

# Introduction to Digital Libraries

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## Federations and Hierarchies at a Higher Level – Networked DLs

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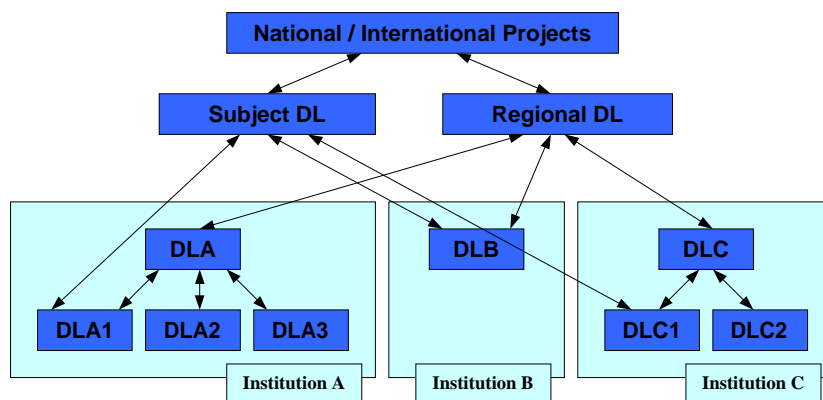
## Design Decisions

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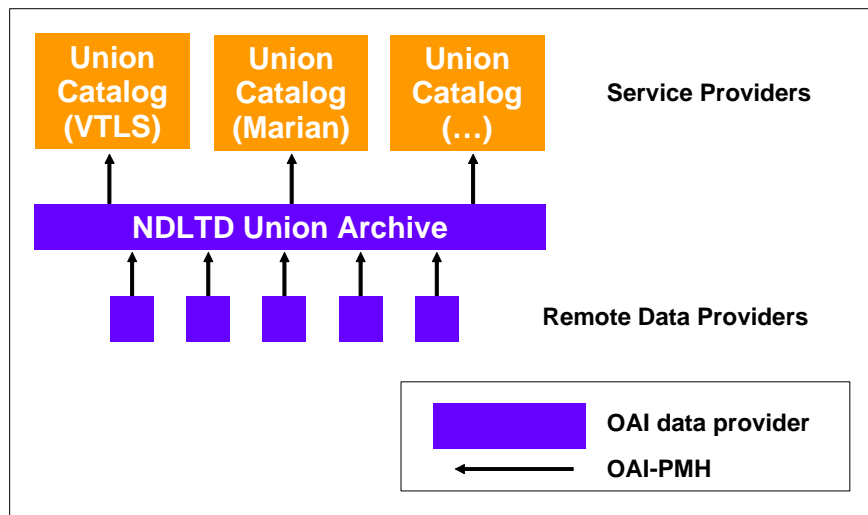
- ❑ Metadata standard(s).
- ❑ Metadata standard(s) semantics.
- ❑ Metadata encoding(s).
- ❑ Communication principles/mechanisms:
  - federation and/or harvesting
  - synchronous and/or asynchronous
  - stateless and/or stateful
- ❑ Privacy, security, etc.

## General Model

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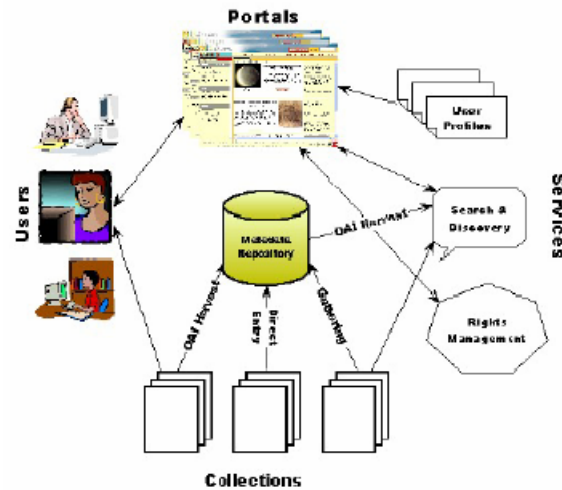
## NDLTD 1/2



## NDLTD 2/2

- ❑ Multiple metadata formats: MARC, DC, ETDMS.
- ❑ Central metadata archive maintained by OCLC – metadata is harvested, gathered and submitted “manually”.
- ❑ Member sites are either single institutions (e.g., UHK) or cooperatives (e.g., PhysNet).
- ❑ Parallel services provided by:
  - MARIAN search system (VT)
  - Virtua (VTLS) – <http://www.vtls.com/ndltd>

## NSDL 1/2



Lagoze, et. al. (2002) Core Services in the Architecture of the National Digital Library for Science Education (NSDL), JCDL 2002.

## NSDL 2/2

- ❑ 8 metadata formats, including Qualified-DC and IMS Metadata Set.
- ❑ Central metadata archive maintained by Cornell University/US-NSF – metadata is harvested, gathered and submitted “manually”.
- ❑ Member sites are mostly subject-based digital archives (e.g., CITIDEL for computer science).
- ❑ Piecewise services provided by:
  - NSDL Core Integration Team
  - NSDL Service Partners

## RePEc

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- Research Papers in Economics
- “Many archives ==> One dataset ==> Many services”
- Uses a standard (pre-XML) metadata format and static files on anonymous FTP servers (simplicity!).
- Central but mirrored metadata collection.

## Federated Resources: Appropriate Copies

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- When multiple archives contain a copy of a resource, which one should users be directed to?
- Issues
  - cost, network speed
- SFX is a context-sensitive linking system where users are directed to local or accessible copies of resources.
  - Transparent access to appropriate copies of resources!

## Federated Service Suites: OpenURL

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- Extension of SFX ideas from “appropriate copies” to “appropriate services”.
- Context-sensitive reference linking to services associated with resources.
- Based on a specific format for URLs (hence the name).
  
- Example:
  - <http://sfxserv.rug.ac.be:8888/rug?id=doi:10.1074/jbc.M004545200>
  - (from DLib paper on OpenURL)

## Federated Metadata and DeDuping

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- How do we reconcile multiple records in an archive that describe the same resource?
  - Keep multiple metadata records?
  - Delete least descriptive / oldest records?
  - Link records?
  
- Protocol solution: OAI has a container for record provenance
  
- Metadata solution: DC has a relation field but IMS has a relation category of fields!

## Federated Search

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- Z39.50 / ZING
- Dienst / OpenDLib
- SDLIP (Simple Digital Library Interoperability Protocol)
  - Defines simple HTTP/CORBA-based interfaces for remote searching (esp. wrapping existing search systems)
  - Stateless/full a/synchronous operation
  - 3 sub-interfaces
    - source metadata
    - search
    - result access

## Federated Authentication

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- Shibboleth is a networked authentication/authorisation model.
  - Single sign-on model.
  - Access without identity!
    - Only by attributes e.g., student at UCT.
  - Privacy is user-controlled – users can decide how much information to pass on to third parties.
  - Trust relationships are established among collaborating systems out-of-band.
  - SAML records are exchanged to specify attributes (and club membership) of users.
- Security Assertion Markup Language (SAML) is an XML-based security assertion language.

## Other Federated Services

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- Dienst / OpenDLib / ODL ?
- W3C's Annotea
  - Remote annotation management service
- Any service that is traditionally provided locally can be provided remotely, using Web Services and Web-based services.
- What issues arise because of distribution?
  - latency, stability, state, security, ...
- Bottom line:
  - shared (metadata+services)=networked digital libraries



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