

# Open-Source Server Applications

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The information in this chapter is as current as possible in a print publication. For the most up-to-date information on this software, check the code4lib Web site.

*code4lib Open-Source Software Directory*  
<http://code4lib.org/trac/wiki/OSSDir>

## Integrated Library Systems

### Koha

Koha, a seven-year-old project, was the first open-source ILS and is licensed under the GPL. It's developed on the LAMP (Linux, Apache, MySQL, Perl) platform, though it also runs on Windows. Basic features include circulation, borrower management, cataloging, and a powerful OPAC. Advanced features include budget-based acquisitions, serials management, and MARC authorities control (MARC21 and UNIMARC). It also supports spell-checking, enriched bibliographic content (jacket covers, "read inside," reviews, ratings and, descriptions from Amazon.com), RSS feeds of searches and borrower account data, e-book integration, and patron-initiated reservations and renewals, as well as virtual shelves (lists) for organizing collections of records. Notably, recent versions of Koha's OPAC include a powerful standards-based search engine built around Zebra, the high-performance indexing and retrieval database. Zebra supports large databases (more than ten gigabytes of data, tens of millions of records), as well as incremental, safe database updates on live systems. Zebra also brings native support for important library standards such as Z39.50 and SRW/SRU. Koha supports multiple formats for bibliographic records including several flavors

of MARC (UNIMARC, MARC21, KORMARC, ESMARC, etc.), MARCXML, MODS, and Dublin Core.

Koha was initially developed in New Zealand by Katipo Communications Ltd. and first deployed in January 2000 for Horowhenua Library Trust. It is currently maintained by a team of software providers and library technology staff from around the globe and is in use in over 350 libraries. While initial versions were developed for small- and medium-sized libraries, Koha is now in use at large libraries, including the Near East University in Cyprus, which has over two million titles. A community exchange site was recently opened to allow libraries to easily share contributions to the project. Koha supports a rich translation framework and has been translated into nearly a dozen languages. A translation site exists to facilitate additional translations. Commercial support is available from several vendors worldwide.

Comments from Koha users:

- "Koha ZOOM really leverages the full potential of the MARC format to bring advanced and intuitive search functionality to our patrons. The OPAC also now [allows] us to integrate content from external web services to expand and improve the information we offer to our patrons."—Owen Leonard, webmaster, Nelsonville Public Library System<sup>1</sup>
- "Was it the right thing to do? We think so. Frankly, after experiencing the sensation of having total control over our software, we could probably never go back to a commercial system."—Stephen Hedges, director, of Nelsonville Public Library<sup>2</sup>
- "For instance, if we need to add a feature—no matter how specific—we can either develop it in-house, or contract with a support company like LibLime. As more libraries switch to Koha and sponsor new

functionality, other libraries will benefit when the next upgrade cycle occurs. Koha has a steady stream of updates, and the momentum for this open-source product is excellent.”—Darrell Ulm, systems administrator, Stow-Munroe Falls<sup>3</sup>

#### *Koha Web Site*

[www.koha.org](http://www.koha.org)

#### *Koha Demo*

<http://liblime.com/demos>

### Evergreen

Evergreen is a consortia-level ILS that allows clustering and other enterprise-level options, including fault tolerance and redundancy. The system was designed to use commodity hardware, giving cost savings for large installations and the ability to scale gradually with demand. Multiple open-source technologies are used, including Jabber and PostgreSQL. The staff client uses the XUL language, which allows cross-platform access using a Mozilla-based browser.

The system currently includes circulation, cataloging, and a robust OPAC, which includes FRBR-like groupings and faceted search. The addition of other modules, such as acquisitions and serials management, is planned for future releases. The project is currently young and is in use by the Georgia Public Library Service, powering 44 library systems and over 250 locations. Other institutions, such as the University of Windsor, are actively working with the project. Commercial support is also available.

Comment from an Evergreen user:

- “For my system—rural small libraries, many of them staffed by one person, relying solely on my small professional staff and me for training, computer expertise, and backup—I have had less trouble with this system in the two months we have been in operation than I did in the first two weeks when we automated on a commercial system.”—Dusty Gres, director, Ohoopee Regional Library System<sup>4</sup>

#### *Evergreen Web Site*

<http://open-ils.org>

#### *Evergreen Demo*

<http://demo.gapines.org>

### Other Open-Source Integrated Library Systems

Other open-source ILS options include Emilda, OpenBiblio, and phpMyLibrary, all of which are licensed under the GPL. OpenBiblio is a PHP-based system that is a recent addition to the field, with a handful of libraries already using it. Emilda and phpMyLibrary both have libraries using them. However, development seems to have stagnated for both projects.

