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Virtual Tape: What's New with the EMC Disk Library for Mainframe?

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Comprehensive Portfolio

Solution Classes To Meet Functional & Recoverability Requirements

Backup

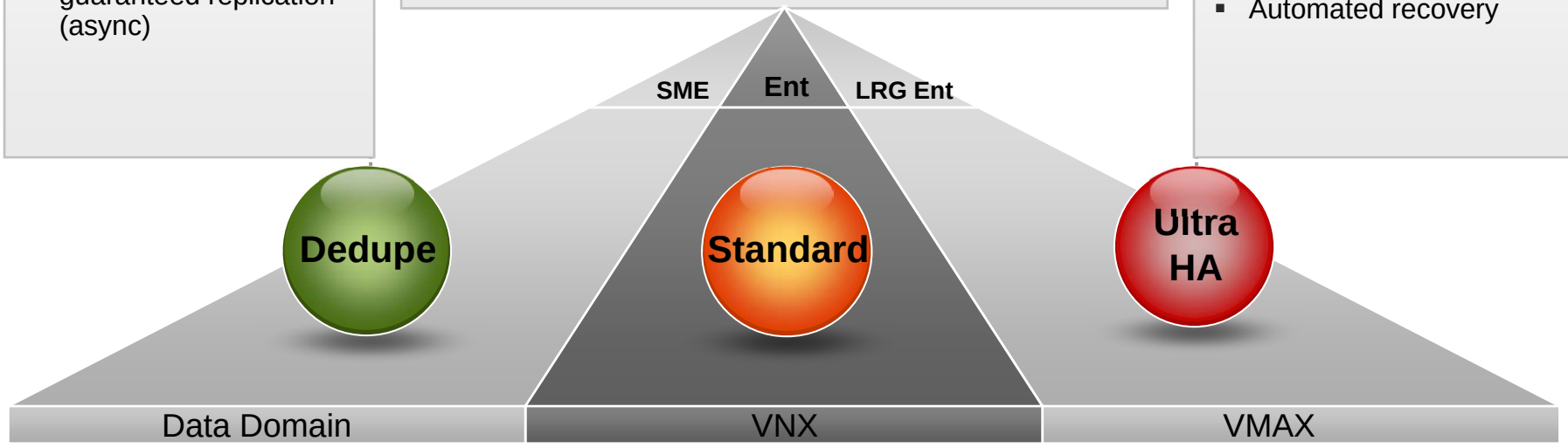
- Data dedupe for efficient storage utilization
- Mixed support for mainframe, IBM-i and open systems
- Incremental delta guaranteed replication (async)

Traditional

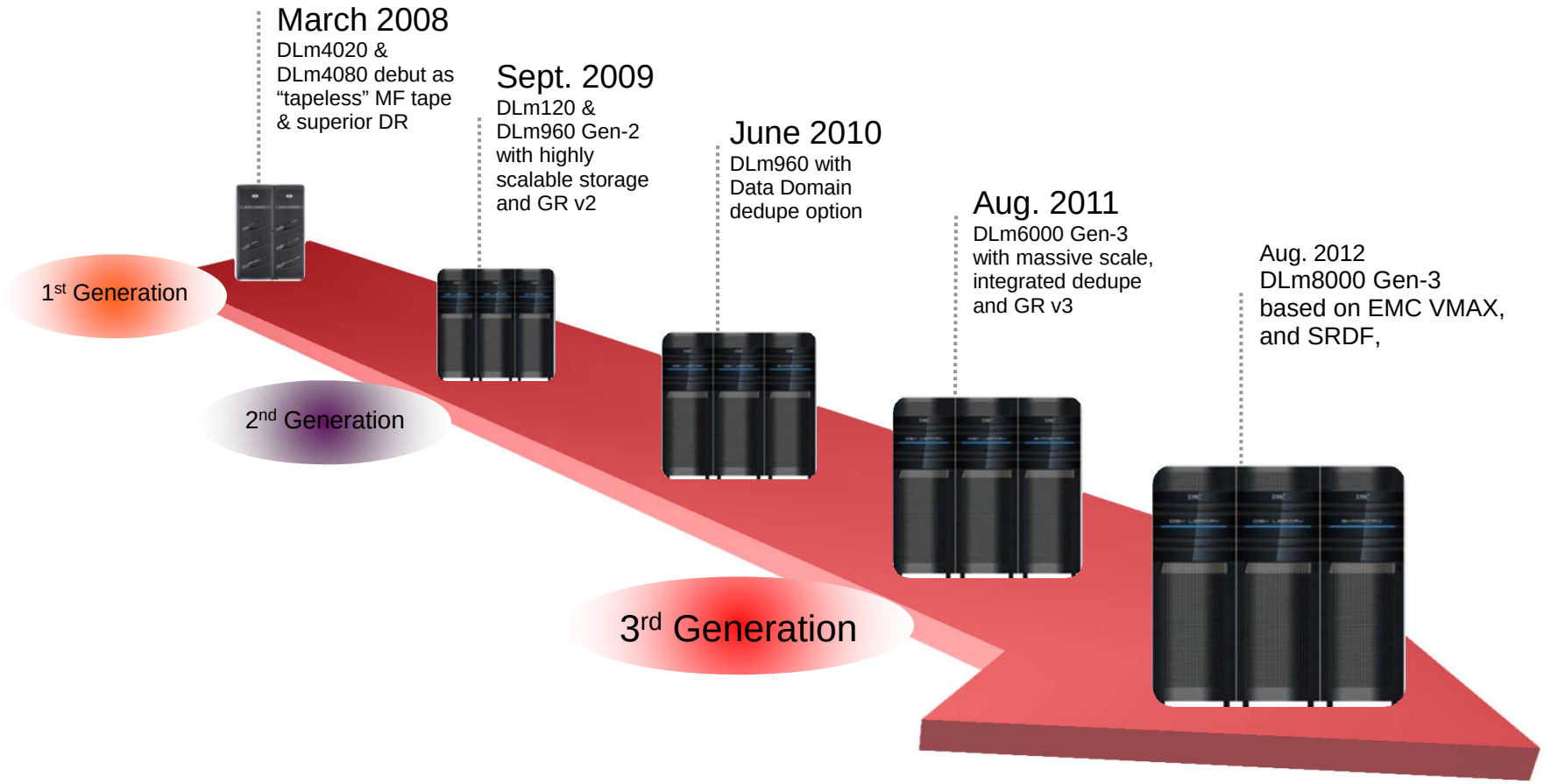
- Batch, HSM, Archive, Backup
- Traditional virtual tape environment
- Large SYSPLEX, multiple LPARs
- Guaranteed replication (sync)

