



DISK LIBRARY FOR MAINFRAME R7.0 models DLm2700, DLm8700

Mainframe tape replacement with
32Gb FICON & cloud connectivity

ESSENTIALS

Broadest Storage Flexibility

- Up to four PowerStore DD, Data Domain Deduplication storage systems
- Up to Two PowerMax 2500, 800 or 8500 storage systems (DLm8700)
- PowerScale / Isilon storage systems
- Concurrent cloud, primary and deduplication storage

A Virtual Library for all mainframe tape use cases

- Best in market connectivity; up to 32 channels of 32Gb FICON (DLm8700)
- Unique data deduplication for Lower TCO and operational cost.
- Improved performance via Dell server technology + 2x compression bandwidth
- Supports Amazon S3 and AWS GovCloud
- Supports Dell Elastic Cloud Storage. (DLm8700)
- Three-site GDDR Tape Technology Automates failover to an alternates site (DLm8700)
- Essential for all types of tape workloads.
- Works seamlessly with mainframe applications

Virtual tape libraries for all mainframe tape use cases including cyber vaults, disaster recovery and long-term retention for physical tape replacement.

Major challenges facing mainframe storage administrators continue to be cyber security, shrinking batch windows, backup/restore, and lower costs for long-term archive. Traditionally, physical tape, and later, a combination of virtual and physical tape, had fulfilled the need. But times have changed. 32Gb FICON connectivity along with data deduplication and cloud storage are technologies that must be leveraged to ensure batch and backup windows are met and long-term retention is achieved at the lowest cost. Incorporating that effectively into mainframe tape solutions is simply not possible with physical tape or other virtual tape vendors. Fast virtual tape, especially when deduplication storage can be used, offers excellent TCO. With the cloud, tape volumes are easier and faster to retrieve than physically vaulted tapes and have lower operational overhead. Until DLm, enterprise-quality virtual tape systems have been extremely limited in their ability. Dell DLm revolutionized the way in which organizations optimize mainframe tape processing with great TCO, and release 7.0 (model DLm 8700) enables up to four Dell PowerProtect DD or legacy Data Domain, Power Scale and Isilon storage systems. DLm8700 supports PowerMax 2500 and 8500. Release 7.0 for DLm8700 also includes AMDD support for ADABAS backups.

DLm8700 also incorporates GDDR (Geographically Dispersed Disaster Restart) technology called GDDR Tape. GDDR became a standard in mainframe for failover

automation of DASD. GDDR Tape not only automates the failover of a DLM system to alternate sites in the event of a disaster, it automates and simplifies routine DR testing as well. DLM8700 supports 3-site automated failover using GDDR tape.

High Availability (HA) capability, in place since release DLM 4.5, expanded the Data Domain deduplication storage options, including PowerProtect DD and legacy Data Domain's High Availability (HA) models. Key management for encrypted data is improved as well with the incorporation of KMIP compliance.

The use of PowerProtect DD storage provides up to 5PBs (native, no deduplication) of storage capacity, enabling growth of the DLM's native / logical capacity to 40PB total (assumes 8:1 duplication for customer data) in a 2-frame footprint. The PowerProtect 9900, 9410, 9400, 6900 as well as the previously available DD9800, DD9300 & 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.

In today's world, simpler is better, and DLM follows suit with model DLM8700 that can scale from 2-8 virtual tape engines as well as scaling the storage and other infrastructure required to support up to the world's largest enterprise multi-site data centers.

BEST PERFORMANCE AND SCALABILITY

In addition to traditional backup and recovery, mainframe tape has always been 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.

