Data Deduplication: It's not just for reducing storage requirements

When virtual tape solutions include **data deduplication**, the **network bandwidth requirements** for replication are **dramatically reduced**.

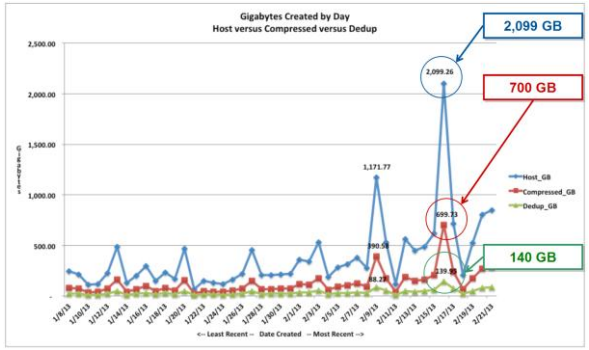


Start with a Tape Assessment

MVT Sizing & Modeling

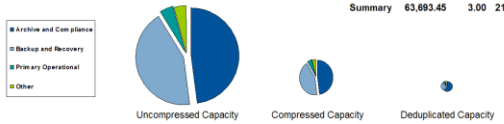
- Sizing # of CGXs, Storage & Network Capacity
- Throughput Analysis (MBytes/sec)
  - RMF Channel Stats
  - SMF21 Records
- Storage Capacity Assessment
  - From Tape Management Catalog
  - By Category
  - By Application
  - By Last 45 Days of Activity
  - By Age

RMF (Type 73) Analysis – By Sysplex



TMC Analysis – By Application

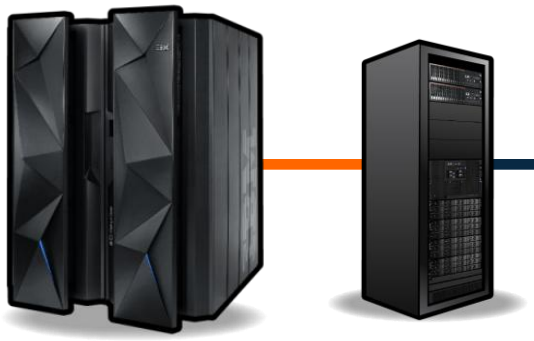
Program	Description	Category	Capacity (GB)	Comp. Rate	Comp. Capacity (GB)	Dedupe Rate	Dedupe Capacity (GB)
ARCCTL	IBM DFSMShsm Migration	Archive and Compliance	27,018.30	3.00	9,006.10	8.00	3,377.29
IDCAMS	IBM VSAM Utility (Define, Repro, Export, etc.)	Backup and Recovery	22,177.91	3.00	7,392.64	15.00	1,478.53
ADRDSSU	IBM DFSMSdss Full Volume / File Disk Backup Utility	Backup and Recovery	3,559.18	3.00	1,186.39	15.00	237.28
IFASMFDP	IBM SMF Data Offload Utility	Archive and Compliance	3,413.77	3.00	1,137.92	8.00	426.72
SAS	SAS Institute, Inc. Statistical Analysis Program	Primary Operational	1,829.80	3.00	609.93	8.00	228.73
DSNUTILB	DB2 Utilities (Load/Unload, etc.)	Backup and Recovery	1,805.20	3.00	601.73	15.00	120.35
IEBGENER	IBM Sequential File Copy Utility	Primary Operational	919.44	3.00	306.48	8.00	114.93
BAKPROD8		Other	431.96	3.00	143.99	8.00	54.00
DRCPYDAT		Other	302.47	3.00	100.82	8.00	37.81
SORT	IBM SORT Utility	Primary Operational	291.78	3.00	97.26	8.00	36.47
Other		Other	1,943.64	3.00	647.88	8.00	242.96
		Summary	63,693.45	3.00	21,231.15	10.02	6,355.05



Sizing Capacity & Network Bandwidth

(100TB Example)

