



# DISK LIBRARY FOR MAINFRAME

## Mainframe Tape Replacement with cloud connectivity

### A GLOBAL VIRTUAL LIBRARY FOR ALL MAINFRAME TAPE USE CASES INCLUDING LONG TERM RETENTION FOR PHYSICAL TAPE REPLACEMENT

#### ESSENTIALS

A Global Virtual Library for all mainframe tape use cases

- Supports private and public cloud providers.
- GDDR Technology Automates failover to an alternate site
- Presents a global, coupled view of tape volumes across sites
- Essential for all mainframe workloads.
- Works seamlessly with mainframe applications

#### Best Performance and Scalability

- Global View of tape volumes across pairs of libraries
- Access tape data at disk speeds
- Reduce CPU utilization
- Scale performance and storage as needed

#### Broadest Storage Flexibility

- VMAX, VNX, Data Domain Deduplication storage
- Concurrent cloud, primary and deduplication storage

#### Mainframe compatibility

- Native 3480, 3490 and 3590 tape emulation

#### Automated Multi-site disaster recovery

A major challenge facing mainframe storage administrators today is the demand for Long-term archive storage capacity at the lowest cost. Traditionally, vaulted physical tape has fulfilled that need. However, the advent of private and public cloud storage offers a better alternative to physical tape with great TCO. With the cloud, tape volumes are easier and faster to retrieve than vaulted tape and have lower operational overhead. However, until DLm release 4.5, enterprise-quality Virtual tape systems have been extremely limited in their ability to connect to the cloud. Dell EMC's innovative DLm once again is revolutionizing the way in which organizations can optimize mainframe tape processing with great TCO.

Additionally, DLm now incorporates GDDR (Geographically Dispersed Disaster Restart) Technology, which has become standard in mainframe for automation of DASD failover and ensuring Universal Data Consistency™ between tape and DASD. GDDR not only automates the failover of a DLm system to an alternate site in the event of a site disaster, it automates and simplifies routine DR testing as well. Release 4.5 also expands the Data Domain deduplication storage options, including data Domain's High Availability (HA) models. Key management for encrypted data is improved as well with the incorporation of KMIP compliance.

The Data Domain 9800, with up to 1PB (native, no deduplication) of storage capacity, enables growth of the DLm's native / logical capacity to 10PB total (assumes 10:1 duplication for customer data) in a single DD9800. With 2 DD9800s DLm8100 supports a logical capacity of 20PBs! For smaller environments, the new DD9300 can store up to 720TBs natively. Both the DD9800 as well as the DD9300 and previously available DD9500 & DD6800 models can be used with DLm in a High availability (HA) configuration, improving upon DLm's high availability architecture.

Disk Library for mainframe combines RAID 6 protected disk storage, hot-standby disks, tape emulation, deduplication, replication, and hardware compression. All are essential capabilities for a high capacity, availability and performance-oriented enterprise mainframe virtual tape storage solution in the smallest possible footprint.

Dell EMC Disk Library for mainframe is available in two models, DLm8100 for large enterprise data centers and the DLm2100 for smaller data centers. The two models share the functionality that virtual tape delivers, but can vary in scalability, performance, and storage platforms supported.

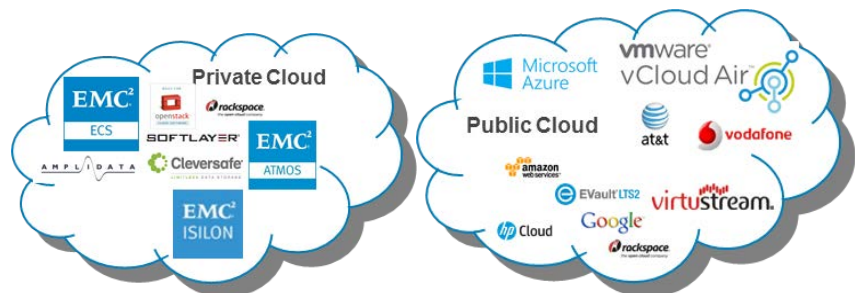
## BEST PERFORMANCE AND SCALABILITY

In addition to traditional backup and recovery, mainframe tape is an active storage tier for space management and archive applications. Beyond backup, tape is used for production batch applications, fixed-content archival, and DFHSM migration that extends online storage for a variety of data types including information, billing records, and call center data. Unlike any other vendor, the Disk Library for mainframe supports all of the common mainframe tape use case workloads in a single platform.

