#SHAREorg

SHARE
Technology · Connections · Results

Replicating Mainframe Tape Data for DR – Best Practices

Session #10929

Lee Reiersgord
Systems Engineer
Luminex Software, Inc.

Steve Schwietz
Senior Systems Programmer
Agribank

Buddy Moore
Systems Programmer
Texas Dept. of Public Safety

Scott James
VP Global Alliances & Marketing
Luminex Software, Inc

Jerry Johnson
Consulting Systems Engineer
LexisNexis

Discussion Topics

- Why Replicate Mainframe Tape Data?
- Network Bandwidth Requirements for Replication
- Replication Options
- Replication Architecture
- Monitoring Tools for Replication
- Summary - Best Practices
- Customers Share Their Experience with Tape Replication for DR

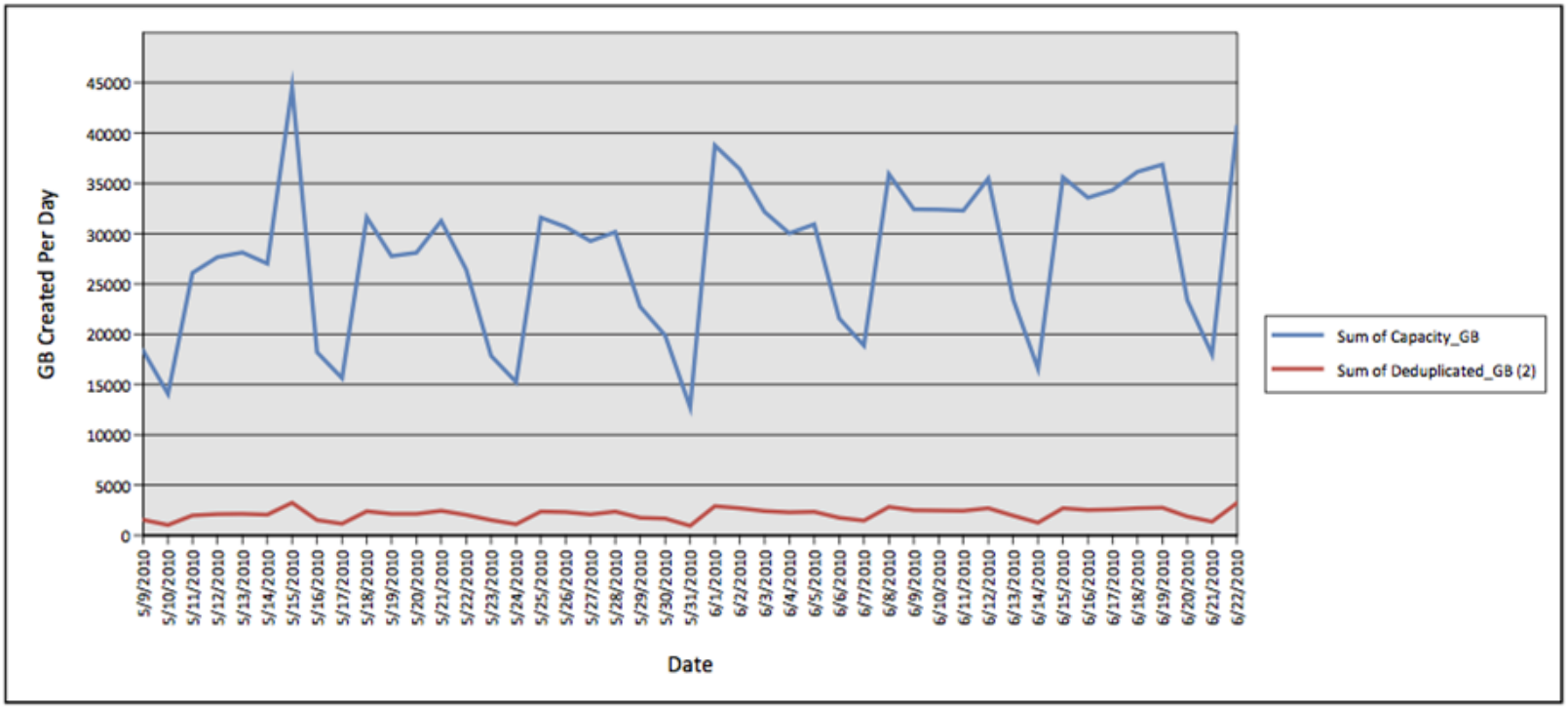
Why Replicate Mainframe Tape Data?

