

MDL w/EMC Celerra for Tape Replacement

Mainframe Data Library with EMC Celerra

An Alternative for Traditional Mainframe Backup

Executive Summary

Today's mainframe data centers are, for the most part, still highly dependent on tape systems to provide daily/weekly backups for disaster recovery. These tape systems are large and expensive; occupy huge amounts of data center floor space; often use tens of thousands of cartridges; and require on-going preventative maintenance and intense operations support. And, for all that, retrieval and/or recovery of data stored on tape remains time consuming and unreliable.

As disk technology has advanced, the use of low-cost ATA disk storage for backup has become a popular alternative to tape in the open systems server market. However, because of the unique nature of channel input/output and count-key-data direct access storage (DASD), mainframe adoption of low-cost disks to replace tape has been slow to take off.

Bus-Tech's Mainframe Data Library (MDL) provides a reliable, cost-effective tape-on-disk solution for IBM zSeries or compatible mainframes. Together with EMC's Celerra network-attached storage, Bus-Tech's MDL can greatly reduce or eliminate a data center's dependence on tape by transparently replacing high-cost tape subsystems—including automatic tape libraries (ATL) and virtual tape systems (VTS) —with new, low-cost ATA storage.

This paper provides an overview of this powerful Bus-Tech/EMC solution and the benefits it can provide to customers interested in replacing their aging tape or optical systems with a solution designed for the 21st century.

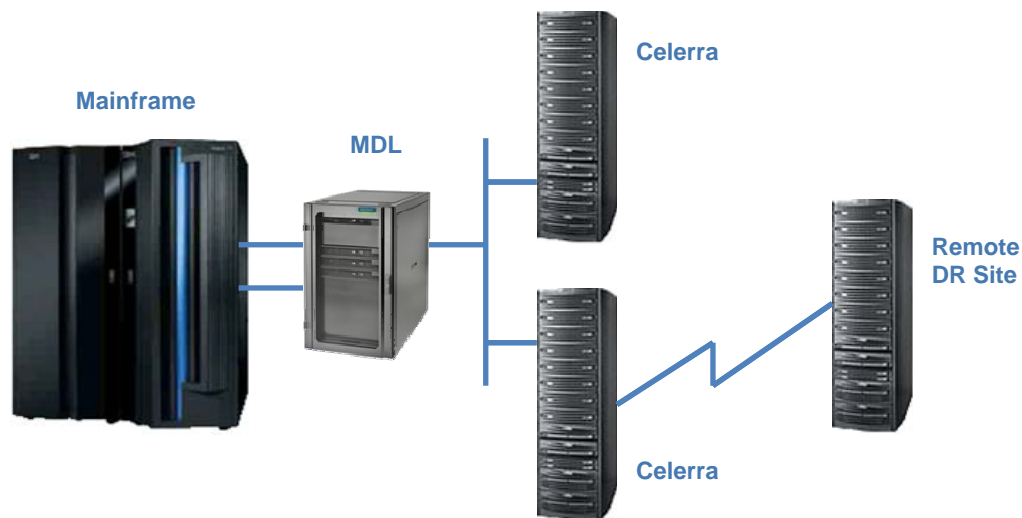
MDL and Celerra Overview

As shown in the picture below, the Mainframe Data Library (MDL) connects directly to the IBM zSeries (or compatible) mainframe using either ESCON or FICON attachments. The MDL appears to the mainframe operating system (z/OS, OS/390, VSE, VM, or TPF) as standard 3480/3490/3590 tape drives. Existing mainframe-based applications can use MDL tape drives just as they would any real mainframe-attached tape drive. No application changes are required.

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But instead of writing data to physical tape cartridges, the MDL uses the Network File System (NFS) to store a tape volume's data as a single file on an exported Celerra file system. Furthermore, each stored tape volume is named using its mainframe tape Volume Serial Number (VOLSER), allowing it to be easily identified and mounted in response to future read or update requests from the mainframe.

MDL – a zSeries Tape-on-Disk Controller



The MDL family of tape-on-disk controllers supports either 4 Gbit FICON or ESCON connectivity to the mainframe. All MDL controllers include IP connection to EMC Celerra and emulate 3480, 3490, or 3590 tape drives. The product line begins with the MDL-1000, which provides a single FICON interface and emulates 256 tape drives, and scales to the MDL-6000, which provides up to 12 FICON or 18 ESCON channels and 1,536 tape drives. All MDL models are compatible with one another and can be used in combination to provide a single logical tape library of any size.