The Disk Library for mainframe connects directly to the mainframe host via FICON channels and it appears to the mainframe operating system as 3480/3490/3590 tape drives. All tape commands are supported by the Disk Library for mainframe. It responds as physical tape drives. Existing work processes, tape management systems, and applications run without any modifications.

## PRIVATE, PUBLIC CLOUD TO REPLACE PHYSICAL TAPE WITH BROADER STORAGE FLEXIBILITY

Volumes of data that need to be stored for extended periods of time, often decades, continue to increase dramatically, and storage administrators are under tremendous cost pressure to store them economically. Until now, physical tape was the only viable option to meet these simultaneous demands. However, the maturity and affordability of the cloud, both public as well as private, offer viable alternatives with considerable benefit compared to physical tape. DLM release 4.5 allows storage administrators to take advantage of a myriad of cloud offerings, including Dell EMC's ECS for private on-premises cloud as well as Virtustream for Public cloud. DLM has the broadest cloud connectivity options in the market and

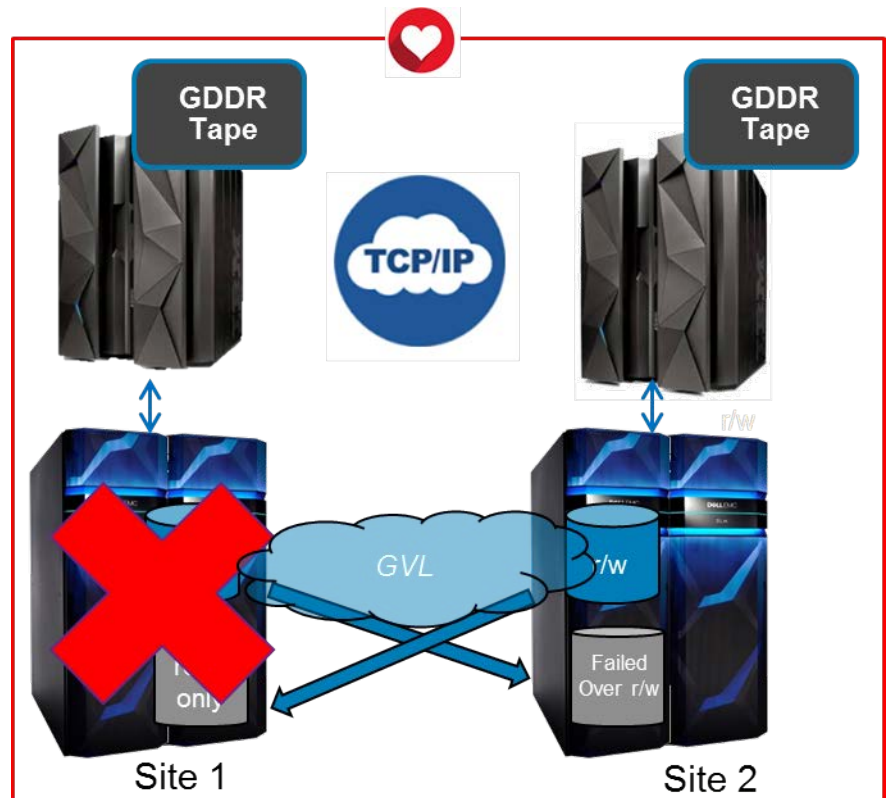


DLM's built-in policy manager enables storage administrators to plan and automate the movement of volumes between DLM's primary storage and the cloud.

## GDDR TAPE LEVERAGES GLOBAL VIRTUAL LIBRARY AND DASD AUTOMATED FAILOVER

Today, mainframe tape storage must be as reliable as DASD, and DLM is no exception. Starting with release 4.5, DLM's industry leading. High Availability architecture has been enhanced with GDDR (Geographically Dispersed Disaster Restart) technology that has been used to automate failover of Dell EMC DASD for generations. GDDR tape eliminates the need for a complex, ever-changing compilation of scripts and manual procedures for both DR tests and actual disasters. It leverages the Global Virtual Library technology

introduced in the previous release of DLm. GDDR tape uses a “heartbeat” to monitor the health of the DLms across sites and alerts the storage administrator if it senses action needs to be taken in the event of an actual outage.