- It is the best way to move tape data between the production and disaster recovery site
  - Much faster than shipping physical tape
  - Eliminates security risk associated with shipping physical tape
  - Eliminates the cost of physical tape media, shipping & storage
- Less complexity compared to physical tape encryption key management
- Dramatically improves the remote disaster recovery plan
  - Improve RPO through continuous replication
  - Recovery time is significantly reduced

Network Bandwidth Requirements for Replication – Use TMC & SMF records to calculate network requirements

Tape Analysis By Day (Last 45 Days) - ALL - Prod

Date	Capacity (GB)	Current Volumes	% of Total	Cumulative % of Total	Expected Dedupe Rate	Deduplicated Capacity(GB)
Summary:	1,251,224.49	234,747.00	100.00%	100.00%	13.07	95,718.34



Replication Options

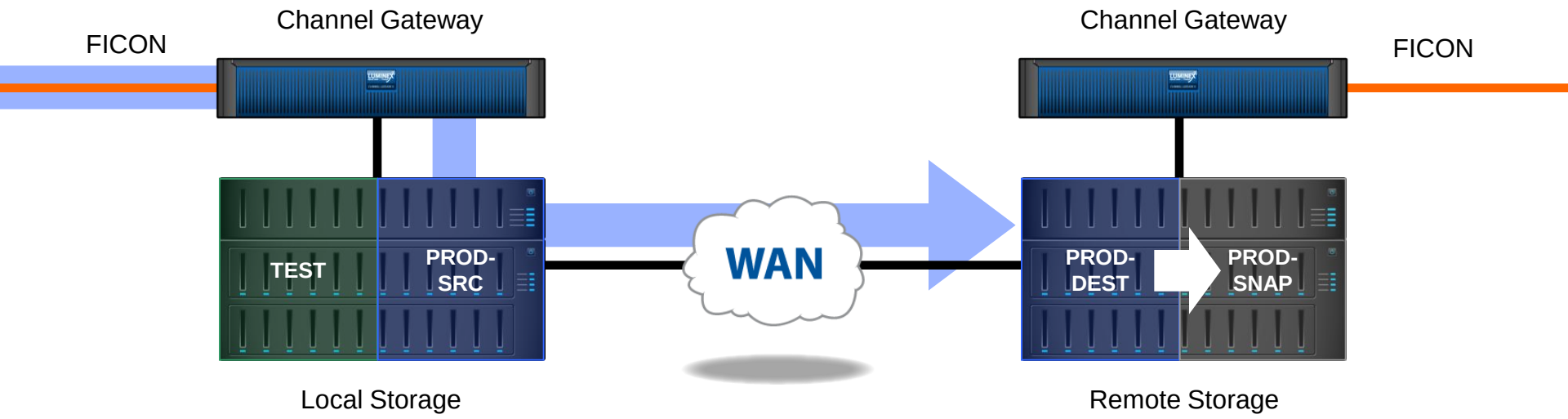
- Replication Management
  - Control Unit-based
  - Deduplication Storage Gateway-based
  - Storage-based replication

Replication Architecture
Goals

- Continuous protection of production tape data – replication never stops
- Allow customer to setup for DR test and clean up after test
- One-time configuration of remote CG for multiple future DR tests