#### *Emilda*

[www.emilda.org](http://www.emilda.org)

#### *OpenBiblio*

<http://obiblio.sourceforge.net>

#### *phpMyLibrary*

<http://sourceforge.net/projects/phpmylibrary>

### Metasearch and OpenURL Resolvers

#### LibraryFind

LibraryFind is a Ruby-on-Rails–based metasearch application licensed under the GPL and created by Oregon State University. The application can search multiple databases using z39.50 access and can also search a local index of OAI harvested data. The application is stand-alone and does not require other vendor products, other than access to z39.50 or OAI databases. LibraryFind can be run as a single application with a front-end or as a server only, allowing custom interfaces to be built locally. Currently only WSDL is supported for interfacing with the server, although other interfaces are planned. The system may also use Solr/Lucene in the future, which will allow faceted searching and possible use as a full catalog. An OpenURL resolver is also included in the system. Currently only Oregon State University has the software in production. However, the mailing list appears to show a growing interest from others.

#### *LibraryFind Web Site*

<http://libraryfind.org>

#### *LibraryFind Demo (production system)*

<http://search2.library.oregonstate.edu>

## Ümlaut

Ümlaut is a Ruby-on-Rails-based OpenURL resolver released under the MIT license. It is not stand-alone, as it requires an external knowledge-base. The software is module-based and attempts to pull in information from multiple sources for the user. Ümlaut currently supports multiple catalogs (SRU only), link resolvers (SFX support only), Amazon, Google, Yahoo and Yahoo My Web, Connotea, CiteULike, and OAI-PMH.

### *Ümlaut Web Site*

<http://umlaut.library.gatech.edu/umlaut>

### *Ümlaut Demo*

<http://findit.library.gatech.edu>

## Other Metasearch and OpenURL Resolvers

Other open-source metasearch options include Xerxes, a PHP front-end to the MetaLib X-Server, and dbWiz, a Perl-based system that handles multiple z39.50 targets. CUFTS is an OpenURL resolver available under the GPL that includes its own knowledge base. Some digital library systems, such as Keystone, also offer metasearch and OpenURL capabilities.

### *Xerxes*

<http://xerxes.calstate.edu>

### *dbWiz*

<http://dbwiz.lib.sfu.ca/dbwiz>

### *CUFTS*

<http://cufts.lib.sfu.ca>

### *Keystone*

[www.indexdata.com/keystone](http://www.indexdata.com/keystone)

## Digital Library and Repository Software

### DSpace

DSpace is a popular repository system that is in use by a large number of institutions, with most using it as an institutional repository. The software is written in Java and is available under a BSD license, with a growing community base contributing enhancements. DSpace uses the Handle System from CNRI to assign and resolve persistent identifiers that are UN-compliant. DSpace can act as an OAI provider and also provides a plugin interface that

can be used to create other import and export interfaces. The digital items can be stored on the file system, while a RDBMS is used for all metadata, and Lucene is used for search. While the current user interface is built using Java Servlets, there is discussion regarding using Manakin, a SAX/Cocoon framework layer, instead. Dublin Core is used for much of the metadata, and METS export support is currently in development. Extensive information about the project is available on its Web site, wiki, mailing lists, and discussion forums.

### *DSpace Web Site*

[www.dspace.org](http://www.dspace.org)

### *DSpace Demo (list of live instances)*

<http://wiki.dspace.org/index.php/DspaceInstances>

## FEDORA

FEDORA is a general purpose repository system developed jointly by Cornell University Information Science and the University of Virginia Library and released under the Educational Community License 1.0. While it is currently funded by Mellon grants, there is discussion of forming a foundation to fund and guide the project in the future.

FEDORA differs from DSpace; it is more of a framework for building repository systems than a turnkey solution. For example, FEDORA itself does not include a full user interface, but instead exposes multiple SOAP and REST Web services on which interfaces can be built. With its community growing strong, there are already multiple front-end interfaces in various programming languages available for download.