Dell MC replication software enables network-efficient replication to one or more disaster recovery sites. Data can be encrypted in-flight when being replicated between Data Domain systems.

Using Dell EMC’s snapshot technology, storage administrators can perform complete end-to-end DR testing with read/write capabilities on all tape data at the target site. Dell EMC DLm was designed to give storage administrators 100 percent confidence in their disaster recovery (DR) readiness with the least amount of set-up. In addition, replication continues uninterrupted during DR testing. When testing is complete, the snapshot is simply deleted without affecting the existing backup tape volumes.

## VIRTUAL TAPE ELIMINATES THE BOTTLENECKS OF TAPE PROCESSING

Batch windows are shrinking and backup windows and recovery time objectives continue to decrease. Disk Library for mainframe provides a significant advantage over tape by eliminating physical tape mounts, robotic movements, tape rewinds, and drive contention. Batch and backup operations that took hours can now finish in minutes.

The Disk Library for mainframe stores each volser as an individual file on disk and only uses as much space as required, eliminating the need for tape stacking. As a result, when the tape management system issues a mount request, it is typically satisfied within one second. This feature is ideal for recall operations such as accessing fixed-content data or DFHSM recalls. With Disk Library for mainframe, the retrieval time for information is reduced from

minutes via tape to just seconds via disk. Disk Library for mainframe can help reduce CPU utilization by redirecting DFHSM workloads from tier-1 storage. By leveraging its disk-based performance and compression, you can migrate L0 data sets directly to ML2 and avoid ML1 processing, without compromising recall time.

The modular architecture of the Disk Library for mainframe allows FICON channels and storage capacity to be added non-disruptively as processing requirements change. FICON channels can be added up to the maximum supported in each system. Storage can be added to meet your storage requirements.

Disk Library for mainframe enables you to share tape drives between 64 active LPARs and SYSPLEX systems without the need for additional tape-sharing software on the mainframe, reducing CPU utilization and avoiding maintenance costs.

## **MAINFRAME COMPATIBILITY AND SEAMLESS INTEGRATION**

The Disk Library for mainframe presents itself to the mainframe as native IBM tape drives. It easily integrates into your existing infrastructure without requiring changes to JCL or additional mainframe host software. With native IBM 3480, 3490, and 3590 tape drive emulation, you can leverage a Disk Library for mainframe system in IBM z/OS, z/VM, z/VSE or TPF and UNISYS OS2200 environments. The solution is transparent to all applications and provides fast throughput and consistent recovery times.

The Disk Library for mainframe works with the leading mainframe backup products including IBM DSS and Innovation Data Processing FDR and all leading Tape Management Systems including IBM RMM, CA-1, TLMS, BMC CONTROL-T, ASG ZARA, VM/Tape, BIM-EPIC, and others.

## **FASTER BACKUP AND RESTORES**

Traditionally mainframe data centers have had to decide between faster backups and slower restores or slower backups and faster restores. With Disk Library for mainframe that compromise has been removed from the equation. The performance of the Disk Library for mainframe scales to over 6 GB/sec. Tape data is transmitted to the recovery site and mount requests are typically satisfied in less than one second, greatly reducing recovery times.

## **DATA ENCRYPTION**

Your tape data can be encrypted at rest or during replication to a remote site. For data at rest the Disk Library for mainframe invokes D@RE (Data at Rest Encryption) for VNX-based storage used by the DLm (VN5400 or VNx7600), D@RE for all Data Domain storage configurations within the DLm as well as D@RE for the VMAX 40K DLm configuration. Additionally, DLm offers KMIP compliant and VTE-based static Key Encryption with VNX or VMAX storage when data encryption in flight is required.

## **REMOTE SUPPORT CAPABILITIES**

The Disk Library for mainframe is protected by EMC's Secure Remote Support (ESRS). ESRS proactively identifies and resolves potential issues before they impact your operations by providing secure, high-speed, around-the-clock

remote support for your EMC information infrastructure. If unexpected issues arise, our proven processes ensure the fastest possible response, escalation, and resolution time to maximize information availability and reduce costs. With ESRS, we handle the workload so that you can devote more time to your business.

