



An Informational Paper

Integrating an Optical Archive System

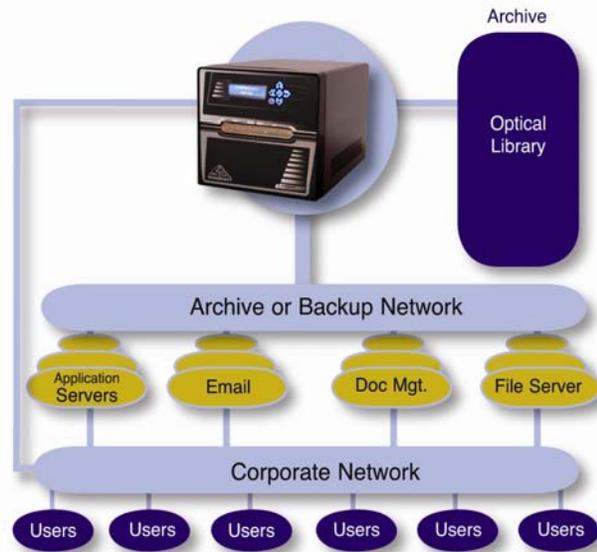
Appliance Solution vs. Software Solution

Once the decision has been made to utilize optical storage technology to meet today's stringent regulatory requirements for information archival, the next step in the decision process is how the optical storage will be integrated into the businesses infrastructure. The purpose of this paper is to highlight the differences and associated benefits of utilizing an appliance based solution vs. software connectivity based solution.

Introduction - MSM 150 Appliance

What's a network appliance solution? It's simply a dedicated solution which is based on the tight integration of hardware, software, networking and web-based technologies in a single box. The appliance model is a dedicated and simple approach to a very specific application requirement. In the case of the MSM 150, it's to simply and easily integrate optical storage as an open archive solution.

The MSM 150 delivers a totally OPEN solution to archival storage requirements, eliminating proprietary formats, file systems and interfaces. Any business application can now take advantage of the security and permanency of optical storage for the archiving of data to meet compliancy requirements such as SEC 17a-4, Sarbanes-Oxley and HIPAA, to name a few. Application Servers can easily store and retrieve archived data through industry standard based networking protocols. And, all archived data is easily transportable to all major operating system including: Microsoft Windows, Linux, UNIX and MAC OS X through the use of the industry standard file format UDF (Universal Disc Format) supported natively by these operating systems.



The MSM 150 enables any optical library to be easily connected and managed through a standard network interface. Entry level system administration personnel can install, configure and manage archived data easily, so there is no costly IT support required.

The MSM 150 virtualizes any optical library into one or more network shares or mount points, each being accessible on the network by any application. For example, the MSM can be configured to allocate an individual optical disc in the library to a specific user, or it can assign a group of discs in the library to a specific user group or class of data or application. A storage administrator can easily allocate discs in a library to meet the needs of the user environment at any time simplifying storage provisioning of archival systems.

The Software Solution

On the surface, a software solution would seem like a clean, straightforward and cost effective solution for the integration of optical storage into a businesses infrastructure. However, nothing could be further from this perception.

The fact that an archival storage solution utilizing optical technology will be part of a businesses existing storage infrastructure it must be totally open and adaptable to be cost effective-hence available to any application requiring archival storage capacity.

Today's optical connectivity software is in fact an old solution, as most of these software products were designed many (10-15) years ago with little on-going product enhancement investments. One of the reasons is optical technology is based on standards and simply did not require many changes to the basic interface as it evolved. So these software companies took advantage of this situation and only maintained its compatibility at the operating system level it was built on. This is another limiting issue, as most of these software solutions were built on a Microsoft Windows operating system the utilization of optical storage was greatly limited to only those applications that also ran on Windows and had a unique API (Application Program Interface). The API is another special piece of software that enables traditional business applications to work with the connectivity software in order to utilize the optical storage. Sound complicated? It is!

