Data Strategies Int'l Europe, S.r.l.

Mainframe Data Conservation Services

By

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The problem of Mainframe Data Conservation

Many mainframe installations have large quantities of legacy data stored in tape archives. Most of these tape archives are maintained in a TMS (Tape Management System).

When migrating applications off the mainframe onto midrange platforms, the question arises what to do with the legacy tape data. In many cases, much of the data has been generated by utilities such as data base backups, HSM, SMF etc. Should this data be preserved for the possibility that it might be required in the future? How would this data be accessed on the midrange. Much of the application-generated data will never be accessed but must be maintained for compliance. However, some of the data may require easy access by the migrated applications.

To compound the issue, the tape data is often stored on media of several types and sometimes as virtual tape images stacked on high-density tapes in the VTS. After the mainframe decommission there will be no hardware or software for accessing tape data and outsourcing solutions may turn out to be quite expensive. One should also not forget that in order to allow access to mainframe tape data a significant amount of "control metadata" is needed.

Several alternative approaches to mainframe data conservation may be considered. Only an in-depth analysis of each situation and its specific requirements will permit the identification of the best solution.

Dataset Migration Approach.

One solution is to extract the "datasets" from all the tapes and move them to disk files on the midrange platform (a Dataset Catalog is also created). This process, if performed on-line, can consume large quantities of compute resources such as tape drives and CPU cycles. Some data sets may also require a time-consuming conversion process (e.g. performing EBCDIC to ASCII or copybook directed conversion). In any case, storing the extracted/converted datasets on the midrange platform would require a large amount of disk storage. One can, however, use a storage appliance that supports data compression and MAID technology.

Control Metadata Migration Approach.

Another solution is to export the mainframe metadata from the System Catalog, TMS, and if present the VTS and keep the data in its original "tape format". The "preserved" metadata can then be used to locate desired datasets in the future, which can be extracted from the tapes via a service using non-native tools. This

solution is the least expensive as far as the migration is concerned and requires the lowest investment in disk storage, but relies on an external service for the "vaulting" of the original tape media and the on-demand extraction of the needed data.

Deep Archive Migration Approach

A variation of this solution is the creation of a "deep archive" of the original tapes in the form of virtual tapes stored on disk storage (e.g. VTL, MAID, etc.) or stacked on high-capacity state-of-the-art media (e.g. LTO-4, T10K, etc.). This significantly reduces the footprint of the conserved data and protect it from technology obsolescence over its useful life. Data access at the virtual tape level and the dataset level is ensured by the presence in the "deep archive" of the control metadata in consolidated form.

Data Strategies' Mainframe Data Conservation Services (MDCS).

Data Strategies has been providing for many years a variety of services aimed at extracting, converting, migrating, and preserving mainframe data stored on magnetic tapes.

Leveraging this experience and the availability of sophisticated tools (hardware and software) developed and employed as part of its media conversion and data migration business, Data Strategies is now offering the MDCS (Mainframe Data Conservation Services) comprehensive set of services specifically targeted to long-term mainframe tape data conservation.

These services vary with the customer's specific environment, but share the common objective of allowing the 'removal' of the mainframe while maintaining the ability to identify and access any 'data' of interest. This goal is achieved by providing an alternative (to the mainframe) hardware and software environment specifically designed for legacy tape data.

In particular the MDCS provide:

- A hardware platform based on open-system technology that can easily evolve with time to guarantee its long-term operability. This includes legacy tape drives, tape libraries, new technology tape drives, and/or virtual tape libraries.
- A database containing all the information derived from the mainframe Tape Management System in use, System Catalog, application specific databases for tapes/datasets under application control (e.g. HSM, backup, etc.).

- A set of integrated software tools capable of retrieving, extracting, restoring/converting on demand any data of interest from the 'conserved' legacy tapes (or virtual tapes).
- The DataArk Appliance to provide a long-term repository for mainframe tape data and convenient data access by migrated applications.

More important, the MDCS relieve the customer from the hassle and cost of maintaining legacy hardware, keeping maintenance contracts for unsupported software, and retaining staff with skills of decreasing value to the organization.

How Are MDCS Services Provided?