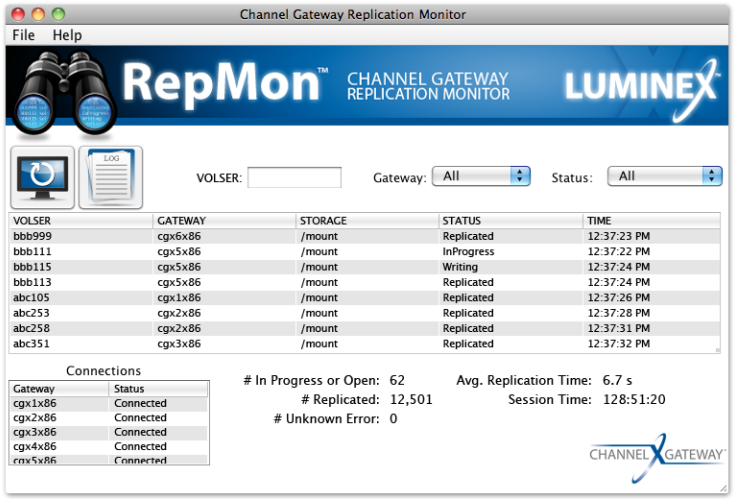
Replication Architecture
Typical Configuration

- CG and virtual tape storage at production site
- CG and virtual tape storage at DR site
- Replication of local virtual tape storage never stops



Monitoring Tools for Replication

- Satisfy legal and audit concerns
- No chain of custody issues
- Replication logs
- VOLSER-level monitoring
- Detailed reporting



Best Practices for Continuous Replication and DR Exercises

- Use a Non-distruptive tool & process
  - It will provide continuous protection of the production site's data
  - Enables non-distruptive remote DR tests
- Replication monitoring at the volser level is recommended
- Detailed documentation for selectively or completely replicating tape data should be established

#SHAREorg

SHARE
Technology · Connections · Results

AgriBank FCB

End User Experience

Steve Schwietz
Senior Systems Programmer
Agribank

AgriBank FCB

SHARE
Technology · Connections · Results

The Company

- AgriBank, FCB is one of the largest four banks within the national Farm Credit System, with $71 billion in total assets, representing the 7th Farm Credit District.
- As the district hub, Agribank provides IT services for associations across 16 states in the Midwest.
- Agribank employs 225 people in their St. Paul MN corporate office.
- Mainframe Software:
  - z/OS, DB2 (Image Copy), DFdss for backup & recovery, HSM ML2, batch processing and RMM

