

SMART ARCHIVE DISK AND TAPE LIBRARY ARCHIVING



KEY

SMART ARCHIVE is suite of solutions to streamline archiving needs of television and ranging from simple removable solution up to fully automated Disk or Tape archive systems

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One of the most critical and expensive task of Tapeless Television is Digital Archiving System. For those broadcasters that already migrated to file based system it is well known how fragile Digital Tape Library System is, while demanding several efforts for continuous maintenance.

To streamline such a complex task, Media-Alliance integrated and/or developed scalable smart archiving solutions

Removable Smart Archive Solution

The solution is based on standard PC offering capabilities to store/backup data over removable hard disk with docking station or stand alone LTO-5 Tape Drive.

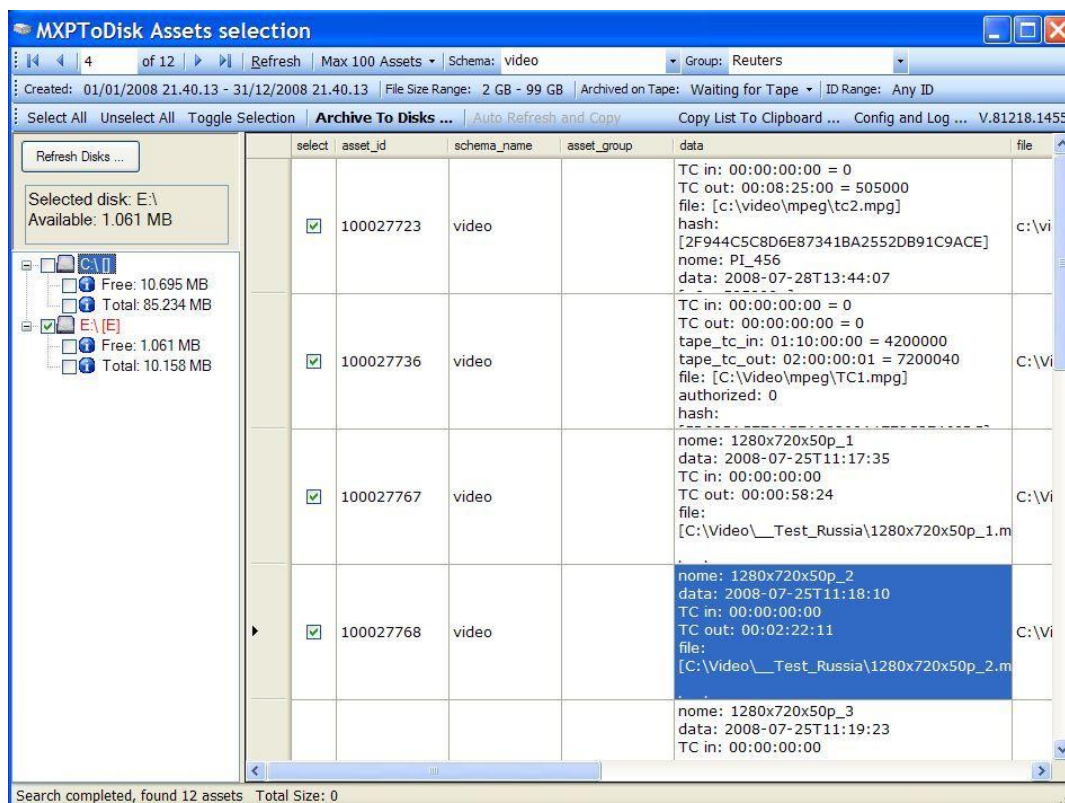
For Docking Station we mean a simple device to temporarily support insertion and extraction of removable Hard Disk, as in the picture below and as better alternative to Data Tape:



Material will be archived “off the shelf” on hard disks or data tapes depending on selected solution

After initial configuration to define folder creation and location, the archivist simply needs to copy or move the material to a predefined folder.

