



# The Academy of Motion Picture Arts & Sciences

## Requirements for a Digital Motion Picture Preservation System

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# The Digital Dilemma



# Requirements for Digital Motion Picture Archiving

1. Access guaranteed for at least 100 years
2. Assets survive periods of benign neglect
3. The digital system should be at least as good as the photochemical system it replaces
4. We don't know what we're willing to pay, but \$500/Terabyte/year is too much



# NDIIPP: Digital Motion Picture Archiving Framework

- Digital preservation case study: StEM
- Report: what about the independent filmmakers and small archives?
- File formats & metadata
- Research - distributed storage, low cost/low power storage, data compression
- Education and Outreach

# Current technologies and practices are inadequate for motion pictures (and other applications)

- SNIA 2007 Report: “Migration is Broken”

## 100 Year Archive Requirements Survey

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### **The Petabyte Problem**

Migration is broken. Migration practices do not scale to meet the digital preservation requirements of the data center.

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future applications or readers without losing the authenticity of the original. Physical migration means to copy the information to newer storage media to preserve the ability to access it and to protect it from media corruption. Best practices today require logical and physical migration every 3-5 years. Based on these practice standards, the real underlying challenge is how to scale migration capabilities while controlling cost. An organization that has 1,000 TB (a petabyte, PB) in its digital archive repository will have 50% more next year. In three years, they will need to migrate that first petabyte. In five years they will need to migrate 2.25 PB. How do organizations expect to do that and keep up with the growth, the cost, and the complexity? The answer is they can not. They will not<sup>2</sup>. It is the contention of the 100 Year Archive Task Force that migration as a discrete long-term preservation methodology is broken in the data center. Today's migration practices do not scale cost-effectively and won't be done until a crisis erupts. This means that today's reliance on migration is taking us down a 'dead-end path'. Hear this clearly. Under these practice guidelines, the world's digital information is at great risk! New technological approaches are required that meet the legal, business, cost, and scalability requirements of the 'digital age' for long-term digital information retention.

### **The Requirements Survey**

In September 2006, the SNIA's 100 Year Archive Task Force decided it needed a clear statement of business requirements to frame and bound potential technology solutions to the long-term digital information retention challenges of the data center. The plan was to design and conduct an online survey inviting a broad range

## StEM Case Study

- Historic film/digital collection produced in 2003, deposited in Academy Film Archive in 2004
  - 20 TB collection, but a *real digital motion picture* collection is 2 – 10 PB, 5 - 25 million objects
- Develop interim, “active” preservation strategy and infrastructure
  - Bit-level and Essence-level preservation
  - Evaluate and choose container, metadata schema
  - Not likely to be the reference design
- Use best preservation practices to drive design

# This is what the StEM looks like

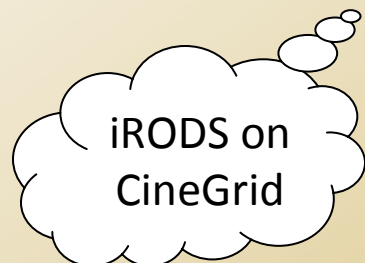
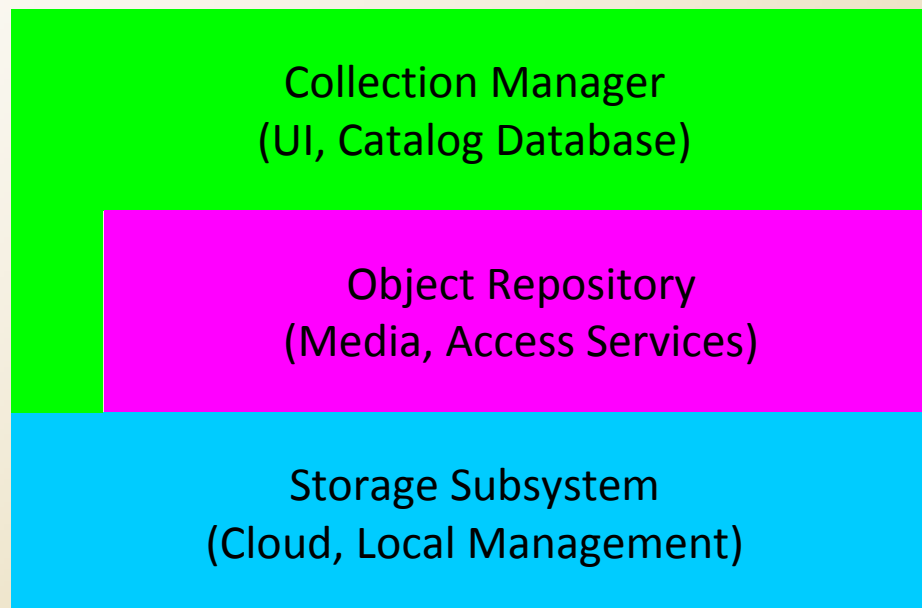


## StEM Case Study – 2

- Developing an open source software “stack”
  - Collection manager
  - Repository
  - Digital storage options
- Objectives:
  - Drive software costs down
  - Simplify technical skill set required to configure and maintain



# StEM Case Study software stack



## But there are big technical issues

- Storage “Total Cost of Ownership” increases over time
  - Labor, energy, system “stack”
- Network and device bandwidth is not keeping up with increased storage demands
- High performance digital storage systems are very complex and far beyond the skills of film archivists
- Migration doesn’t scale well



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Any questions?

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