Mission-Critical

- Critical operational tape data (HSM)
- Very short RTO
- Synchronous/Asynch replication
- Consistency between primary and tape data
- Automated recovery



Evolution of DLm for mainframe tape



Today's DLm Product Line

Primary Storage	Dedupe Storage	Combined Dedupe and Primary Storage

Enterprise

DLm6000
w/ VNX7500

DLm8000 w/
VMAX

DLm6000
w/ DD890

DLm6000
w/ VNX7500 & DD890

Small to Medium

DLm2000
w/ VNX5300

DLm1000
w/ DD 600/800/900

DLm: 2012 Deliverables

- DLm2000 and DLm v3.2 software (Feb.)
  - Follow on for DLm120
- DLm1000 and DLm v3.2 software (Apr.)
  - 2 new models
  - Added VM/VSE support
  - DLm1020 tape import/export
- EzSM v4.1 (May)
  - DLm plug-in (ISPF/TSO)
- Virtuent 7 for DLm960 (DLm v3.3 software (July))
  - Investment protection commitment
- DLm8000 and DLm v3.4 software (Nov.)
  - VMAX-based featuring SRDF replication

Customer Workload Trends

BACKUP

- True synchronous replication
- Remote vaulting
- Faster backup (smaller windows)
- Tight SLAs
- Avoid data movement through mainframe
- Non-proprietary
- Data deduplication
- No data loss

SPACE MGMT

- Eliminate ML1 costs
- No data loss
- Eliminate host CPU cycles for compression
- ML2 with ML1 performance
- Consistent high performance on recalls

DATA ARCHIVE

- Unpredictable access patterns
- Performance oriented recalls
- Must be accessible (online) always
- Active archive versus inactive
- Need better integration with applications
- No data loss

WORK TAPES

- Reduce CPU overhead
- Reduce elapsed time (e.g., sorts)
- Reduce batch windows
- Tight SLAs
- Log files key to recovery

Data Deduplication

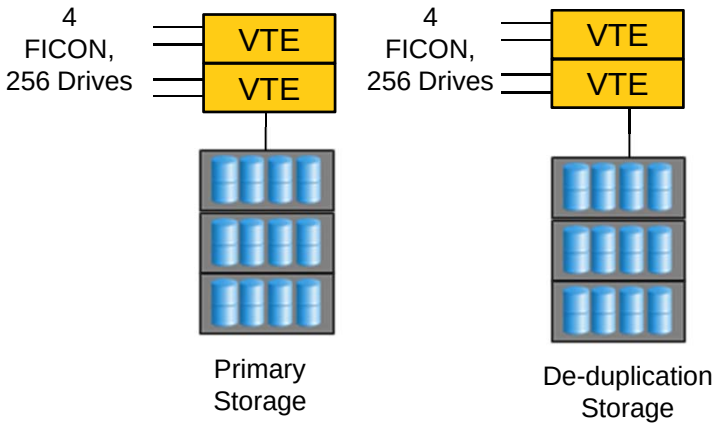
- Virtual tape On disk is the mechanism for bringing data de-duplication to the mainframe
- As the mainframe writes data to the virtual tape the storage performs de-duplication on the data
- Reducing Local and Remote Storage Footprints
- Reduces the data sent across DR Links
- Repetitive backup data will achieve the highest benefit from this technology
  - Daily FDR / DSS Dumps of static DASD volumes