AgriBank FCB

SHARE
Technology · Connections · Results

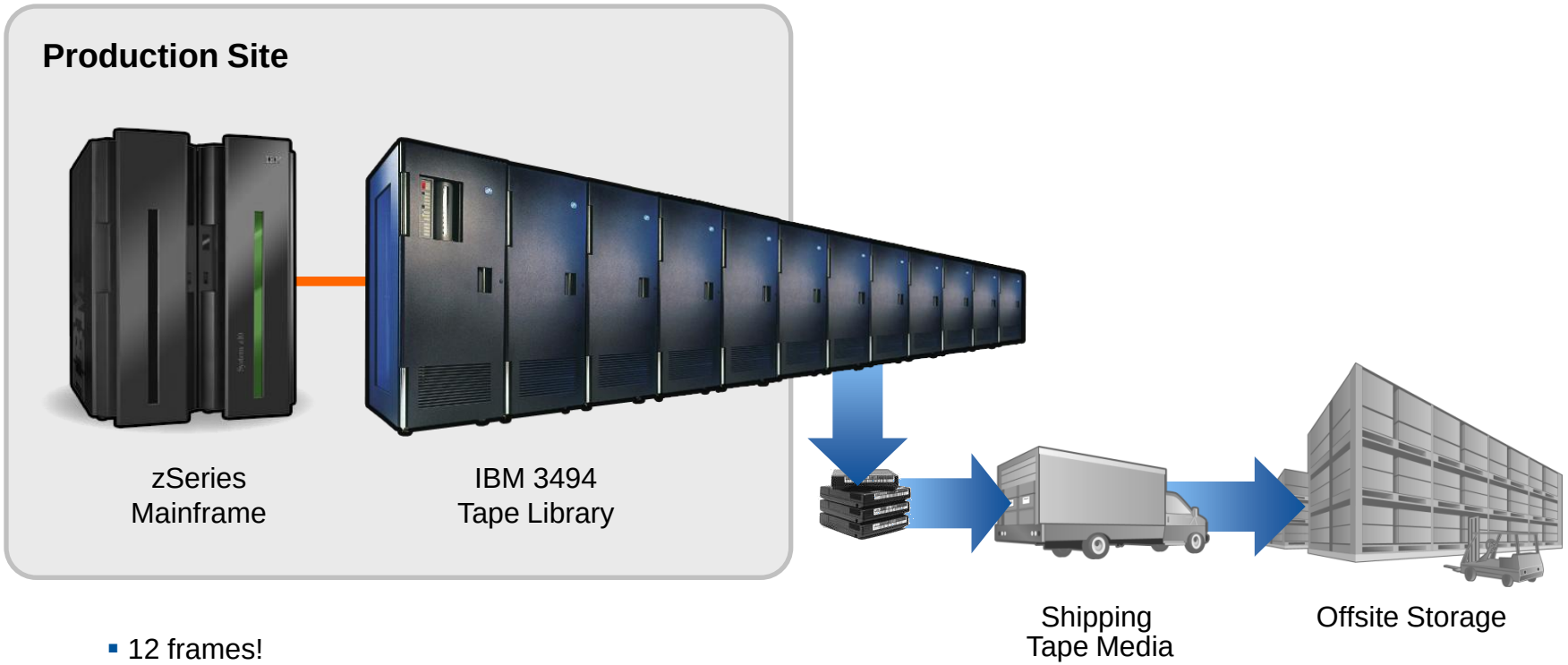
What were our Goals and Objectives?

Challenges/Goals:

- Improve disaster recovery time
- Eliminate the delays that physical tape imposes on the DR plan
- Replace the aging IBM 3494 tape library
- Replace the tape library before relocating Agribank's data center.

