



Introduction to Open Access and the OAI-PMH

15th Hellenic Academic Libraries Conference, University of Patras, Greece

1st – 3rd November, 2006

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Overview of the tutorial

- Overview and Introductions
- Part I
 - History and overview
- Short break (Coffee 18.00)
- Quiz
- Part II
 - Main Ideas of the OAI-PMH
- Part III
 - Implementation issues
- Information Sources



About me

- UKOLN <http://www.ukoln.ac.uk>
- Software developer since 2000
- Resource Discovery projects, especially OAI-PMH
 - Resource Discovery Network
 - The eBank Project
<http://www.ukoln.ac.uk/projects/ebank-uk/>
- Tutorial at CERN OAI3 (2004)

- Slides and tutorial originally developed by the Open Archives Forum, funded by the IST under the EU Fifth Framework Programme.
- Several contributors and donations of slides, including: Herbert Van de Sompel, Carl Lagoze, Michael Nelson, Simeon Warner, Andy Powell, Pete Cliff, Uwe Muller (and possibly others!).
- UKOLN for my time



Tutorial 1

An introduction to the Open Archives Initiative and the Protocol for
Metadata Harvesting

Part I: History and basic concepts



The Open Archives Approach

- Facilitates access to heterogenous web-accessible material
- A low-barrier interoperability solution
- Based on repositories supporting
 - Metadata sharing
 - Publishing
 - Archiving
- Arose out of the e-print community
- 2 main features
 - Open Archives Initiative
 - OAI Protocol for Metadata Harvesting (OAI-PMH)



The Open Archives Initiative

- Mission
 - "The Open Archives Initiative develops and promotes interoperability standards that aim to facilitate the efficient dissemination of content."
- Executive for management, Steering and Technical Committees
- Funding
 - Digital Library Federation (DLF)
 - National Science Foundation (NSF)
 - Coalition for Networked Information (CNI)
- Participation of a world-wide community, especially Europe and North America

- A mechanism for harvesting
- Data providers make metadata available for harvesting
- Service Providers harvest metadata
- Metadata can be centrally collected or “aggregated”
- That’s all it is: a way to bring metadata together in one place!



Open Archives Forum Tutorial

- Task List Page
- Task 1 Seven key definitions
- Web link
 - <http://www.oaforum.org/tutorial/english/page1.htm#section3>

- Early activity: scholarly research (eprints archive)
 - XXX (arXiv) – high energy physics
 - CogPrints - psychology
 - NCSTRL – computer science technical reports
 - RePEc - economics
- Web interfaces for people
 - No machine interfaces
- Different interfaces for different archives
- End Users forced to learn diverse interfaces
- Little or no autonomous metadata sharing

- “...the joint impact of these and future initiatives can be substantially higher when interoperability between them [e-print archives] can be established...”

[Ginsparg, Luce, Van de Sompel, UPS Call, July 1999]



The Problems

Two problems:

- End users were/are faced with multiple search interfaces making resource discovery harder.
- No machine based way of sharing the metadata

- US Digital Library Experience suggests cross searching doesn't scale - $N > 100 = \text{bad!}$
- Collection description - knowing which target to use
- Query language and search attribute variation
- Rank merging problem
- Different size and type of target can skew results
- Performance - limited to slowest target
- Difficult to build a browse interface

SOLUTION: get all the metadata records in one place



Harvest?

- Harvest records out of archives into one place
- Universal Preprint Service Prototype

So:

- $N = 1$ most of the time...
- One query language, set of search attributes and ranking algorithm
- An awareness of the data makes browse structures easier to build
- UPS was quickly changed to OAI - the Open Archives Initiative

- Data Provider
 - Creators and keepers of the metadata and repositories of resources
 - Handle deposit and publishing
- Service Provider
 - Harvesters of metadata for the purpose of providing a service such as a search interface, peer-review system, etc.
- One 'service' can play both roles

To facilitate metadata harvesting there needs to be agreement on:

- Transport protocol - HTTP or FTP or ...
- Metadata format - Dublin Core or MARC or ...
- Metadata Quality Assurance - mandatory element set, naming and subject conventions, etc.
- Intellectual Property and Usage Rights - *who can do what with what?*

- Agreement led to (fanfare): the Santa Fe Convention

- First incarnation of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)
- Drew upon:
 - The UPS Prototype
 - RePEc/SODA - the Service/Data provider model
 - the Dienst Protocol
 - Work of the Santa Fe group
- To “optimise the discovery of e-prints”



The OAI-PMH 1.0

- Introduced Dublin Core element set
- Drew upon:
 - Santa Fe Convention
 - Digital Library Federation meetings
 - Work at Cornell
 - Feedback from alpha-testers
- A new focus to facilitate the discovery of “document-like objects”



The OAI-PMH 1.0 - Summary

- Low barrier interoperability specification
- Based around metadata harvesting model
- Focus on “document-like objects”
- HTTP based
- GET / POST requests
- XML responses
- Uses unqualified Dublin Core
- Not a search protocol!
- **Experimental**



The OAI-PMH 1.1

- A revision of the 1.0 specification taking account of changes to the emerging XML Schema specification