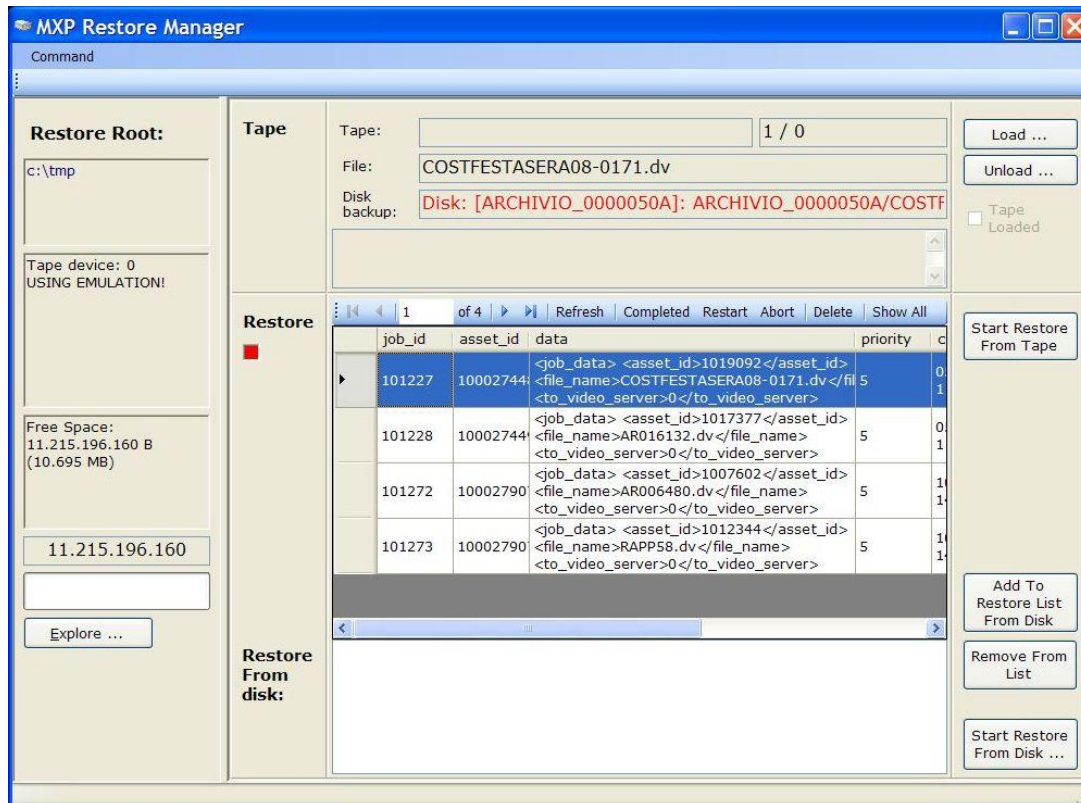
Following procedure applies to Hard Disk, but it is almost the same for data tape although data tape is not as efficient and safe as Hard Disk. The archivist takes an empty Hard Disk, labels it with name or progressive number and inserts into the docking. Soon after the archivist runs a dedicated application as below:



When the archivist runs this application, it lists all assets to be archived as coming from previous selection in the MAM.

With almost fully automatic process finally the archivist stores material on docking Hard Disk and MAM is informed of the new position of material since the Archivist has to provide the label indication to this application. Now the material is fully archived to “off the shelf” disk.

At this point all material is stored on external disks; however the users can browse any material with MAM using proxy/thumbnail/shots. Once the user finds some material needed for any purpose, user marks it to restore. To restore this material it is enough to go to Archive Station and run the restore application as below:



When the user runs this application, it lists already all assets to be restored as coming from previous MAM selection. The application asks to the user to insert the right Hard Disk and then begins to restore the material to a predefined folder.

Tape Archive Manager: XENDATA

For the tape archive manager we offer 64 bit XENDATA MX tape archive manager, which we call MediaCentre; **simpler version based on single server and 32 bit OS is also available**. At present we have more than 30 systems installed with Xendata and the reason of our selection for this product is due to extreme simplicity and manageability of the solution.

The 64 bit Edition of XENDATA Archive Series software manages data tape libraries and magnetic disk cache on multiple Windows 64 Bit file servers to create a highly scalable digital video archive. The 64 bit Edition is optimized for large digital video archives, meeting the most demanding needs of the broadcast industry. An archive running the 64 bit Edition software delivers high data transfer rates by load balancing over multiple servers. Performance may be increased by adding additional datamover servers to the system.

In addition to high transfer rates, the system provides the following key features:

