The future is web-scale

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Why Web-scale / Cloud Computing?

- Libraries are doing more than ever
- Silos, costs, time requirements, inefficiency are hindering libraries
- Cloud computing has helped other industries
- Libraries building “cloud” services with OCLC
- Enables libraries to focus on innovation
Today’s Library Service Infrastructure

- ILS
- OPAC
- Circulation
- Cataloging
- Users
- Print Vendors
- Electronic Vendors
- Self Service
- Acquisitions
- A to Z List
- ERM
- Resolver
- Institutional Repository
- Meta-search
- Cataloging Utility
- National/Global System
- Consortial System
- Vendor System
- OCLC
• Full-text and Meta search
• ILS functions
• My account
• Payment
• Link resolver support
• Social Network Services
• ILL/DD
• ....

• High efforts for any integration activity
• High operating and maintenance efforts
• Interrupted workflows and procedures
Disruptive Technologies on the Horizon

Cloud Computing

- Web Analytics and Business Intelligence
- Semantic Tech
- Enterprise 2.0
- Mobile Cloud Computing
- HTML 5/Silverlight/AIR
- Location-based computing
- Natural Language Processing
- Open source software
- Augmented Reality-ARML
- Dynamic Scripting Languages
- RIA
- XML
- Blogs
- Micro-Targeted Advertising
- Mash-Ups
- APIs
- Ontologies
- 802.11n
- Agent
- 3D/Holographic Displays
- E-Readers
- RSS
- E-Paper
- Virtual Reality/Communities
- Visualisation
- Netbooks
- Wearable Computers
- RFID/RFID Dust
- Wikis
- RFID/RFID Dust
- Micro Formats
- Vertical Search
- Micro Blog
- XML
- Semantic Web
- Singularity

Importance

High

Low

Today – 2 years

2 - 4 years

5 years and out

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10 Technologies which will change the IT world within the next years

1. Multicore
2. User Interfaces
3. Virtualisation
4. Unified Communications
5. Ubiquitous Computing
6. Business Intelligence
7. web-oriented Architectures
8. Web Mashups
9. **Cloud Computing**
10. Social Software/Networking
Cloud computing

Web-based applications with shared data and services

Infrastructure  Platform  Applications  Services

KPMG  Amazon Web Services™  Google  Salesforce
Amazon S3  Facebook  NetSuite  ADP
Simple Storage Service  mint
WMS - Web-scale Management Services

Principles and Functions
WMS principles: web technologies

- Completely web-based
- Developed based on open web standards
- Highly scalable and fault-tolerant Infrastructure
- Easy integration with 3\textsuperscript{rd} party web services
WMS principles: service oriented

WMS Services:

• Encapsulate Application functionality
• Accessible via web API / Interfaces
• Offer Interfaces to integrate with 3rd. Party service (e.g. Finance systems, IDM, B2B, NCIP, ...)
WMS principles: flexible workflows

- Support variable library management processes depending on the type of library
- Allow individual adaption to local business process needs
- Supports communication within business processes
WMS integrates

• traditional business processes for print material

• the management of electronic resources

• the license management

• digitized materials
WMS principles: network effects

WMS connects through

- Centralized data services
- The shared usage of common resources, applications, vendor data and workflows
- The provision of an communication platform
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WorldCat</strong></td>
<td>- WMS Shared Catalogue</td>
</tr>
</tbody>
</table>
| **Circulation**        | - Traditional Circulation Component  
                         - Holdings management  
                         - Interfaces (NCIP)                                                          |
| **Acquisitions**       | - Acquisitions of printed and electronic Resources  
                         - B2B Interfaces (EDI)  
                         - Accountancy Interface                                                          |
| **IDM**                | - Patron and User Management  
                         - Authorization / Authentication                                                |
| **License Manager**    | License Management for licensed Resources  
                         - Used also for ILL                                                                |
| **KBWC**               | - Electronic Resource Knowledgebase  
                         - Electronic Holdings                                                             |
| **VIC**                | - Shared Vendor Information Center  
                         - Global, Regional and Local views to vendors                                      |
| **Resource Discovery** | - Librarians Interface to search electronic Resources  
                         - Support collection policies                                                     |
| **WorldCat Registry**  | - Manage Institutions (Libraries, Branches, Consortia)                        |
| **WorldCat Local**     | - WMS End-User Interface                                                     |
| **Service Configuration** | - Central Configuration Interface for Institutions                        |
| **Workflow**           | - Configurable Workflows                                                      |
WMS - modular staff interface

Browser (Firefox, IE, Safari, ...)