The OAI-PMH 2.0

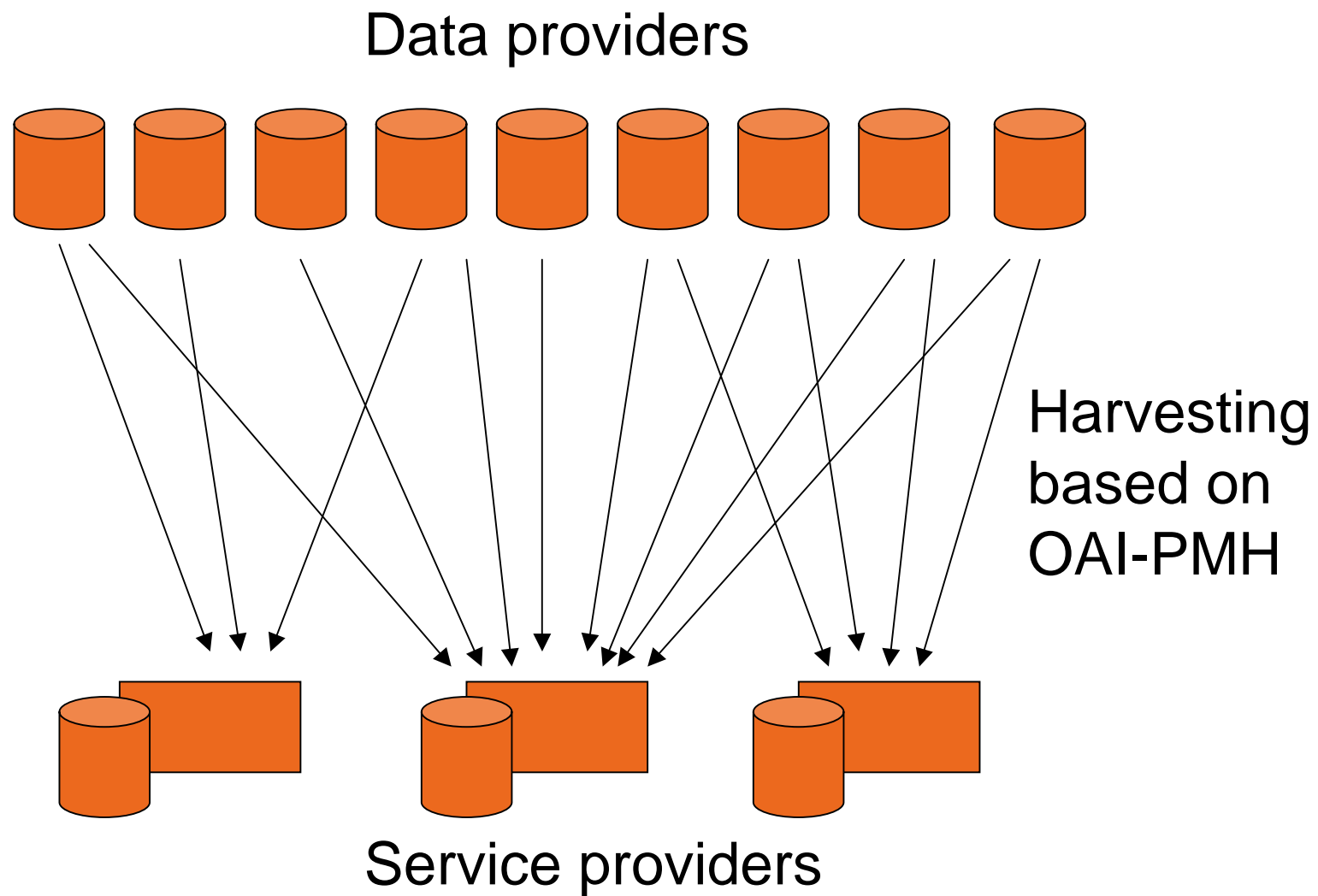
- Major revision - not compatible with 1.x
- Drew upon:
 - OAI-PMH 1.x
 - Feedback from OAI Implementers List
 - OAI tech deliberation
 - Feedback from alpha-testers
- “the recurrent exchange of metadata about ***resources*** between systems”

