



# **The Future of Tapes in the New Compliance Context**

**What the Future Bodes for Tape Backups**

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## **The Future of Tapes in the New Compliance Context**

There is much speculation in various industry segments and the corporate community regarding the role of backup tapes going forward. Historically, backup tapes have been both the salvation and the bane of corporate IT departments. On the one hand, they have played an indispensable role in disaster recovery scenarios and saved many an IT neck from the proverbial chopping block. On the other hand, they have garnered a reputation as not management friendly ie difficult to deal with, time consuming, overly complex, costly etc.

As a result, there are some contradictory signals regarding the viability and role of tapes in the evolving technology landscape that is driven so much these days by regulatory and litigation concerns.

In order to understand the likely future of tapes, in the new world order to come, one has to establish a conceptual foundation in the current records management and compliance frameworks.

## **What is the New Landscape That Tapes Need to Address**

It is clear that a new paradigm has been born, one of the truly managed electronic information. This development has been driven by the perfect storm of regulatory, litigation and operational considerations that dictate the fundamental premises of the new order. In short, corporate data has been recognized as a valuable asset, in some instances the most valuable asset an organization possesses. Regulatory requirements have dictated that it be organized and managed, ie that organizations assume responsibility for it. Litigation & compliance have necessitated that it be easily and universally accessible, on an as needed basis.

The new concepts making the rounds speak of ECM, ILM, RIM, KM, BPM, etc. It seems like each new day produces a new abbreviation. More and more ambitious architectures and conceptual frameworks are proposed. Vendors taut increasingly comprehensive records management or content management solutions to a confused and wary corporate audience.

The bottom line is, we have come to a watershed era where information is no longer viewed as a nebulous free flowing and largely invisible "ether" but must be considered a specific, quantifiable, manageable and controllable asset akin to the more traditional assets like plant and equipment. In an information economy it makes sense to manage the information produced or acquired within an organization.

Concepts such as records management, retention schedules etc., once relegated to a breed apart, akin to librarians, have entered the mainstream of corporate consciousness. New titles are springing up such as CCO (Chief Compliance Officer), etc. Granted, it may take a while for these to result in practical application, but, they command an increasing mind share in corporate thinking.

So where is this path taking us? The future tellers inform us that we should expect a world where all our information is completely accessible and perfectly managed based on corporate policies dictated by the various stakeholders such as regulatory agencies, corporate management and, of course, the attorneys.

On the way to this paradise, we will master the art of the archival records repository (not just for emails but for all information content), automated records management policy application, including end of life cycle disposition and instantaneous accessibility, on as needed basis, via fabulously user friendly search capabilities incorporating contextual and semantic features.

The challenge, of course, is that there are no easy solutions to implement that will get us from here to there. In fact, the whole arena is plagued by tremendous fragmentation and lack of clear technical directions. I believe that the real potential of this new world order is not going to come about until the necessary tools are built into the very core foundations of the computing platforms ie into the operating systems, and possibly even, into the hardware architectures. This is where things such as integrated extensible metadata, robust granular security, automated policy application, etc., need to reside in order for the larger vision to materialize.

### **So, what about tapes?**

Finally we come to the real focus of this article. What role do tapes play in this new vision?

Different views of the possible roles tape can play in the evolving business landscape have been presented by various interested parties. Disk storage solution vendors are already trumpeting the death of the tape. The tape backup solutions community has presented new product directions to help ensure a permanent role for tapes for the foreseeable future.

In order to really understand what the future may hold, it is important to clearly understand why tapes have played such an important role in the evolution of computing and why they are still so entrenched. This will lay a foundation for appreciating the value proposition that tapes have historically represented that has made them so popular.

### **A Short Historical Perspective on Tapes**

Let's start by examining what organizational role tapes have played in the past. The whole rationale of tapes has been that they represent a less expensive storage medium than disks. This cost advantage has leveraged them in prominence by allowing greater frequency of backups or multiple backup points in time, whereas more expensive solutions would have constrained the users to fewer backups. In applications where large amounts of data need to be stored and the data doesn't require that instantaneous accessibility of on-line disk storage, tape has always had the upper hand. In addition, tapes have traditionally been physically smaller than equivalent disk storage making for more convenient warehousing. You could afford to make a backup and store it indefinitely. Even though disk storage costs have rapidly fallen and the price differential between the two media is not as dramatic, this is still largely true.