DLm6000
w/ DD990

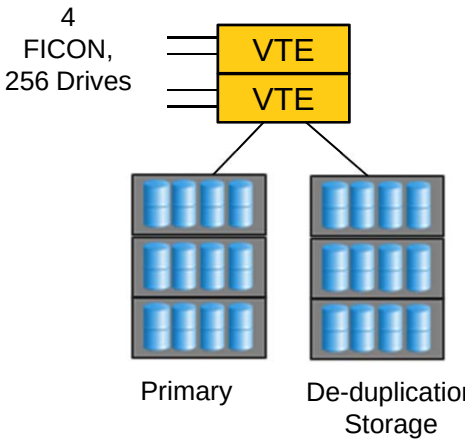
DLm1000
w/ DD 600/800/900

DLm6000 Supports Both Traditional and Dedup Storage

Traditional Environments

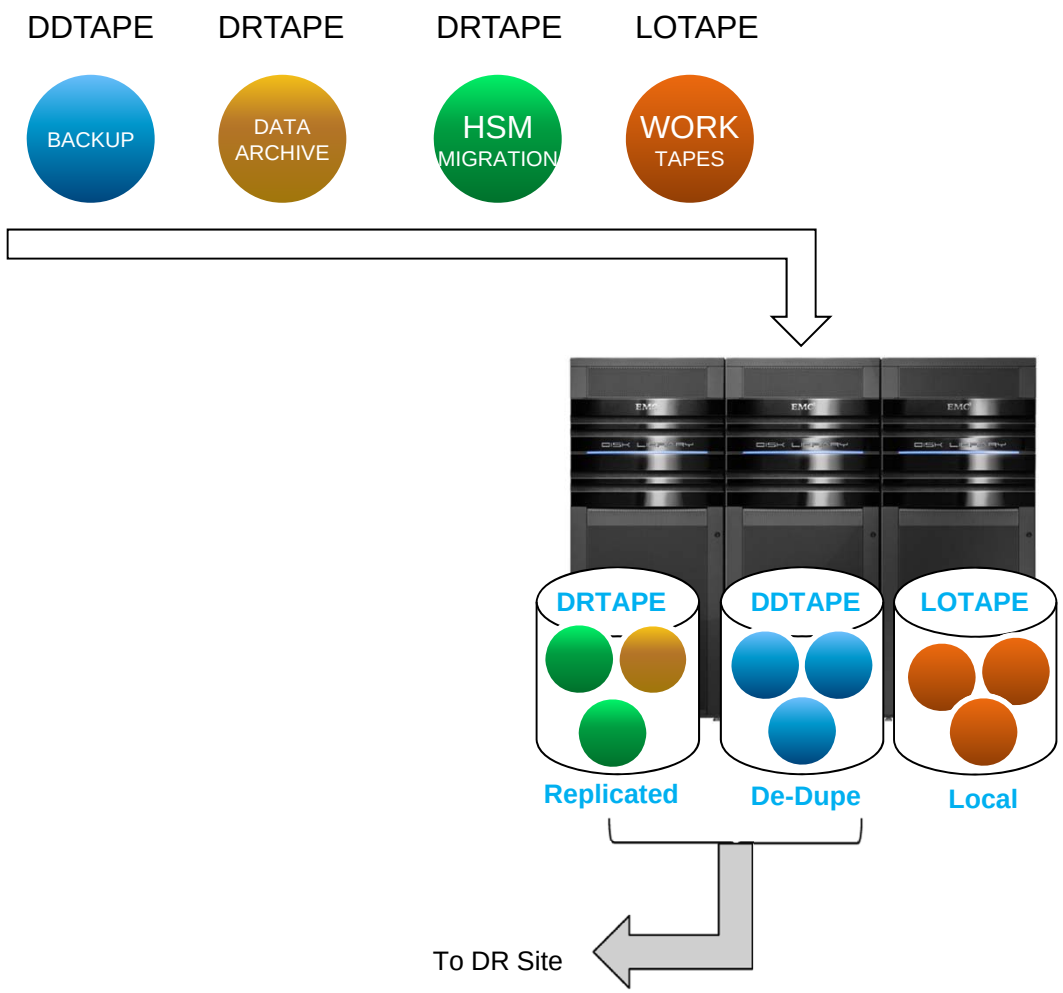


DLm6000 w/ VNX and DD Storage



- Most Virtual Tape Systems support a single type of storage
- Introducing De-duplication requires separate virtual tape solutions requiring more mainframe resources
- DLm6000 concurrently supports both traditional and de-duplicating storage
- Allowing Tape and FICON resources to be shared
- Directing individual VOLSERs to the most appropriate storage

Individual Tapes Directed to Appropriate Storage



- DLm6000 supports multiple concurrent storage classes (types)
- TMS tape pools (DRTAPE, DDTAPE, LOTAPE) allocate individual tapes to a specific storage class
- Storage classes are configured based on use case (Backup, Archive, Work, HSM)
- Simplifying management and administration of the library

Product Overview – DLm8000

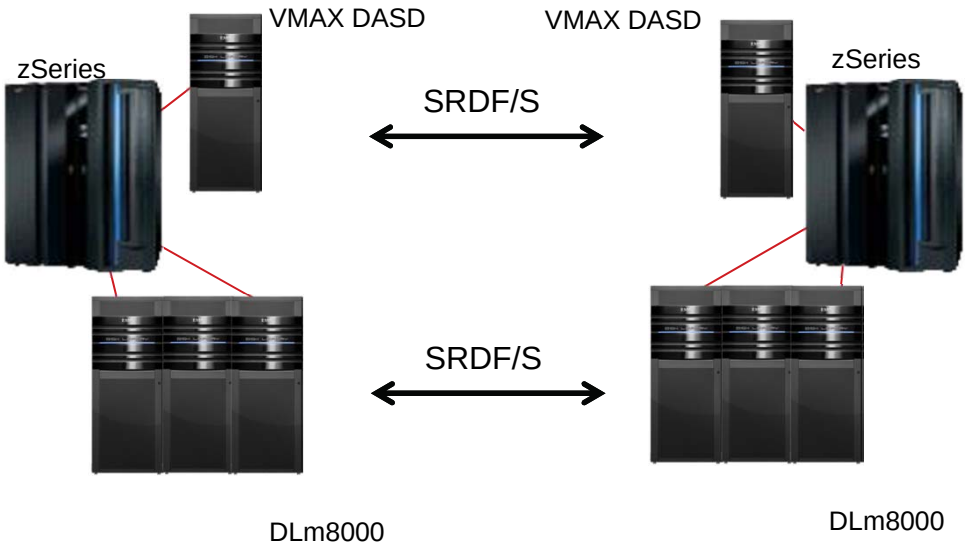
- Designed to meet the tape processing needs of customers with requirements for ultra high data resiliency
- Features:
  - VMAX as the backstore
  - SRDF for synchronous and asynchronous replication
  - Tape and DASD in the same consistency group
- Competitive advantages over IBM, Oracle and HDS
  - VMAX
  - Scale
  - Replication
  - Automated Restart

