



Report on the European Resolution Discovery Service (ERDS) Meeting (Feb 17/18, 2010)

Kirubel Legasion, German National Library (DNB)
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Persistent Identifiers

Having a global solution to access digital objects persistently over the Internet has been an intensively discussed issue in the last few years. Different solutions (Persistent Identifiers) have been implemented by different institutions in order to ensure persistent accessibility of digital objects. URN-based mechanisms, DOI, Handle, ARK and PURL are some of the well known persistent identifier schemes that are currently being implemented and used by quite a few Cultural Heritage Institutions in Europe.

Europeana (www.europeana.eu) is a portal that provides a portal for users to access a growing number of digital items (currently around seven million) in the form of text, image and audiovisual data formats¹. These digital items are located in European Cultural Heritage Institutions, such as National Libraries, Museums, Archives and Audio-visual archives. Europeana is a gateway providing access to these digital items.

At the moment, most of the Cultural Heritage Institutions provide URLs as references to the digital objects in their archives. But referencing digital objects by URLs is not a reliable solution, because, if the physical addresses of these digital objects are changed, the URLs are no longer valid links to those objects. In order to avoid this problem, Cultural Heritage Institutions should use Persistent Identifiers to point to their digital objects. These Persistent Identifiers link to the actual locations of those objects through implemented resolution services.

EuropeanaConnect (www.europeanaconnect.eu) is a Best Practice Network² that will provide several services in order to enable different functionalities for the Europeana users. Among these services, the European Resolution Discovery Service (ERDS) is the one that will provide a meta-resolver for European Cultural Heritage Institutions. The ERDS will provide a solution to the challenge of persistent identification of digital objects across the different resolution services that are currently in use by the numerous Cultural Heritage Institutions.

The ERDS Service

The ERDS Service provides the opportunity that the identification of an object in the world wide web is made independent from that object's actual physical location. Implementing resolution services assures persistent accessibility of the digital objects and the ERDS provides this accessibility across the different resolution scenarios for all objects referenced in the Europeana portal.

When a user attempts to access a digital object through the Europeana Portal using its persistent identifier, the ERDS captures this request and forwards it to the respective local resolution service of that specific institution. To do this, ERDS refers to a database of local resolvers to choose the appropriate one and reformulates the request in a way understandable by that specific resolver.

¹ <http://www.europeana.eu/portal/aboutus.html>

² http://ec.europa.eu/information_society/activities/econtentplus/index_en.htm

Given a successful reply from the local resolution service, that is at least a valid URL link to redirect the user to the actual reference of the digital object.

The German National Library leads the task of developing the ERDS together with the Austrian National Library, the National Library of Portugal, the National Library of the Netherlands, the University of Vienna and the European Digital Library, which is the organization responsible to create the Europeana Portal.

The Persistent Identifier Meeting in Frankfurt (Feb. 17/18, 2010)

On February 17/18, 2010, The German National Library hosted meeting in Frankfurt, bringing together projects and individuals that are dealing with the archive keeping entities to discuss the importance of persistent identifiers and their implementations. The main goal of the meeting was to exchange experiences and discuss on how the different projects are facing and solving the challenge of persistent identification. Additionally, the technical development of the ERDS and the requirements for such a service were discussed.

Altogether, 28 professionals from different projects representing different heritage organizations took part in the meeting. Apart from Europeana and EuropeanaConnect participants, there were representatives from museums, national libraries and archives.

Participating Projects

PersID (www.persid.org) is a project supported by Knowledge Exchange (www.knowledge-exchange.info) and Surf (www.surffoundation.nl) to build a widely used identifier system based on the URN scheme for naming resources. The main goal of PersID project is to guarantee access to electronic scholarly and cultural resources by developing a Global Resolution Infrastructure.

According to Maurizio Lunghi, Scientific Director of Digital Renaissance Foundation (<http://www.rinascimento-digitale.it/>), PersID will provide an added value service in the NBN-domain, offering a unique entry point in order to resolve any NBN name, in a transparent way for the final user (also for the ERDS) and with homogeneity of the service.

The infrastructure has basically two layers, a national and a global one. On the national level, there are the resolver servers which have information enabling location of digital objects through its identifier. A global resolver service is able to redirect queries to the correct national-level resolver.³

The cooperation between EuropeanaConnect and PersID project is:

- To share knowledge and experience in order to avoid redundant efforts and resources for the same purpose.
- To explore if the two services can support or mirror each other in the future in order to further strengthen the reliability of sustainable resolution service for the users.

The **ATHENA** Project (<http://www.athenaeurope.org>) develops an agreed set of standards and guidelines in order to harmonize access to the contents in museums and other cultural heritage

³ <http://www.surffoundation.nl/wiki/display/persid/About>

institutions. Gordon McKenna, representative of the ATHENA project from the Collections Trust (<http://www.collectionstrust.org.uk/>), pointed out that museums uniquely identify their physical objects. The implementation of Persistent Identifiers for their digital surrogates is in its infancy in this sector.

Part of the work of the ATHENA project is to report on the:

- Requirements for persistent identification of objects, collections and institutions
- Technical and policy infrastructure to needed support persistent identifiers

ATHENA is doing this because much of the technical infrastructure, interoperation and syndication of content from the cultural sector depend on persistent identification. Currently museums have no coherent framework for how this is to be achieved. This work has obviously to be carried out in concertation with Europeana.