## **THE RIGHT STORAGE FOR YOUR REQUIREMENTS**

The Disk Library for mainframe supports different storage platforms configurations that can be tailored to the specific needs of your environment.

### **VMAX Storage for Critical Tape Operations**

The DLm8100 supports VMAX 40K and 20K storage arrays that utilize SRDF/S and Consistency Groups to insure Universal Data Consistency between DASD and tape data at identical points in time in production and recovery sites. By having this consistency, customers can benefit from the fastest possible recovery with highly available and predictable results. The DLm8100 also supports for SRDF/A using Multisession Consistency (MSC) for an out-of-region data center supporting a three-site STAR configuration. EMC's Geographically Dispersed Disaster Restart (GDDR) product automates disaster restart of applications and systems in mainframe environments in the event of a planned or an unplanned outage.

### **VNX Primary Storage**

VNX storage delivers industry-leading innovation and enterprise capabilities. The VNX combines powerful and flexible hardware with advanced efficiency, management and data protection software to meet the demanding needs of today's enterprises. VNX

also supports guaranteed replication so you will know the status of tape files at the recovery site and WORM support for fixed content archive.

Since release 4.3, the DLm8100 supports one or two VNX7600 or VNX5400 platforms with a total capacity of 3.1 PB usable.

### **Data Domain Deduplication Storage**

The Disk Library for mainframe can be configured with Data Domain storage systems. Deduplication reduces the amount of disk storage needed to retain and protect data by an average to 10-30 times. This greatly reduces the amount of disk storage needed to safely store your tape data and also is beneficial with replication to a recovery site since the amount of data to be transmitted is reduced.

The DLm2100 supports a variety of Data Domain storage platforms (DD2200, DD4xxx, DD7200 and DD990 currently). With logical capacity ranging from 83TB to 5.7 PB.

As of release 4.4, DLm8100 supports one or two DD9500, DD990 or DD7200 storage systems with a total logical maximum capacity of 17 PB total with the DD9500.

### **Concurrent Cloud, VNX and Data Domain Storage**

The DLm8100 offers concurrent support for Cloud, primary and deduplication storage within the same platform. Tape data can be directed to the appropriate storage based on its intended use. For example, backup

operations to what were physical tape cartridges can be directed to cloud storage, with deduplication to minimize the amount of data transferred to and from the cloud, significantly reducing storage and replication costs. Unique data types, such as DFHSM migration, can be directed to primary storage and will be available for near-instantaneous recalls. One VNX (either VNX5400 or VNX7600) and one Data Domain storage model (DD9800, DD9300 DD9500, DD6800 and legacy models) can be intermixed behind the DLm8100, combining the best performance- based storage and deduplication storage.

### Mixed Use for Mainframe and Distributed Systems

The Data Domain storage system attached to the DLm can be shared with other non- mainframe server platforms concurrently. This streamlines your entire backup process into a single storage platform reducing overhead and simplifying management. This feature is specifically designed to address the needs of enterprises that desire a converged mainframe and distributed systems approach to data protection. Since release 4.3, sharing of Data Domain Storage using the Data Domain Mtree directory structure has been supported.

### DELL EMC GLOBAL SERVICES

DLm models include a limited hardware warranty\*. DLm hardware and software maintenance contracts offer 24x7 access to technical expertise, Online Services, remote monitoring and problem resolution, on-site services, and premium software maintenance providing 24x7 access to technical expertise and rights to new releases of the software at no additional charge.

Dell EMC Global Services provides the strategic guidance and technology expertise that organizations need to address their business and information infrastructure challenges and to derive the maximum value from their information assets and investments. Our 16,000+ professional services and support services experts worldwide, plus a global network of alliances and partners, leverage proven methodologies, industry best practices, and experience and knowledge derived from Dell EMC's information-centric heritage to address the full spectrum of customer needs across the information lifecycle: strategize, advise, architect, implement, manage, and support. Ask your Dell EMC sales representative about the specific services that can benefit your organization.

\* Warranties may vary outside the United States. Contact your Dell EMC representative for local warranty and service terms and conditions.

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