DLm8000 Features
Unprecedented scale, resiliency

- High-availability (HA) DLm architecture
- 56TB – 1,792TB per VMAX
- 700MB – 2.8GB/second throughput
  - Up to 8 VTE's
- 512 – 2,048 virtual devices
- 4 –16 FICON attachments
- SRDF/S and SRDF/A replication for tape
- GDDR for automated recovery
- Universal Data Consistency™ DASD & tape
- Transparent to mainframe
- 3-13 cabinets footprint

DLm8000 Offering Synchronous Replication

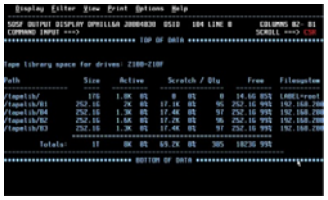
- Built on EMC VMAX 20K
- Using SRDF/S replication
- Eliminating replication lag between DASD and Tape
- Viable for both EMC and non-EMC DASD customers



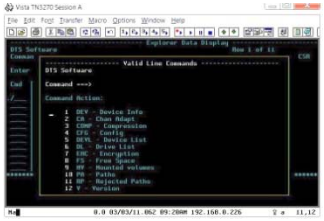
DLm Management

- DLm has to be easy to configure, manage
- Must have multiple interfaces to meet different users
- Must be able to manage complete system front to back

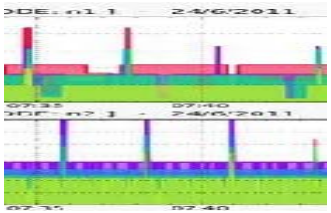
Presentation Layer



z/OS console



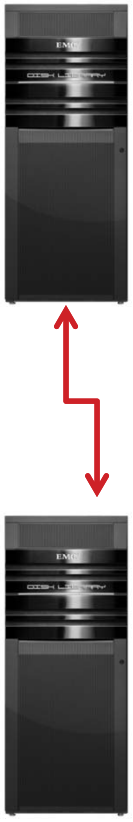
ISPF/TSO (EzSM)



GUI

Abstraction Layer

- Realtime Monitoring
- Operational Management
- Replication Management
- Capacity Planning
- Problem Determination