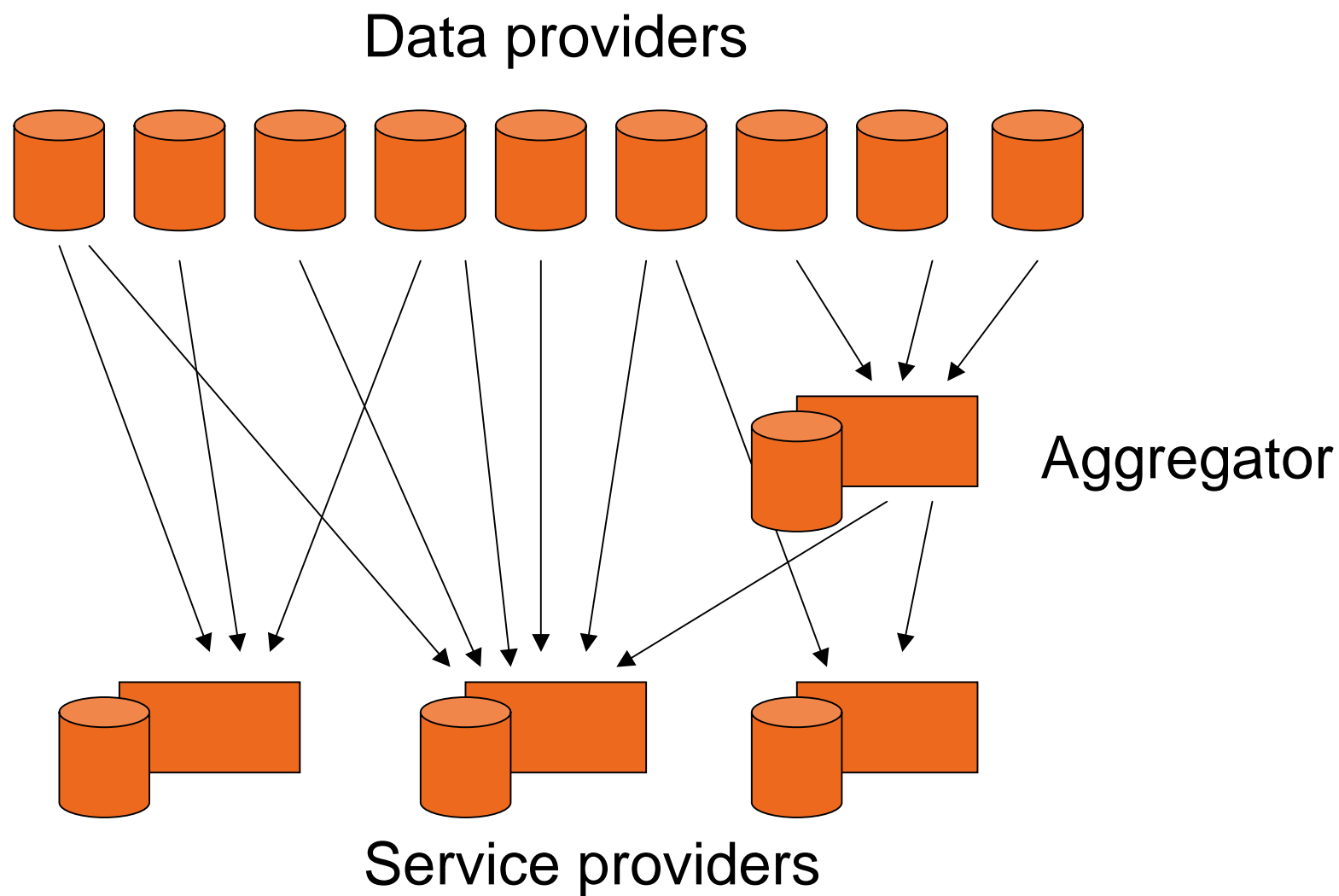


The OAI-PMH 2.0 - Summary

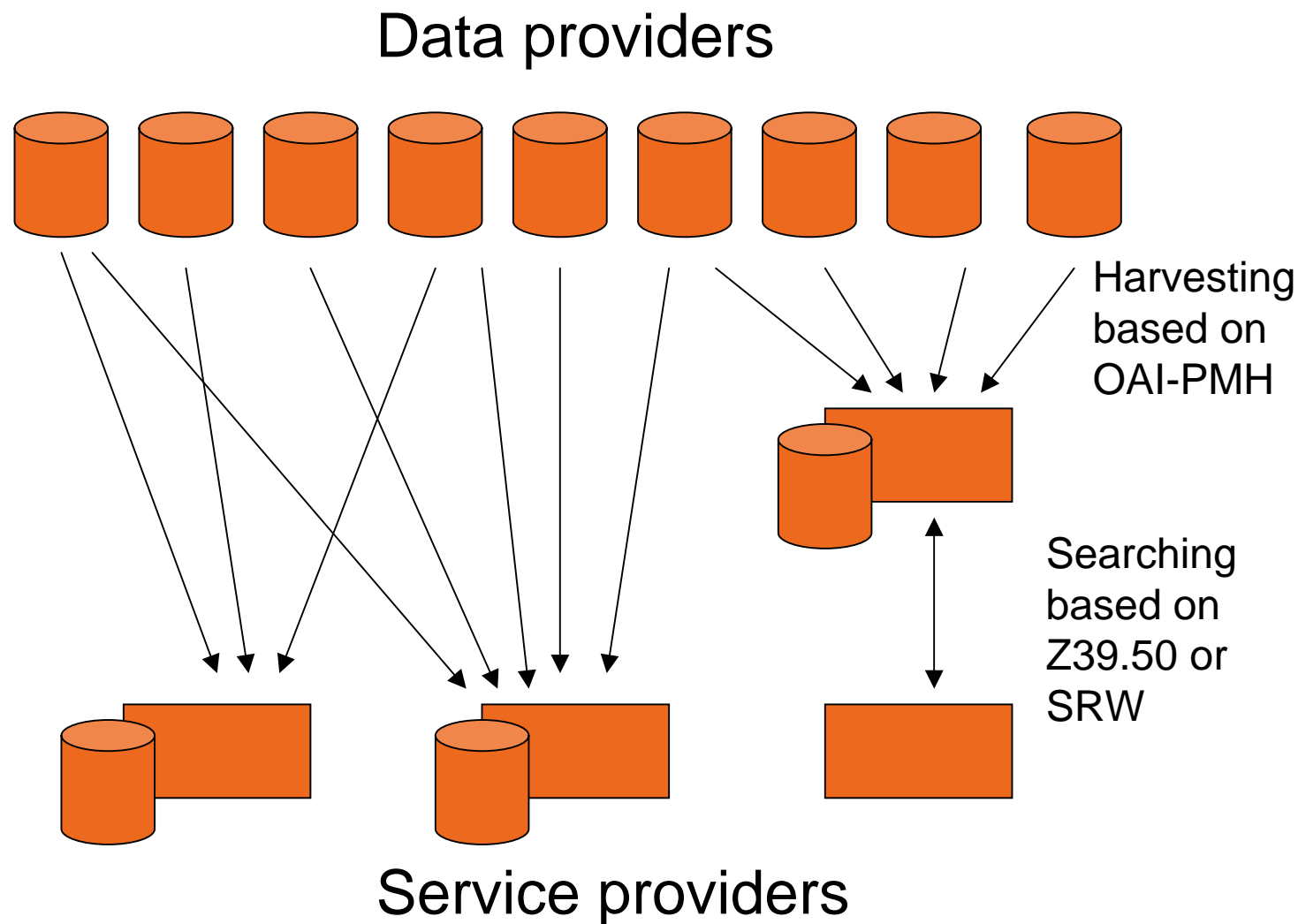
- Still a low barrier interoperability specification
- Based around metadata harvesting model
- **Metadata about resources**
- HTTP based
- GET / POST requests
- XML responses
- Uses unqualified Dublin Core
- Not a search protocol!
- **Stable - OAI has committed to making subsequent revisions of the protocol backwards compatible**

Multiple data and service p's





Can be mixed with x-searching





The Benefits of OAI-PMH

- Simple
- Web (and so firewall) friendly
- Access-control, compression, error codes, etc. based on HTTP
- Many toolkits - can hide the protocol from developers
- Multiple SPs can harvest from multiple DPs ensuring a wider spread of metadata
- A base layer to build other services on
- Complements search protocols like Z39.50

- Early movers developing separately
- Need for interoperability
- Santa Fe Meeting led to OAI
- OAI promotes interoperability via:
- OAI-PMH
 - Low cost
 - Harvest model
 - Data Providers / Service Providers
 - Simple, easy and built on existing technology
 - An open standard



Open Archives Forum Tutorial

- Task Page
- Task 2: Sources of further information
- Web link
 - <http://www.oaforum.org/tutorial/english/page2.htm#section9>

Tutorial 1

An introduction to the Open Archives Initiative and the Protocol for
Metadata Harvesting