FEDORA uses a custom XML format called FOXML for internal storage, although METS and MPEG21/DIDL are supported for import and export. By default, metadata is indexed in a relational database that is then used for basic search, but more advanced search can be done with the GSearch service, which supports Lucene and Zebra. Relationships between objects is kept using RDF triplets within the metadata file. The format also supports versioning.

An OAI-provider and XACML-based policy framework is also included.

Comments from FEDORA users:

- “Taken as a whole, the vision for FEDORA is to enable ‘object-centric’ collaborations. FEDORA is evolving into an open source platform that integrates a robust core (repositories and enterprise SOA) with dynamic content access (collaborative applications and web access/re-use). It is a technology for complex digital objects.”—Peter Murray<sup>5</sup>

- “As foundation architecture with powerful API based interoperability features, Fedora is highly flexible and powerful, and has proven itself with large networked repositories similar to those envisaged with the OARINZ project. With no set user interface, Fedora has true separation between the ‘backend’ and ‘front-end’ which allows for smart and flexible integration methods.”—Open Access Repositories in New Zealand<sup>6</sup>

#### *FEDORA Web Site*

[www.fedora.info](http://www.fedora.info)

#### *FEDORA Demo (projects built on FEDORA)*

[www.fedora.info/wiki/index.php/Examples](http://www.fedora.info/wiki/index.php/Examples)

## Other Digital Library and Repository Software

Other open-source options include aDORe, Greenstone, and Virtual Data Center, all of which appear to be under active development. VDC is unique in that it focuses on the sharing of large datasets instead of the more generic object approach of the other options. Greenstone features an “export to CD” option for digital library collections.

#### *aDORe*

<http://african.lanl.gov/aDORe>

#### *Greenstone*

[www.greenstone.org](http://www.greenstone.org)

#### *Virtual Data Center*

<http://thedata.org>

## OPAC Replacements

The following are catalog interfaces that, while potentially stand-alone, do not include any of the other features expected from an ILS, such as cataloging and acquisitions. They are meant to provide a better interface than the one provided by the ILS vendor.

### Scriblio

Scriblio (formerly WPOpac) is an OPAC based on the WordPress blogging software, which is also open source and released under the GPL. While Scriblio tends to be centered towards use as a library catalog, it can also potentially be used as a digital library collection interface or something similar. In Scriblio, each item is treated as a “post,” which allows the use of the WordPress plugin system to enhance the display and also the other blogging features such

as permalinks, comments, RSS, and a robust templating system. However, due to limitations of the plugin system, some changes to the core WordPress code have been made to allow the searching and storage of library-centric data.

#### *Scriblio Web Site*

<http://scriblio.net>

#### *Scriblio Demo (library catalog)*

[www.plymouth.edu/library/opac](http://www.plymouth.edu/library/opac)

#### *Scriblio Demo (digital image collection)*

<http://beyondbrownpaper.plymouth.edu/browse>

## SOPAC

SOPAC is a set of Drupal modules and scripts that allow the Innovative Interfaces OPAC to be displayed within the Drupal content management system. This allows a seamless experience for patrons between the library Web site and the catalog. It includes features such as comments, ratings, tags, and reviews. The code is rather implementation-specific, so using it may take expertise and time. Although it is also III specific, it can likely be ported to other systems since it uses screen scraping methods.

#### *Evergreen Web Site*

<http://open-ils.org>

#### *Evergreen Demo*

<http://demo.gapines.org>

## Programming Libraries

Programming libraries are bits of code that aren’t applications themselves, but can be used by programmers to make application development easier. For example, tools to parse MARC data can be combined with tools to connect to OAI or SRU services to fetch library records for a metasearch application.

### Lucene and Solr

Lucene is a full-text search engine released by the Apache Foundation. Because of its speed and configurability, many in the library technology field are beginning to look at it for their projects. Multiple related projects are also available as layers on top of Lucene in order to make integration easier.

One of the more popular of these projects is Solr, also an Apache Foundation project. Solr builds a Web service application on top of Lucene which provides XML/HTTP

and JSON/Python/Ruby APIs, hit highlighting, faceted search, caching, replication, and a Web administration interface. Adding records to the index is as easy as sending a POST of the information within a customized XML schema. Searching is performed with GET requests. The built-in faceting is one of the more popular features. Many of the projects featured at the 2007 Code4Lib conference included Solr as a component.