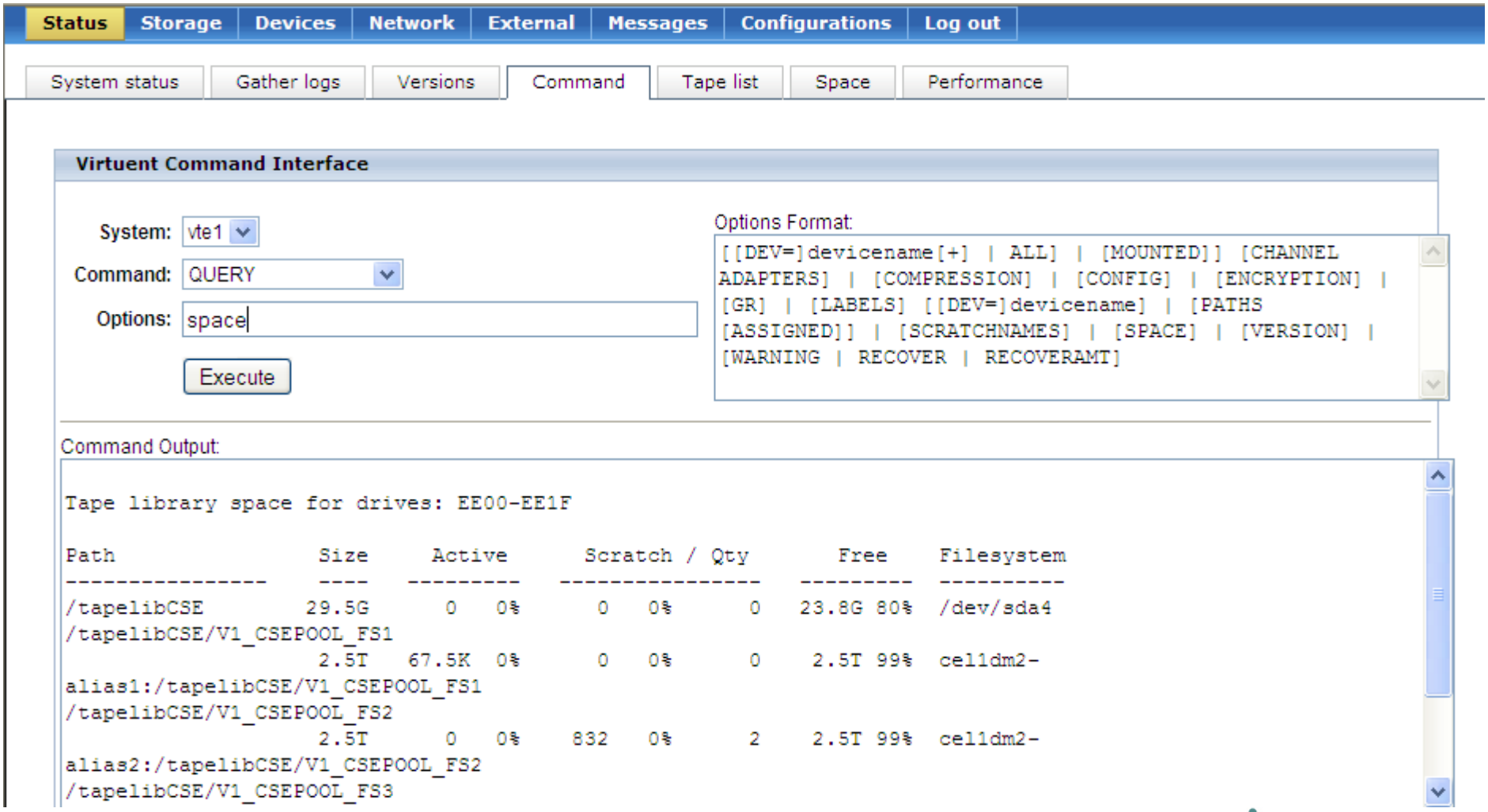
3.5 GUI Release Features

Release 1 (3.5) | Release 2 | Release 3 | Release 4

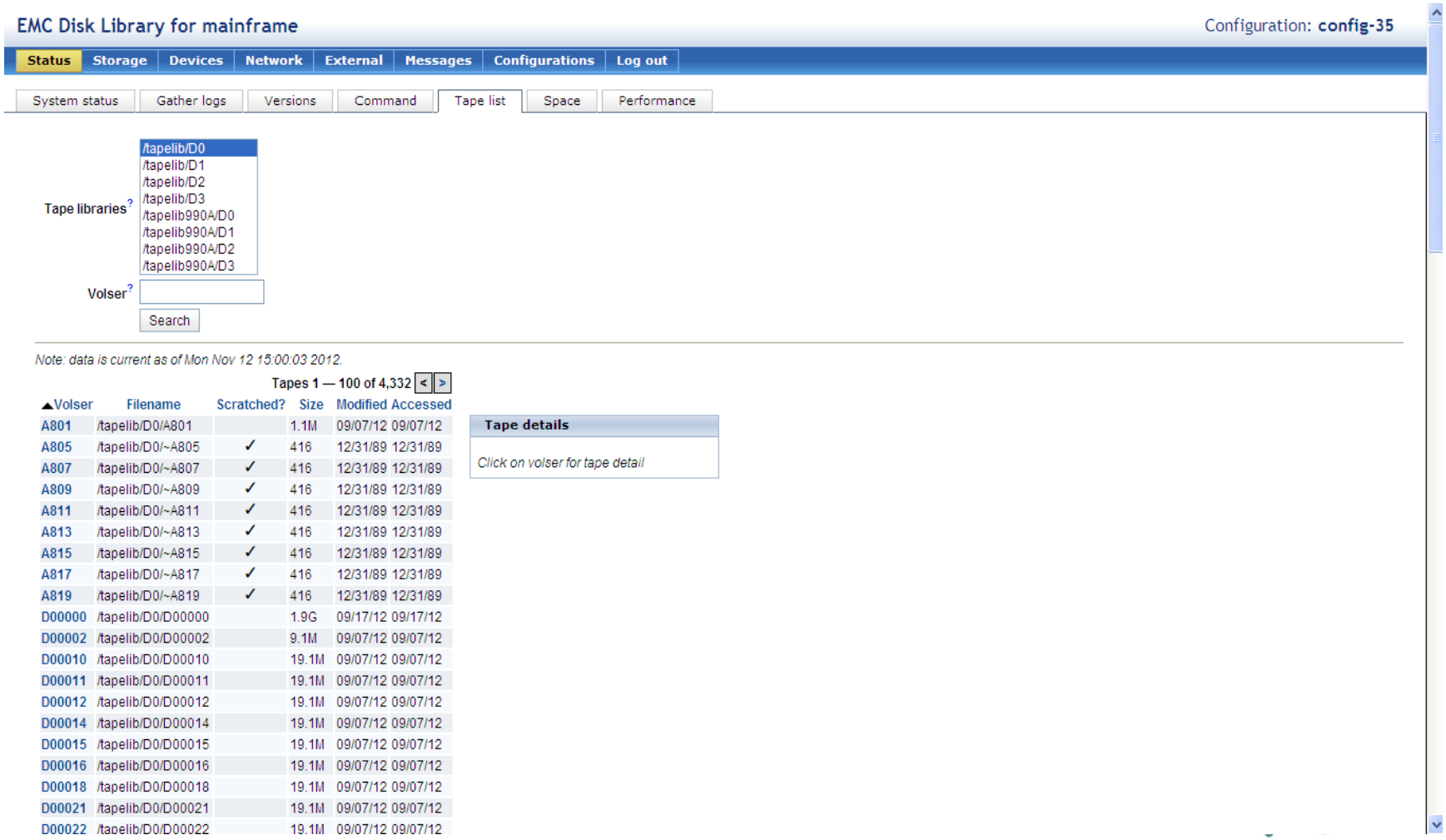
Features (Q1 2013):

- Realtime statistics (graphic thermals, etc.)
- Enable all VT commands (query, find, initialize, etc. to be called from DLm Console.
- Graphical mapping of tapelibs and mainframe
- Tape volume reporting
- Statistics for most recently mounted tape volumes
- Message filtering
- Mount statistics
- Health check indicators
- Access Storage Configuration
- Log gathering