Adding to the complexity, and greatly increasing its cost to implement these software solutions, a dedicated server and a general purpose operating system is required. Let's take a moment and examine these requirements. The addition of a dedicated server may not seem like a big issue to some; however, this server must run a Microsoft Windows operating system. So what if your company is traditionally a UNIX, Linux or even a MAC shop? Integrating foreign servers and operating systems increases the costs above the purchase price of the server to now include IT resources to implement, test, debug and maintain the solution. If your company is a Windows environment, you still now have an extra server to purchase or allocate, install and manage – just to add archival storage!

Utilizing a general purpose operating system like Windows as the platform for a dedicated storage solution is a risk. Yes a risk. Not because Windows is an unreliable operating systems but the fact is its General Purpose and was never developed or intended to be a high performance, highly available foundation for a dedicated a storage solution! Utilizing a general purpose operating system greatly increases the risk of crashes. The need to constantly update and patch (i.e. Service Packs) requires time and effort and even when performed by competent IT personnel issues can still occur. These updates also require the archival storage system be taken off-line in order to apply them which mean the archival system will be unavailable. Additionally, general purpose operating systems are not known for providing high performance, high availability and robustness. All of these attributes are basic requirements for an enterprise class storage solution.

Additionally, many connectivity software products utilize proprietary formats essentially "Locking-In" your archived data to that particular software vendor' solution or "agenda".

In short, your data is at risk based on the software vendors' future viability as a company and its ability to continually evolve products to meet the latest storage technology and business requirements. Businesses implement archival systems to eliminate or greatly reduce risk. Implementing an archival system with a component that potentially introduces risk is totally contrary to the requirement and should be considered unacceptable.

Software Considerations

Software solutions providing optical storage connectivity require the following considerations before an archival system implementation decision is made:

- High Initial Software Product Cost - Limits Adoption & Application by Small and Mid-sized businesses
- Requires a Dedicated Server – Added Costs and Complexity
- Limited to General Purpose Operating System - Introduces Risks & Questionable Performance
- Limited to Windows Applications with API – Limits Application Availability & Reduces ROI
- High On-going Support Costs – Increases Total Cost of Ownership
- Experienced & Trained IT Personnel Required – Increases Costs
- Proprietary Format - Locks Archived Data to a Specific Vendor & Increases Risk
- Limited Optical Media Support – Limits utilizing specific formats (i.e. DVD-R)

Putting it into Perspective

Consider this: Let's say you wanted to add additional storage capacity to your PC and your options were;

1. To purchase an additional PC, OS and expensive and complicated software that required you to spend a day or more to set up and/or hiring someone with the expertise to do it. While keeping in mind the data you store on this new storage device can't be read by any other system unless that system also had the same software installed. (Cost \$\$\$\$)

- OR -

2. To purchase a dedicated network appliance that would plug-n-play with your existing PC enabling you to start utilizing your additional storage immediately, knowing your data is readable by any major operating system natively. (Cost \$)

No doubt you'd opt for option #2. But seriously, while this example is simplistic, it accurately illustrates exactly the same issues which exist in today's businesses only the associated costs are; x100, x1000 or even x10,000 times the above example. The costs and consequences of making the wrong decision could be financially devastating or lead to criminal liability or both. When you consider the penalties associated with Sarbanes-Oxley legislation.

Clearly the conclusion can be made that software solutions have serious implications which involve cost, complexity, availability, reliability, compatibility and support.