100 TB of Virtual Tape Data



Primary Storage Capacity Requirement

100 TB	1:1
33.3 TB	3:1
10 TB	**10:1**

1 TB of Daily Backup Data

Replication Bandwidth Requirement

1000 GB	1:1
333 GB	3:1
67 GB	**15:1**

100 TB of Virtual Tape Data

DR Storage Capacity Requirement

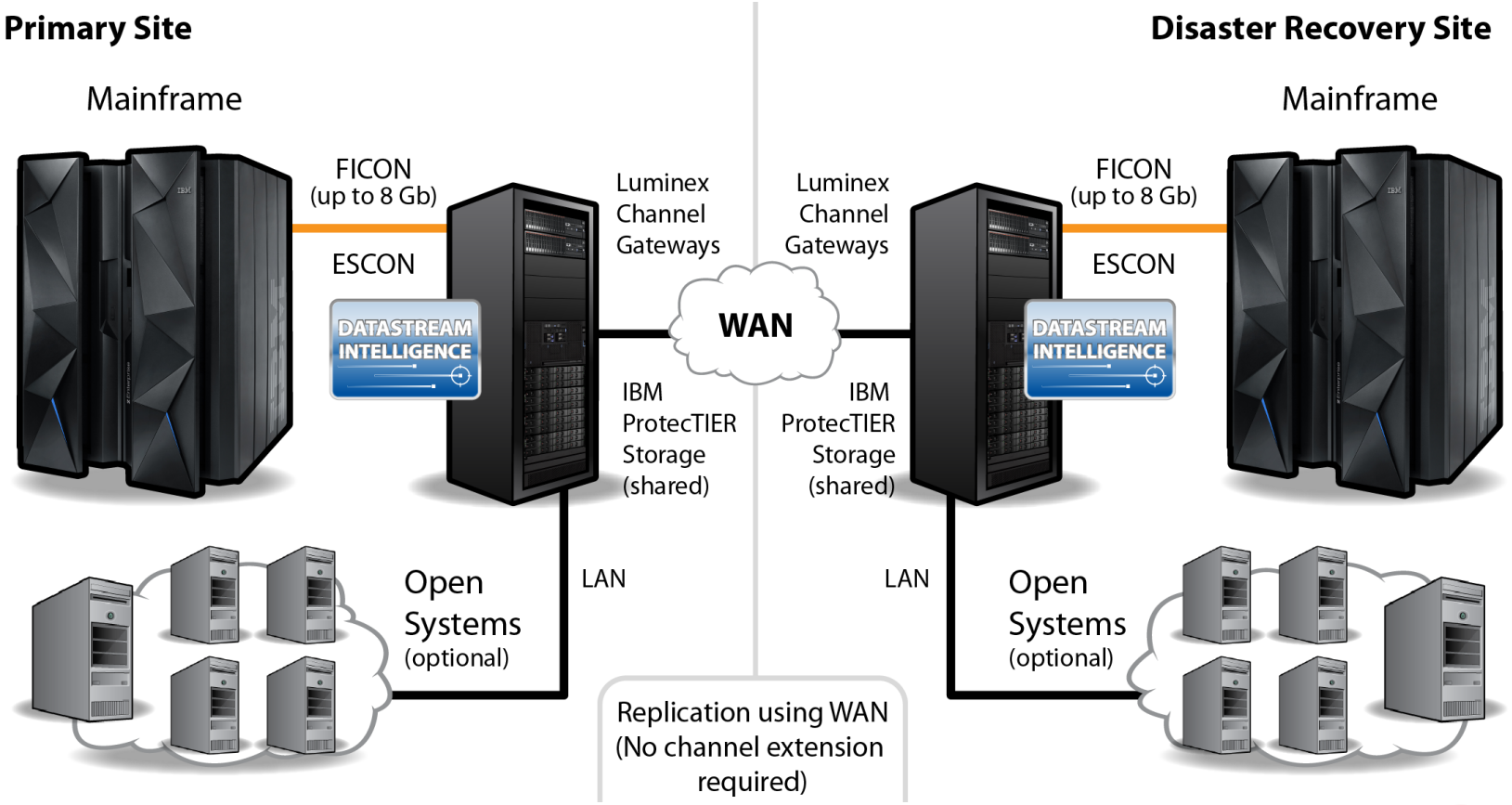
100 TB	1:1
33.3 TB	3:1
10 TB	**10:1**

No Compression
Compression
Deduplication

Note: Best Practice – Seed DR storage at the Primary Site before shipping

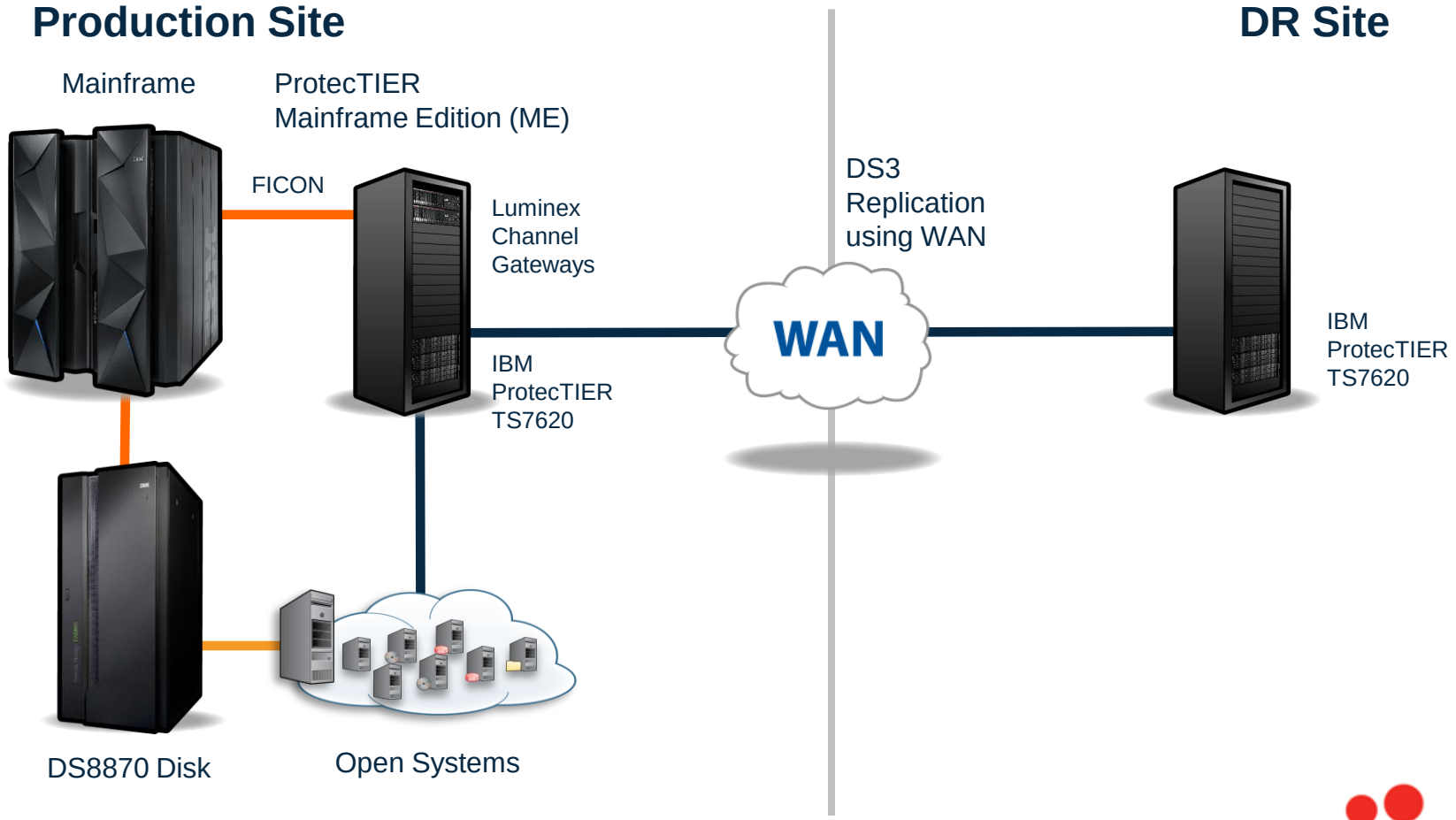
Shared Infrastructure