AgriBank FCB

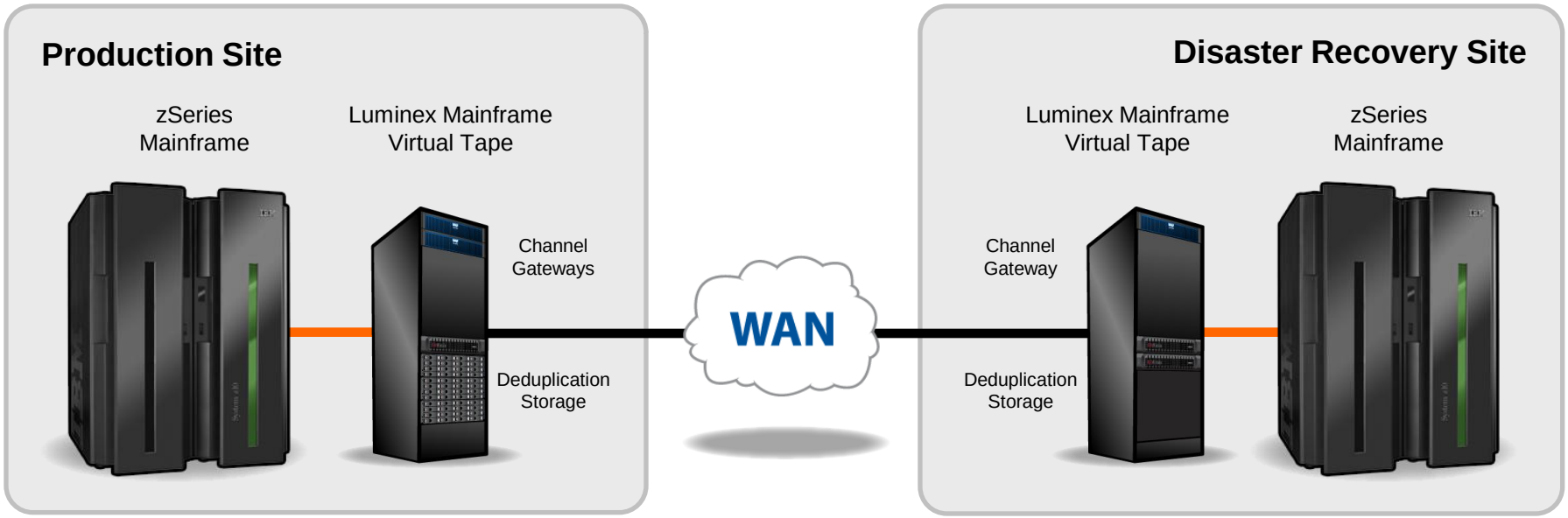
Previous Tape Environment



- 12 frames!
- 8x 3590 tape drives
- 4x 3592 tape drives with encryption

AgriBank FCB

New Tape Environment



AgriBank FCB

SHARE
Technology · Connections · Results

How Did We Do?

Benefits/Achievements

- ☑ We're completely tapeless!
- ☑ Reduced floor space - From 12 IBM frames to a single 19" rack
- ☑ Recovery time went from 3 days, to 4 hours
- ☑ Several DR test have been successfully completed
- ☑ Replaced and removed the 3494 tape library, before the data center relocation, which saved significant $ and floor space

#SHAREorg

LexisNexis®

SHARE
Technology · Connections · Results

End User Experience

Jerry Johnson
Consulting Systems Engineer
LexisNexis

LexisNexis®

SHARE
Technology · Connections · Results

The Company

- A leading global provider of information and technology solutions for the legal, risk management, corporate, government, law enforcement, accounting, and academic markets
- Serves customers in more than 100 countries
- More than 15,000 employees worldwide
- Mainframe Software:
  - z/OS, HSM ML2, DFdss and batch processing

LexisNexis®

SHARE
Technology · Connections · Results

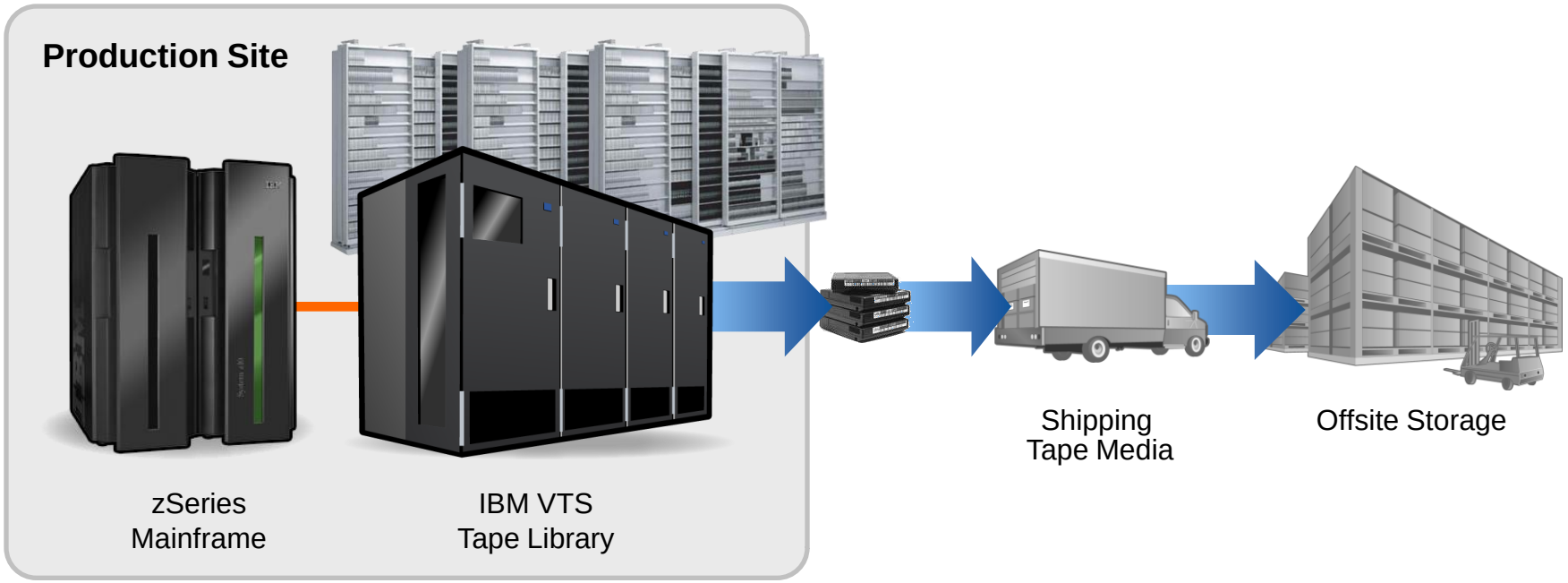
What were our Goals and Objectives?

