Linking Systems
Transforming Resource Sharing
Through ISO ILL and Other
Standards

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Background on
Library Communications Protocols
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1.1 What is this item? Who owns it?

1.2 Libraries X, Y & Z own copies

1.3 Who are X, Y, Z? Will they lend items to me? Do I have to pay?

1.3 Z is a consortial friend, Y is ...

2.1 Will you lend this item to me?

2.2 Sorry, it's out on loan

2.3 Will you lend this item to me?

3.1 Will you lend this item to me?

3.2 Is this item available for loan?

3.2.1 Is this item available for loan?

3.2.2 The Circ. System indicates it's out on loan

3.3 Sorry, our copy is on loan

4.1 Will you lend this item to me?

4.2 Yes, and we're shipping to you now

4.3 Will you lend items to me? Do I have to pay?

5. Item

Library Y ILL System

Library X ILL System

Library Z (consortial friend)
Machine-to-machine conversations

- System to system, application to application
  - not person to person
- Human users only interact with local application
  - never directly with remote system
- Protocols invisible to the human users of the application
  - ... when applications are well designed
Library Communication Protocols

- Provide rules for sets of messages and associated behaviour for use by libraries to perform resource-sharing activities
  - in a distributed network environment, i.e.,
    - from different manufacturers
    - under different managements
    - of different levels of complexity
    - of different technologies
  - text from intro of ISO 10161-1 and X39.50
Peer to Peer

ILL App <-> ILL App

Vs.

Client-Server

Z39.50 Client <-> Database <-> Z39.50 Server
confirmed

vs.

unconfirmed

z39.50 client

z39.50 server

ill app
Z39.50

- Search and Retrieval
  - NISO Z39.50 - 2003
  - ISO 23950
- Maintenance Agency at the Library of Congress
- Used for
  - Verification of bibliographic data
  - Identification of locations
**Z39.50**

- **Is an international standard which**
  - Is a computer-to-computer protocol for communication between different systems to search & retrieve information
  - Provides an abstract model of information retrieval
  - Language for expressing searches (attributes)
  - Means to encode searches and results

- **Is not:**
  - User interface
  - Local application functionality
  - Solution to cataloguing & systems differences
Z39.50 Issues

• Choices
  • Support different attributes
  • Vendors have selected different options or interpretations
  • Support different record syntaxes
  • Standard does not provide clear product specifications for developers

• Can be complex to implement
• Until recently no definition for exchange of holdings
• Cataloguing, semantic, systems & firewall issues

• Partial solution = Profiles
  • Bath Profile
  • NISO Z39.89 - 2003
Current Status/Future

- Z39.50 widely implemented
  - Internationally
    - 1819 servers
  - Canada
    - 115 catalogues represented
- Profiles not widely implemented
- Z39.50 & the Web
  - SRU/SRW
Directories

- Directory Services for Interlibrary Loan (IPIG)
- X.500 / LDAP
- ISO 2146
- proof-of-concept:
  - OCLC/NLA/NLC-OpenILL
Directory Scenarios

• Who is this Library, will it lend to me and if so, how much will it cost?
• Which libraries holding this item will lend to me at a price I can afford and using request methods that I support?
• What level of protocol support does this library have and which address should I use?
Global ILL Directory Network: Long-term Benefits

- Access to standards-based ILL policy data
  - help ILL systems work better
  - ultimately serve the patron better
  - help globalize community of Interlending partners
- Maintain lending policies in a shared directory
  - Reduce work and improve accuracy of directory information
Global ILL Directory Network: A Vision

- International framework facilitating the sharing of ILL policies and automated ILL requests
- Proof-of-concept directory network
  - National Library of Australia/Fretwell-Downing
  - OCLC
  - LAC/OpenILL
- Using X.500/LDAP
  - Client-server protocol used to retrieve and manage ILL directory information
  - Directory schema based on the IPIG Directory Services Information Model
“Directory” Issues for Canadian Libraries

- Canadian model of ILL directory
  - What data elements and services are required?

- Authoritative Master File
  - Who will own the Master directory?
    - Centralized or distributed?
  - Who will maintain the data?
    - Centralized or distributed?
  - What are the security requirements?

- Why X.500 or LDAP?
NCIP

- Circulation Interchange Protocol
- Connection-oriented, sessionless
- Talks "XML"
NCIP

- Protocol specifies 45 services
  - Each service comprised of a pair of messages
    - Initiation message
    - Response message
  - Each service is independent of any other service
NCIP Objects

- **Agency Object**
  - Library or other organization that lends items from its collection(s) or provides related services to one or more classes of users

- **Item Object**
  - Physical or logical (electronic) entity within an Agency’s collection that may be lent or to which access may be provided to a User

- **User Object**
  - Person or organization that is or may become an authorized user of items owned by an Agency
NCIP Services

- **Lookup**
  - Tell me something about...
    - an Agency, an Item or a User

- **Update**
  - Please take an action
    - Typical circulation activities, maintaining Object info, tracking items

- **Notification**
  - I have taken an action
    - Notification of actions taken
    - One for each update...
Current Status:

- Potential to support:
  - Direct Consortial Borrowing
  - Circulation/Interlibrary Loan Interaction
  - Self-Service Circulation
- Has an active implementors group
  - A sign that implementations are progressing?
- Most applications still under development;
- Watch for announcements from vendors this summer
NCIP Issues

- Many choices allow implementation of many models
- No required messages; implementors can pick and choose
- Still not stable; Implementor’s Group is tweaking the standard.
ILL Protocol

- Interlibrary Loan Application
  - ISO 10160:1997
  - ISO 10161-1:1997

- Uses either
  - Internet connections
  - E-mail
  “Talks” ASN.1 BER
ILL Protocol

• Protocol specifies 20 messaging services
  – Covers activities during life of an ILL-Transaction
  – Always starts with the ILL-REQUEST for an item
  – Continues with an ILL-ANSWER or SHIPPED
  – Tracks the stages of a Loan (RECEIVED, RETURNED, CHECKED-IN, LOST, DAMAGED, etc.)

• Helps applications track ILL activities
  – Record the current state of each ILL transaction
  – Maintain a history of ILL activities
ILL Protocol:
IPIG Profile

• Limits use of some messages
  – Forwarding handled outside the protocol
  – Role of intermediary outside scope of profile
  – Provides structures for some information to facilitate machine parsing
  – Allows for uses of both E-mail (mandatory) and Internet connections (optional)
ILL Protocol: Status of Implementation

- Interoperability Testing
  - Market-driven conformance

- Implementors:
  - National Libraries
    - Canada, Australia, New Zealand, UK
  - Bibliographic Utilities
    - RLG (Shares), OCLC
  - Lending partners outside consortial boundaries
    - Universities & other large research libraries

- Version 3
Request Submission Message

• Message used by a client to submit a request for an item
• Developed by IPIG
• “Talks” XML
• Not yet widely implemented
• Being registered as an OpenURL

Client-initiated request for item

Library A
Interlending Conversations

- Question and Answer Period