E-LibUkr portal: Case study of Shibboleth and EZProxy in Ukraine.

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Introduction

The Kyiv Mohyla Foundation of America and the National University of Kyiv Mohyla Academy, in collaboration with the Association "Informatio-Consortium", Y. Fedkovych National University of Chernivtsi, V. Karazin National University of Kharkiv (Ukraine) and and faculty from the Center for Technology and Innovation Management at Northwestern University (USA) started the Electronic Library of Ukraine Project (**ELibUkr**) in 2009. The **ELibUkr** will be available for the participation of all universities of Ukraine. The **ELibUkr** is a nation-wide linked *Electronic Library/Knowledge Centers* network that will provide academics, students and practitioners enhanced access to the world's digitized network of academic and research information thus promoting the active use of local, regional, and global information. The project will upgrade the intellectual holdings of Ukrainian libraries and include them into the worldwide digitized information bases. As a part of the project the creation of the E-LibUkr portal was started. You can see more detailed information about the project at - www.elibukr.org/en/

E-LibUkr – some key information

Brief information about the Services of the E-LibUkr portal:

- Systematized catalogue of electronic scientific resources
- Access to external resources (subscribed and open)
- Social scientific network
- Interdisciplinary repository
- Electronic resources search

General requirements

- Access via web-interface from any network point in the 24/7 mode
- Convenient user interface
- Scaled solution
- FOSS orientation

Requirements to the portal

- Single access point for services provided by the project
- Flexible navigation management
- Full-fledged management of web pages
- Convenient news management. RSS channels support
- Management of project event calendar
- Management of project image galleries
- Project documentation
- Being multilingual; localization

User workplace requirements

- User profile (photo, short information, scientific interests sphere etc)
- Corporate social networks services (wiki, blog, communities)
- Personal materials allocation

Search system requirements

- Large capacity knowledge bases search
- Integrated A-Z base
- Link resolving
- Integration with reverse proxy server

Access control system requirements

- Single sign on system
- Centralized users base
- Subscribed resources access control
- Resources access personification
- Scrambled authentication channels
- Federalized user control system

Repository requirements

- All types of digital materials support
- Subject catalogue organization of materials
- Organization of multi-disciplinary repositories
- Support of materials meta-description
- Extended search
- Large scopes of electronic materials support

E-LibUkr portal architecture: Structural components

1. CMS: Joomla

For the project portal part implementation CMS Joomla 1.5 is selected. The product functionality allows to create a convenient navigation on the portal. To create web pages and allocate there text, images, links etc. Page editing is done with WYSIWYG – editor. News module with RSS channels support is a part of basis control component. Expansions to basic component allow:

- To make the portal multilingual
- To adjust for accounts administrator interface localization
- To use image galleries
- Event calendar
- Document library (is used to store the documents allocated in the portal)
- Integrates with system SSO **Shibboleth**

2. Social scientific network: Joomla Component Community builder

- A powerful environment for creation and support of online communities for Joomla;
- User profile data integration system in Joomla function;
- Several registration/authorization forms for Joomla sites;
- Environment that allows to create user profile of Joomla sites with additional parameters;
- Flexible structure by which it is possible to unite Joomla components with user profiles Community builder.

3. Authentication environment: Single Sign On (SSO). Shibboleth: http://shibboleth.internet2.edu/

The Shibboleth System is a standards based, open source software package for web single sign-on across or within organizational boundaries. It allows sites to make informed authorization decisions for individual access of protected online resources in a privacy-preserving manner.

The Shibboleth software implements widely used federated identity standards, principally OASIS' Security Assertion Markup Language (SAML), to provide a federated single sign-on and attribute exchange framework. Shibboleth also provides extended privacy functionality allowing the browser user and their home site to control the attributes released to each application. Using Shibboleth-enabled access simplifies management of identity and permissions for organizations supporting users and applications. Shibboleth is developed in an open and participatory environment, is freely available, and is released under the Apache Software License.

Why Shibboleth?

More and more, universities, companies and government agencies offer services and collaborate online. Users typically access both online resources inside and outside their organizations to do their work. In the past, each of these services required its own ID and password and, for the user, that meant adding another set of credentials to that collection of sticky notes. For the institution, closing the security holes and just keeping up with the access changes for the services on and off campus was quite a challenge.