New Command Tab

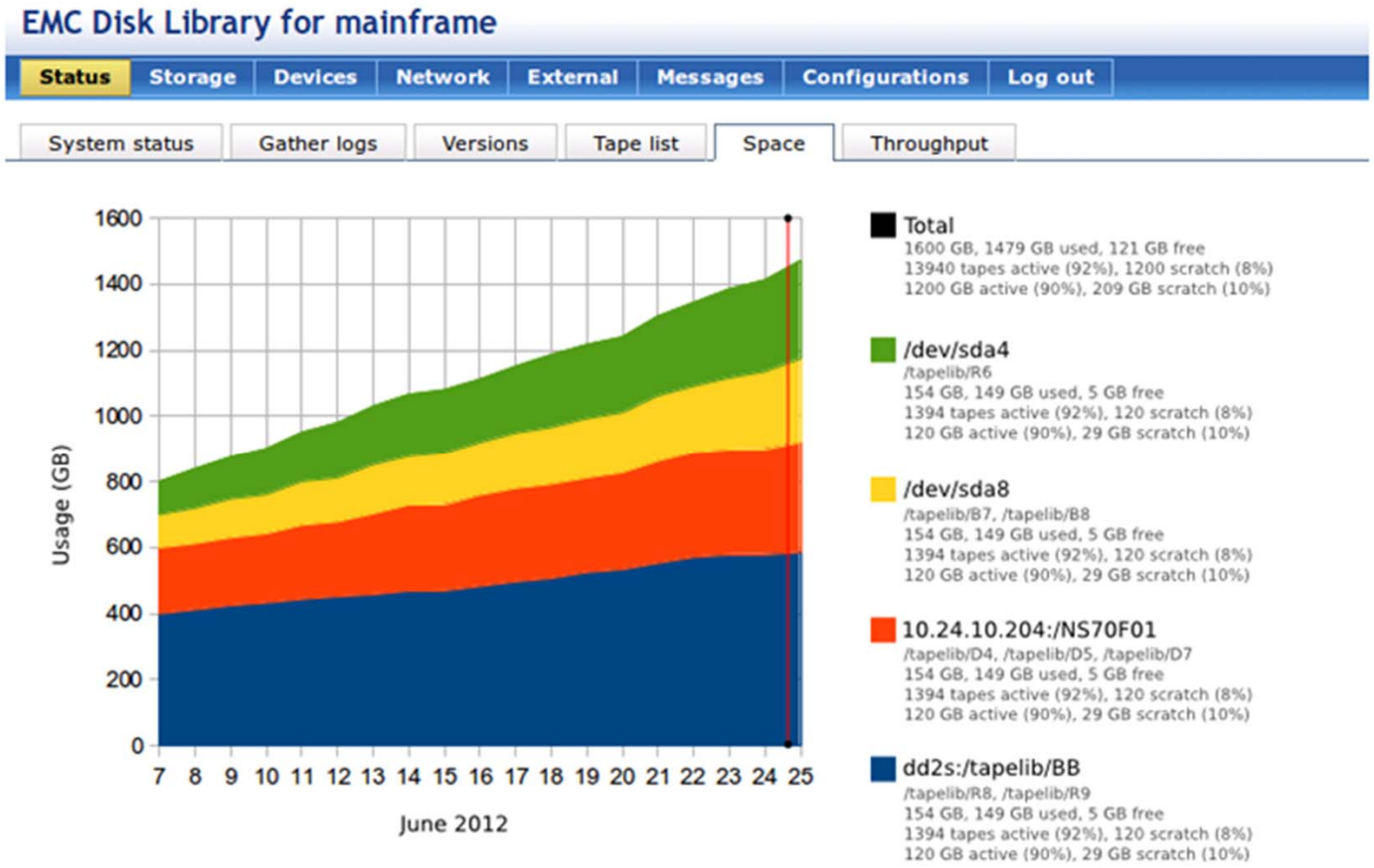


New Tapelist Tab

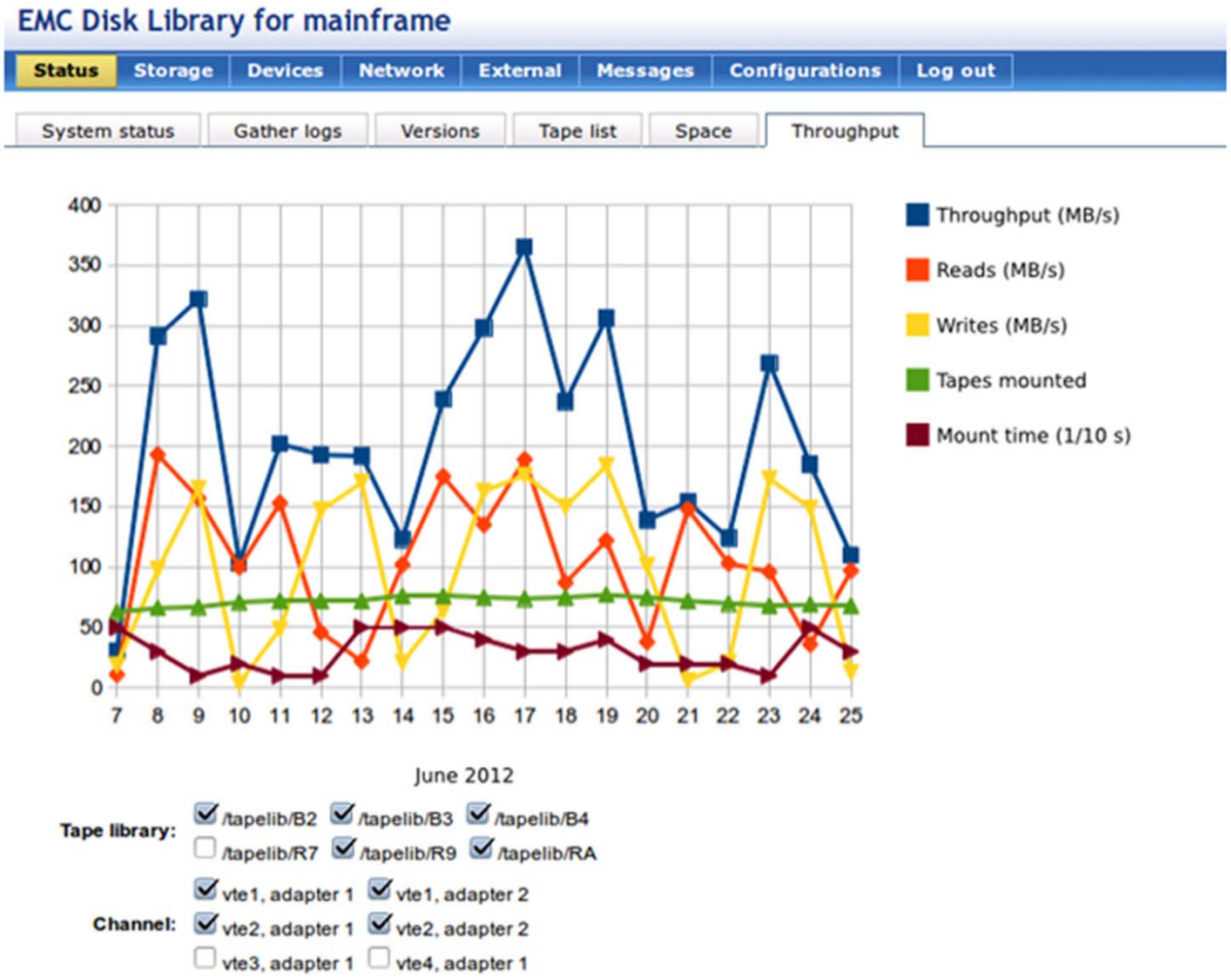


▲Volser	Filename	Scratched?	Size	Modified	Accessed
A801	/tapelib/D0/A801		1.1M	09/07/12	09/07/12
A805	/tapelib/D0/~A805	✓	416	12/31/89	12/31/89
A807	/tapelib/D0/~A807	✓	416	12/31/89	12/31/89
A809	/tapelib/D0/~A809	✓	416	12/31/89	12/31/89
A811	/tapelib/D0/~A811	✓	416	12/31/89	12/31/89
A813	/tapelib/D0/~A813	✓	416	12/31/89	12/31/89
A815	/tapelib/D0/~A815	✓	416	12/31/89	12/31/89
A817	/tapelib/D0/~A817	✓	416	12/31/89	12/31/89
A819	/tapelib/D0/~A819	✓	416	12/31/89	12/31/89
D00000	/tapelib/D0/D00000		1.9G	09/17/12	09/17/12
D00002	/tapelib/D0/D00002		9.1M	09/07/12	09/07/12
D00010	/tapelib/D0/D00010		19.1M	09/07/12	09/07/12
D00011	/tapelib/D0/D00011		19.1M	09/07/12	09/07/12
D00012	/tapelib/D0/D00012		19.1M	09/07/12	09/07/12
D00014	/tapelib/D0/D00014		19.1M	09/07/12	09/07/12
D00015	/tapelib/D0/D00015		19.1M	09/07/12	09/07/12
D00016	/tapelib/D0/D00016		19.1M	09/07/12	09/07/12
D00018	/tapelib/D0/D00018		19.1M	09/07/12	09/07/12
D00021	/tapelib/D0/D00021		19.1M	09/07/12	09/07/12
D00022	/tapelib/D0/D00022		19.1M	09/07/12	09/07/12