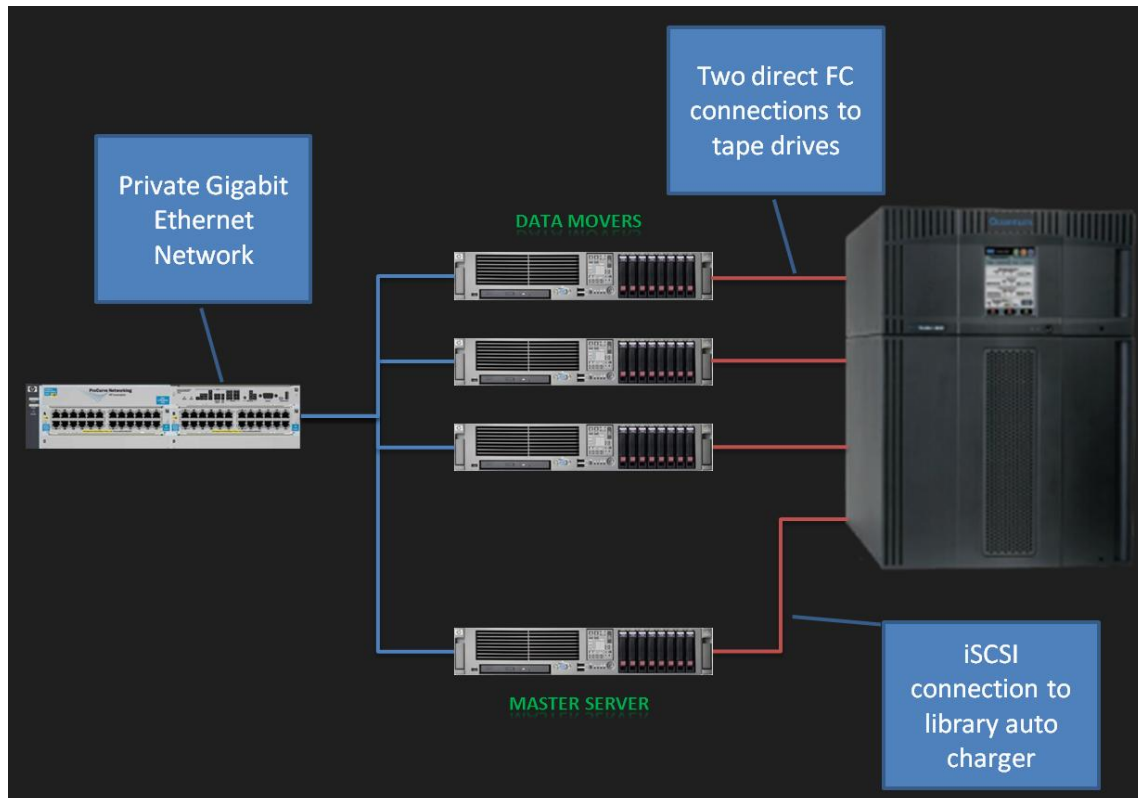
- Standard Windows File System Interface: The managed tapes appear as a single standard Windows logical drive which means one or more software applications can write to and read from the archive as though it were a standard shared disk-based logical drive.
- Strong Data Protection: The system provides the option for automatic tape cartridge replication, creating additional copies of each tape cartridge. When full, the replica tapes may be exported from the tape library

and held in a secure offsite location. If required, the replica tapes can be quickly imported into a duplicate archive system.

The archive consists of the following components:

- robotic data tape library
- a master server running Windows 2003 X64
- multiple datamover servers, each running Windows 2003 X64
- a private network connecting the master server to the datamovers

The master server uses RAM to act as a high speed conduit for files which are transferred between the external high speed LAN and the datamovers. By using multiple datamovers, the load is balanced across multiple servers to achieve high total transfer rates. A typical archive configuration is shown below:



The physical storage location of files is driven by policies set by the administrator. Options include:

- automatic duplication of data tapes
- setting file retention times on RAID cache
- grouping of files on specified tape sets

Features and benefits are the following:

Standard File System: The entire archive appears as a standard Windows file system within a single logical drive letter. The solution uses the standard Windows offline file attribute to identify when a file is no longer online.
Benefit: seamlessly integrates with standard applications and existing network infrastructure without modification.

Microsoft Security: MXP-VAM software is fully integrated with the Microsoft Windows security model, based on Active Directory.
Benefit: effortlessly integrates with existing security, minimizing system administration.

Automated Tape Cartridge Replication: Replication of tape cartridges is automatic and follows the policies defined by the Administrator.
Benefit: it is easy to generate tape cartridge replicas for off-site retention for data protection purposes.

Offline Tape Cartridge Management: The system retains meta-data for offline tape cartridges. **Benefit:** the system supports an unlimited number of tapes 'on the shelf'.

Partial Read of Large Files: With very large files there is often a need to read only a portion of the file. For example, this frequently occurs with multi-gigabyte video files when a short clip is requested. MXP-VAM software supports partial reading of large files. **Benefit:** enhanced performance when dealing with large files

Multiple Tape Set Support: The software allows file groups to be allocated to specified groups of tapes. **Benefit:** the Administrator can group related files together on the same set of tapes.

Open Standard Tape Format: Open standard TAR file format is used on the tape, allowing the tape cartridges to be read using third party utilities. **Benefit:** the use of open standards on industry standard hardware ensures the long term availability of data.

Dynamic Expansion of Tape Sets: The system will dynamically expand tape sets to meet capacity demands. **Benefit:** this minimizes system administration.

Familiar Administration: File policy and tape cartridge management is performed by the Administrator using the MXP-VAM Management Console which is a Microsoft Management Console Snap-In. **Benefit:** the Administrator uses a familiar tool for system management.

Highly Scalable: Archive Series software supports tape libraries with multiple Petabyte capacities.