Common open and mainframe backup and disaster recovery solution

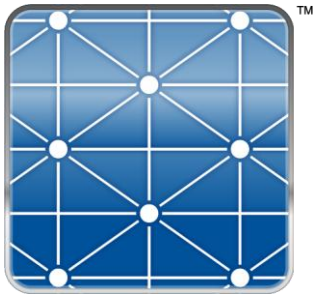


Customer Example

Leading Motor Vehicle Manufacturer

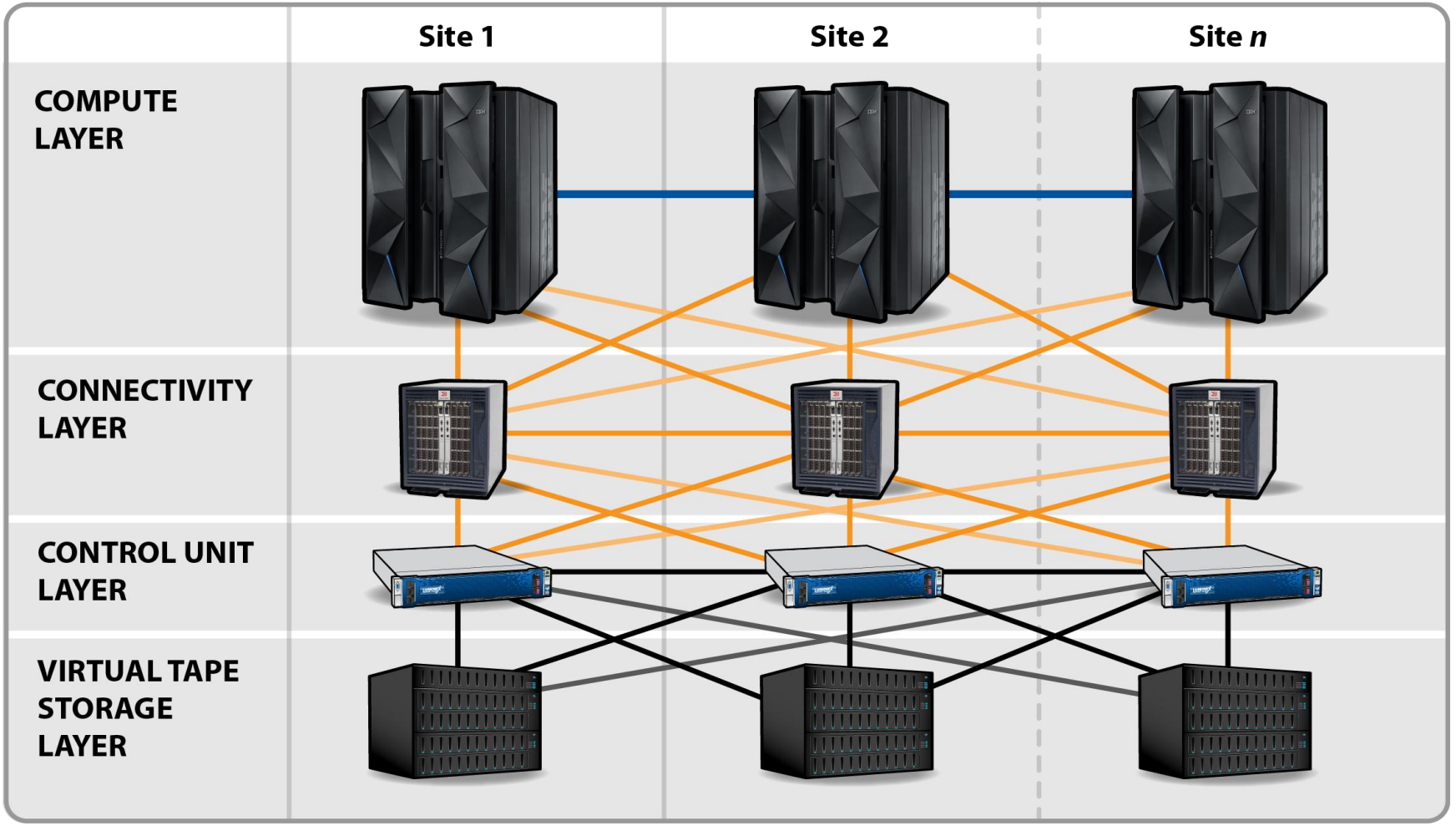


Continuous Availability: Synchronous Tape Matrix (STM)