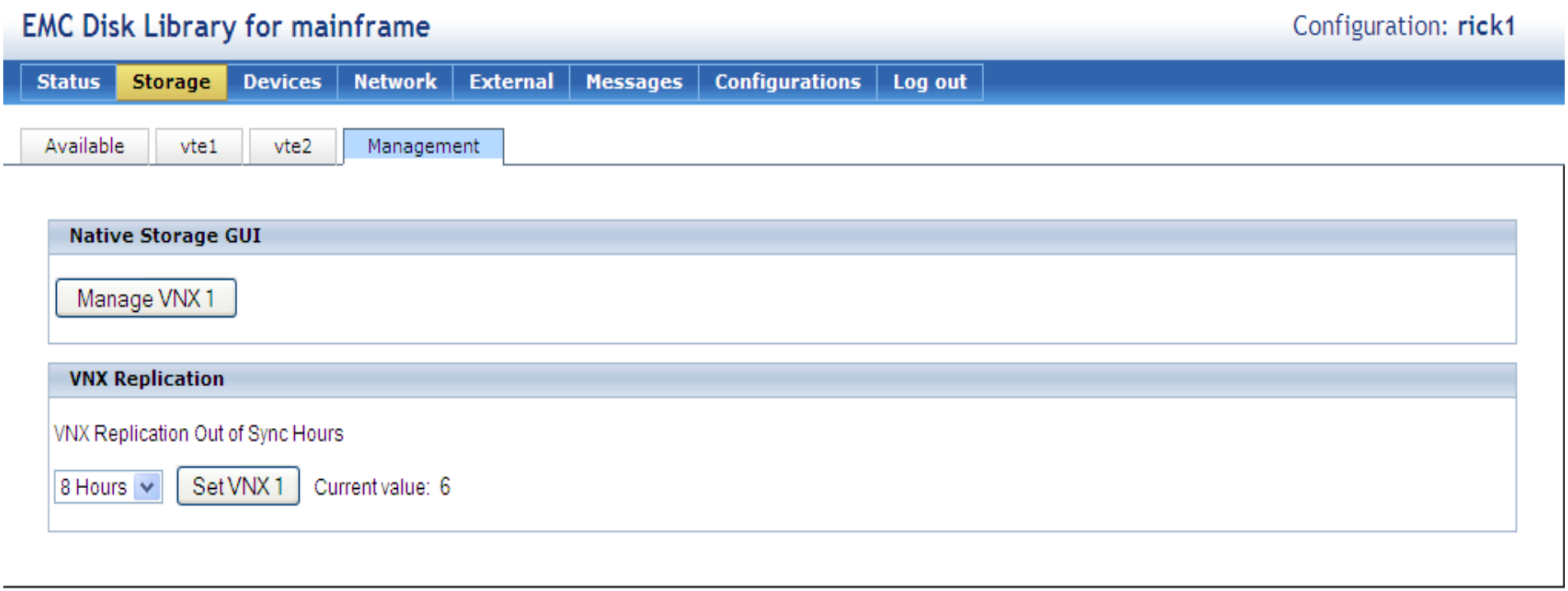
Capacity Statistics Example



Throughput Statistics Example

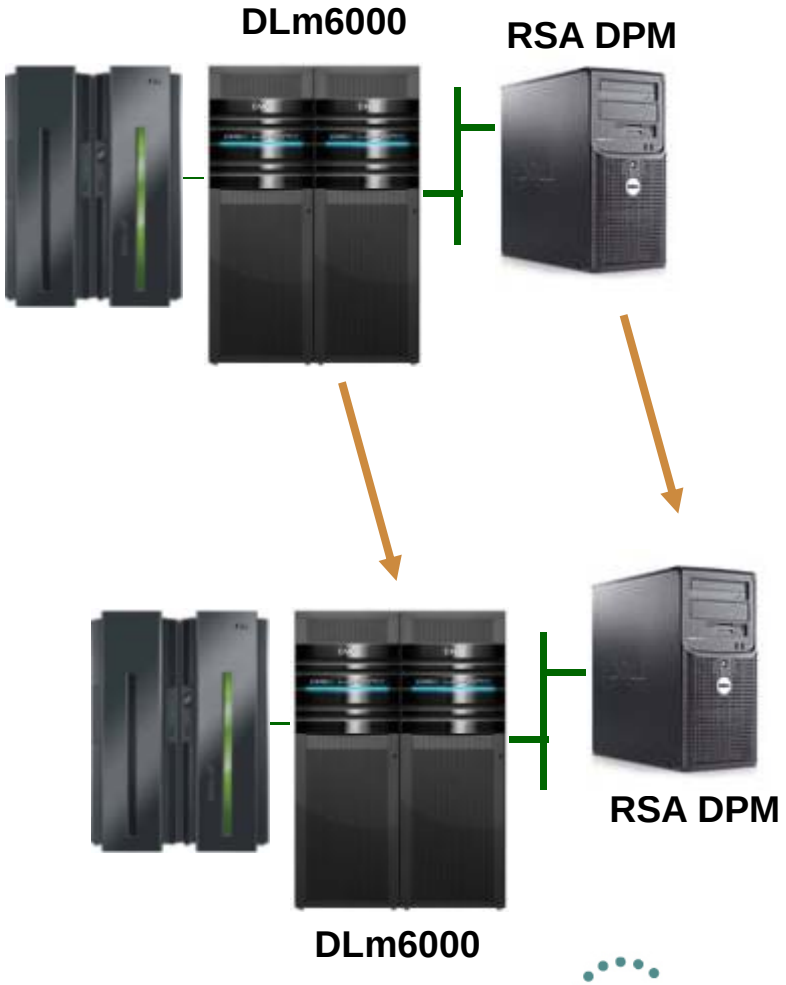


Access to Storage Configuration



DLm V3.5 – Data Encryption

- DLm6000 provides data encryption at rest and uses RSA Data Protection Manager for key management
- DLm release 3.5 enhances data encryption by implementing RSA BSafe technology
- Providing Galois/Counter Mode (GCM) encryption



DLm Key Differentiators

1. Future-Proof Architecture
   - Modular approach with VTEs enable scale-on-demand and seamless storage migration
2. Breakthrough Disaster Recovery
   - Perform complete volser read/write - 100% end-to-end DR testing without losing replication or production data; also great for QA & migration test
3. High Availability – No Single Point Of Failure (No SPOF)
   - The HA architecture means 99.999% RAS in every DLm8000 – no metadata to lose
4. Superior Scale and Throughput
   - Up to 2.7GB/sec. per DLm – greater than 4x faster than alternatives
   - Up to 7X more capacity than competition
5. Universal Data Consistency™
   - Data on DASD and on Tape consistent at same point in time copy
6. Ultra-high Data Resiliency
   - True synchronous replication at the I/O level, not a tape copy
7. Non-Disruptive Code Updates (virtual tape engines and storage)
   - High availability architecture of DLM allows for non-disruptive code updates of virtual tape engines (VTE) and storage

Thank You!