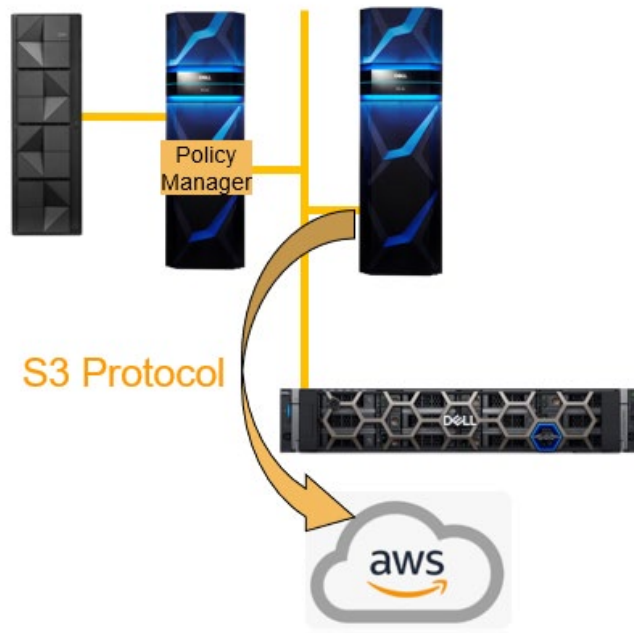
The Disk Library for mainframe connects directly to the mainframe host with up to 32 32Gb FICON channels and it appears to the mainframe operating system as 3480/3490/3590 tape drives. All tape commands in the IBM tape command set are supported by the DLM. It responds as a physical tape drive so that existing work processes, tape management systems, and applications run without any modifications yet, do not have to have their performance impacted by the delays of physical tape

Amazon S3 Support

Amazon web services continue to grow in popularity, even as an extension to mainframe external data storage for the long-term retention of tape volumes. Additionally, Amazon's introduction of AWS GovCloud is being used by governmental (US federal agencies) which also have mainframes. Recognizing this trend, DLM since release 5.3 supports the S3 protocol, enabling DLM long-term data retention using the Amazon cloud.

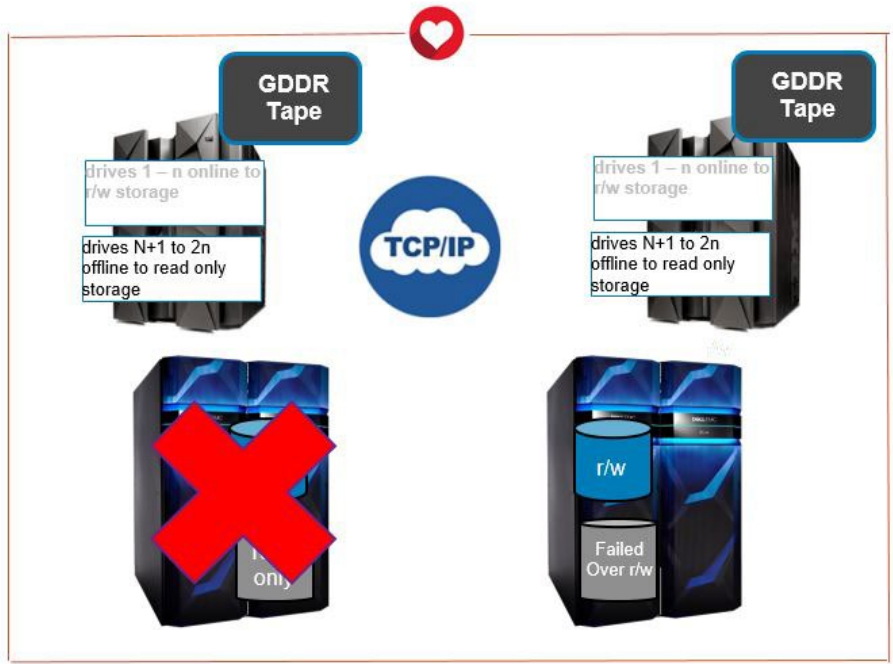
CLOUD REPLACES PHYSICAL TAPE with Dell ECS FOR MORE FLEXIBILITY

Volumes of data that need to be stored for extended periods of time, often decades, continue to increase dramatically, and storage administrators are under constant pressure to store them economically. Until now, physical tape was the only viable option to meet the demand. However, the security, maturity and affordability of the cloud, both public as well as private, makes it a viable alternative with considerable benefit compared to physical tape. Since DLM release 4.5, storage administrators have been able to take advantage of the cloud, using Dell ECS for cloud storage. DLM's built-in policy manager for the cloud enables storage administrators to plan and automate the movement of volumes between DLM's primary storage and the cloud as a 2nd tier of tape storage.