Modular Staff Interface

Network

Web-Service Circulation
Web-Service Acquisition
Web-Service Licenses
Web-Service Vendor
own Web-Services
WMS - modular staff interface

Component navigation

Menu of the Acquisitions component
Components in detail
<table>
<thead>
<tr>
<th>Title</th>
<th>Material Type</th>
<th>Quantity</th>
<th>Submitted?</th>
<th>Owed / Received</th>
<th>Order Name</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A pair of blue eyes</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>January Nature</td>
<td>Hugendubel</td>
</tr>
<tr>
<td>Tamburlaine's malady, and other essays on astrology in Elizabethan drama</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>January Popular</td>
<td>Pustet</td>
</tr>
<tr>
<td>Middle East</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>March Child</td>
<td>Pustet</td>
</tr>
<tr>
<td>Putnam's economic atlas; a systematic survey of the world's trade, economic resources &amp; communications</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>February Child</td>
<td>Pustet</td>
</tr>
<tr>
<td>Evaluation of Salvaciom pavement /</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>February Child</td>
<td>Pustet</td>
</tr>
<tr>
<td>Petroleoy diversificacion economica /</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>February Fiction</td>
<td>Pustet</td>
</tr>
<tr>
<td>Meruhin's house of music; an impression of the Yehud Meruhin School at Stoke d'Aberno, Surrey, England</td>
<td></td>
<td>4</td>
<td>No</td>
<td>----</td>
<td>January History</td>
<td>Hugendubel</td>
</tr>
<tr>
<td>The works of Albert Goodwin exhibition, 13th May until 25th May, 1970</td>
<td></td>
<td>1</td>
<td>No</td>
<td>----</td>
<td>February Nature</td>
<td>Pustet</td>
</tr>
</tbody>
</table>
Acquisitions: functional scope

1. Discover / Evaluate
2. Approve / Negotiate
3. Acquire / Subscribe
4. Receive / Manage
5. Withdraw / Cancel
Knowledgebase as a Cloud Service

- Achieve web scale for KB services
- Move the KB to the cloud
- Provide KB services through an API model to:
  - Provide a central platform for KB data management
  - Allow read and write access to the KB within OCLC services
  - Allow read and write access to the KB for external services
- The KB can be managed in one place, but exposed anywhere
Configuration of electronic content providers, is powered by Vendor Information Center (VIC) and integrated with OCLC Knowledgebase (KB)

Negotiation, approval, and management of licenses and license terms for electronic content

Activation of electronic resource titles and collections for my institution
Browse licenses

<table>
<thead>
<tr>
<th>Name of License</th>
<th>Provider</th>
<th>Collections</th>
<th>Start Date</th>
<th>End Date</th>
<th>Status</th>
<th>Signed/Approved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elsivier Master Agreement</td>
<td>Elsivier</td>
<td>13</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>EbocoHost Public Library</td>
<td>Eboco</td>
<td>8</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>General Science</td>
<td>LexusNexus</td>
<td>22</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>Nature</td>
<td>Nature.com</td>
<td>2</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>No</td>
</tr>
<tr>
<td>Nursing</td>
<td>Elsivier</td>
<td>3</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>Sage Communication</td>
<td>Sage</td>
<td>2</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>School of Business</td>
<td>Elsivier</td>
<td>2</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>Tlorem ipsum dared</td>
<td>Elsivier</td>
<td>2</td>
<td>01/01/10</td>
<td>12/31/10</td>
<td>Pending</td>
<td>No</td>
</tr>
<tr>
<td>Vepluribue unum</td>
<td>Ipsum</td>
<td></td>
<td></td>
<td></td>
<td>Current</td>
<td>Yes</td>
</tr>
<tr>
<td>Wipsum Schmipsum</td>
<td>Ipsum</td>
<td></td>
<td></td>
<td></td>
<td>Pending</td>
<td>No</td>
</tr>
<tr>
<td>XGavest Emptor</td>
<td>Ipsum</td>
<td></td>
<td></td>
<td></td>
<td>Current</td>
<td>Yes</td>
</tr>
</tbody>
</table>
License management

**Enter valid dates and approvals**

- **Licensor**: begin typing a licensor name...
- **Valid from**: 07/01/2009
- **Valid to**: 06/30/2010
- **Approved**: [ ]

**Add new collections from KB**

- **Licence**: XYZ University
- **Currently Active**: [ ] Yes, [ ] No
- **Applications Notes**:
- **Elemental Biology**: -

**Add Terms of Use, e.g. ILL**

- **ILL allowed**: [ ] Yes, [ ] No
- **ILL instructions**: 

---

*OCLC Web-scale management service*
Activating a collection

View info about e-collection

Configure prior to activation
Activating titles and customizing

Select titles and even change coverage dates
Workflow integration

What is Workflow?

- A business has a set of processes through which they provide value to their customers. A workflow is a business process, or part of a process, that is supported by a computer system.
Workflow features

• Show assigned tasks of a user
• Re-assign tasks
• Execute tasks in the Modular Staff Client
• View process environment
• Allows institutions to customize their processes or define new processes using a graphical workflow editor
• Share workflow with other WMS institutions, whether library or consortia
WMS Identity management

• Authentication
  • Who are you?

• Authorization
  • What can you do?