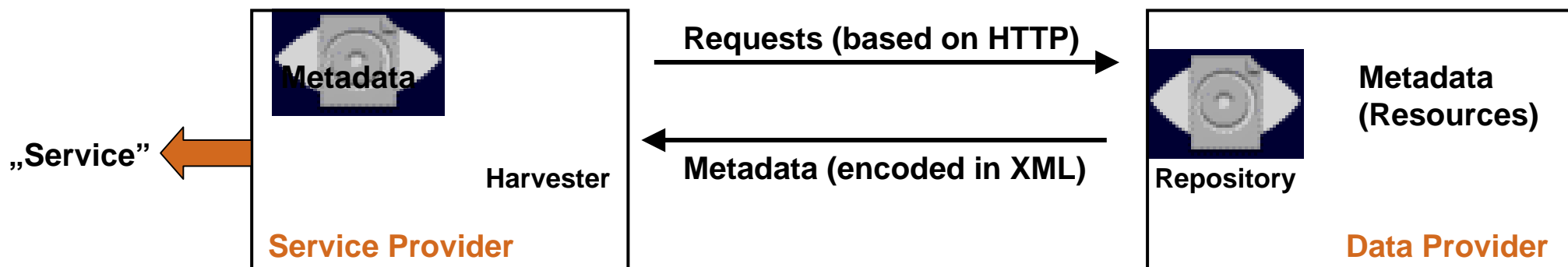
Part II: Main Ideas of OAI-PMH



Open Archives Forum Tutorial

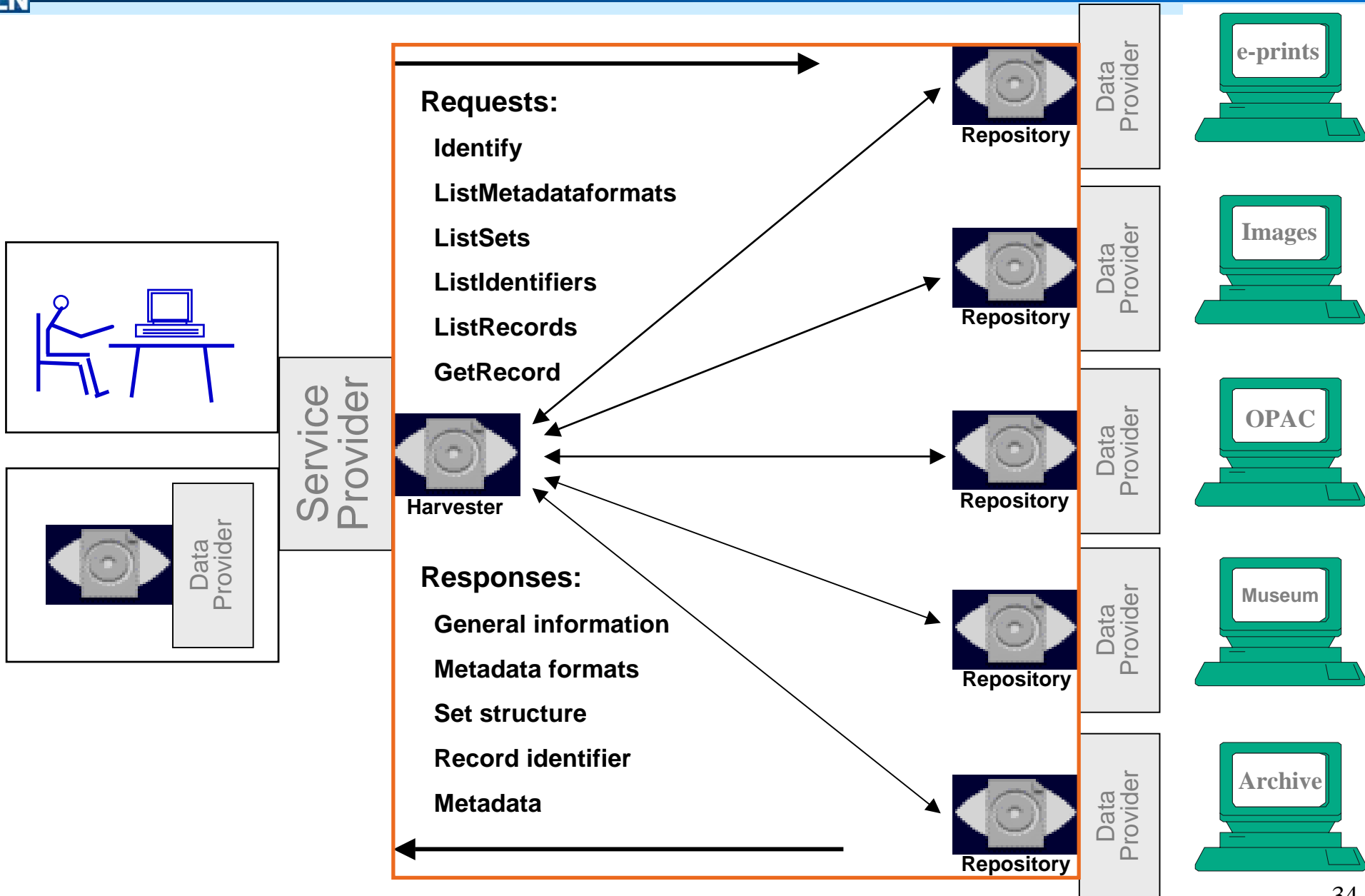
- Task Page
- Task 3 Quiz
- Web link
 - <http://www.oaforum.org/tutorial/english/page1.htm#section5>

- Main ideas
 - ✗ world-wide consolidation of scholarly archives
 - ✗ free access on the archives (at least: metadata)
 - ✗ consistent interfaces for archives and service provider
 - ✗ low barrier protocol / effortless implementation
 - ✗ based on existing standards (e.g. HTTP, XML, DC)
- Basic functioning of protocol



- two groups of ‘participants’
- *Data Providers* (Open Archives, Repositories)
 - ✗ free access of metadata
 - ✗ not necessarily: free access to full texts / resources
 - ✗ easy to implement, low barriers
- *Service Providers*
 - ✗ use OAI interfaces of the *Data Providers*
 - ✗ harvest and store metadata (no live requests!)
 - ✗ may select certain subsets from *Data Providers*
(set hierarchy, date stamp)
 - ✗ may enrich metadata
 - ✗ offer (value-added) service on the basis of the metadata

OAI-PMH: Structure Model



- ✗ protocol based on HTTP
- ✗ request arguments as GET or POST parameters
- ✗ six request types
- ✗ e.g. `http://archive.org?verb=ListRecords&from=2002-11-01`
- ✗ responses are encoded in XML syntax
- ✗ supports any metadata format (at least: Dublin Core)
- ✗ logical set hierarchy (definition: data providers)
- ✗ date stamps (last change of metadata set)
- ✗ error messages
- ✗ flow control



