

# Long-term Data Preservation Media



**Permanent Data  
Storage**



# Preservation Media Requirements



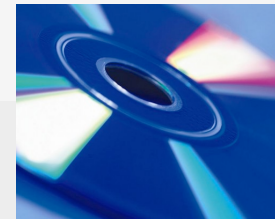
- **PERSISTENT**
- **Secure**
- **AFFORDABLE**
- **Minimal Maintenance**
- **Accessible**

# Why is Optical Persistent?



- **Longevity**

- Highly stable under recommended storage conditions
- Able to survive storage condition emergencies
- Hardware failure does not lead to media failure



- **Materials**

- Optical allows use of innovative, stable, non-ferris materials
- Materials not sensitive to magnetic or electrical effects
- Data encapsulated in advanced protective, long-life, cocoon

# M-Disc Expected Data Life

100 GB BDXL Disc



- Under normal storage conditions ( 77F, 50%RH):
  - 95% confidence time to first failure: >1000 years



- Under harsh storage conditions (100F, 50%RH):
  - 95% confidence time to first failure: >180 years

# Durability



Test Item	Conditions	Result
Sea water resistance	<ul style="list-style-type: none"> <li>Sunk into the sea for 7 days</li> </ul>	Perfect
Corrosive environmental gas resistance	<ul style="list-style-type: none"> <li>Corrosive gas atmosphere: 25° C, 75% RH, 96 h, H<sub>2</sub>S: 12.5 ppm, SO<sub>2</sub>: 25 ppm</li> </ul>	Perfect
Light resistance	<ul style="list-style-type: none"> <li>Using solar simulator (Xe lamp energy 550 W/m<sup>2</sup>, 3 weeks)</li> </ul>	Perfect
Temperature and humidity resistance	<ul style="list-style-type: none"> <li>80° C, 80% RH, 750 h</li> <li>-40° C, 250 h</li> </ul>	Perfect
Chemical resistance	<ul style="list-style-type: none"> <li>20 times wiping test using sodium hypochlorite 1% solution, ethanol 77% solution</li> </ul>	Perfect



\*MKM In-house tests

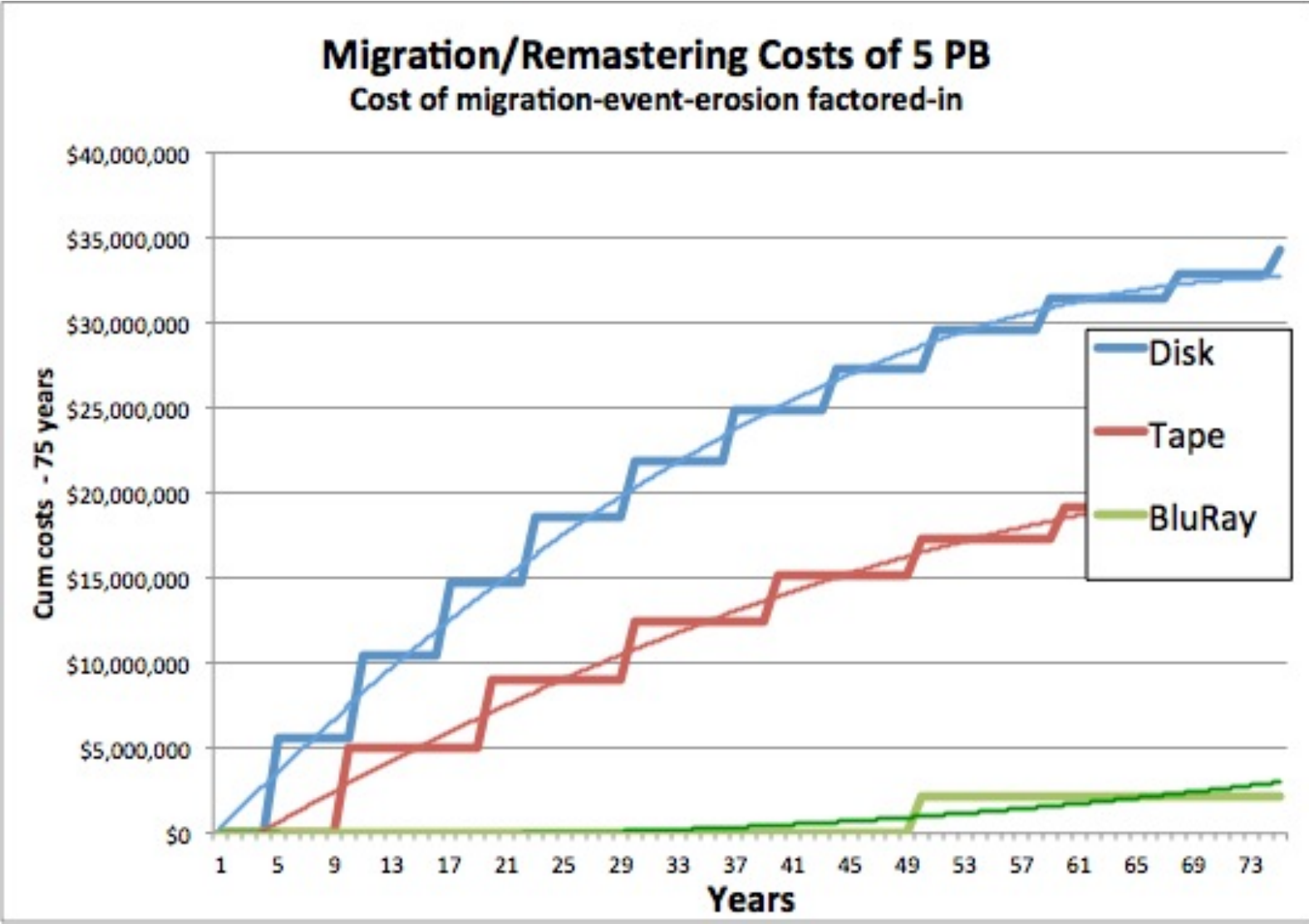


# Affordable Data Lifecycle

- What drives DATA lifecycle costs?
  - Infrastructure acquisition – am I only buying technology?
  - Or ownership? – The DATA is what I own and maintain.
  - Storage technology is a means to keep DATA alive
  
