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# Library of Congress Storage Architecture

OCIO/ITSO  
Production Engineering  
and  
Operations & Maintenance



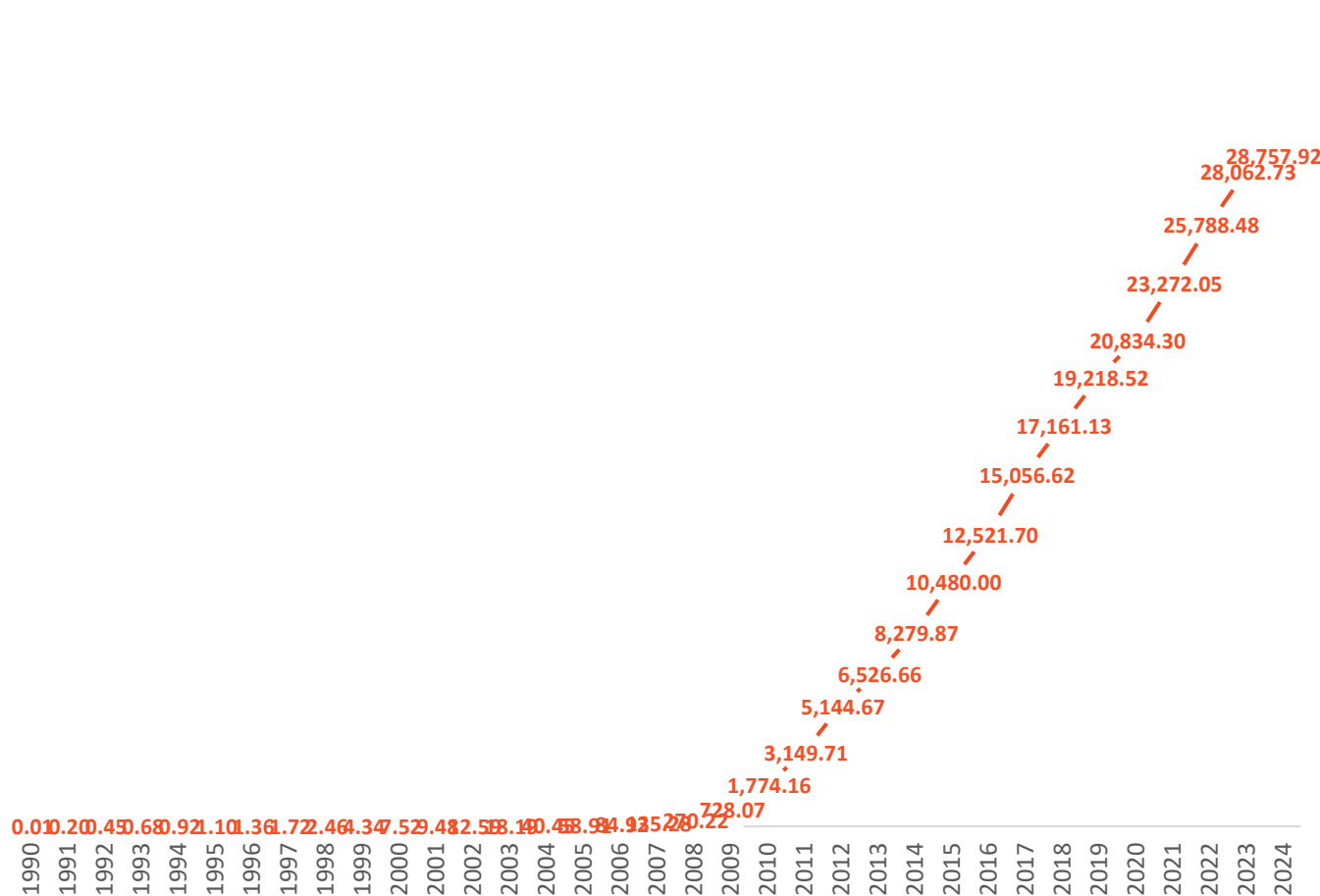
# Overview

- Content Storage Environment Stats
- Content Storage Environment Strategies
- Current Storage Architecture
- Perpetual Migration Continues
- Large Scale Data Propagation – Content Verification
- Tech Refresh – ScoutAM Deployment
- Tech Refresh – Bulk Storage Deployment