Protocol Details: Definitions

Harvester

- ✘ client application issuing OAI-PMH requests

Repository

- ✘ network accessible server, able to process OAI-PMH requests correctly

Resource

- ✘ object the metadata is “about”, nature of resources is not defined in the OAI-PMH

Item

- ✘ component of an repository from which metadata about a resource can be disseminated
- ✘ has an unique identifier

Record

- ✘ metadata in a specific metadata format

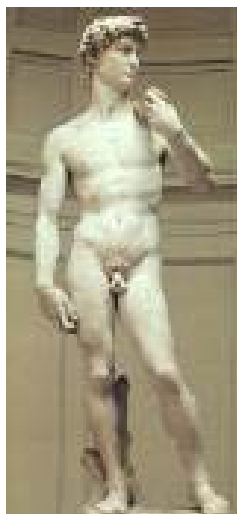
Identifier

- ✘ unique key for an item in a repository

Set

- ✘ optional construct for grouping items in a repository

Protocol Details: Definitions (2)



← resource

item =
identifier

all available metadata
about *David*

← item

Dublin Core
metadata

MARC
metadata

SPECTRUM
metadata

← records

- metadata of a resource in a specific format
- three parts
 1. header (mandatory)
 - * identifier (1)
 - * datestamp (1)
 2. metadata (mandatory)
 - * XML encoded metadata with root tag, namespace
 - * repositories must support Dublin Core
 - * May support other formats
 3. about (optional)
 - * rights statements
 - * provenance statements



- OAI-PMH supports dissemination of multiple metadata formats from a repository
- properties of metadata formats
 - ✘ id string to specify the format (`metadataPrefix`)
 - ✘ metadata schema URL (XML schema to test validity)
 - ✘ XML namespace URI (global identifier for metadata format)
- repositories must be able to disseminate unqualified Dublin Core
- arbitrary metadata formats can be defined and transported via the OAI-PMH
- returned metadata must comply with XML namespace specification

- minimum standard: unqualified Dublin Core
 - ✗ <http://dublincore.org/>
 - ✗ Dublin Core Metadata Element Set contains 15 elements
 - ✗ elements are optional
 - ✗ elements may be repeated

The Dublin Core Metadata Element Set:

Title	Contributor	Source
Creator	Date	Language
Subject	Type	Relation
Description	Format	Coverage
Publisher	Identifier	Rights



Request Types

- six different request types
 1. Identify
 2. ListMetadataFormats
 3. ListSets
 4. ListIdentifiers
 5. ListRecords
 6. GetRecord
- harvester has not to use all types
- repository must implement all types
- required and optional arguments
- depend on request types

verb=ListIdentifiers&from=2002-01-06&until=2002-01-08&
metadataPrefix=oai_dc&set=doctypes:dissertations

```
<?xml version="1.0" encoding="UTF-8"?>
<OAI-PMH xmlns="http://www.openarchives.org/OAI/2.0/"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/
    http://www.openarchives.org/OAI/2.0/OAI-PMH.xsd">
  <responseDate>2002-10-22T17:49:49+01:00</responseDate>
  <request verb="ListIdentifiers" from="2002-01-03" until="2002-01-08" metadataPrefix="oai_dc"
    set="doctypes:dissertations">http://edoc.hu-berlin.de/OAI-2.0</request>
  <ListIdentifiers>
    <header>
      <identifier>oai:HUBerlin.de:3000819</identifier>
      <timestamp>2002-01-08</timestamp>
      <setSpec>doctypes</setSpec>
      <setSpec>doctypes:dissertations</setSpec>
      <setSpec>dnb</setSpec>
      <setSpec>dnb:dnb33</setSpec>
    </header>
    <header>
      <identifier>oai:HUBerlin.de:3000831</identifier>
      <timestamp>2002-01-07</timestamp>
      <setSpec>doctypes</setSpec>
      <setSpec>doctypes:dissertations</setSpec>
      <setSpec>dnb</setSpec>
      <setSpec>dnb:dnb27</setSpec>
    </header>
  </ListIdentifiers>
</OAI-PMH>
```

- Logical partitioning of repositories
- Optional – archives do not have to define sets
- No recommendations
- Also support selective harvesting
- Useful sets are defined by the community where they are used:
 - ✘ publication types (thesis, article, ...)
 - ✘ document types (text, audio, image, ...)
 - ✘ content sets, according to DNB (medicine, biology, ...)



Protocol Details: Datestamps

- date of last modification of a metadata set
- mandatory characteristic of every item
- enables selective harvesting

Example





Task 4

Using Repository Explorer

- <http://re.cs.uct.ac.za/>
- Tasks
 - Scroll down the alphabetical list to find the arXiv repository
 - Click on the **Identify** link in the **Verbs** box
 - Scroll down, Click on the **list Metadata Formats** link
 - Write oai_dc into the **MetadataPrefix** box in the parameters section
 - Click on **ListRecords**
 - Copy the **identifier** from the **header** section of the first result, scroll to the bottom of the page and paste the identifier into the identifier box of the parameters section
 - Select **raw XML** in the **display** section and click **GetRecord** in the **verbs** section

Tutorial 1

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Part III: Implementation Issues

1. Data Provider or Service Provider
2. Metadata Records
3. Tools and services
4. Examples



Data Provider

- Which data do I want to deliver?
- Which service providers do I want to provide with data?

Service Provider

- Which Service do I want to provide?
- From which data providers do I get the metadata?
- In which way the metadata have to be processed?

Data Provider & Service Provider

- Which aspects do we have to agree upon?

