Tools and Services for the Long Term Preservation and Access of Digital Archives

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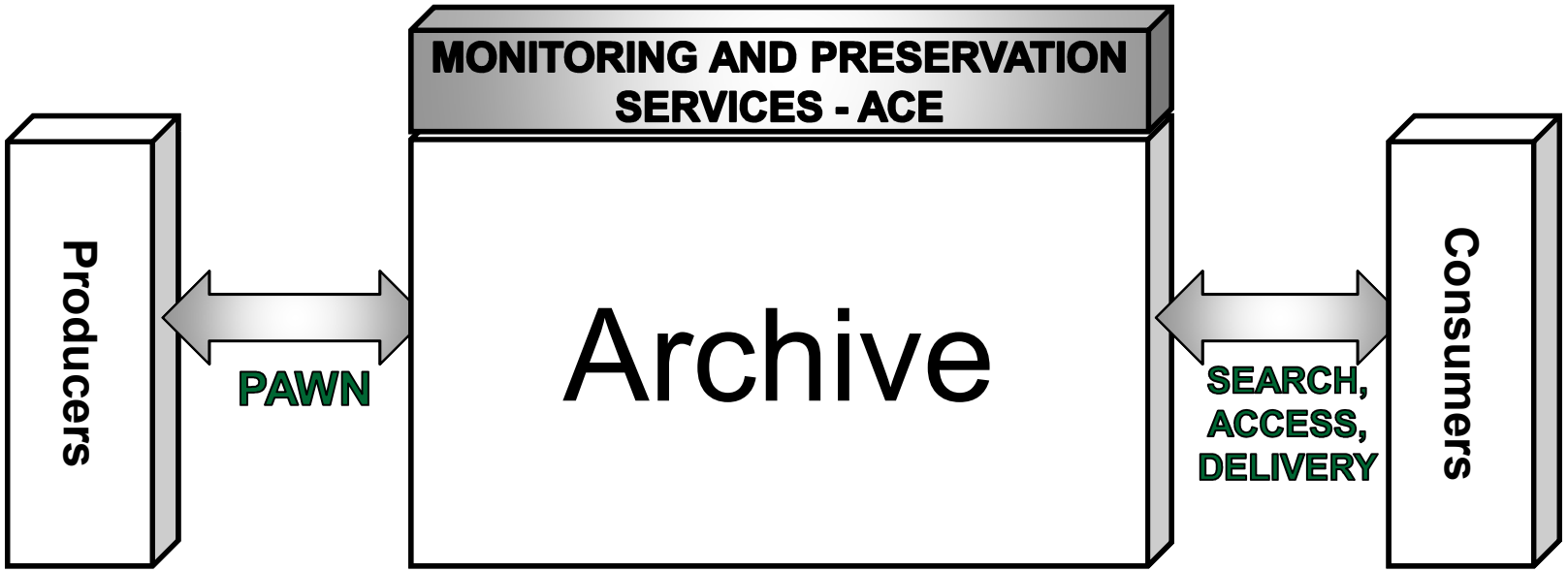
Research Goals

- Development of flexible, platform-independent modular tools and technologies, specifically targeting long term preservation and access.
- Evaluation and demonstration on different architectures (centralized and distributed) and large scale heterogeneous collections (government records, scientific data, web data, images, etc.)