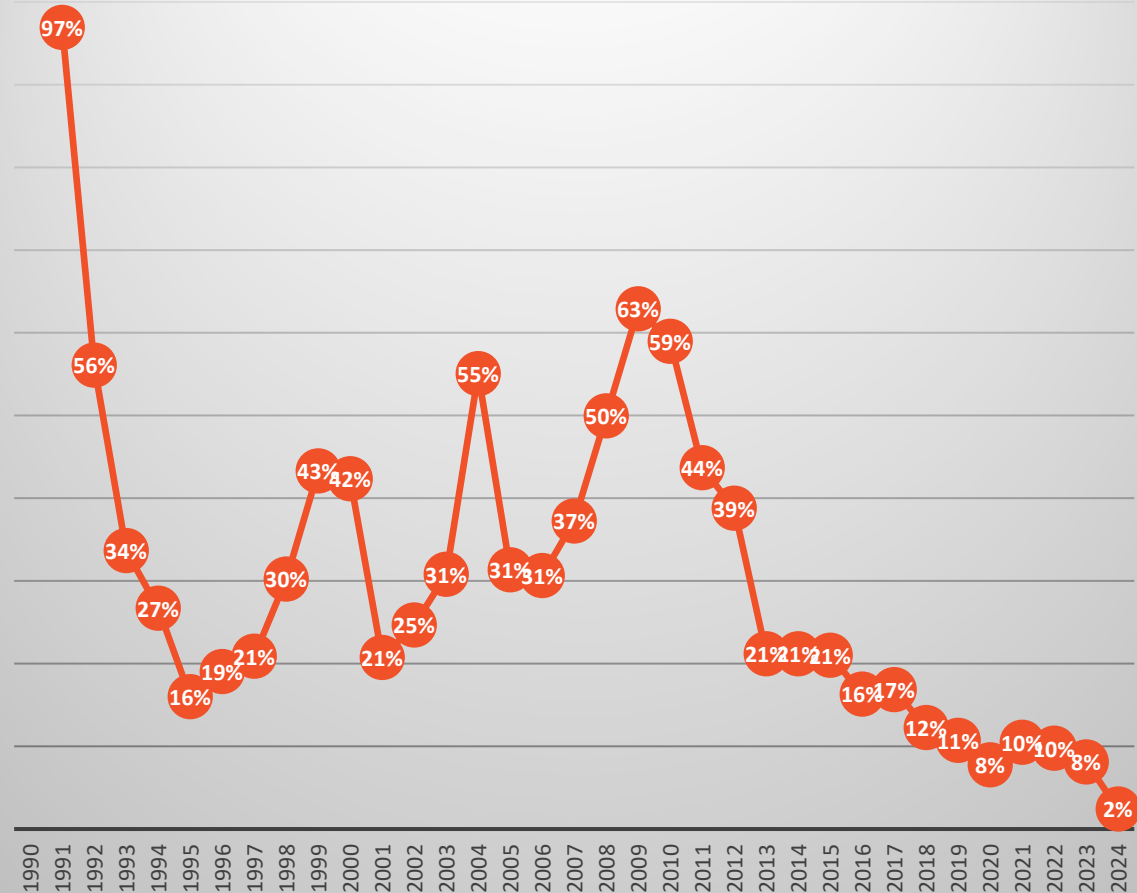
# Content Storage Environment Statistics

- Preservation Single Copy 1.04B Objects (28.7PB)

SINGLE COPY PRESERVATION (IN TB)