GDDR TAPE LEVERAGES DASD AUTOMATED FAILOVER

Today, mainframe tape storage must be as reliable as DASD. Since release 4.5, DLM's industry leading High Availability (HA) architecture was enhanced with GDDR (Geographically Dispersed Disaster Restart) technology to automate failover of Dell DASD for generations. GDDR tape eliminates the need for a complex, ever-changing compilation of scripts and manual procedures for both DR tests and failover in the event of an actual disaster. 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 replication software enables network-efficient replication to one or more disaster recovery sites. Data can also be encrypted in-flight when replicating between storage systems.

Dell DLM was designed to give storage administrators 100% confidence in their disaster recovery (DR) readiness with the least amount of set-up. DLM leverages Dell snapshot technology so that storage administrators can perform complete end-to-end DR testing with read/write activity on any tape data at the target site. 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 continue 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.

DLM 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 a maximum of 32. Storage can be incrementally added to meet growth 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. 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) Additionally, DLm offers KMIP compliant and VTE-based static Key Encryption when data encryption in flight is required.

REMOTE SUPPORT CAPABILITIES

DLm operation is protected by Dell 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 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 remote support so that you can devote more time to your business.

THE RIGHT STORAGE FOR YOUR REQUIREMENTS

Unique to the mainframe virtual tape market, DLm supports different storage platforms configurations in order to meet the specific needs of your environment.

PowerProtect DD / Data Domain Deduplication Storage

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 improves replication performance and cost between product and recovery sites since the amount of data to be transmitted may be significantly reduced.

The DLm8700 supports a variety of PowerProtect and Data Domain storage platforms. Physical capacity for these Data Domain systems range from 45TB to more than 6PBs.

Cloud + PowerProtect DD / Data Domain Storage

DLm8700 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 (tier 1) can be directed to PowerProtect DD, with deduplication to minimize the amount of data transferred. This data can later be archived to and from the cloud, significantly reducing tier 1 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.

Mixed Use for Mainframe and Distributed Systems

Uniquely in the market, Data Domain storage 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 and may significantly reduce overhead and simplify management of your company's overall storage infrastructure. 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.

PowerMax 8500 Storage for Critical Tape Operations

The DLm8700 supports PowerMax storage arrays that utilize SRDF/S and Consistency Groups to ensure Universal Data Consistency between DASD and tape data

at identical points in time in production and recovery sites. Tape and disk consistency is essential to applications that rely on multiple datasets (for example data and log information) being time consistent as well as data consistent. In other words, these datasets are known to be written at the same point in time, with data that correlates precisely with its log or metadata, thus avoiding a potentially lengthy resync between these datasets after a DR event. One example would be DB2 logs and user data.

Synchronous replication between primary and secondary (DR) DLm+PowerMax 2500 or 8500 sites leverages SRDF/S, which offers improved performance and scalability over IBM's synchronous replication methodology based on "sync points".

The DLm8700 also supports for SRDF/A (asynchronous replication) using Multisession Consistency (MSC) for out-of-region (geographically beyond synchronous distances) locations supporting a three-site STAR configuration. Dell 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.

Dell GLOBAL SERVICES

DLm8700 includes 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 usage rights to new releases of the software at no additional charge.

Dell 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'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 sales representative about the specific services that can

benefit your organization.

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

DELL DISK LIBRARY FOR mainframe



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