- required: unqualified Dublin Core
- special subjects / communities: other metadata specifications may be required
 - ✘ describe resources in a specialised way
 - ✘ definition of an XML schema (publicly available for validation)
- define set hierarchy
 - ✘ sensible partitioning for selective harvesting
 - ✘ agreement between data providers and between data and service providers

- aggregated data providers
 - ✘ if harvested by a service provider, “sub data providers” should not be harvested by same SP (duplication ...)
- subject gateways
 - ✘ selective harvesting if corresponding sets have been defined and implemented

- metadata on resources (“items”)
 - ✗ should be stored in (SQL) database
 - ✗ possible in case of need: file system ...
 - ✗ unique identifier for each item
- web server, accessible via the internet
 - ✗ e.g. apache, IIS
- programming interface / API
 - ✗ e.g. Perl, PHP, Java-Servlet
 - ✗ web server extension
 - ✗ access to database (or filesystem)
 - ✗ not needed: session management

- archive identifier / base URL
- unique identifier for items
- metadata format (at least: unqualified Dublin Core)
- timestamps for metadata (created / last modified)
- logical set hierarchy (may have)
 - ✘ agreement within (subject) communities
- flow control / implementation of resumption token (optional, 'larger' archives should have that)



Service Provider: Prerequisites

- internet connected server
- database system (relational or XML)
- programming environment
 - ✘ can issue HTTP requests to web servers
 - ✘ can issue database requests
 - ✘ XML parser

1. Data Provider or Service Provider
2. Metadata Records
3. Tools and services
4. Examples

- OAI-PMH uses XML Schemas
- Schemas described what is allowed in an XML document
- Schemas have a 'name' (namespace)
- Schemas have a physical location (commonly on the web)
- Example

http://www.openarchives.org/OAI/2.0/oai_dc/

Namespace



http://www.openarchives.org/OAI/2.0/oai_dc.xsd

Location





OAI-PMH and XML schemas

- Any XML with an XML Schema = OK for OAI!
- OAI-PMH mandates 'oai_dc' schema
- OAI-PMH documentation includes schema for
 - RFC1807 metadata
 - MARC21 metadata (Library of Congress)
 - oai_marc metadata