Thus, for instance, tapes, have been utilized for the daily backups of information stores where the duplication across multiple tape backups has been considered an asset since, if a restore from one backup fails, you can always go back to the next previous one. This has seemed like an added safety valve, given the relatively low cost of tape media.

In addition, tape backups represented one of the earlier attempts at archival storage. Once you stored something to tape it would remain there until you either destroyed, or overwrote, the whole tape, ie data was not normally selectively and granularly erasable on a tape.

On the other hand, this very feature of tapes, or rather, of the tools used to perform backups and manage them, ie that tapes need to be treated

more as a physical unit rather than being accessible in a more granular, logical fashion seems to limit their applicability to the new conceptual framework of records management where data needs to be managed in an arbitrarily and selectively granular manner, in order to fully support the records management dictates of comprehensive records life cycle management, from creation to disposition.

### **What is coming up for tapes**

Some bold visionaries have suggested that there may be a much lesser role for tape backups in the future of computing. This is not clear. However, it is likely that what we know as tape storage will change dramatically over the course of foreseeable period of time as tapes come to increasingly resemble their on-line disk competition. In order for this to come about, tapes would have to acquire the salient characteristics of disks such as near instant, random access, indexability, more granular backup and access (on a file level at a minimum), selective granular eraseability, etc.

Tape drive and tape media vendors are taking note and moving ahead to position themselves for the future. For instance, some of the tape technologies appearing on the market incorporate an index of contents on a microchip embedded in the plastic tape cartridge housing. This index allows the software or firmware of the tape drive to more directly and quickly access specific tape contents. Another approach is to position the tape heads, by default, in the middle instead of at the beginning of the tape, thus, statistically allowing for faster access in either direction. And, of course, tapes are acquiring more capacity and are becoming increasingly faster. WORM (Write Once Read Many) features are now being incorporated into many tape families to allow them to play a role in archival storage formerly reserved for optical disk media.

The backup software vendors are also aggressively re-examining the role of tapes in the future, enterprise-wide backup solution strategies by incorporating a disk based, on-line backup layer in front of the final backup to tape, with additional logic to alleviate the perceived weaknesses of tape based backups ie slow backup and restore cycles and lack of logical granularity by allowing more effective incremental and archiving specific backups (encompassed by comprehensive retention schedules) as well as quick, granular restores.

Many of these features, although seemingly outlandishly bold for tapes, can be implemented via software based strategies. Some of them have

already been implemented, in association with tapes, albeit in a limited and fragmented fashion. Other features will need further hardware evolution for effective implementation. So far, no single tape based solution offers the full necessary feature set but it is not impossible to envisage the evolution of such functionality.

In a fully implemented application of such new feature sets, tape libraries would be seen, as a seamless extension of multi-tiered disk storage, with transparent re-positioning of data across all the storage assets of an organization, whether disk or tape, based on automated, policy driven management. In this vision, tapes would appear as logical storage pools rather than discrete physical units, just like networked disk storage is evolving.

### **In the meantime**

As for what this bodes for us in the present time dimension, let me offer a quick guideline for smart tape management.

On the most immediate basis, the greatest difficulty we see companies facing is, surprisingly, the most simple to address, the effective storage, management (including record keeping) and access to the physical media itself!

Yes, you heard me right, most large organizations have difficulty keeping track of what tapes they have and where they are. This difficulty relates back to the traditional role of tape backups as simple operational tools unencumbered by any larger considerations of record keeping and regulatory compliance and therefore not requiring the additional expense and effort associated with official corporate records.

A solution to this issue may not require any fancy futuristic technologies but rather straightforward operational controls and discipline, including staff training and responsibility ownership.

Taking care of this single problem would go a long ways to both addressing some of the current pain points and risks associated with tapes as well as setting the foundation for a happier organizational future of tapes, irrespective of what technology directions may materialize.