• User Information
  • What’s your name, e-mail address, …?
Authorization

- Role-based Access Control (RBAC)
  - Services define Permissions
    - Users require specific permissions to perform particular operations
  - Institutions define Roles
    - Roles are associated with sets of permissions
  - Users are associated with Roles
IDM: Distributed & Federated

- FEIDE Federation
  - Hosted IdP
  - 3rd Party IdP
  - 3rd Party RP

- InCommon Federation
  - Hosted IdP
  - 3rd Party IdP
  - 3rd Party RP

- Meta-Auth

- OCLC Federation
  - WMS
  - WCL
  - Net Library
The Management Services Platform
WMS Architecture - multiple ways to integrate

Tools/Application Layer
- Circulation
- Acquisitions
- Lic. Manager
- Workflow
- Co-op Intel
- Discovery
- Metadata

Service/API Layer
- Circulation
- Acquisitions
- Lic. Manager
- Workflow
- Co-op Intel
- Discovery
- Metadata

Data Layer
- Bibliographic
- Digital
- License
- Workflows
- Patron
- Transaction

Component usage
- Metadata Management
- License Manager
- Discovery
- Co-op Intelligence
- any apps...

Service Integration
- Knowledgebase
- WorldCat API
- Vendor Management
- License Management

Data Synchronization
- Bibliographic records
- Holdings information
- Knowledgebase data
- Statistical data
- Registry data
Integration of add-on applications in WMS - The Application Gallery
### Example: Using a Bestseller Widget in ACQ

#### Bestsellers

<table>
<thead>
<tr>
<th>Rank</th>
<th>Title</th>
<th>Weeks On</th>
<th>Copies</th>
<th>Holds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>The girl with the dragon tattoo</em></td>
<td>13</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td><em>The girl who played with fire</em></td>
<td>12</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td><em>Black hills</em></td>
<td>3</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td><em>The bourne deception</em></td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td><em>The doomsday key</em></td>
<td>3</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td><em>Orchard valley grooms</em></td>
<td>3</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td><em>Garrett</em></td>
<td>3</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td><em>Medusa</em></td>
<td>3</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>9</td>
<td><em>Matters of the heart</em></td>
<td>3</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td><em>Married by morning</em></td>
<td>3</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

Results 1-10 of 20
Managing data in the cloud
Move the data to the cloud...
Efficient storage of data in the cloud: Common use data
Efficient storage of data in the cloud: Data by agreement
Efficient storage of data in the cloud: Private data
Nodes in the Cloud
WorldCat Local - the WMS end user service
WorldCat Local - WMS end user service

WorldCat Local

WMS Management services

Knowledge Base

Central Index

WorldCat with your library holdings

OCLC Licensed Content

Non-OCLC Licensed Content

Remote Index

Remote Index

Knowledge Base

Central Index

Remote Index

WorldCat with your library holdings

OCLC Licensed Content

Non-OCLC Licensed Content

Remote Index

Remote Index
An end user service platform ....

- Cloud Services based on aggregated data and services
- Same principles like the Management Service platform
  - web based, service oriented, various ways to integrate with, extensible, ..
- New data services based on aggregated library data
- Easy to integrate into your own applications / services - device independent
End user services on the platform

Service Layer
- Discovery Services
- Reference Services
- Authentication SNS, ...
- Enrichment services
- ...

Data Layer
- Locally indexed data
- External License data
- Central Indexes
- BI Information
- Trusted Content
- ...

WorldCat API
WorldCat Identities
Knowledge Base API
XISBN API
Time schedule and summary
Localisation and Internationalisation

General Release: Scaled Roll-out

Jul - Dec 2010
(Q1-2 2011)

- Service Directory Adaptation Testing
- Detailed plans for next delivery

Jan - Jun 2011
(Q3-4 2011)

- Non-US Node for WMS Preparation and implementation
- Non-US customer implementation

July 2011

Circ Development

Acquisitions & Workflow Development

License Manager Development

U.S.
License Manager General Release

U.S.
Circulation General Release

U.S.
Acquisitions Vendors, Orders, Budgets Release

PILOT TESTING: Acquisitions

U.S. Acquisitions Full Release

Non-US Node for WMS Preparation and implementation

Non-US customer implementation

Non-US Node for WMS Preparation and implementation

Non-US customer implementation

2010-2011 Fiscal Year = WMS Quarterly INSTALL
Top reasons that OCLC Web-scale Management Services are unique

- System built on aggregated shareable data
  - Built by the community: WorldCat, holdings, vendors, etc.
  - Added by OCLC: knowledge base, evaluative content, etc.
- Simplified identification and selection of materials using WorldCat
- Unified acquisitions workflow for physical and electronic materials to match today’s collection
- Provides a Platform to build extended services on
- Built on a commercial workflow engine to make workflows flexible and expandable
- Single search and delivery user interface to match today’s users
Thank you for your attention!

Additional information’s under:

http://www.oclc.org/webscale/default.htm

http://www.oclc.org/worldcatlocal/default.htm