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Long Term Digital Preservation

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http://www.haifa.il.ibm.com/projects/storage/datastores/index.html

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Questions

- What software technology are you most concerned about for preservation archives in terms of reliability of the bits, and why?
  - All technologies related to obsolescence of formats and software
    - Only a “solved” problem for static data types
      - No support for dynamic data, e.g., Web sites
    - Automation
      - Collecting metadata
      - Verifying metadata
      - Determining format obsolescence
      - . . .
- What software technology are you least concerned about for preservation archives in terms of reliability of the bits, and why.
  - Migration of the bits to address media obsolescence
    - Multiple technologies exist and have been used for years
    - Although room for improvement

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Preservation DataStores: Storage Assist for Preservation Environments

- OAIS-based
- Independent of the underlying physical storage layer (tape, disk,…)
- Generic, independent of the type of stored data
- Scaleable (e.g. global namespace)
- Offloading functionality to the storage layer
  - Decrease the probability of data loss
  - Simplify the applications
  - Provide improved performance and robustness
  - Utilize locality properties
    - Compute data intensive functions internally e.g. fixity
    - Provide better support for links among objects
- Part of EU CASPAR Project
  - Cultural, Artistic and Scientific knowledge for Preservation, Access and Retrieval
  - http://www.casparpreserves.eu/

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Preservation DataStores: A New Storage Paradigm

Functionality	Rational
Physically co-locate the Information Object (AIP)	Ensure metadata is never lost when raw data survives
Execute **data intensive functions** at the storage component: ◈ fixity computations and validation ◈ data transformation	Utilize the data locality property
Handle **provenance events internally**	E.g. migration and copy occurs at the storage
Support the loading and execution of **external transformations**	Ideally performed during bit-migration performed close to data

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Preservation DataStores: A New Storage Paradigm (Cont.)

Functionality	Rational
Maintain **referential integrity** Update links during migration	Ideally done during migration
Ensure ***readability*** of the data by a different system in the future. Support global **self-described** formats	Interaction with backend storage
Support media migration Load and execute transformations Portable export format	Interaction with backend storage
Support a ***graceful loss*** **of data** Self-describing **self-contained** media format	Minimize the effect of media loss/corruption