Challenges/Goals:

- Improve the LexisNexis remote disaster recovery plan
- Reduce the cost for physical tape drive and library maintenance
- Reduce the cost of physical tape media, shipping and off site storage

LexisNexis®

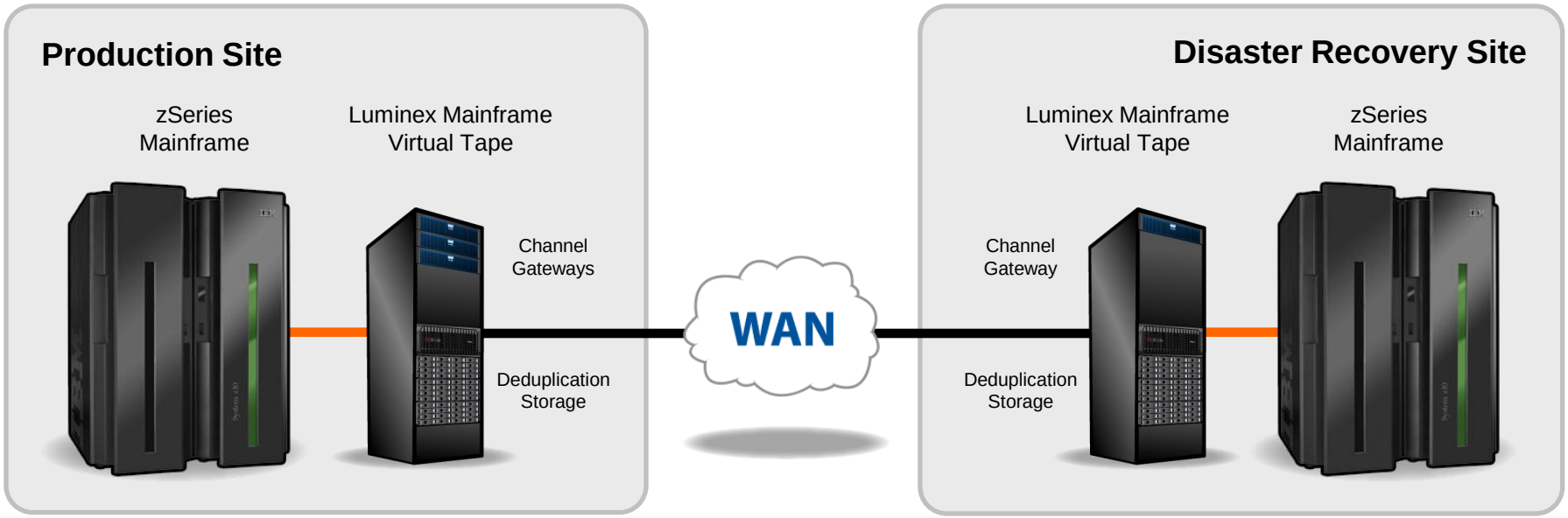
Previous Tape Environment



- 8x 3480 tape drives
- 16x 3490 tape drives
- 10x 3590 tape drives
- 3000 physical mounts per day

LexisNexis®

New Tape Environment



- 48 virtual tape drives
- Production tape mounts are virtual only

LexisNexis®

SHARE
Technology · Connections · Results

How Did We Do?