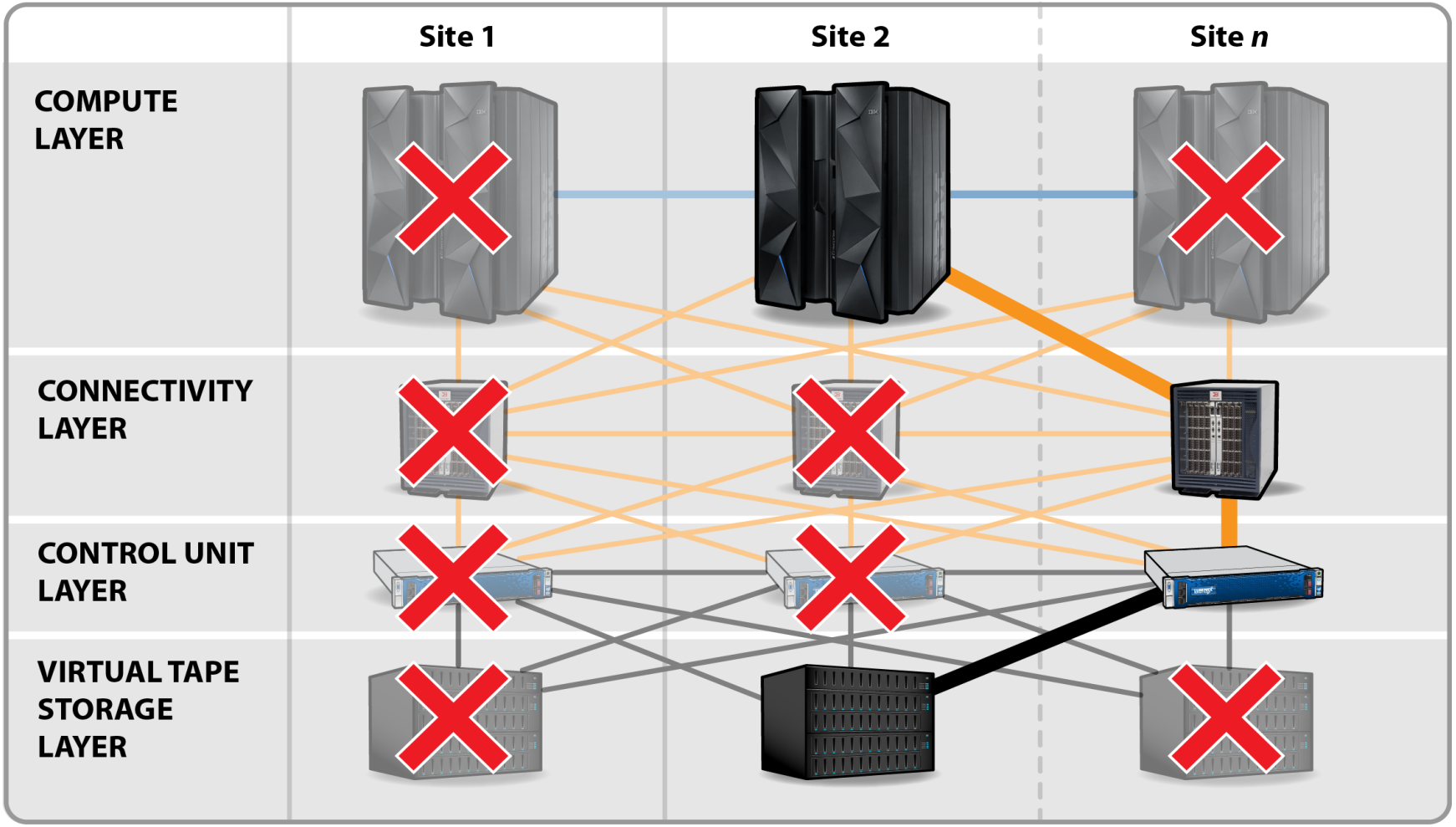


- Continuous Availability
  - Resilient architecture instantly and automatically adjusts to multiple failures without interruption
  - Data is always available for I/O
  - No downtime from failover or restore processes
- No idle components to buy
  - All components contribute to day-to-day operations, not just during failure events
- Easy to implement
  - No host scripts or policies required
- Scalable
  - No limitations for throughput, capacity or degrees of redundancy
- Modular design ensures investment protection
- Supports dissimilar storage systems and compression/deduplication technologies