Shibboleth Single Sign-on and Federating Software was developed specifically to address the challenges of:

- multiple passwords required for multiple applications
- scaling the account management of multiple applications
- security issues associated with accessing third-party services
- privacy
- interoperability within and across organizational boundaries
- enabling institutions to choose their authentication technology
- enabling service providers to control access to their resources.

An individual uses his or her campus login and password to access resources offered by the institution and provider organizations. And campus IT shops can use their authentication technology of choice - Shibboleth sits on top and provides the web single sign-on functionality.

- Developed in university environment
- Used in many educational institutions throughout the world
- Allows to integrate diverse systems and platforms into single authentication environment
- One login and password to enter all the connected systems
- Supported by main web servers, CMS, electronic repositories
- Transparent for end-user
- LDAP support (User base. Microsoft Active Directory)
  - Multifunctional catalogue service
  - Based on LDAP
  - Developed infrastructure
  - Convenient user interface
  - Full-fledged access and security parameters administration

4. Reverse proxy server: EZProxy.

- Created especially for support of remote access to subscribed library resources
- Used by the majority of world leading university libraries

- Contains ready specific adjustments for optimal access to the most world databases of electronic publications
- Convenient in adjustment and support
- Can be integrated with the system SSO Shibboleth

5. Search engine: CUFTS: Open Source Serials Management - http://researcher.sfu.ca/cufts:

- Knowledgebase of full-text journal collections
- Searchable A-Z database of databases
- Searchable A-Z journal database
- MARC records for each title
- Direct to article OpenURL link resolving

6. Electronic repository: DSpace

- A powerful tool for electronic materials creation and storage
- Supports different formats
- Supports mass data
- Convenient structural data organization system
- Global search
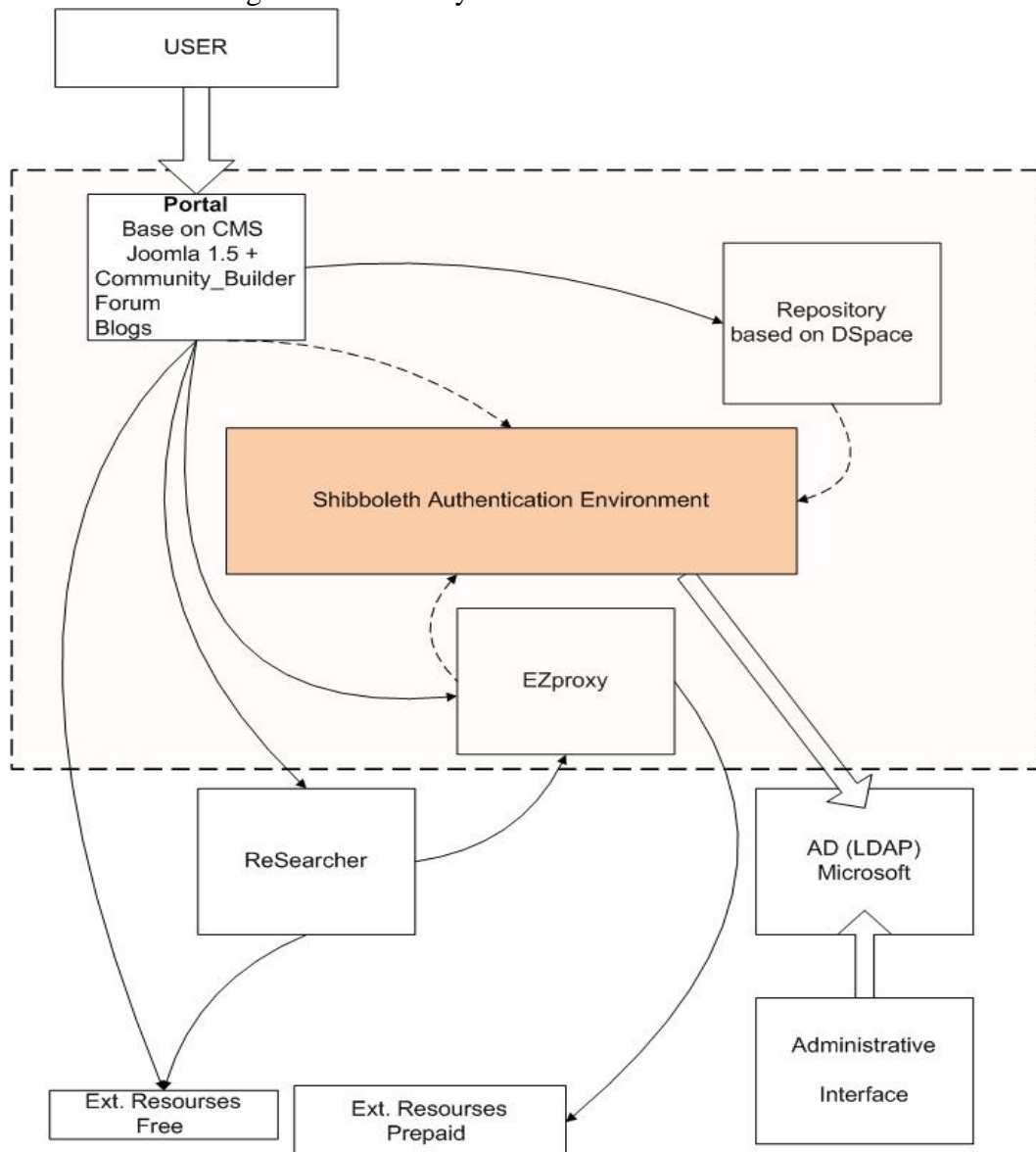- Can be integrated with the system SSO Shibboleth