Example: <http://edoc.hu-berlin.de/OAI-2.0?>

verb=GetRecord&identifier=oai:HUBerlin:3000819&
metadataPrefix=oai_dc

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<OAI-PMH xmlns="http://www.openarchives.org/OAI/2.0/"  
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

```
  xsi:schemaLocation="http://www.openarchives.org/OAI/2.0/
```

```
    http://www.openarchives.org/OAI/2.0/OAI-PMH.xsd">
```

```
<responseDate>2002-11-27T14:57:01+01:00</responseDate>
```

```
<request verb="GetRecord" metadataPrefix="oai_dc"
```

```
  identifier="oai:HUBerlin.de:3000819">http://edoc.hu-berlin.de/OAI-2.0</request>
```

```
<GetRecord>
```

```
<record>
```

```
<header>
```

```
<identifier>oai:HUBerlin.de:3000819</identifier>
```

```
[...]
```

```
</header>
```

```
<metadata>
```

```
<oai_dc:dc xmlns:oai_dc="http://www.openarchives.org/OAI/2.0/oai_dc/"
```

```
  xmlns:dc="http://purl.org/dc/elements/1.1/"
```

```
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

- Mandatory ‘Lowest Common Denominator’
- Simple unqualified DC schema
- A Container schema is also required
 - OAI specific
- Locations:
 - Container schema hosted @ OAI Web site
 - Imports a generic DCMES schema
 - DCMES schema @ DCMI Web site

- oai_dc is a simple format providing baseline interoperability
- It may not be suitable:
 - Not enough (or the required) elements!
 - Not very precise - it is an “unqualified” MES
 - (not covered in this talk... Sorry!)
 - Not the metadata format you need ie. not:
 - IMS/IEEE LOM - eLearning metadata
 - ODRL - Open Digital Rights Language
 -



oai_dc... is not the MES I'm looking for

- Implement a different format eg. IMS/IEEE LOM
- Already agreed names, XML schema and namespaces
- Easier than creating your own schema
- Create test records and validate
- Modify repository (source code and/or configuration files) to support new format
 - e.g. listMetadataRecords response
- Test and validate new repository output



Extending a format

- Decide a name and some namespaces
- Develop XML schema for the container and the new elements
- Create test records and validate
- Modify repository (source code and/or configuration files) to support new format
- Test and validate new repository output

- OAI-PMH allows for any MES so long as...
- ...it is encoded in XML with an XML Schema
- All repositories *must* support oai_dc for...
- ...minimum level of interoperability
- If oai_dc is not enough - extend it!
- If oai_dc is not 'the one' - use something else as well!



Agenda

1. Data Provider or Service Provider
2. Metadata Records
3. Tools and services
4. Examples

Choosing tools

- Choice depends on
 - Technical skills available
 - Type of repository or service
- Evaluations and comparisons
 - Guide to institutional repository Software (Aug 2004)
<http://www.soros.org/openaccess/software/>
 - DAEDALUS: Initial experiences with EPrints and DSpace at the University of Glasgow <http://www.ariadne.ac.uk/issue37/nixon/>
(Ariadne – 2003)
 - DSpace vs. ETD-db: Choosing software to manage electronic theses and dissertations <http://www.ariadne.ac.uk/issue38/jones/>
 - Technical criteria for evaluating repository software (2005)
<http://www.ukoln.ac.uk/distributed-systems/jisc-ie/arch/ir-software.pdf>

- Large choice see list at
 - <http://www.openarchives.org/tools/>
- Most are open source
- Available for a variety of platforms
- Difference in emphasis
 - Metadata formats supported
 - Configurability
 - Use out of the box or programming library



Tool Examples

- Dspace
 - <http://www.dspace.org/>
- Eprints.org
 - <http://www.eprints.org/>
- Fedora
 - <http://www.fedora.info>
- Develop your own (if none of these meet your requirements)



How to advertise your service and find data providers

- Repository Explorer
 - <http://re.cs.uct.ac.za/>
- OAISTER
 - <http://www.oaister.org/>
- ROAR (Southampton)
 - <http://archives.eprints.org/>
- OpenDOAR
 - <http://www.opendoar.org>
- DOAJ (Open Access Journals)
 - <http://www.doaj.org/>

1. Data Provider or Service Provider
2. Metadata Records
3. Tools and services
4. Examples

https://portfolio.oit.duke.edu/index.jsp





The LACITO Archive

http://lacito.vjf.cnrs.fr/archivage/index.html

Le Programme Archivage du LACITO - Microsoft Internet Explorer provided by the University of Bath

File Edit View Favorites Tools Help

Address <http://lacito.vjf.cnrs.fr/archivage/>

The LACITO Archive
An archive of natural spe

Home page
Version française
The archive
About the Archiving project
Contacts

For linguistic science, language is fir
LACITO archive gives access to orig
authenticity and as a resource for tur

A sound archive with syn

A structured, open archi

The archived data is structured in ac
downloaded for research purposes.

Copyright

The Archive is an ongoing project of
National Center for Scientific Resear

Copyright of Archive documents is h
contact the project for any other use.

LACITO
(Laboratoire de LANGUES
et CIVILISATIONS à
TRADITION ORALE)

Yemeni Arabic [about the language](#) Another language

Title: **Yemenit story from Sanaa** [metadata](#) Another Yemeni Arabic text

View: Show

Search list: (left column) phonetic forms glosses Show

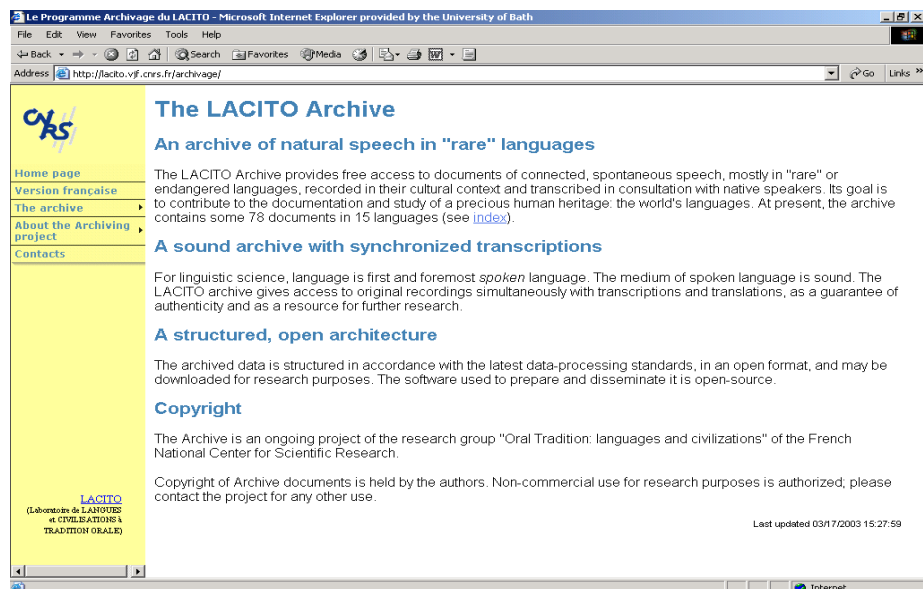
Search list:

- [a](#)
- [a:k](#)
- [abet](#)
- [abu](#)
- [abu:](#)
- [ah](#)
- [ak](#)
- [al](#)
- [albas](#)
- [alla](#)
- [alla:h](#)
- [allah](#)
- [alli](#)
- [an](#)
- [ana](#)
- [ant](#)
- [antu](#)
- [arzañ](#)
- [asa:biñ](#)
- [asraf](#)
- [at](#)
- [awwal](#)
- [ay](#)
- [avn](#)

1. şallu ʃa n-nabi:
imp.pl.prier loc. art.-Prophète
2. ʔalla mʃalli wa sallam ʃala ʔa:tim an-nabiyy-i:n wa sayyid al-mursal-i:n