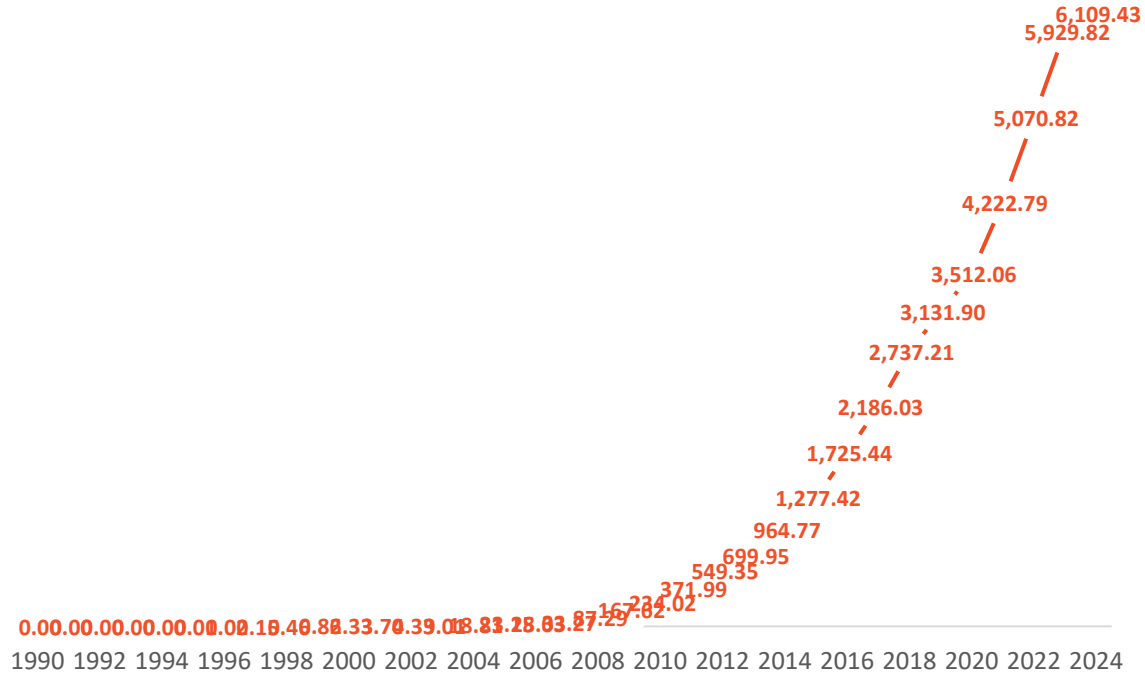
Preservation Annual Growth



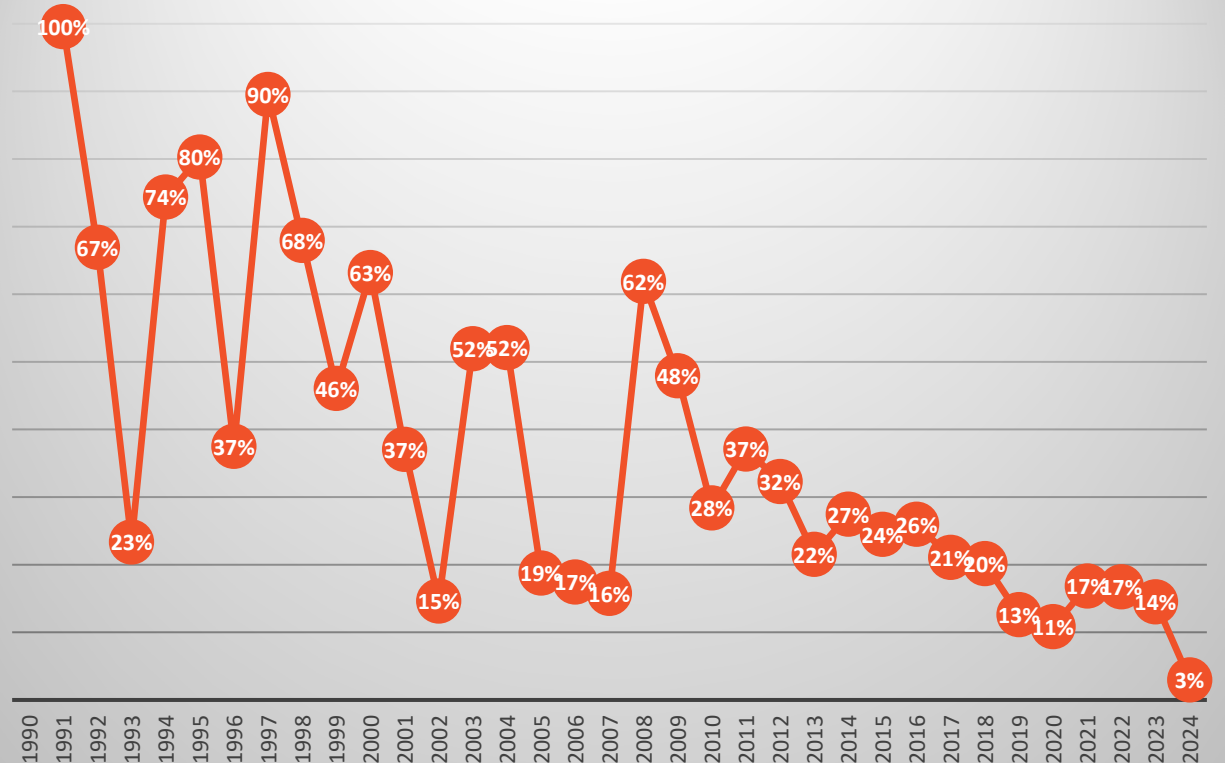
# Content Storage Environment Statistics

- Presentation Single Copy 272M Objects (6.1PB)

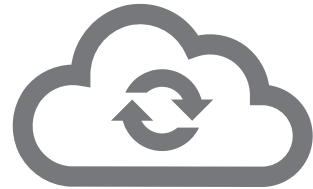
SINGLE COPY PRESENTATION (IN TB)



Presentation Annual Growth



# Content Storage Environment Strategies

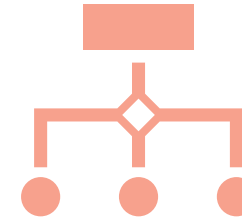


## Preservation Deploying a 3:2:1 strategy

Three (3) copies of the data (2 tape copies and one cloud copy)

Two (2) technologies (Versity and AWS)

One (1) off premises copy (AWS Glacier)