Benefits/Achievements

- ☑ Virtual tape data is replicated immediately and readily available for DR test and disaster recovery
- ☑ They eliminated tape media, shipping and off site storage (vault) cost
- ☑ No tape librarians are required
- ☑ All tape mounts are now virtual (faster), instead of physical

#SHAREorg

Texas Department of Public Safety

SHARE
Technology · Connections · Results

End User Experience

Buddy Moore
Systems Programmer
Texas Department of Public Safety

The Organization

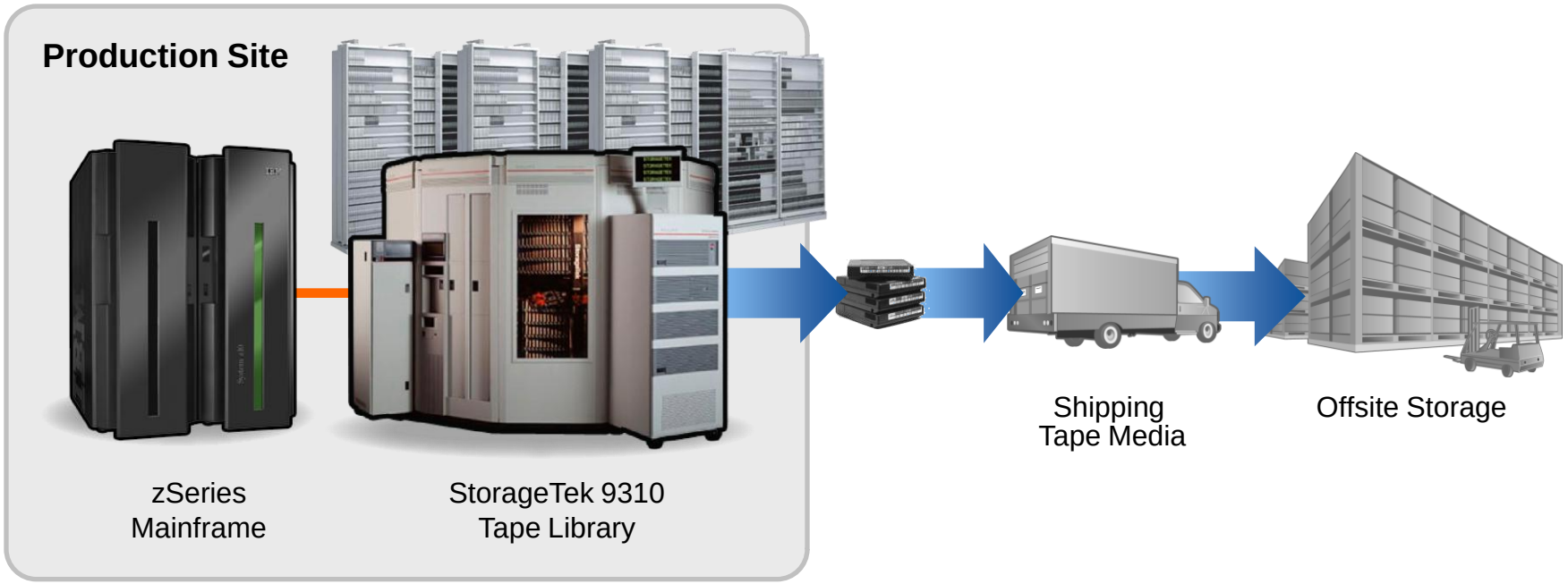
- Comprised of 14 departments including Finance, Law Enforcement, Counter Terrorism, Emergency Management and Aviation
- $1+ billion annual budget
- Over 8,000 employees
- Mainframe Software:
  - z/OS, DB2, HSM, CICS, FDRABR and RMM

What were our Goals and Objectives?

