"The Future of Archiving today"

Technology Brief

Key Factors to consider when selecting a Long-Term Archive Technology

A core best practice for effective storage management is archiving technology, that frees up storage resources, improves performance and protects data that must be retained. Comparing different technologies for archival storage is complicated by the technology life cycles of the underlying components.

Tape technology has an incompatibility every 3-4 years (e.g. LTO 1 media can not be read by LTO 5) which requires technology refreshes and complete data migrations. Magnetic Hard Disks also have a relatively short life time yielding the same requirement for technology refreshes and data migrations at least every 4 years.

The key issue is that archive storage involves longer retention periods yielding data migrations and technology updates for hard disk and tape. These involve high costs and risks, positioning Blu-ray as a superior archiving technology for "file-and-forget" for longer periods of time, offering:

√ **Lower cost than existing primary storage**
Best TCO with low energy consumption and cooling costs and no need for data migration and constant data back-up

√ **Long term data retention**
Blu-ray media longevity of 50 years and 30 years backwards compatibility in non-proprietary data format

√ **Compliance with international regulations**
UDF standards based media offers intrinsic hardware level WORM Compliance

√ **Off-line management of very old information**
Removability of media allows for unlimited off-line archive storage which allows system administrators to safely remove data and offload the network.

The total cost of ownership of Blu-ray Storage for long-term archive storage is less than half the cost for alternatives like Hard Disk and Tape

TCO COMPARISON: 50TB Enterprise Hard Disk vs. 50TB Blu-ray Appliance						
PERIOD	**5-Year TCO**		**10-Year TCO**		**15-Year TCO**	
COST/TECHNOLOGY	**HARD DISK**	**BLU-RAY**	**HARD DISK**	**BLU-RAY**	**HARD DISK**	**BLU-RAY**
Acquisition	$93,000	$73,000	$93,000	$73,000	$93,000	$73,000
Maintenance	$51,500	$43,900	$61,800	$98,800	$63,500	$153,700
Power & Cooling	$53,200	$5,300	$106,500	$10,600	$159,700	$14,000
Technology Refresh	$46,600	$0	$68,000	$6,700	$69,900	$6,700
Data Migration	$39,900	$0	$119,800	$0	$159,700	$0
TOTAL	$284,200	$122,200	$449,100	$189,100	$545,800	$247,400

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TOP 10 Reasons For Selecting Blu-ray Archiving Technology

1. Cost of Ownership
The total cost of ownership of Blu-ray storage for archival purposes is less than half the cost for alternatives like Hard Disk and tape.

2. Compliance
Blu-ray media offers a true WORM recording medium which can't be altered with software hacks or viruses. This is essential considering today's requirements for multi-year data retention periods and growing regulatory compliancy requirements for unalterable, non-erasable storage capabilities. Optical technology meets these requirements as part of its standard features.

3. Capacity
Blu-ray Disc format is easily extendable (future-proof) as it includes support for multi-layer discs. This allows the storage capacity to increase the current 100-128GB/disc capacity to 200GB in the near future simply by adding more layers to the discs.

4. Compatibility
Optical media has industry standard formats; ISO 9660 and UDF (Universal Disk Format) which are supported on every operating system including Windows, Linux, UNIX and MAC OS X. This avoids the direct need for additional client software as data can still be read in a standard drive in a standard PC, yielding complete vendor Independence.

5. Access
Blu-ray technology offers random access to any file on Blu-Ray Discs. Unlike with Hard Disk storage, media is not spinning and less subject to physical damage, viruses, etc. Tape drives provide sequential access and recovery times are slow as the tape needs to spool to find the file.

6. Removability
Off-line management of very old information is not possible with magnetic hard disks as they can't be safely removed and stored long-term outside of the archive. Tape can be removed and stored off-line, however, tape needs periodic re-tensing to prevent tape adhering together and is like hard disk vulnerable to (electro) magnetic radiation. Blu-ray Discs can be safely removed and stored off-line, offering unlimited archive storage capacity.

7. Innovation
While maintaining all benefits of a standardized format, Blu-ray technology is available as a best-of- breed hybrid solution technology for organizations. Combining the removability and longevity of Blu-ray with direct access and speed of hard disk yields easy to deploy and maintain appliance type solutions.

8. Cloud & Blu-ray
Cloud storage has some advantages, but many companies choose for a mixed model to implement a secure, physical archive in place which is less susceptible to outages, network bandwidth and privacy breaches.

9. Green Technology
Blu-ray technology offers a sustainable archiving technology. Blu-ray media consume zero power when not being accessed, reducing power consumption, air conditioning needs and CO_2 emission. As there is no need for frequent data migrations, less waste products will be generated by having to replace devices.

10. Long-term
Due to its advanced media lifetime of 50+ years , standardized format and removability, Blu-ray technology offers the possibility to build long-term infinite off-line media archives.

Blu-ray archive solutions are similar to tape but the main difference is in the media itself. Blu-ray technology offers an effective storage management solution for numerous archive-centric markets and applications. It is reliable, robust and like CD/DVD before it, it will be widely available for coming years. Furthermore, an average media life of 50 years is predicted for current 100-128GB Blu-ray Discs, due to its advanced coating technologies. In combination with its low energy consumption and cooling costs, Blu-ray media technology is extremely suitable for long-term and sustainable archiving.