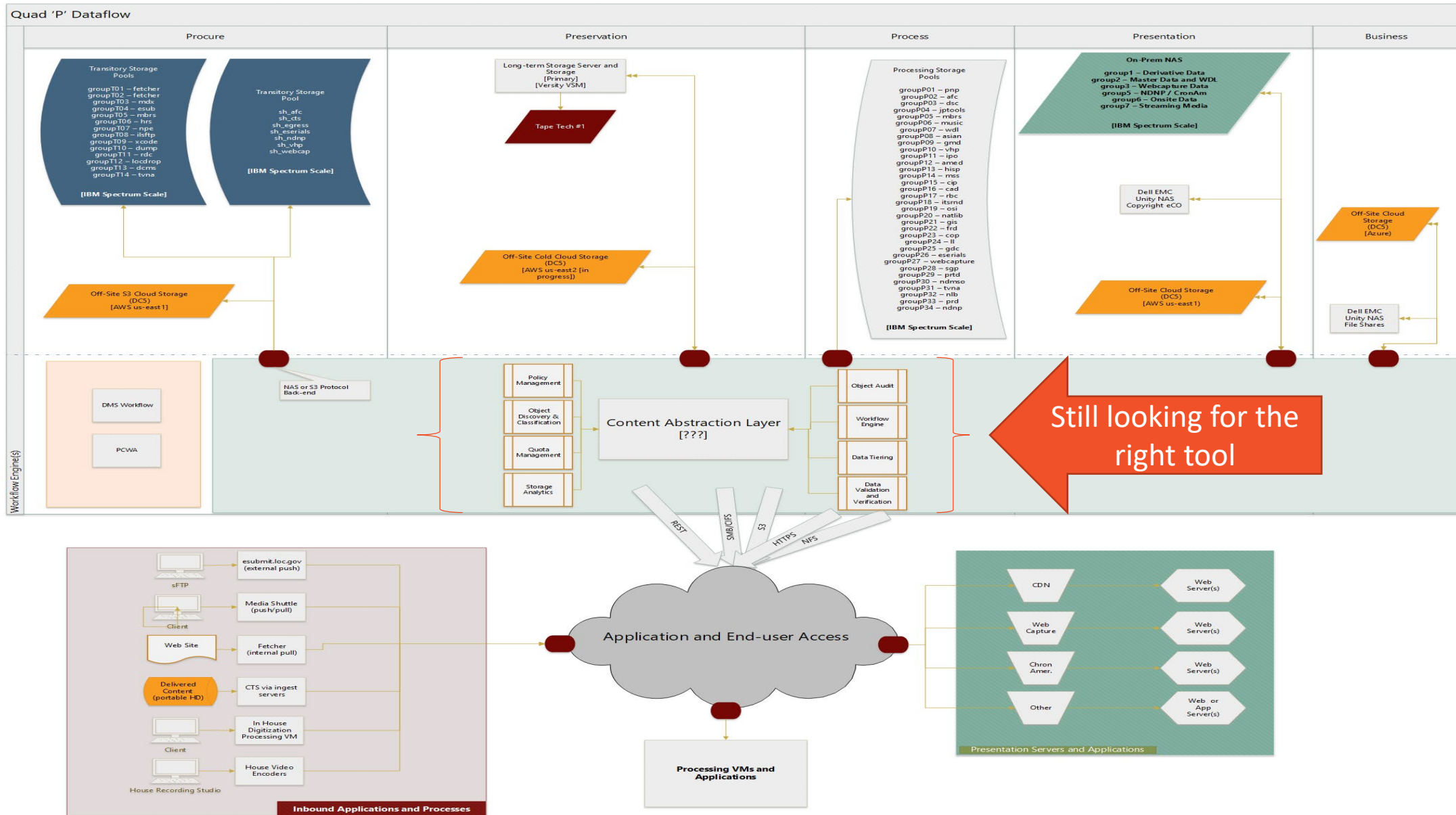
## Presentation Deploying a 2:2:1 strategy

Two (2) copies of the data

Two (2) technologies (Spectrum Scale [gpfs] and AWS S3)

One (1) off premises copy (AWS S3 Intelligent Tiering)

# Current Storage Architecture (adding the Content Abstraction Layer)



# Perpetual Migration Continues

- Software Technical Refresh
  - Versity Storage Manager to ScoutAM Archiver
- Technical Refresh and End-of-service-life
  - Replace old arrays with new
- Changing resources
  - Move to LTO9 tape