Dieu partc.prier et acc.3sg.saluer loc. dernier art.-Prophète-suf.pl. et seigneur art.-envoyé-suf.pl.
3. ga:lu ka:n bih wa:hed ta:zer
acc.3pl.dire exp.tps. cop.exist. un commerçant
4. ligiy ʔabi:r sa:r w ʃalla fi-l ʔa:miñ w ligiy ʔabi:r-eh
acc.3sg.trouver ami acc.3sg.aller et acc.3sg.prier loc.-art. mosquée et acc.3sg.trouver ami-suf.
5. b-yitha:kaw w kayf ʔa:l-ak w min ha:na la hunak
part.-inacc.3pl.parler et comment état-suf. et loc. déic.ici dir. déic.là-bas
- 6.

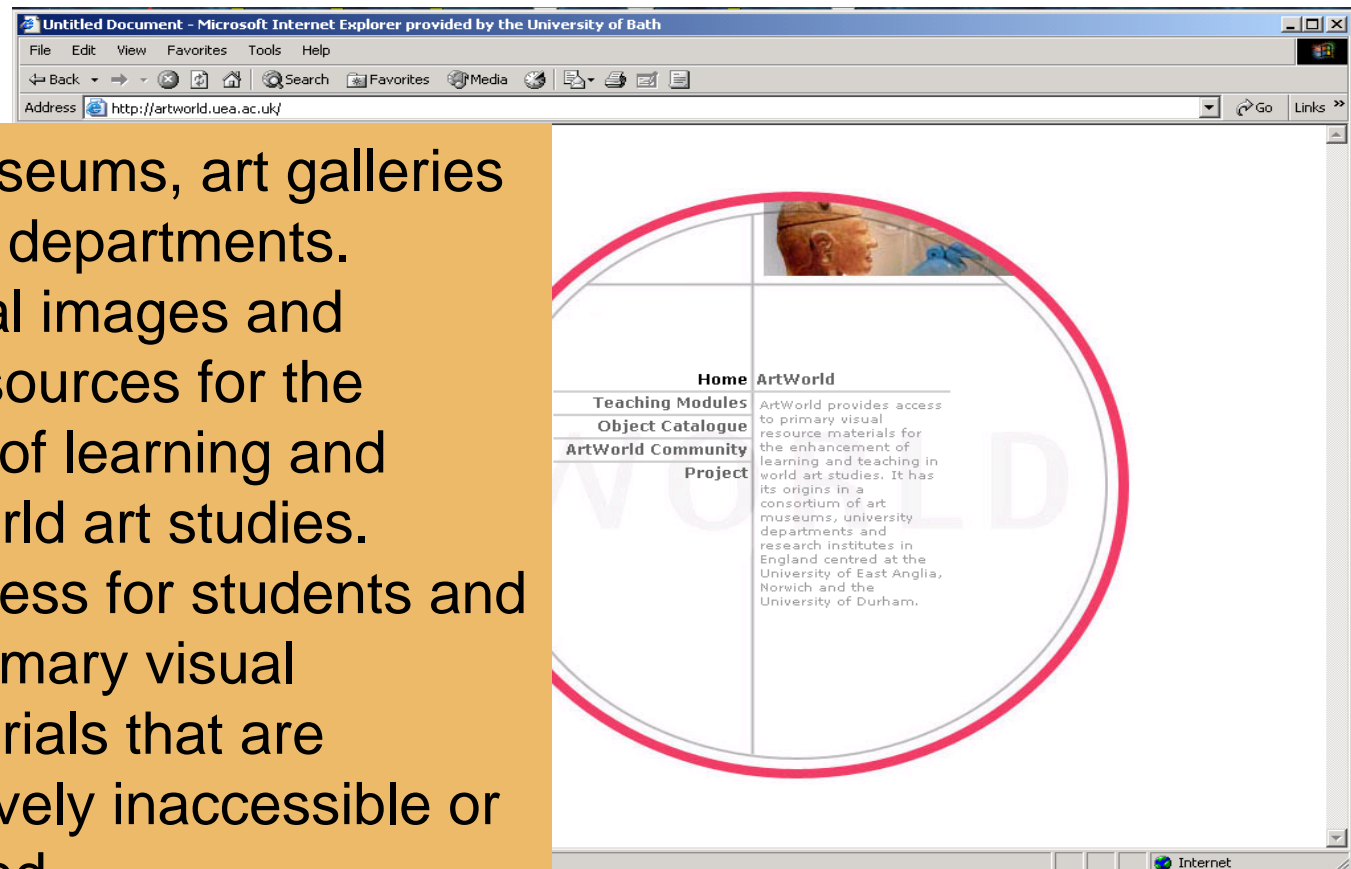
Done Internet

- The LACITO Archive
 - An archive of natural speech in “rare” languages
- Gives access to original recordings, with transcriptions and translations



<http://artworld.uea.ac.uk/>

- A group of museums, art galleries and academic departments.
- Provides digital images and associated resources for the enhancement of learning and teaching in world art studies.
- Facilitates access for students and teachers to primary visual resource materials that are normally relatively inaccessible or widely scattered.





http://www.darenet.nl/nl/page/language.view/search.page

Instant message | vwebmail | Radio | People | Yellow Pages | Download | Calendar | Channels

15th Hellenic Academic Libr... | June 2005 Birth Club | Extended breastfeeding | **DAREnet** | JISC Digital Archives of JISC-REPOSIT...

DARE Digital Academic Repositories
Een SURF-programma

SURF

Home | Nederlands

DAREnet

Cream of Science
Promise of Science
Repositories
Services
DARE
Contact

News

Balancing rights and interests in the digital age
2006-10-25
New international model agreement for...
[read more](#)

SURF DARE project gains European-wide adoption

Worldwide access to Dutch academic research results

DAREnet is a search service which gives free access to academic research output in the Netherlands. This is a broad collection which guarantees digital accessibility to the full text without any restrictions. DAREnet consists of **85831** digital objects.

DAREnet Cream of Science Promise of Science

Searchterm(s) [Advanced >>>](#)

You can search with:

- **DAREnet** containing **85831** scientific publications and research output from all Dutch universities, scientific institutes, KNAW and NWO.
- **Cream of Science** containing **45740** scientific publications written by more than 200 prominent scientists in the Netherlands.
- **Promise of Science** with **11973** doctoral e-theses from all Dutch universities.

You can search in all institutions, or you can select 'Advanced Search' to search by institution, search by year, and/or search for a specific author.

DAREnet is the result of the DARE programme, funded by SURF. All Dutch universities, the National Library of the Netherlands, the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Netherlands Organisation for Scientific Research (NWO) participate.

Done

- During today's tutorial I hope that you have
 - ✘ gained an overview of the history behind the OAI-PMH and an overview of its key features
 - ✘ acquired an understanding of how the protocol works
 - ✘ learned something about some of the main implementation issues
 - ✘ gained familiarity with the OAForum tutorial and learned where to look for more information
 - ✘ become comfortable with the terminology used
 - ✘ started thinking about how you will be using OAI in your institution



Questions

- now...
- feel free to tell me what you didn't understand
- and ask general questions

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- Open Archives Initiative (OAI official Web site)
 - <http://www.openarchives.org/>
- Open Archives Forum (OA-Forum Web site)
 - <http://www.oaforum.org/>
- OAI-PMH protocol specification
 - <http://www.openarchives.org/OAI/openarchivesprotocol.html>
- Implementation guidelines:
 - <http://www.openarchives.org/OAI/2.0/guidelines.htm>

- OAI general mailing list
 - <http://www.openarchives.org/mailman/listinfo/OAI-general/>
- JISC digital repositories wiki
 - http://www.ukoln.ac.uk/repositories/digirep/index/JISC_Digital_Repository_Wiki
- JISC repositories mailing list
 - <http://www.jiscmail.ac.uk/lists/jisc-repositories.html>
- OA-Forum expert reports and reviews of organisational and technical issues
 - Links from <http://www.oaforum.org/documents/>



Resources

- Repository explorer
 - <http://re.cs.uct.ac.za/>
- Tools
 - <http://www.openarchives.org/tools/>
- Implementers mailing list
 - <http://www.openarchives.org/mailman/listinfo/OAI-implementers/>
- Dublin Core
 - <http://dublincore.org/>
- The Eprints User's Handbook
 - <http://www.eprints.org/documentation/handbook>



- ArXiv
 - <http://arXiv.org/>
- RePec
 - <http://www.repec.org/>
- Cogprints
 - <http://cogprints.org/>
- NCSTRL:
 - <http://www.ncstrl.org/>



Examples of Service Providers

- Intute – UK service
 - <http://irs.ukoln.ac.uk/> (experimental)
- Printing on Demand Service
 - <http://www.proprint-service.de>
- DINI
 - <http://edoc.hu-berlin.de/oaisearch/>
- Physnet
 - <http://physnet.uni-oldenburg.de/oai/query.php0>
- ARROW
 - <http://www.arrow.edu.au/>

–Task 1 Seven Key Definitions

–<http://www.oaforum.org/tutorial/english/page1.htm#section3>

–Task 2 Sources of Further Information

–<http://www.oaforum.org/tutorial/english/page2.htm#section9>

–Task 3 Quiz

–<http://www.oaforum.org/tutorial/english/page1.htm#section5>

–Task 4 Using Repository Explorer

–<http://re.cs.uct.ac.za/>

–Task 5 Exploring some service interfaces: choose from

•<https://portfolio.oit.duke.edu/index.jsp>

•<http://artworld.uea.ac.uk/>

–Or any of the data or service providers or archives listed under Resources