Building integration environment based on OAI-PMH protocol

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Roadmap

- What is OAI-PMH?
- Requirements for infrastructure
- Step by step building integration environment
- Additional services for end-users
- Future directions for integration
- Some issues
- Questions
What is OAI-PMH?

OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting) is a protocol developed by the Open Archives Initiative. It is used to harvest (or collect) the metadata descriptions of the records in an archive so that services can be built using metadata from many archives. An implementation of OAI-PMH must support representations metadata in Dublin Core, but may also support additional representations.
### Protocol Requests and Responses

<table>
<thead>
<tr>
<th>Requests</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>GetRecord</td>
<td>Metadata item</td>
</tr>
<tr>
<td>Identify</td>
<td>Information about repository, schema, protocol version and other information</td>
</tr>
<tr>
<td>ListIdentifiers</td>
<td>Returns record header it contains:</td>
</tr>
<tr>
<td></td>
<td>- unique identifier -- the unique identifier of an item in a repository;</td>
</tr>
<tr>
<td></td>
<td>- datestamp -- the date of creation, modification or deletion of the item for the purpose of selective harvesting;</td>
</tr>
<tr>
<td></td>
<td>- zero or more setSpec elements -- the set elements belong to item for the purpose of selective harvesting.</td>
</tr>
<tr>
<td>ListMetadataFormats</td>
<td>is used to retrieve the metadata formats available in a repository</td>
</tr>
<tr>
<td>ListRecords</td>
<td>is used to harvest records from a repository</td>
</tr>
<tr>
<td>ListSets</td>
<td>is used to retrieve the set structure of a repository, useful for selective harvesting.</td>
</tr>
</tbody>
</table>
Requirements for infrastructure

- Data provider
  - Eprints (http://www.eprints.org)
  - Dspace (http://www.dspace.org)
  - Fedora (http://fedora-commons.org)
  - Other software applications which support uploading data in OAI-PMH
- Service provider
  - Open Harvester Systems (http://pkp.sfu.ca/?q=harvester)
  - Omeka (http://omeka.org)
Step by step for building integration environment

1. Select hosting for installation Service provider
   • aggregations many big repositories need a lot of RAM (~3 GB) for PHP execution
   • Crontab
   • Long time execution script
   • Needs dedicated server or VPS

1. Installation and configuration Service provider
   1. Installation Service provider
   2. Customization user interface
   3. Connection digital libraries
   4. Configuration Reading Tools
PKP Open Harvester Systems

- Easy to install
- Long term support
- Easy to upgrade
- Many plugins
- Supports ETD-MS, MARC, Dublin Core, MODS metadata formats
- Good performance
The project http://oai.org.ua started in 2008 and its main goal is to integrate open archives/repositories of Ukraine. Currently, it integrates 35 open archives of Ukraine. And it contains more than 126,000 records. The system was developed and is maintained by Institute of Software Systems of the NAS of Ukraine.
Addition services for end-users

PKP Harvester offers a range of tools that you can use in scientific discovery. For example, the Reading Tools. This tool allows to carry out a quick search of related resources.
# Reading Tools

## Загальні дані

Інтеграція анотацій в Semantic Web. Модель інформаційного середовища

**Zhytomyr State University Library**

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<td>Subject</td>
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<tr>
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"Интеграция аннотаций в Semantic Web. Модель информационного середовища"
Reading Tools

Linked to Scientific Digital Library periodicals NAS of Ukraine
http://dspace.nbuv.gov.ua
Future directions for INFORMATION integration

Protocol OAI-PMH provides a structured data integration, however leaves aside the semantics.

We plan to use the model of semantic description for each resource by using RDFa. This will allow search engines to search for more information.
Future directions

INFORMATION integration

- Support distributed full text search in the archives.
  - We have already developed for EPrints a set of web services that enable searching for metadata fields as well as full-text search. In the near future we plan to introduce this extension to our system http://oai.org.ua.

- The integration of archives based on ontologies
  This direction is being studied by us, and we plan the use of ontologies to integrate heterogeneous resources that harvester collects.
Some issues

- Some users install DSpace without supporting OAI-PMH
- Some EPrints installations do not have unique OAI Repository Identifier
- Repositories can change their URL. It gives additional difficulties in supporting the list of repositories (keeping it up to date).
Questions

Thank you for your attention!