

# **DISC Archiving Technology**

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The Future of Archiving Today

### Agenda

- DISC Archiving Systems
- Why Archive
- Hybrid Archive Storage Technology
- Blu-ray Technology
- Blu-ray Positioning
- DISC SmartPack
- Summary



## **DISC Archiving Systems**

#### Market Leader in Hybrid Archive Storage Systems

DISC provides integrated, value-added solutions with a focus on protecting the long-term technology investments of clients by ensuring quality, reliability and value

#### Member of Blu-ray Disc Association

The Blu-ray Disc Association (BDA) is the industry consortium that develops and licenses Blu-ray Disc Technology and is responsible for establishing format standards

#### Member of OPARG

The Optical Archive Group (OPARG) promotes the benefits of optical archiving (BD/BDXL/DVD/CD Technology) and encourages the widespread adoption by proposing professional solutions for long-term storage systems



Blu-ray Disc

**Blu-ray Disc Association** 

**OPARG** 

### **Why Archive**

- 1. Data ProtectionSecure data usage and long-term retention2. Data Optimization100% data availability thru storage efficiency
- 3. Data Compliance

Meet regulatory requirements





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### **Why Archive**



- Automate archiving of all non-changing data to WORM compliant Blu-ray Discs with 50 years media longevity
- Off-load primary storage & reduce daily back up
- Maximize network performance & manage very old information

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#### **DISC ArXtor Series: Hybrid Storage Technology Best of Best of** Disk Blu-rav **Blu-ray Disc Technology** Near-line/off-line WORM Archive Storage Middleware 3<sup>rd</sup> Party Software Library Management/ILM Applications ArXtor **RAID Technology** ArXtor1000 Appliance ArXtor1000 Appliance **On-line Storage/Storage Virtualization** front view rear view

#### Long-term Archive Storage Solution based on HDD Cache with Blu-ray Optical Library

- ✓ Combine hard disk (speed) with durability of Blu-ray Archive Storage
- ✓ Intelligent Libraries & Network Attached Appliance Solutions
- ✓ Excluding 3<sup>rd</sup> Party Software for Library Management/Storage Virtualization

# **DISC SmartPack™ Technology**

Profile by

The SmartPack<sup>™</sup> Removable Media Technology offers simple and secure long-term archiving of optical media. Each SmartPack<sup>™</sup> can hold 15 media and is inserted into one of four locations on the front of DISC libraries.





- •In and outside of the library
- •Enclosed design to ensure protection against scratches, dust, fingerprints, shock and light
- Media locked into place

#### **Easy Media Handling**

- Inserted into one of four locations in the front of the library
- Uses same tray system as libraries
- Hot swappable exchange whilst the library is operating

#### **On/Offline Data Mgt.**

DISC SmartPack (720 gr. 5.25")

- Worldwide unique serial number & bar code stored on label and on smart memory chip
- Unlimited Offline Media Storage
- Light weight ergonomic design

# **Blu-ray Disc Technology**



- Blu-ray Disc (BD) is an optical disc storage medium with industry standard formats; ISO 9660 and UDF (Universal Disk Format). The plastic disc is 120 mm in diameter and 1.2 mm thick, the same size as DVDs and CDs.
- The name Blu-ray Disc refers to the blue laser used to read the disc, which allows information to be stored at a greater density than is possible with the longer wavelength red laser used for DVDs.
- Conventional Blu-ray Discs contain 25 GB per layer, with dual layer discs (50 GB) being the industry standard for feature-length video discs. Triple layer discs (100 GB) and quadruple layers (128 GB) are available for BD-XL drives.

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## **Blu-ray Disc Capacity & Protection**



- The development of new low-cost hard-coating technologies make the discs even more resistant to scratches and fingerprints. Blu-ray also adopts a new error correction system which is more robust and efficient than the one used for DVDs.
- Blu-ray Disc format is easily extendable (future-proof) as it includes support for multi-layer discs. This allows the storage capacity to be increased to 200GB in the near future simply by adding more layers to the discs.
- Sony & Panasonic have announced the development of professional-use 300GB Blu-ray Optical Disc for long-term digital storage.

# **Blu-ray for Long-Term Archiving**



- Tests show that BD-R Media are extremely suitable for long-term archival storage purposes. In a typical office environment (normal room conditions), the projected archival lifespan is at least 50 years.
- High reliability is verified by third-party TÜV Rheinland Certification Institution





Unlike CD-R, DVD-R Discs, and LTH BD-R discs, which use an organic dye for the recording layer, Blu-ray Discs use an inorganic phase-change material. This minimizes light-induced degradation of the recording layers and resists the effects of heat and humidity, making these discs ideal for long-term data archiving and storage.

### DISC Positioning: Hard Disk only vs. Blu-ray

- RAID is great for transactional data storage, not for archive storage
- RAID has the following disadvantages:
  - Enterprise RAID is expensive
  - Expected to fail, hence the Redundant Array -RAID
  - Must be backed up
  - Limited life, 3-5 years: Frequent technology refreshes and costly data migration required every 3-5 years
  - High energy consumption, every year!

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	<b>BLU-RAY</b>		
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	<b>\$0</b>		
TOTAL	\$284,200	\$122,200	\$449,100	\$189,100	\$545,800	\$247,400		



# **DISC Positioning: Tape vs. Blu-ray**

- Tape is great for backup, not for archive storage
- Tape has the following disadvantages:
  - Slow access times, around 60-80 seconds. Archives require individual file access, tape is designed to stream data
  - Tapes need management to prolong life. Regular re-spooling is required
  - Limited backward read compatibility.
    Only two generations, LTO5 can't read LTO3
  - Tapes are fragile
    - IBM recommend 16-25'C, and replace if dropped
    - Only 20,000 load cycles or individual file reads
  - Frequent technology refreshes and costly data migration required every other generation: 7-10 years

Archiving Technologies Compared	HDD	LTO	Blu-ray
Lower cost than existing primary storage	V	V	<b>vv</b>
Long-term retention	X	X	<b>vv</b>
Compliance with regulations	V	V	<b>V</b> V
Transparent access to archival information	V	X	<b>V</b> V
Offline management of very old information	X	Х	٧V

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## **Sustainable Blu-ray Technology**



Blu-ray media consumes zero power when not being accessed and the energy consumption is low thanks to shared resources. This generates low heat and little or no cooling required.

### **Summary**

- Archiving requires Long-Term Storage Strategy
- Blu-ray Technology offers:
  - 30+ Year Backward Compatibility (Successor of CD & DVD)
  - 100-128 GB (UDF) Standard Media with 50+ Year Media Life
  - Promising Roadmap: 300GB Optical Disc Development
  - Possibility to integrate within

Hybrid Archive Storage Solution (RAID, Cloud)

Sustainable Alternative to Traditional
 Solutions with Lowest TCO







# **DISC Archiving Systems**

### Thank You



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