MSM 150 Appliance Features

The design goals for the second generation of MSM appliances were driven by market feedback. Specifically, both users and storage resellers overwhelmingly wanted a Simple & Open solution to integrate an optical based archive solution into today's business infrastructure. It was identified that businesses today demand the following requirements when considering new archival storage solutions;

MSM 150 meets today's archival storage requirements through:

Open system design

- *The MSM 150 is a hardened Linux based dedicated solution which employs standard web based technologies, standard networking protocols, industry standard I/O interfaces and file formats.*

Network attachment

- *The MSM 150 fully supports the following industry standard protocols: NFS, TCP/IP, CIFS, DHCP, FTP, NTP & HTTP as part of its standard configuration.*

OS independence

- *The MSM 150 utilizes the industry standard UDF (Universal Disk Format) which provides native OS support on the following operating systems; Windows, Linux, UNIX and MAC OS X.*

Global web-based management

- *The MSM 150 employs a very intuitive web based management GUI (Graphical User Interface) for all of its set up, configuration, monitoring and management functions.*

Plug-n-Play integration

- *The MSM 150 provides just that; in 30 minutes or less any optical library can be configured and active (storing & retrieving data) on a network.*

Fast archival performance

- *The MSM 150 utilizes an internal hardware based high performance SATA RAID level 1 cache for all reading and writing operations. It's also used for off-line media tracking and Disc-at-Once staging, providing the utmost in performance and availability. The MSM 150 utilizes Intel's Pentium-4 chipset and associated infrastructure components providing leading edge technology, assuring performance and availability. At the I/O level, the MSM 150 supports; a Gig-E network interface, Ultra160 SCSI, FireWire 400 (1394) and USB-2 interfaces as standard.*

Industry standard file format (non-propriety)

- *The MSM 150 utilizes the UDF (Universal Disk Format); while ISO standard optical media gives the assurance that you can access your data in a wide variety of different optical drives. UDF provides the long term assurance that your archived data can be read many years down the road, thus protecting your valuable information while maintaining full compliancy with regulations and laws governing information retention.*

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MSM 150 meets today's archival storage requirements through: ...continued

Low cost administration

- *The MSM 150, being a network attached storage device, inherently enables optical storage to be easier to deploy, however, it goes a step further. The MSM 150 standardizes how optical storage is integrated and managed within a businesses storage infrastructure. Optical storage now becomes a seamless part of the businesses total storage resource available to any application requiring the advantages of optical storage.*

Multi-vendor, multi-technology storage support

- *The MSM 150's open design enables it to easily support any optical drive/media/automation (DVD-R, DVD-RAM, MO, UDO, PDD) product currently available today, as well as, the capability to easily support future technologies and associated products when they become commercially available. The MSM 150 incorporates a very flexible I/O system while it supports Gig-E, SCSI, FireWire and USB-2. It has the flexibility to also support; iSCSI, Fibre-Channel and future networking and device interfaces due to its industry standard design architecture which makes the MSM 150 "Future Proof".*

Scalable & Field Upgradeable

- *The MSM 150 is fully scalable and field upgradeable increasing its already excellent value proposition. It can be upgraded to support additional optical library capacity through either enabling additional slot/shelves or the daisy chaining of libraries. The MSM 150 can also be reconfigured in the field at any time to support different media types or even different library manufactures, all through a simple downloadable software license scheme. This again establishes the MSM 150's "Future Proof" design, whereby, changing business requirements will always be commonplace, the archival storage system must be open and flexible enough to easily accommodate these changes quickly, simply and economically – Its what the MSM 150 does!*

Conclusion

When considering optical storage as part of an archival storage solution in today's ILM (Information Lifecycle Management), Compliant Storage (Sarbanes-Oxley, HIPAA, SEC 17a-4, ...ect) or Commercial/Industrial (Broadcast, Video/Audio, Medical Imaging ...etc.) applications, businesses demand Simple, Open, Scalable solutions which are Network Attached.

Software solutions that require the need of an additional server, complex setup and training by experienced IT personnel coupled with the traditional high cost for the basic software product should be carefully considered on both technical and financial merits.

Users no longer need to face the prospect of skyrocketing costs, complexity and propriety to implement an optical archival solution. The MSM 150 enables companies to unify optical storage archival systems within their current storage systems through existing network infrastructures. The MSM 150 provides open system standards with easy-to-deploy capabilities that ensure best-in-class archival storage implementations that are "Future Proofed" with the flexibility and scalability to meet changing business requirements and maximize return on investment.



The MSM 150