Flexible, Layered, OAIS-Compliant Architecture

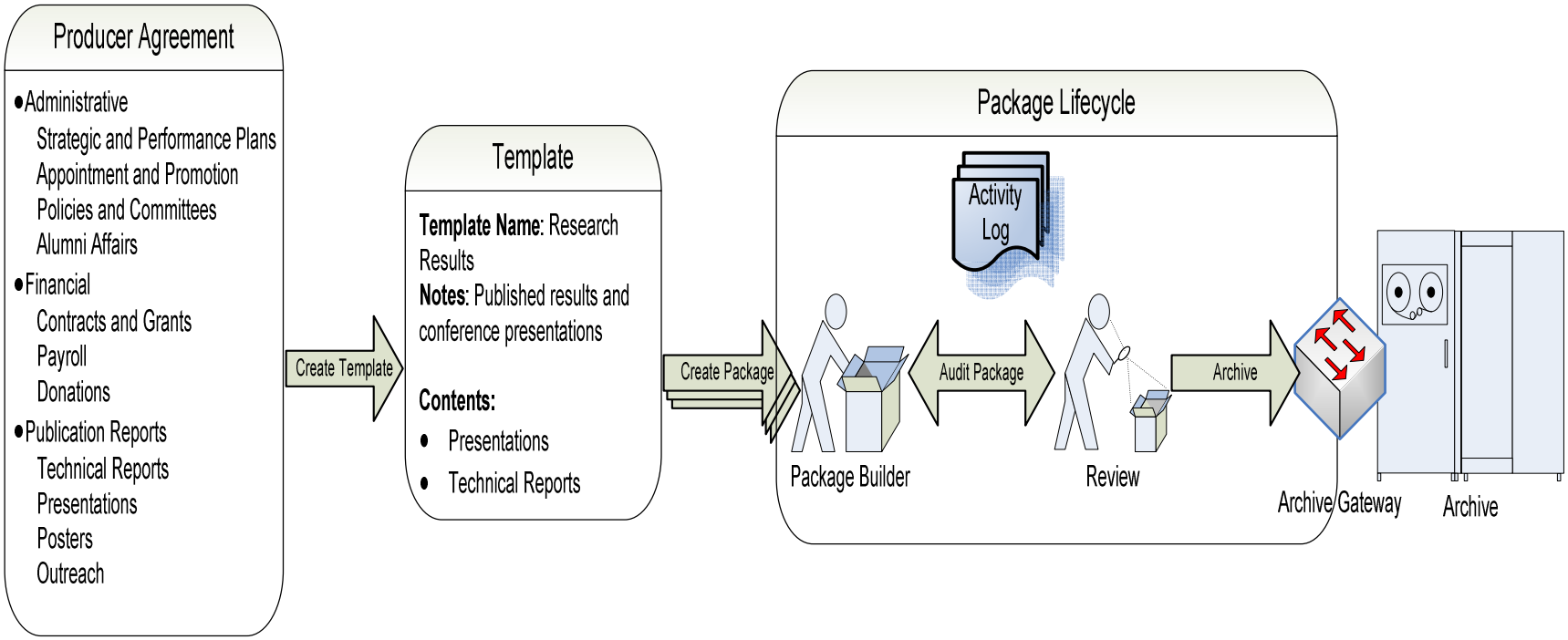
Open Standards, Platform-Independent Components



PAWN – Producer Archive Workflow Network

- Software that provides a flexible and customizable distributed ingestion framework
- Automate the process of submitting or pulling data into an archive in multiple contexts.
- Handles the process in a reliable and secure fashion:
  - From package assembly
  - To archival storage
- Simple interface for end-users and archive managers