Simplified STM Configuration with *n*-Sites

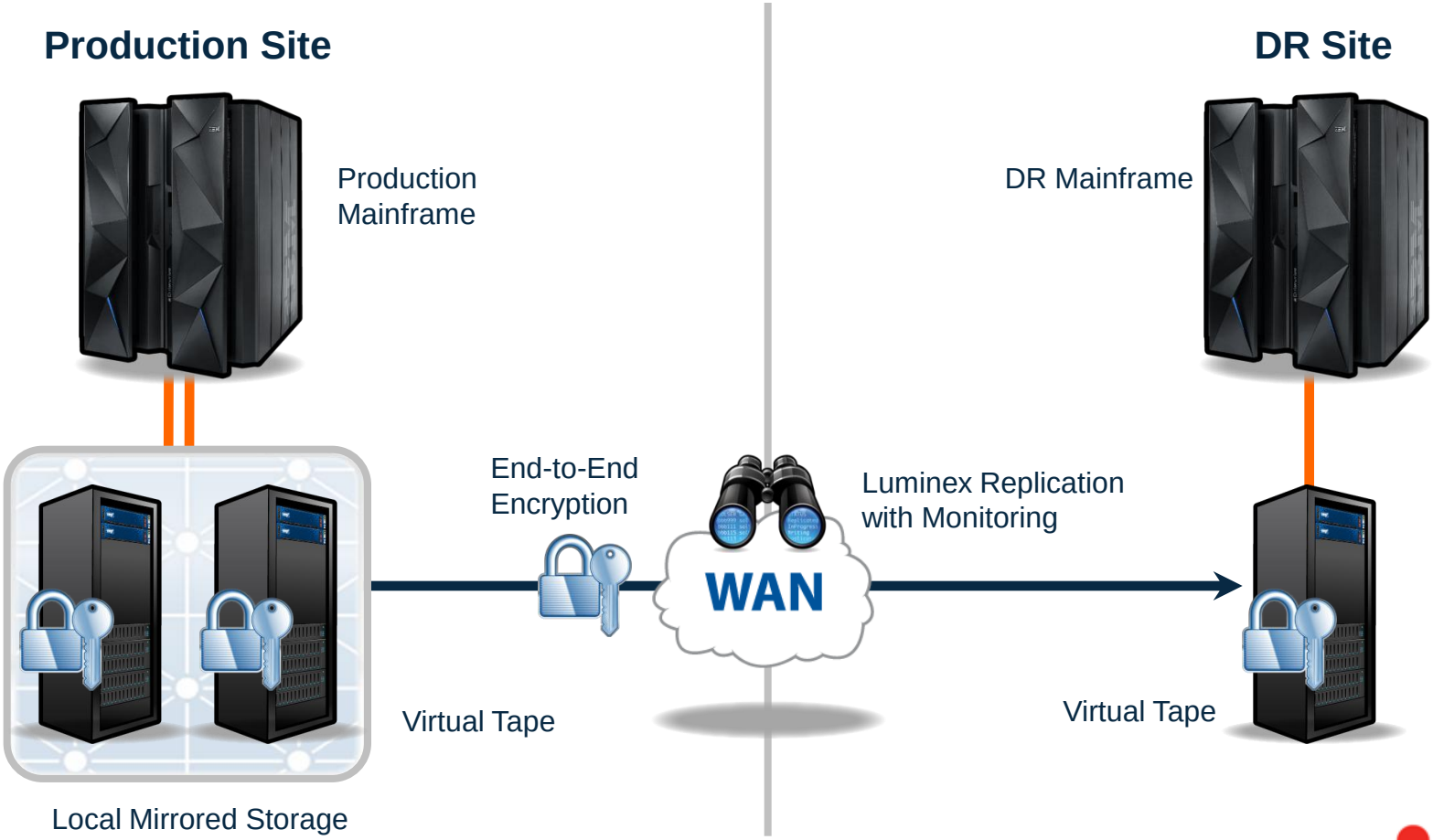


Operational STM Configuration with Multiple Failures Across Layers and Sites



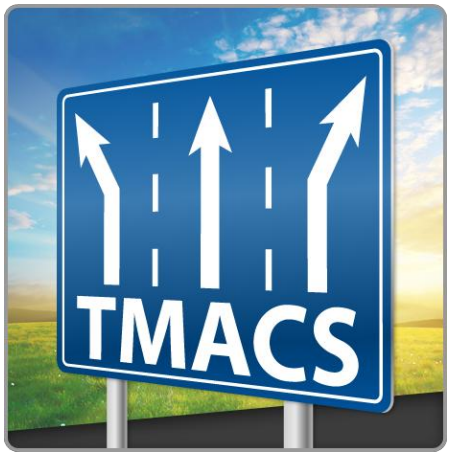
STM Customer Example

Leading U.S. HealthCare Provider



Tape Migration Services and Software

- **Luminex offers unique Tape Migration Services to migrate to STM**
  - Elegantly designed to work with TMACS to move tape data without touching the 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
- **TMACS (Tape Monitoring and Allocation Control Software)** is optional host-based software to automate device allocation steering for complex environments