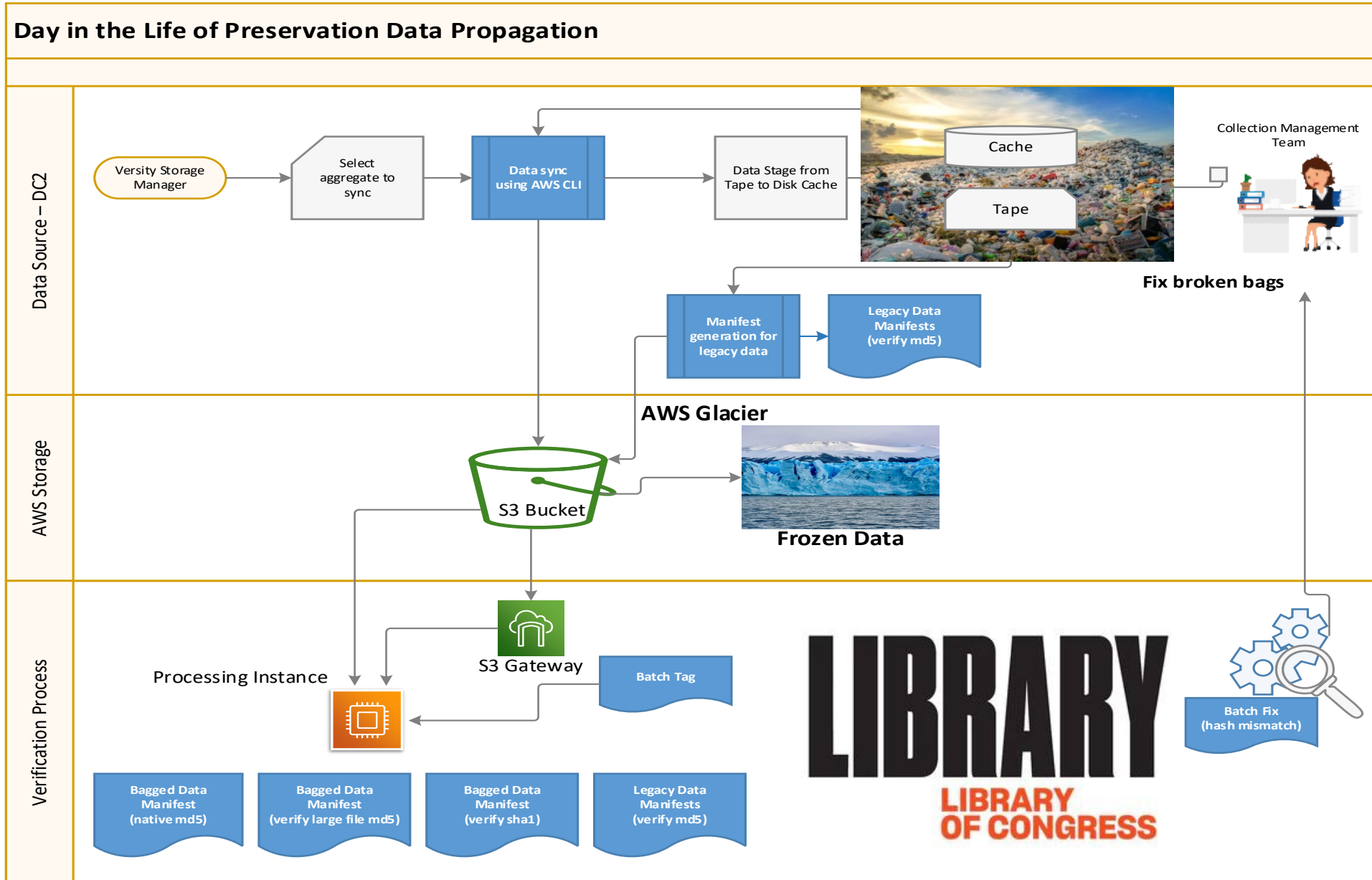
Continuous Migration From the 2017 Conference  
From the 2012 Conference



"Working on the cure for those suffering with digital Disposophobia"

6

# Large Scale Data Propagation – Content Verification





# ScoutAM Deployment – Versity Tech Refresh

- Moving from single metadata server to a clustered model for availability and performance
- Upgrading from RHEL7 (EOL in June 2024) to RHEL8
- Moving from T10k-D tape drives to LTO9
- Versity S3 gateway for object-to-tape capability
- Challenges
  - Integration with our older SL8500 tape libraries
  - New interfaces and terminology versus familiarity with SAM-QFS

# Spectrum Scale – RAID Inc. Tech Refresh

- Introduced RAIDINC ARI-609 platform to replace legacy ARI-109
- Seagate Exos X 5U84 hardware
- Use of ADAPT (Autonomic Distributed Allocation Protection Technology) erasure coding instead of RAID 6.
- Challenges
  - Early firmware issue
  - Disk installation/replacement



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# Thank you!

## For More Information

Web: <https://digitalpreservation.gov/meetings/>

## Points of Contact

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Questions?