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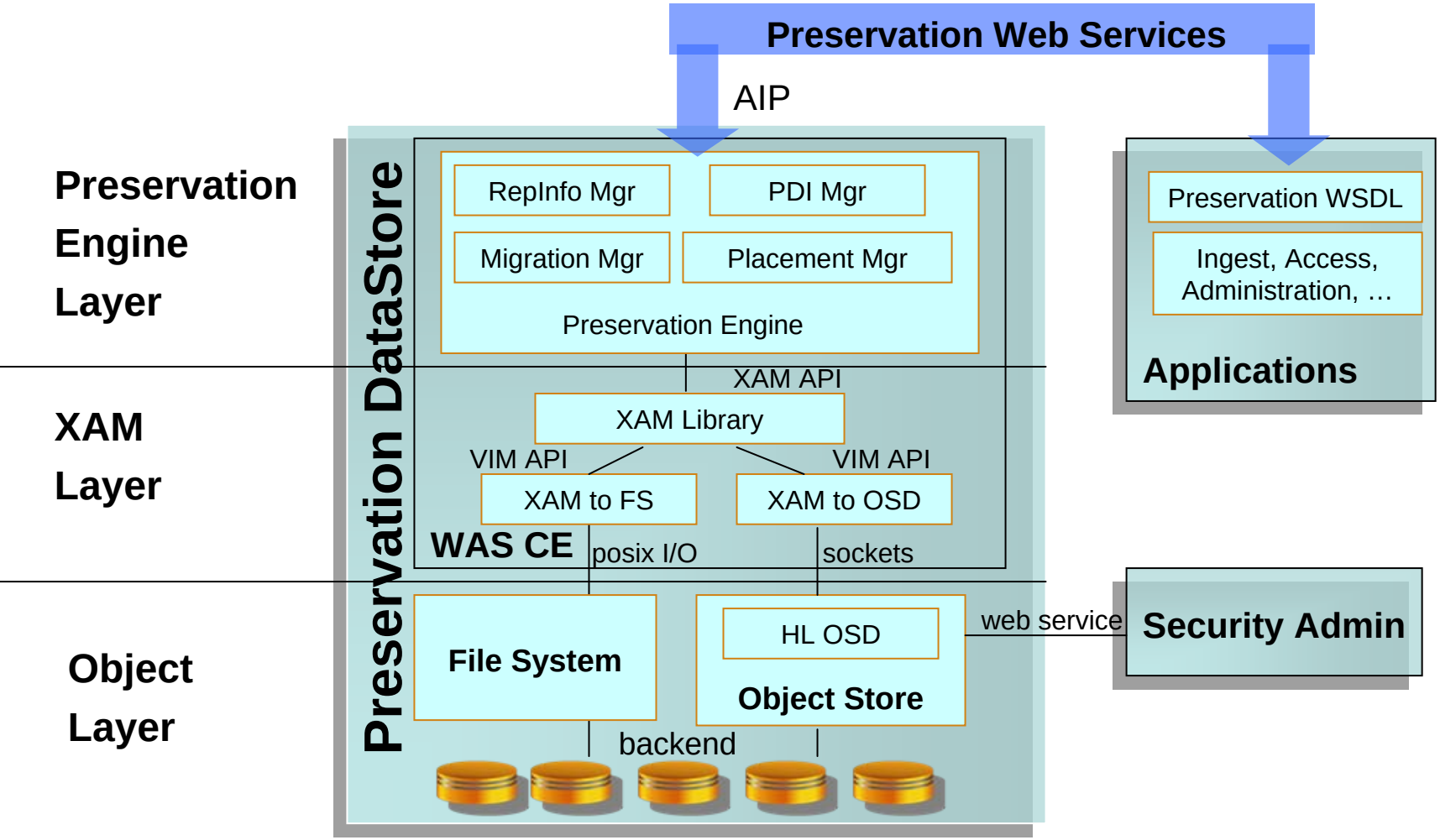
Preservation DataStores: Architecture



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Backup

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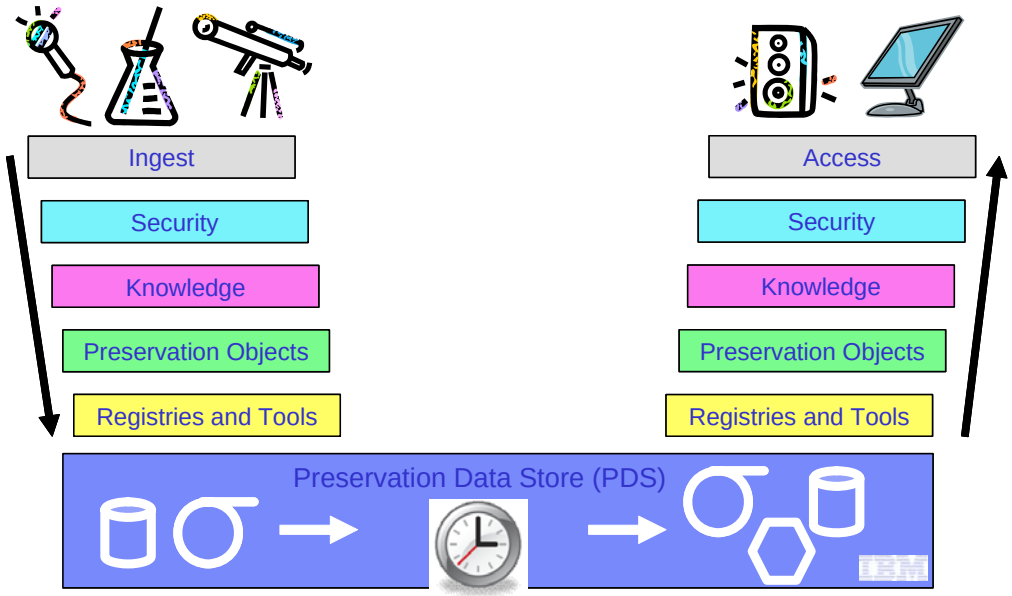
CASPAR and Preservation Data Stores