Email Alerts Notification of hardware errors or archive system problems is provided by e-mail alerts and / or on-screen messages

For more information please, check Xendata Web Site: <http://www.xendata.com>

Deep Archive: DiskArchive ALTO-100

A similar concept to tape archive but based on disk is also applicable to deep or long term archive, which today is dominated by Tape Libraries. Deep archive based on disk can be also considered as an upgrade to SMART ARCHIVE as seen in previous section. This section shortly describes DiskArchive ALTO-100, which is better alternative to tape libraries for deep archive. For more information please, check DiskArchive Corporation Web Site:

<http://www.diskarchive.com>

Current data collections involve large arrays of spinning drives; ALTO-100 looks at data retention on non-spinning, idle drives. ALTO-100 is sort of MAID (Massive Array of Idle Disks) technology, in which densely packed SATA disks are spun down whenever possible to reduce power, wear and vibration

In the past, tape was adopted as a digital back-up medium simply for economical reasons; at present there is no motivation to continue to use data tape. Moreover, data tape caused several problems to users that adopted it. Take the example of a user that started with LTO-1. LTO-1 tape is durable but the drives for both LTO-1 & LTO-2 ARE NOT. LTO-1 & LTO-2 tapes are no longer produced so this user has problems sourcing them and the supply is very limited. Obviously, his only choice is to transfer the files from LTO-1 to the latest LTO-4. However, this means that the existing LTO-1 drives have to run non-stop for years, in order to finish the transfer. Then, another transfer may have to be started as new formats like LTO-5 may come out. There is another dilemma here: if this user doesn't do anything on the existing LTO-1 archive, the existing LTO-1 drives will probably survive for another 5 to 10 years if the day-to-day access is not very heavy. However, if he starts the LTO-1 transfer to LTO-4 or 5, those LTO-1 drives will most likely die during the transfer due to the heavy load. This is something that will never happen with a Hard Disk based archive.

Today LTO-4 has a capacity of 800 GB, the present capacity of hard disk is 2 TB (2,000 GB). By the time LTO-5, 1.6 TB, is available for sale hard disks will most likely reach the 3 TB mark.

Storage capacity for hard disks now grows faster than for tapes. And most important, storage on disk now costs even less than tape based storage. Moreover, Hard disk is more reliable than tape; it is not influenced by magnetic fields and can be recovered even in disastrous situations. Disk based technology offers random access and therefore offers significantly better performance than can ever be reached using tape based technology. Another big difference between Tape Archives and Disk Archives is the cost; investment cost as well as TCO. Tape based Archive Systems have several significant cost issues, such as:

- Tape Library Hardware
- Big in size and footprint, causing high transportation cost and space requirements
- Maintenance costs; frequent failure of tape drives and robotic
- Management software and related maintenance
- Power consumption of the impressive hardware, like robotic arms and tape drives



DISKARCHIVE ALTO-100

At present on the market only DiskArchive Alto-100 can offer an alternative to Tape Library and certainly far better than any possible deployment of any Tape Library. DiskArchive Alto-100 comes together with the application Prometheus. Prometheus uses sophisticated algorithms providing instant access to any data across the entire storage, which can even consist of several storage pools. It assures the user immediate availability to his archived material at any time. Through sophisticated algorithms content is grouped and physically stored according to categorization. Hard disks are turned on and off according to efficient algorithms, no disk is on and no disk is spinning if not used. This assures long life of the Hard Disks and very low power consumption.

DiskArchive Alto-100 costs much less than any tape archiving system. It has very little maintenance cost and has much less electric power consumption because unused disks are switched off automatically after a predetermined stand-by state.

DiskArchive ALTO-100 is not an online storage system such as NAS or DAS or Cluster Storage, it is rather similar to a normal Tape Library based Archive system. However, unlike a tape library, access to data is random and not sequential and therefore the performance is significantly higher than any tape libraries and for numerous concurrent users not limited by the number of tape drives as found in a tape library. DiskArchive ALTO-100 provides higher data security than any technology based on tape and more than any RAID system. DiskArchive ALTO-100 does not use conventional protection system like RAID, it rather relies on simple data replication among separate disks. ALTO-100 uses the Advanced Encryption Standard (AES) with 128-bit keys in Cipher Block Chaining.

Data replication and disaster recovery is another important feature. With an easy to use configuration wizard you can define data that must be duplicated and set the replication factor. For example very important and strategic data can be replicated 3 times, very important data 2 times and standard data are archived without any replication. Replication factor can be set to any value and the replication can be done inside the same storage unit or with another ALTO system. If replication is configured to happen among two ALTO systems located in two separated locations, you have already set up a disaster recovery configuration.

For general information about the products described in this data sheet, visit: <http://www.media-alliance.it>

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