



White Paper for AUSA's "Call for Innovation"

Data Source Inc.

**Technology Focus Area:
Continuously Upgrade, Protect and Simplify the Network**

Technology Innovation: Legacy Media Archiving (LMA)

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1.0 Technology Innovation – LMA: A new approach to attacking the problem of costly Army legacy data preservation and storage.

1.1 Abstract.

Current Army legacy data storage like magnetic tapes, depending on age and quality of media, and storage environmental conditions, faces almost certain risk of degradation resulting in the loss of valuable if not mission-critical information. Storing legacy data on or off-site is costly, as is the facilities cost and labor associated when accessing them. Our value proposition lies in the unique ability to transfer and archive aging legacy tape and other media to file-based storage systems using our proprietary patent-pending Legacy Media Archiving (LMA) solution for guaranteed data preservation, elimination of physical storage costs, and providing real time on-demand high speed data access 24X7.

1.2 The Problem.

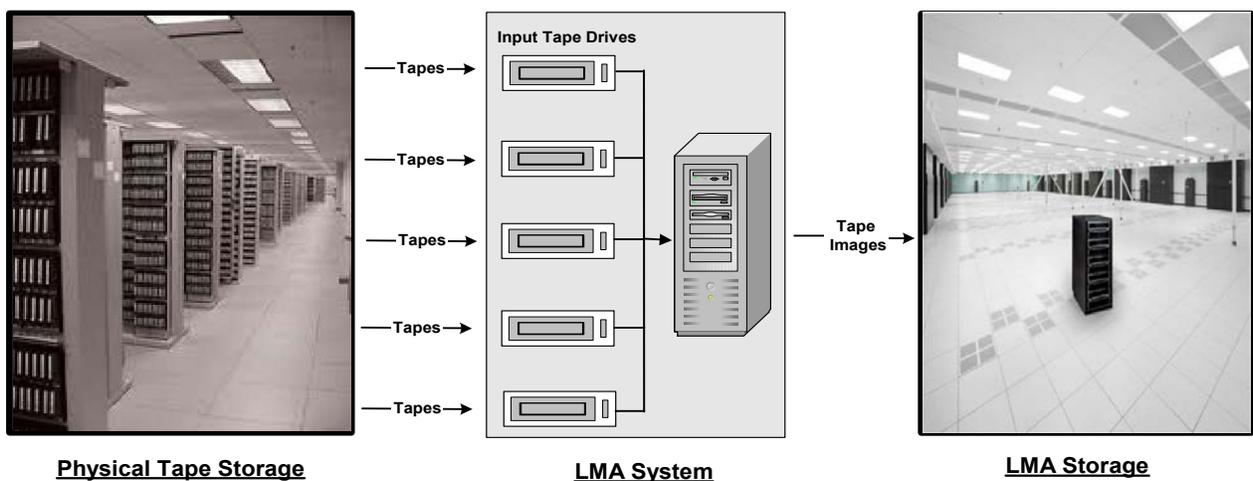
Many of the Army's data centers are responsible for managing, duplicating, distributing, tracking, and storing legacy information which must be retained because of compliance reasons or other leadership guidance. The data stored on magnetic tape and other older media like tape cartridges, optical disks etc. needs to be assured of current and future information distribution capability for its customers as well as provide immediate access when needed. Many of the stored media formats are aged and degrading to the degree that the data will soon be unrecoverable or cost prohibitive to recovery. A recent study at a military base's data center found that there was a 20% loss of legacy media information due to degradation, and a discrepancy in tapes that could not be accounted for. Additionally, data access to these tapes is slow and costly, and is increasingly at risk due to aging equipment and software becoming impractical to maintain and replace. Stored legacy data also has environmental control and security costs associated with it. While the magnitude of this problem within the Army and DoD is impossible to estimate, Storage Strategies NOW (an industry analyst firm) estimates that it *“costs an IT department around \$2,000 to process and restore a single backup tape.”* Multiply this cost times the total number of magnetic tapes in a library, and one can quickly see how this is a considerable drain on any IT budget for legacy data storage.

So how to cost-effectively store, preserve, access, secure, and account for legacy information on various media types that may be aging, mission critical or needed for compliance or Army guidance and leadership purposes?

1.3 The Solution.

Legacy Media Archiving, or LMA, is a service that uses proprietary software called ExactCopy™ to archive all of the data on a tape making a one-hundred percent complete copy of the physical tape data storage to more efficient, longer life, and less-costly to maintain file-based storage systems including RAID, optical, cloud and network attached storage. LMA storage is effectively permanent with storage space consolidation of 30,000 to 1 achievable. For example, a 200,000 sq. ft. warehouse of tapes can fit into 1 rack of raid. Original tape-based data and logical formats are preserved and unaltered. Any tape type, any data, from any application, from any operating system can be archived. LMA archived tapes can be reproduced for future access on the original media or current media types. LMA archived tapes may be accessed directly by host applications without handling physical media or the requirement of aging equipment. LMA can also archive other aging media, such as removable magnetic disk and optical disc.