Fig. 1 System software architecture

Implementation of project

List of the servers and software

1. Directory service server
    a. Windows Server 2008
    b. Active Directory
    c. Terminal Services
2. Shibboleth IdP server
    a. FreeBSD 7.2
    b. Apache Tomacat Server 6
    c. Java SDK 6
    d. Shibboleth IdP 2.1
3. Reverse Proxy-Server
    a. Windows Server 2008
    b. EZProxy 5.1c
4. Web-server
    a. FreeBSD 7.2
    b. Apache HTTP Server 2.2
    c. PHP5
    d. Perl 5.9
    e. MySQL 5.1.
    f. PgSQL 8.3
    g. Shibboleth SP 2.2, mod_shib
    h. CUFTS
    i. Joomla + Community Builder
5. Repository
    a. FreeBSD 7.2
    b. Apache Tomacat Server 6
    c. PgSQL 8.3
    d. Java SDK 6
    e. DSpace 1.5

State of works

Shibboleth server

- The central element (identity provider - IdP) of Shibboleth server is established and adapted to support Single Sign On system
- All portal elements which need authentication will be connected with IdP
- Shibboleth server is linked to Active Directory
- Active Directory To manage portal users database Active Directory is installed (based on MS Active Directory)
- 3 organizational units are established (OU), by 1 for each of the consortium participants (chnu, khnu, ukma)
- Each of 3 OU is provided to register users from corresponded universities
- OU management will be provided by separate delegates from corresponded universities
- Active Directory is linked to Shibboleth portal server

EZProxy - server
- EZproxy is installed to provide access to prepaid databases
- EZproxy is linked to Shibboleth server (conformably to directory service for authentication
- EZproxy is tuned to support prepaid resources of consortium members
- Assess to databases is given on the base of each universities' individual subscription plan
- Users separation is realized on the basis of OU of the catalogue service

Web - server
- Apache HTTP Sever is installed
- Server software is installed and tuned to support web – application : PHP, Perl, MySQL, PgSQL
- CMS Joomla (on the base of PHP, MySQL) is installed
- Community Builder is in the process of setting
- Design and structure of the portal optimization is in the process
- mod_shib is installed and tuned for web- server to fulfill Shibboleth Service Provider (SP) function
- mod_shib is linked to IdP of Shibboleth server
- mod_shib provides portal users authentication on the web - server and on CMS Joomla
- Search engine CUFTS is settled (on the base of Perl, PgSQL). It is in the process of tuning.

- Software Apache Tomacat Server and PostgreSQL Server are installed
- DSpace is installed and tuned
- Preparation of the server for insertion of the repository DSpace into SSO Shibboleth system is in the process
- Preparation of the e- materials catalogue structure is in the process