Challenges/Goals:

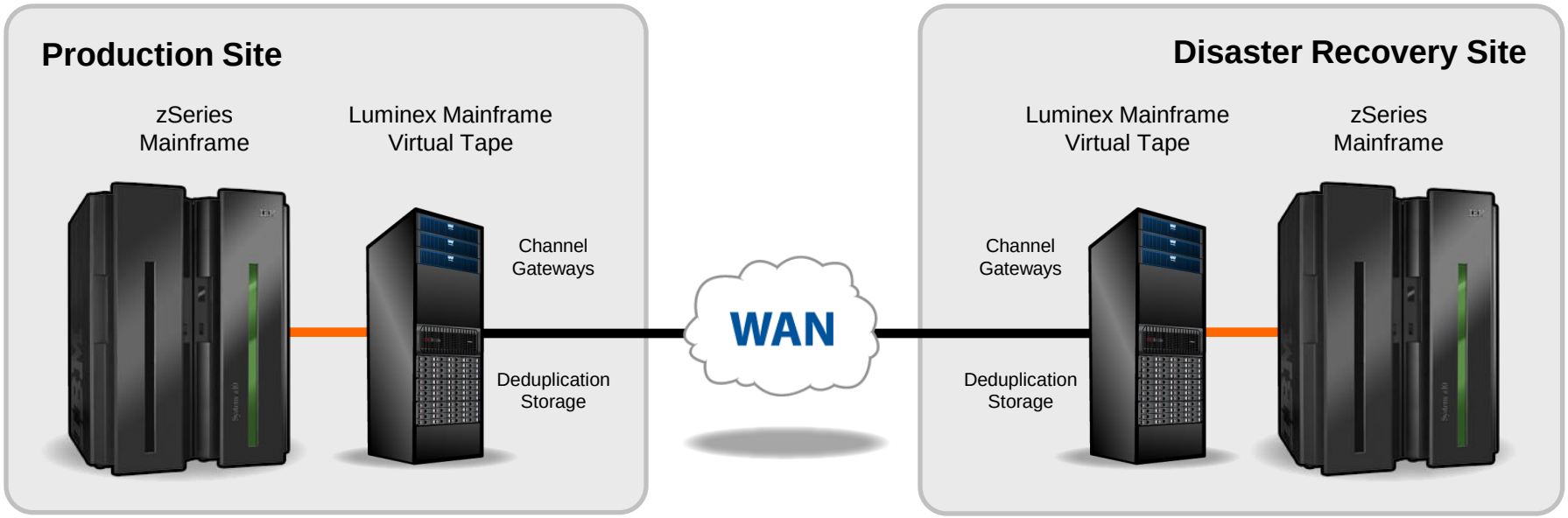
- Replace the Oracle 9310 tape silo (End of Life and End of Support)
- The new solution should not require changes to any tape applications
- Migrate all old tape cartridges to the new solution
- Maintain long term access to the volsers after the tape migration
- Share all tape drives across all LPARs

Previous Tape Environment



- 8x 9840 tape drives
- 20,000 physical tapes

New Tape Environment



- 96 virtual tape drives
- 13 year old data available at disk I/O speeds
- Storage is shared between mainframe and open systems

How Did We Do?

Benefits/Achievements

- ☑ We're completely tapeless!
- ☑ No changes to JCL or tape applications were required (it was seamless...)
- ☑ The DR plan has been substantially improved
- ☑ All tape cartridges (20,000) have been migrated and the original volsers #'s have been retained
- ☑ All 96 virtual tape drives are shared across all 3 LPARS
- ☑ The deduplication storage system used for virtual tape is shared between the mainframe and open systems
- ☑ Significantly more floor space in the data center has been reclaimed

SHARE
Technology · Connections · Results

Thank You

Lee Reiersgord
Systems Engineer
Luminex Software, Inc.

Steve Schwietz
Senior Systems Programmer
Agribank

Buddy Moore
Systems Programmer
Texas Dept. of Public Safety

Scott James
VP Global Alliances & Marketing
Luminex Software, Inc

Jerry Johnson
Consulting Systems Engineer
LexisNexis