The drawing below depicts the LMA process for taking physical legacy media in a tape library and converting it all to one RAID disk cabinet.



1.4 Business Use Case – USAF Robins AFB, Air Logistics Center



Robins Air Force Base (AFB) is located outside Macon, Georgia. Warner Robins Air Logistics Center (WR-ALC), the host unit at Robins Air Force Base along with the 78th Air Base Wing and more than 60 other units, contribute affordable combat superiority, readiness, and sustainability to the Air Force war fighting team which is the worldwide manager for a wide range of aircraft, engines, missiles, software and avionics and accessories components. It is one of three Air Force Air Logistics Centers, the others being Oklahoma City Air Logistics Center (OC-ALC) at Tinker Air Force Base, OK, and Ogden Air Logistics Center (OO-ALC) at Hill Air Force Base, UT.

The Software Control Center (SCC) at WR-ALC is responsible for managing, duplicating, distributing, tracking, and retaining legacy mission-critical information for the Air Force and other U.S. service branches and NATO allies. The data stored here on magnetic tape and other media will assure current and future information distribution capability for its customers as well as provide immediate access when needed. But up to 20% of the stored media formats were found to be aged and degrading to the degree that the data would soon be unrecoverable or cost prohibitive to recovery. There was a 25% difference in reconciling the tapes between the log book and actual physical location. Additionally, this project will also accomplish a disaster recovery effort for the SCC. This will ensure the continuity of operations for SCC and its customers in the event of natural or man-made disaster. Finally, WR-ALC spends an exorbitant amount of money each year for storing, maintaining, and retrieving this legacy information.

For this situation, WR-ALC selected LMA to perform on-site legacy data archiving and consolidation services to transfer its magnetic tape libraries and other media to modern file-based storage systems saving money and information, preserving the data, and providing immediate access.

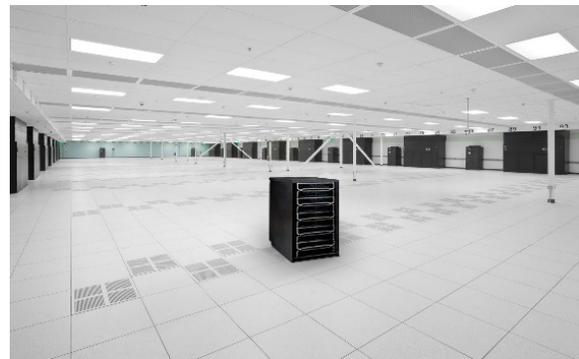
LMA was implemented to transfer legacy magnetic tape data to more efficient, longer life, and less-costly to maintain file-based storage systems including RAID, network storage, and the cloud. Physical storage space efficiencies of 30,000 to 1 were achieved using LMA. The original tape based data and logical formats were

unaltered when archived to file-based LMA tape-images. This allows the original tape data and format to be accessed and reproduced to physical media when required. LMA archived tape data is also accessed directly from other logistics support applications. The LMA at the SCC at WR-ALC transformed their aging, legacy data into a modern corporate data storage system that preserved key information, made it accessible to the USAF ALC's and its customers, and significantly decreased storage and related costs. Upon project completion, the LMA system (along with training and documentation) was retained for SCC to use to produce physical media for distribution. The pictures below shows a "before" and "after" of LMA and its impact on storage space.

Before



After



1.5 Results.

There are many results that Robins AFB ALC realized in implementing LMA for its legacy data storage, including:

- Sustained protection and preservation of archived information making it more reliable with longer shelf-life
- Eliminate costs in storage and labor, environmental control, and security
- Reduced dependence on aging equipment and software for data access
- Archived tape data online for immediate, fast access on-demand 24X7
- Data retention for compliance, legal, regulatory and other purposes according to Army guidance and leadership
- Archived data can be reproduced on current, host compatible media types
- Portable RAID cabinets can be moved easily and inexpensively
- Simple process to create a copy of the entire library for redundant offsite backup
- Easily scalable storage capacity using disks versus tape libraries
- Reduced storage footprint
- Allows for effective disaster recovery
- Key enabler in data center consolidation
- Project success duplicated at Tinker and Hill AFB ALC's
- Archived data can now be integrated with current Big Data, business analytics and other enterprise applications via networks or the cloud
- Network storage capabilities are optimized
- Fully compliant with Green Procurement Program FARS 23.404(b) and other DoD records information management regulations.

1.6 Conclusion.

LMA can help the Army and the other services to better preserve its legacy data and attacks storage costs during a period of time when IT budgets are under intense scrutiny. Potential savings could be in the millions of dollars when considering the elimination of on- and off-site physical space and labor for retrieval and use, not to mention other costs savings like environmental control and security. LMA makes legacy data accessible and helps ensure the continuity of operations in the event of natural or man-made disaster. LMA is a trusted solution in use by the military, and is a potent and dependable weapon to utilize in any Army IT department's arsenal.