Media Migration Services & Software

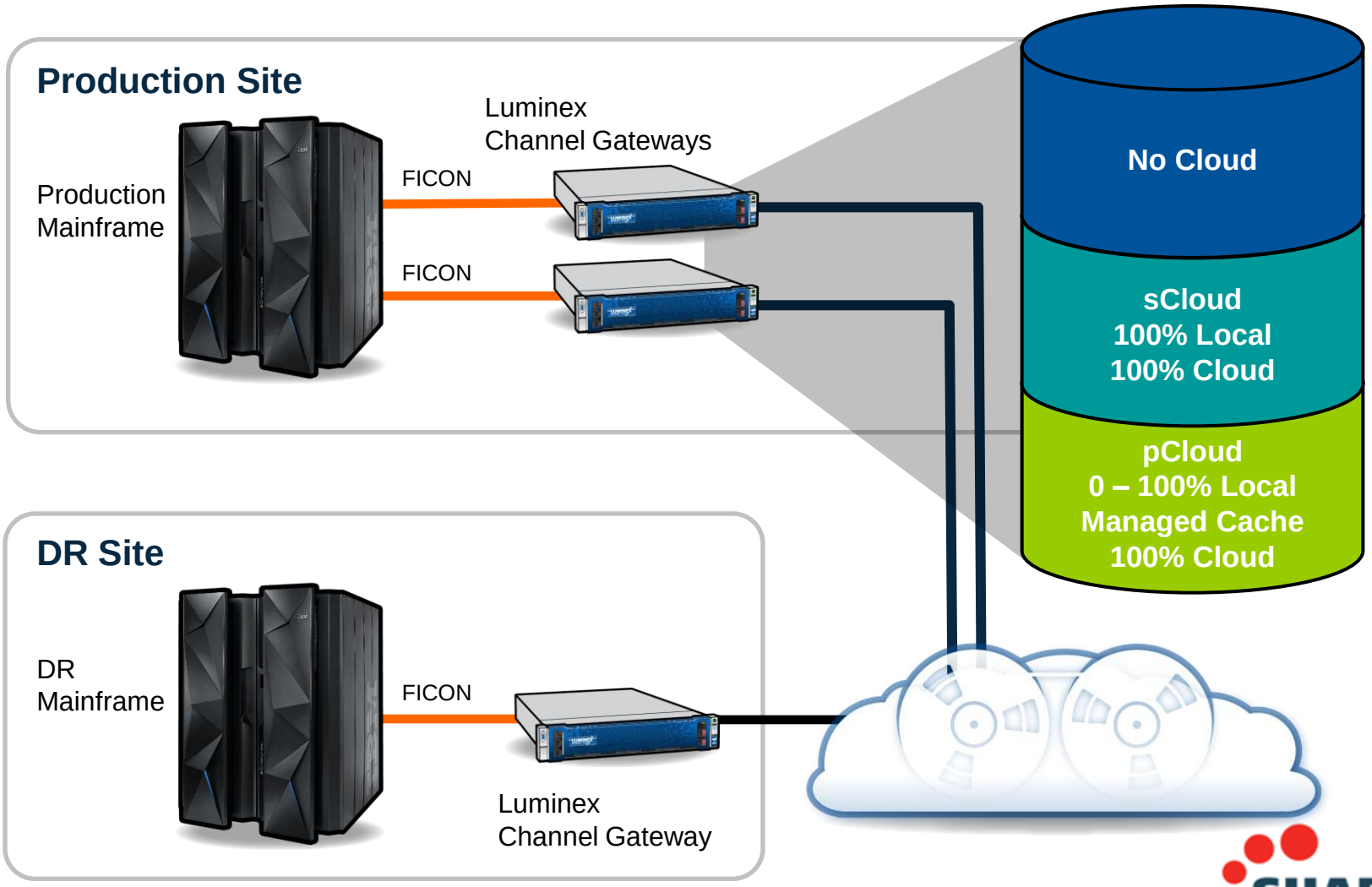
For current Luminex virtual tape environments

- Luminex offers Media Migration to non-disruptively migrate to the new storage target
- Entirely off-host, no mainframe MIPS required
- Current VOLSER #s and all historical information are retained in the new environment (no changes to tape catalogs)
- Volumes will acquire the characteristics of the new configuration

Other Options - CU Based Encryption and Security: CGSafe

Features	Benefits
• 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	• 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 

Other Options:
Tape Vaulting to the Cloud: CloudTAPE



Summary:
Long Live 3590 Virtual Tape

Future-Proof 3590 Virtual Tape

- Access to the latest technologies
- Reduce or eliminate cost & limitations related to physical tape
- Improve all aspects of your tape operations

Thanks for attending!

Visit us at **Booth #400** in the Tech Expo

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