### *Lucene*

<http://lucene.apache.org>

### *Solr*

<http://lucene.apache.org/solr>

## MARC

Code is available in most languages to read and write the MARC format. Some of the offerings are

- *ruby-marc* (Ruby)
- *pymarc* (Python)
- *MARC/Perl* (Perl)
- *MARC4J* (Java)
- *marc\_record.js* (JavaScript)
- *File\_MARC* (PHP)
- *PHP-MARC* (PHP)
- *MARC Toolkit for Libraries* (C++)

### *ruby-marc*

[www.textualize.com/ruby\\_marc](http://www.textualize.com/ruby_marc)

### *pymarc*

[www.textualize.com/pymarc](http://www.textualize.com/pymarc)

### *MARC/Perl*

<http://marcpm.sourceforge.net>

### *MARC4J*

<http://marc4j.tigris.org>

### *marc\_record.js*

[www.pusc.it/bib/mel/marc\\_record.js](http://www.pusc.it/bib/mel/marc_record.js)

### *File\_MARC*

[http://pear.php.net/File\\_MARC](http://pear.php.net/File_MARC)

### *PHP-MARC*

[www.emilda.org/php-marc](http://www.emilda.org/php-marc)

### *MARC Toolkit for Libraries*

<http://mtl.sourceforge.net>

## OAI

A few stand-alone OAI modules are available. Some other open-source programs include OAI support and may have modules that are usable in other programs.

- *Net::OAI::Harvester* (Perl)
- *ruby-oai* (Ruby)
- *.net OAI Harvester* (.NET)—MONO compatible

### *Net::OAI::Harvester*

[www.textualize.com/net\\_oai\\_harvester](http://www.textualize.com/net_oai_harvester)

### *ruby-oai*

[www.textualize.com/ruby-oai](http://www.textualize.com/ruby-oai)

### *.net OAI Harvester*

<http://sourceforge.net/projects/netoaihvster>

## SRU and SRW

SRU/W is a standard Web service protocol for search and retrieval. It is becoming a popular replacement for the Z39.50 protocol.

- *sruby* (Ruby)
- *SRU* (Perl)
- *SRW/U* (Java)—works with DSpace
- *PHP/YAZ* (PHP)
- *SimpleServer* (Perl)

### *sruby*

[www.textualize.com/sruby](http://www.textualize.com/sruby)

### *SRU*

<http://search.cpan.org/dist/SRU>

### *SRW/U*

[www.oclc.org/research/software/srw](http://www.oclc.org/research/software/srw)

### *PHP/YAZ*

[www.indexdata.com/phpyaz](http://www.indexdata.com/phpyaz)

### *SimpleServer*

[www.indexdata.com/simpleserver](http://www.indexdata.com/simpleserver)

## Notes

1. Owen Leonard, quoted in “Koha ZOOM Goes Live, and It Rocks,” press release dated Nov. 15, 2006, on the LibLime Web site, <http://liblime.com/news-items/press-releases/koha-zoom-goes-live-and-it-rocks> (accessed Feb. 25, 2007).

2. Stephen Hedges, "Nelsonville Public Library: Questions and Answers About Open Source," Oct. 20, 2003, on the WebJunction Web site, <http://webjunction.org/do/DisplayContent?id=1172> (accessed Feb. 25, 2007).
3. Darrell Ulm, quoted in "Stow-Munroe Falls for Koha ZOOM," press release dated Feb. 6, 2007, on the LibLime Web site, <http://liblime.com/news-items/press-releases/stow-munroe-falls-for-koha-zoom> (accessed Feb. 25, 2007).
4. Dusty Gres, quoted in Jonathan Weber, "Evergreen: Your Homegrown ILS," *Library Journal*, Dec. 15, 2006, available online at <http://libraryjournal.com/article/CA6396354.html> (accessed Feb. 25, 2007).
5. Peter Murray, "A Vision for FEDORA's Future, an Implementation Plan to Get There, and a Project Update," Jan. 24, 2007, on *Disruptive Library Technology Jester*, <http://dltj.org/2007/01/fedora-update> (accessed Feb. 25, 2007).
6. Comments from the FEDORA Users Interview Survey in "Open Access Repositories in New Zealand," Oct. 8, 2006, on the FEDORA Web site, [www.fedora.info/wiki/index.php/Open\\_Access\\_Repositories\\_in\\_New\\_Zealand](http://www.fedora.info/wiki/index.php/Open_Access_Repositories_in_New_Zealand) (accessed Feb. 25, 2007).

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