- Ownership dominates the data lifecycle cost
  - Maintaining storage environment
  - Regular media migration
  - Energy costs – operations and conditioning
  
- Preservation media and commodity storage serve different purposes

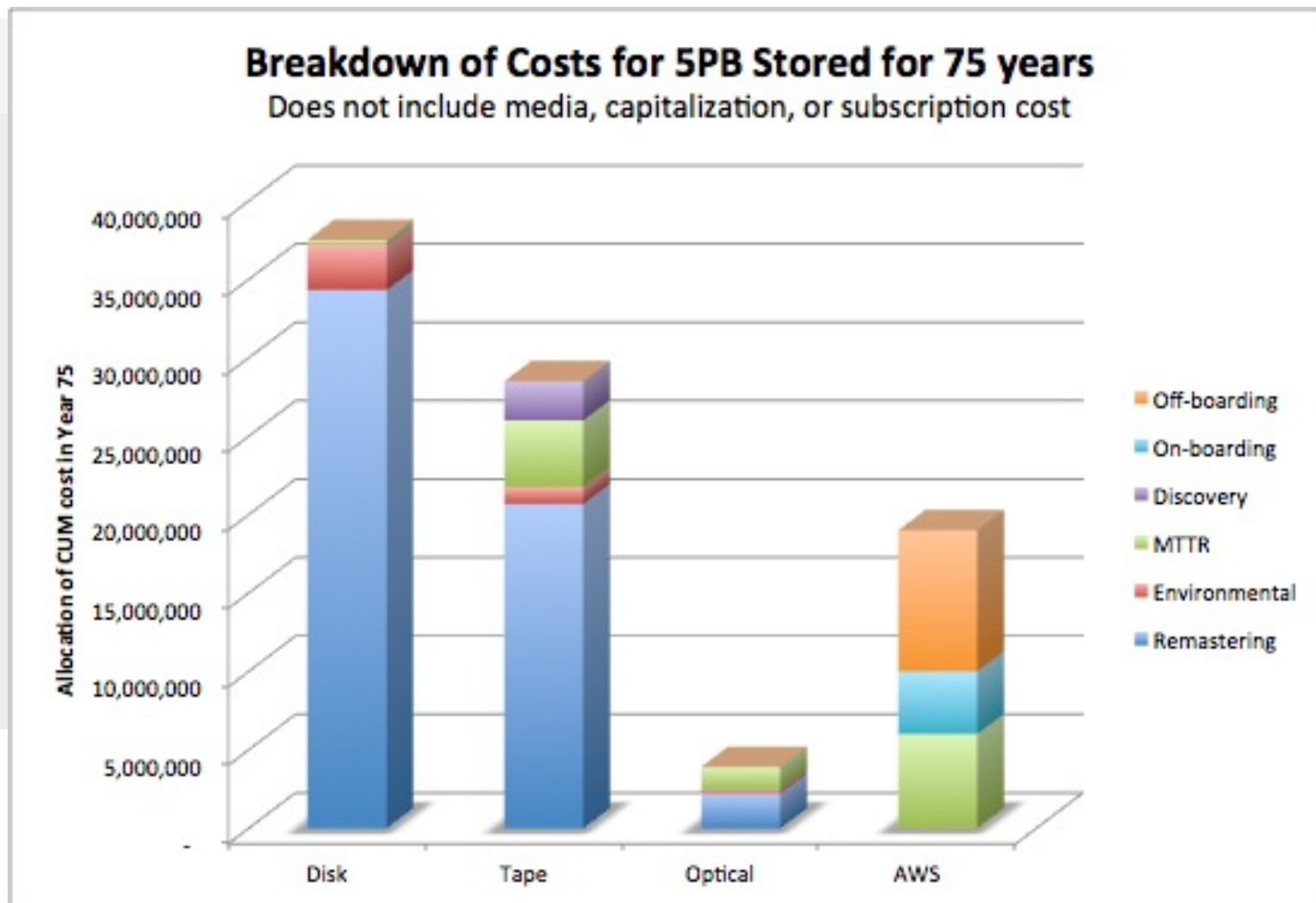


# Data Migration: Optical vs HDD vs Tape



David Merrill, Chief Economist HDS

# Cost Breakdown: Optical vs Disk vs Tape



David Merrill, Chief Economist HDS



# Preservation Media Comparison

	HDD	SSD	TAPE	Optical
<b>Persistent</b>	✧	✧	✧	✧✧✧✧
<b>Secure</b>	✧	✧	✧	✧✧✧✧
<b>Affordable (TCO)</b>	✧✧	✧	✧✧✧	✧✧✧✧
<b>Maintainable</b>	✧	✧✧	✧✧	✧✧✧✧
<b>Accessible</b>	✧✧✧	✧✧✧	✧✧	✧✧✧✧

**Thank You for Your Time**