

# aDORe, A Modular and Standards-Based Digital Object Repository at the Los Alamos National Laboratory

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## ABSTRACT

This paper describes the aDORe repository architecture, designed and implemented for ingesting, storing, and accessing a vast collection of Digital Objects at the Research Library of the Los Alamos National Laboratory.

## Categories and Subject Descriptors

H.3.7 [Digital Libraries]: Disseminations, Standards, Systems issues

**General Terms:** Design, Standardization

## Keywords

Digital Object, MPEG-21, OAIS, OAI-PMH, OpenURL

## 1. aDORe: A MODULAR, STANDARDS-BASED DIGITAL OBJECT REPOSITORY

Over the last 2 years, the Digital Library Research and Prototyping Team of the LANL Research Library has worked on the design of the aDORe repository architecture aimed at ingesting, storing, and making accessible to downstream applications an ever growing heterogeneous collection of Digital Objects. The aDORe architecture is highly modular and standards-based.

In the architecture, the MPEG-21 Digital Item Declaration Language [5] is used as the XML-based format to represent Digital Objects that can consist of multiple datastreams as Open Archival Information System Archival Information Packages (OAIS AIPs) [2]. Through an ingestion process, these OAIS AIPs are stored in a multitude of *Autonomous OAI-PMH Repositories* [3].

A *Repository Index* keeps track of the creation and location of all the Autonomous OAI-PMH Repositories in the aDORe environment. This component is also accessible through the OAI-PMH. For each OAIS AIP stored in aDORe, an *Identifier Locator* contains the identifiers associated with the OAIS AIP itself and with the Digital Object it represents. It also contains the location of the Autonomous OAI-PMH Repository in which the OAIS AIP

and hence the Digital Object reside. The Identifier Locator can be populated through batch loading or OAI-PMH harvesting. It can be queried in a variety of ways, including the Handle protocol.

A front-end to the complete environment – the *OAI-PMH Federator* – is introduced for requesting OAIS Dissemination Information Packages (OAIS DIPs). These OAIS DIPs can be the stored OAIS AIPs themselves, or transformations thereof. This front-end allows OAI-PMH harvesters to recurrently and selectively collect batches of OAIS DIPs from aDORe, and hence to create multiple, parallel services using the collected objects. The OAI-PMH Federator interacts with other components of the environment mainly using the OAI-PMH, thereby hiding all architectural details and complexities from downstream harvesters.

Another front-end – the *OpenURL Resolver* – is introduced for requesting OAIS Result Sets. An OAIS Result Set is a dissemination of an individual Digital Object or of its constituent datastreams for immediate presentation to end-users. These disseminations can be obtained using requests that are compliant with the NISO OpenURL standard [4]. Both front-ends make use of an *MPEG-21 Digital Item Processing Engine* [1] to apply services to OAIS AIPs, Digital Objects, or constituent datastreams that were specified in a dissemination request.

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