The ERDS meeting was the first step in what will be a fruitful relationship. It was especially notable that there was recognition of the particular needs of museums.

The **CATCHPlus** (<http://www.catchplus.nl>) project deals with the persistent identification of contents in audiovisual archives in the Cultural Heritage Institutions. Hennie Brugman, who represented the CATCHPlus project from the Max Plank Institute for Psycholinguistics (<http://www.mpi.nl/>), indicated in his presentation that the Handle technology is found to be a suitable solution for the CATCHPlus project requirements from the point of view of reliability and scalability.

DANS (Data Archiving and Networking Services) (<http://www.dans.knaw.nl>) is an infrastructure for scholarly communication in the Netherlands, which is responsible for making all scholarly output permanently accessible. Laurents Sesink, from DANS, indicated in his presentation that DANS is currently looking for a one stop portal to resolve Persistent Identifiers and access resources permanently on the Internet. Moreover, he also mentioned how important it would be to consider standards and policies in developing the ERDS.

Functional Requirements of the ERDS

1. When a user requests to access a digital item through the Europeana Portal, the ERDS distinguishes the Persistent Identifier type of this digital item and then;
 - Resolves the request if the persistent identifier of the object is a URN:NBN. Resolving means returning the URL with the highest priority pointing the desired electronic resource or its identical copies
 - Redirects the request to other resolution services if the Persistent Identifier is either of the following: DOI, PURL, ARK, OpenURL and Handle requests
2. The ERDS must handle errors thrown by the local/national resolvers
3. The ERDS must provide an easy interface to register additional local resolution services
4. The ERDS must be able to run 24/7

5. The ERDS needs to have the technical and organizational infrastructure to protect itself from unauthorized usage (firewall, intrusion detection system, etc).
6. Performance Requirements
 - a. The ERDS must resolve 90% of the requests within 500 ms
 - b. The ERDS must resolve 95% of the requests within 3s
 - c. The ERDS must resolve all requests within 5s. If a request cannot be resolved within 5s, an error must be thrown to indicate that a local resolver has timed out.
7. The ERDS must provide the following remote interfaces via HTTP:
 - a. For a given URN request, the response must contain at least the URL, with the highest priority
 - b. Sometimes, for a given a URN, more than one digital objects may exist. In such cases, the ERDS should provide the list of all URLs referring to the different digital objects registered under this given URN, depending on the response of the local resolution service (this is an optional feature).
8. The ERDS must support clustered environments, so that hardware defects on one cluster node can not cause a total system failure
9. As a nice-to-have feature, the ERDS may have a simple watch/monitor/check functionality to register which local resolvers are unavailable and for how long. Based on this information, resolving requests must be redirected resolution services which are already mirrored and maintainers must be informed
10. The ERDS must support load balancing to minimize the response time and to serve more users simultaneously

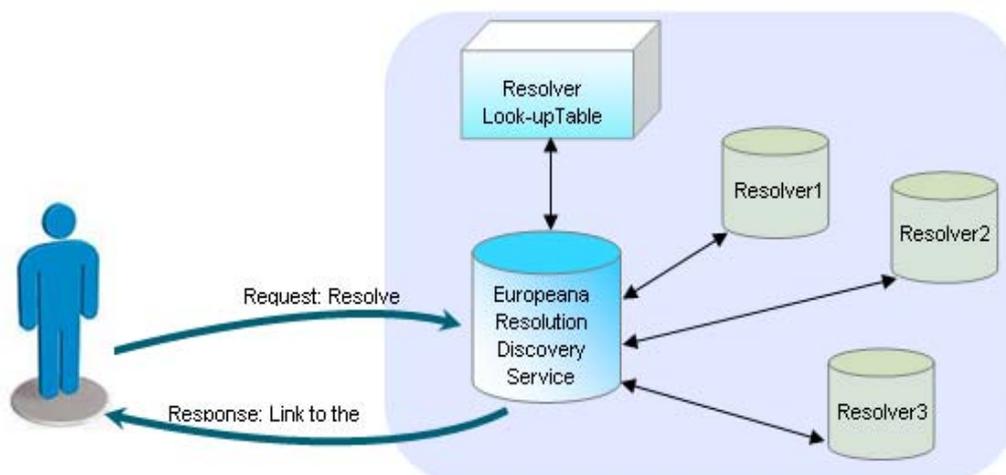


Fig.1: General structure of the ERDS



Development progress of the ERDS Service

The final prototype of the ERDS is aimed to be delivered to Europeana by the end of July 2010.

The German National Library has planned to have a beta-release by the end of March 2010 in order to carry out the basic functionality/unit testing.

Conclusion

There were different participants from different Cultural Heritage Institutions and projects that have intersecting goals in the development of the European Resolution Service.

All the participants agreed on the importance of persistent identifiers but implementation techniques and phases may vary from project to project. For instance, museums are at infancy levels to implement resolution services.

The CATCHPlus project alleviates the Handle technology for the audio-visual archives whereas the PersID project adds value to the NBN-domain by providing a single point of entry.

The meeting was successful and following intended targets were achieved:

- The meeting served as a medium to create awareness and encourage Cultural Heritage Institutions to make benefit of the ERDS upon the completion of its development
- The meeting has strengthened further cooperation and coordination between EuropeanaConnect and other European projects that have the same objectives and goals.
- The minimum Functional Requirements to develop the ERDS were determined in the meeting