Data Strategies goes through the following steps for each new project:

1. Analysis of customer's environment. This task is aimed at quantifying the amount of mainframe tape data to be 'conserved', qualifying the data on the base of type, source, retention and security requirements, and identifying the associated control metadata. It is also aimed at identifying the type of storage media, tape drives, libraries involved.
2. Selection of optimal solution. Based on the results of the analysis, the solution that best meets the functional and cost requirements is identified and a detailed proposal is prepared.
3. Transfer of Control Metadata. This task will consolidate and 'move' all TMS, System Catalog, and application specific metadata from the mainframe to Data Strategies MDCS Data Base.
4. Optional Storage of Legacy Tapes. Customer has the option of keeping the physical storage of the legacy tapes with a company of his choice or of transferring them into the custody of Data Strategies.
5. Optional Datasets Migration. This task uses the MDCS Data Base to extract all datasets from the mainframe tapes and store them on disk storage. A migrated dataset catalog is build as part of the process.
6. Optional Deep Archival of Legacy Tapes. This task creates virtual tapes stored on disk storage or stacked on high-capacity state-of-the-art media and builds the associated database.
7. End-to-end Test of the Process. This task consists in the test processing of a customer request for 'data access' that encompasses a representative mix of data types, media types, etc.
8. On Demand Processing of 'data recovery' Requests. Data Strategies staff will assist customer in the identification of the data of interest and will then proceed to extract, restore/convert the data using non-native software tools, and deliver it to customer in the agreed upon format.

How Applications Access Migrated Data?

The ***DataArk Appliance*** offers several data access modes, namely:

- *Tape Volume Level Access.* Archived virtual tapes can be read, copied, etc.
- *Raw Dataset Level Access.* Datasets can be "extracted" from archived virtual tapes and "moved" to the appliance's Working Disk Storage.
- *Dataset Record Level Access.* Datasets residing in the appliance's Working Disk Storage can be read at the record level in accordance with the format of the original mainframe dataset.

Optionally, the ***DataArk Appliance*** is also capable of providing data storage management functions similar to the mainframe HSM.

Reference Documents.

1. "The DataArk Appliance - A Long-term Repository For Mainframe Tape Data", Data Strategies Product Brochure, Feb. 2010.

How Are MDCS Services Billed?

- ***Analysis of customer's environment.*** Billed in accordance with the rates shown in the "Professional Services Rates" session below.
- ***Transfer of Control Metadata.*** Billed in accordance with the rates shown in the "Professional Services Rates" session below.
- ***Optional Storage of Legacy Tapes.*** Billed at prevailing industry rates.
- ***Optional Datasets Migration.*** Billed with a fixed setup fee plus a processing fee per legacy tape that varies with the type of media and the data format.
- ***Optional Deep Archival of Legacy Tapes.*** Billed with a fixed setup fee plus a processing fee per legacy tape that varies with the type and capacity of the media.
- ***End-to-end Test of the Process.*** Billed in accordance with the rates shown in the "Professional Services Rates" session below.
- ***On Demand Processing of 'data recovery' Requests.*** This service is billed with a fixed setup fee of $500.00 per request plus a processing fee of $150.00 per legacy tape processed.
- ***The DataArk Appliance.*** Price varies with configuration. Training and technical support available.

Professional Services Rates

The following are Professional Services rates for each SOW.

Description	Standard Daily Rate (SDR) < 30 days	Standard Daily Rate (SDR) >= 30 days
Rate - US	$ 1,440.00	$ 1,280.00
Rate – UK	£ 720.00	£ 640.00
Rate Mainland Europe & Ireland	E 1028.00	E 914.00

General Notes:

1. Rates stated above are maximum rates, lower rates may be negotiated. All other types of pricing must be negotiated by the parties and specified in the applicable SOW.
2. Pricing for countries outside of those listed above may be obtained directly from Data Strategies.
3. All expenses associated with providing Services must be in accordance with the Data Strategies Expense Policy.
4. The SDR is exclusive of taxes that may be applicable at the time Services are provided.
5. An engagement day consists of a single 8-hour workday. Additional hours will be charged at a pro-rated amount.
6. Fixed Price proposals are excluded from the above rates and shall be negotiated on a case-by-case basis.

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