Package Workflow Overview



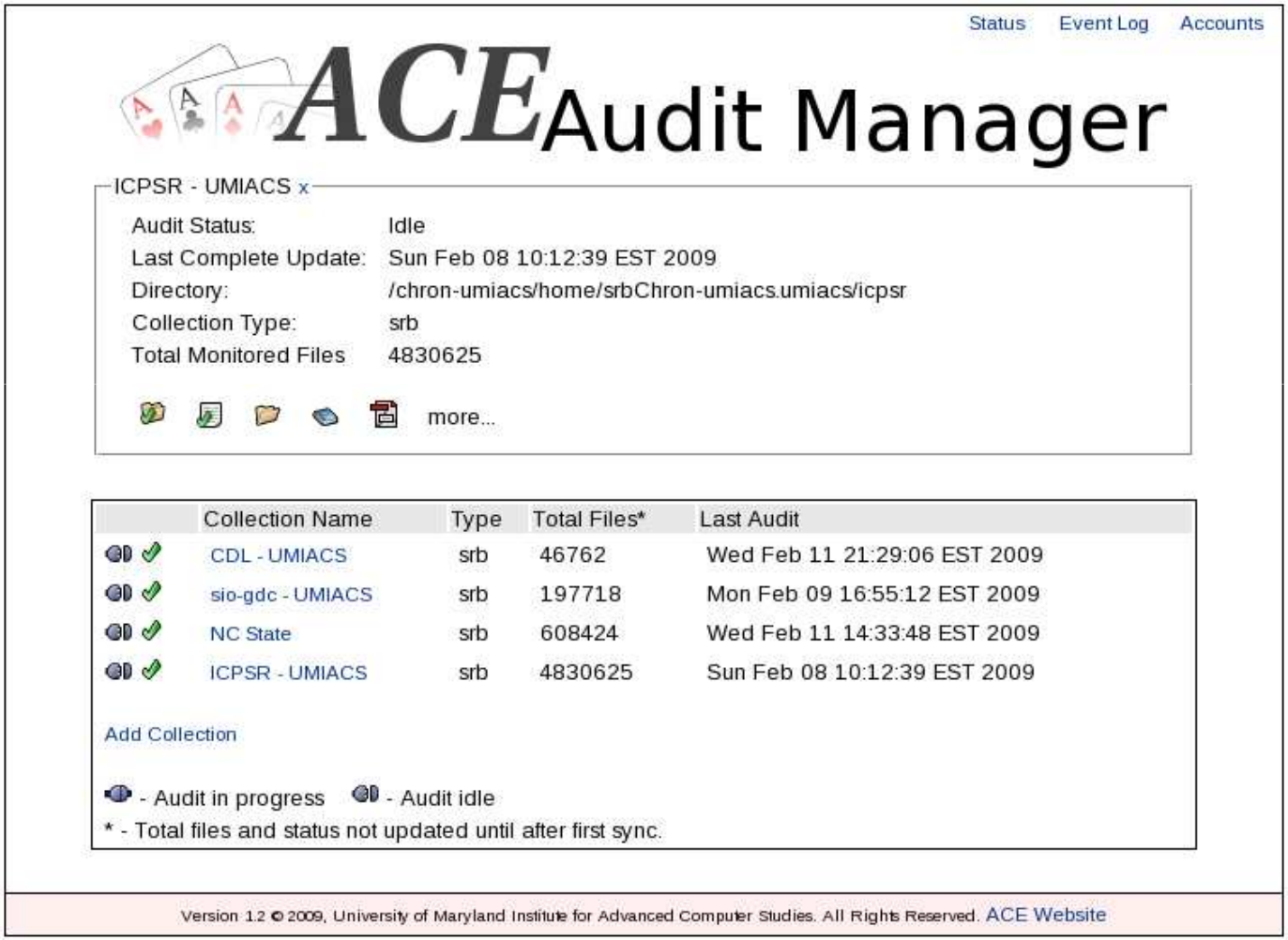
Sample End to End workflow

- On ingest, filtering processes run to perform basic validation.
  - Ensure file is valid and virus free
  - EXIF metadata extraction
  - All approved files are automatically pushed to archival storage
- Archivist may login and handle rejected or non-archived items
- Manual process is invoked to force files to archival storage

ACE – Auditing Control Environment

- Software to protect the integrity of digital assets in the long term
  - Hardware/media degradation
  - Security breaches, malicious alterations
  - Infrequent access to most data
  - Evolution of cryptographic schemes
- Underpinnings are based on rigorous cryptographic techniques.
- Scalable, cost-effective, and can interoperate with any archiving architecture.