- CASPAR: Cultural, Artistic and Scientific knowledge for Preservation, Access and Retrieval
  - 8.8M Euro, 3.5 year, EU Project
- Demonstrate validity of OAIS framework with heterogeneous data



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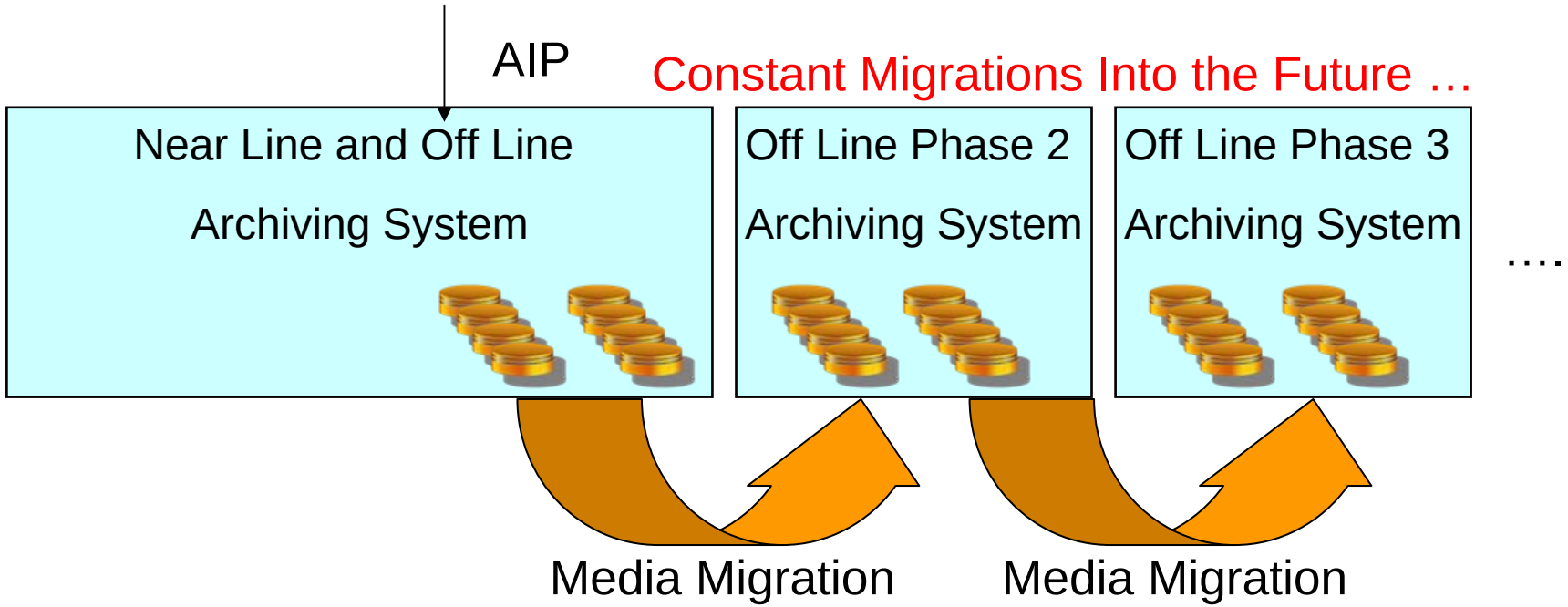
Migration with Self-Describing Self-Contained Media Format



- Encapsulation of data and metadata is done within the tape/disk subsystem
- Migration is simple – just move the tape to the new system
- If a tape is damaged or lost, the effect is contained – the information in the other tapes is still valid!

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