Each MDL provides multiple Gigabit Ethernet ports for connecting to EMC Celerra. Multiple NFS exports can be mapped to a single MDL library, allowing back-end storage capacity to grow as needed.

EMC Celerra offers built-in high availability with N+1 clustering and fast reboot operating environment features as well as benefits from the data-availability features of CLARiiON storage arrays. Customers can take full advantage of EMC

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replication software tools to build mainframe tape-on-disk backup solutions that include remote data replication for disaster recovery, eliminating the need for multiple copies of backup tapes and physical transport of tapes to a remote location.

Benefits

The benefits of implementing an MDL/Celerra tape-on-disk solution are considerable. They include shortened batch processing windows, improved data retrieval, lower operating costs, and electronic disaster recovery. Whether measured in time or money saved, an MDL can quickly pay for itself.

Shortened Batch Windows

When customers implement mainframe tape-on disk solutions, a reduced batch processing window can be an unexpected benefit. For customers replacing non-automated tape drives or Automated Tape Libraries (ATLs), the reduced time an MDL takes to satisfy a mount request can provide significant time savings when a lot of tapes are involved. Additionally, since the MDL allows the customer to set their own tape cartridge size, backups that once took multiple volumes and multiple mount requests can now be reduced to a single volume with instantaneous mount resolution. Customers implementing demanding tape applications have realized as much as a 50% reduction in their overall batch processing windows.

Improved Data Retrieval

Retrieval of data stored on traditional tape can be very time consuming. Even when data is stored in an ATL or VTS, mounting a tape to retrieve data can require several minutes or more if there are no drives available.

And then there is the issue of data reliability. Physical tape can stretch and break, especially when the cartridge has been used repeatedly. The inability to read a tape can make data retrieval impossible.

On the other hand, retrieval of data from a tape-on-disk solution such as MDL and Celerra is fast, efficient, and reliable. Tape mounts are usually instantaneous. And, once the tape is mounted, retrieval of data from a tape volume can be as fast as DASD retrieval. When applications use tape block locate commands, the MDL can access any block on the tape in roughly the same amount of time. There is no need to read through the volume sequentially. Customers who have moved applications from an ATL to the MDL have found significant performance improvements in overall retrieval of data using tape-on-disk versus waiting for an ATL to physically mount a cartridge.

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Lower Operational Expense

Mainframe tape drives, Automated Tape Libraries, and Virtual Tape Servers occupy considerable amounts of space within the data center. Physical storage of thousands of cartridges can add significant space requirements. Electrical expense, maintenance contracts, and the ongoing need for new cartridges all contribute to making large-scale mainframe tape subsystems an expensive proposition.

An MDL and Celerra can significantly reduce operational expense. An MDL and Celerra occupy much less raised floor than a medium or large tape system. Electrical consumption is reduced by the elimination of tape drives and/or robotic arms. And the need to continually purchase new tape cartridges can be completely eliminated.

Finally, there is no need to periodically take the MDL offline to perform preventative maintenance to mechanical robotic arms and drives.

Electronic Disaster Recovery

In this day of high-speed networks and the global Internet, mainframe data centers continue to rely on disaster plans based on physical tape being shipped to remote storage locations.

MDL and Celerra tape-on-disk solutions can alleviate or replace these manual systems. Using EMC replication capabilities, tape volumes stored on Celerra by the Mainframe Data Library can be automatically duplicated to a remote location.

In the unlikely event of a disaster, data stored at a remote location can be retrieved just as if it were locally stored in the library. The difficulties of finding a physical tape and transporting it from the disaster site to be processed are replaced with online electronic efficiency.

Summary

Mainframe data centers have always been highly dependent on tape. From the days when mainframes were only used for batch processing to today's mainframe-based online transaction-based systems, tape has always been the lowest-cost alternative for backing up and storing data when compared to the high cost of DASD.

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But low cost open-systems ATA disk solutions now enable disk-based backup solutions that offer significant advantages over tape. Today, tape-on-disk and disk-to-disk backup solutions have become the next hot technology in the open systems server arena.

For mainframe datacenters, however, tape subsystems continue to prevail.

The Mainframe Data Library allows low-cost, open-systems storage such as EMC Celerra to be directly attached to mainframe Input/Output channels. Appearing to the mainframe as a group of individual tape drives, MDL allows existing tape-based backup applications to store their data directly on disk. EMC replication capabilities allow expansion of the Bus-Tech tape-on-disk solution to provide complete, fully-redundant disaster recovery alternatives which can eliminate aging tape systems and advance the data center into the next generation of backup storage systems.