ACE Audit Manager



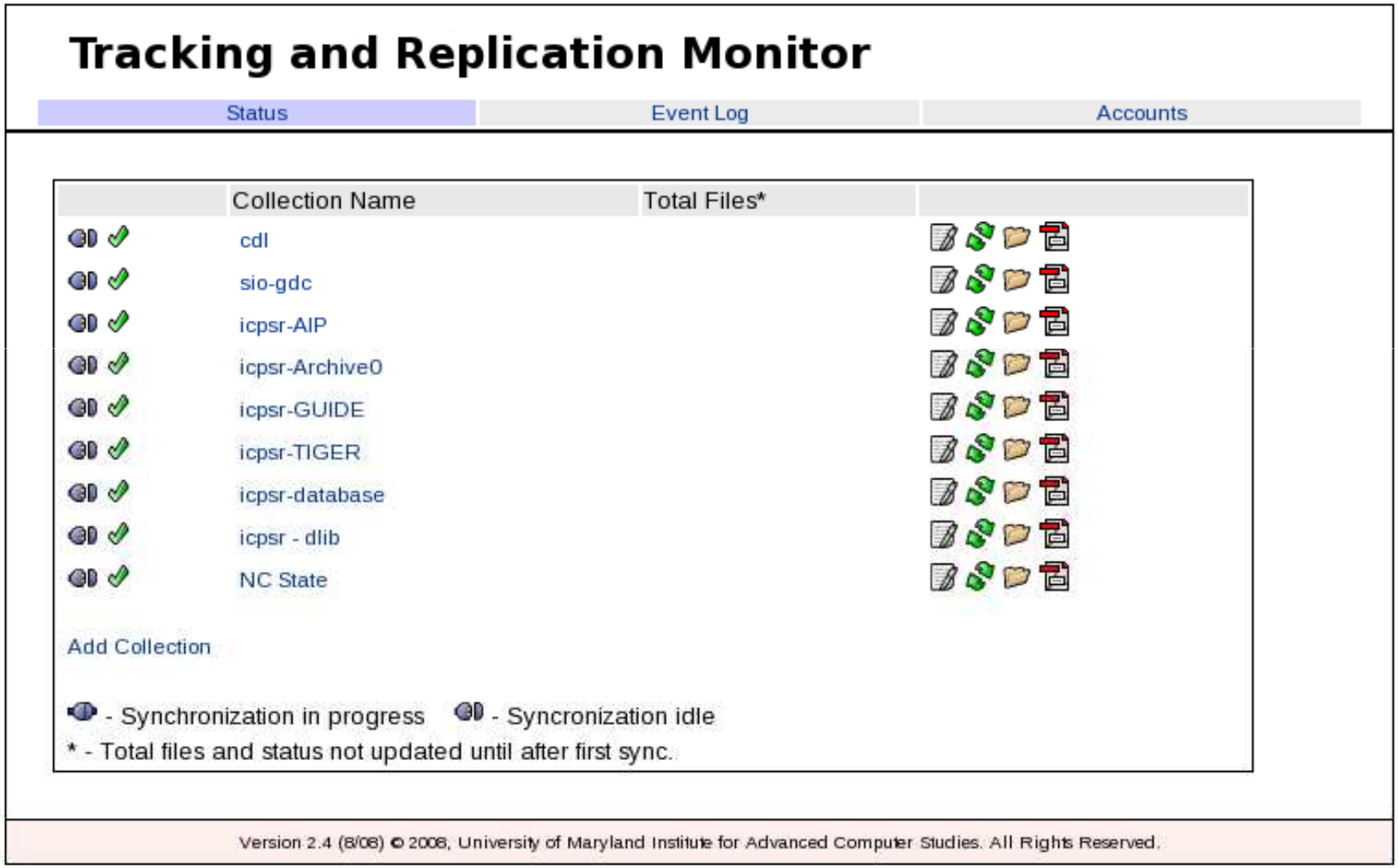
ACE Summary

- Software to track the availability and integrity of the archive's data holdings.
  - Auditing – local service to periodically verify integrity of files
  - Hash integrity – remote, auditable service to secure hash
  - Extensively tested – main bottleneck is network and I/O bandwidth.
- Chronopolis Environment (NDIIPP Project)
  - Multiple Heterogeneous Collections
  - 5+ million files, 13TB
- High performance, Scalable
  - A single manager can audit over 6 million files a day
- Version 1.2 available

Tracking and Replication Monitoring

- Portal that provides overview of the status of all the collections in the archive.
- Enforces policies regarding availability and replication.
- Tracks files at master locations and periodically copy new files to replica sites.
- Log actions on a collection and errors during any processing.
- Currently, incorporated with ACE.

Replication Monitor

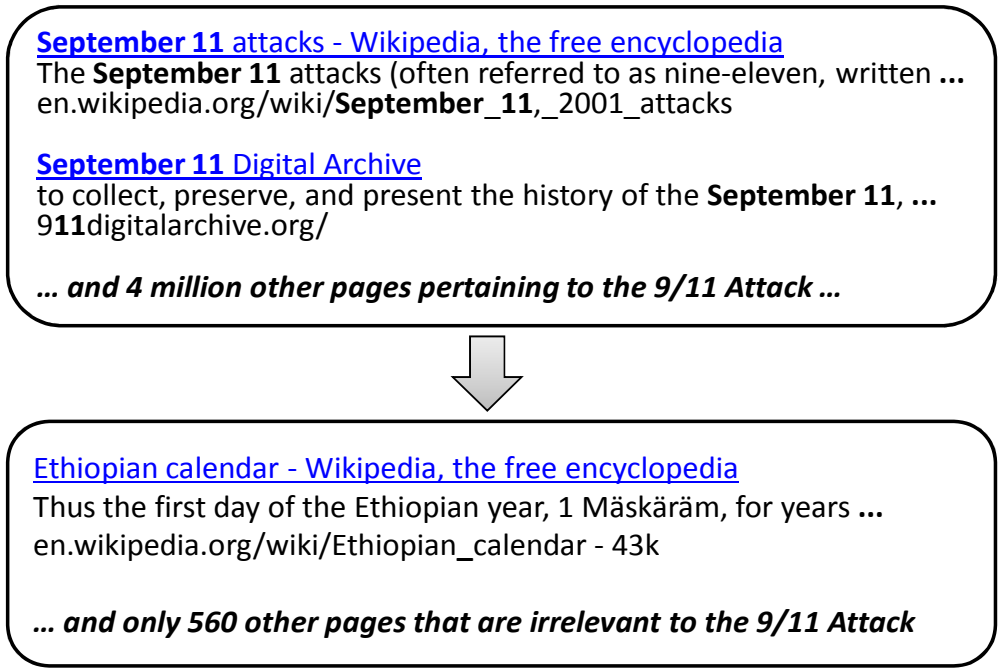


Access Technologies for Long Term Archives

- Search and information discovery within a temporal context.
- Content exploration to enable knowledge discovery.
- Test and validation on significant scale web archives (in collaboration with the Library of Congress and the Internet Archive.)

Scalable Technology for Information Discovery of Web Archives

- Allows discovery through a combination of words and time spans. Web objects are ranked within a temporal context.



More in Archiving'2009

Conclusion

- Focus on platform and architecture – independent tools and services that are specifically tailored to handle core issues in long term archiving.
- Empirical testing and evaluation using a wide variety of collections and different infrastructures.
- Released tools to manage distributed ingestion, monitoring, and integrity of archived objects.