World Library and Information Congress: 71th IFLA General Conference and Council

"Libraries - A voyage of discovery"

August 14th - 18th 2005, Oslo, Norway

Conference Programme:
http://www.ifla.org/IV/ifla71/Programme.htm

juni 14, 2005

Code Number: **122-E**
Meeting: **134 SI - Information Technology**

Delivering Sizzling Services and Solid Support with Open Source Software

Roger Evans
Deichmanske Bibliotek
Oslo, Norway

Abstract

Good stewardship of scarce library resources demands that librarians consider the costs of implementing a new service. By using Open Source Software as a base for new Internet services, the library saves in 3 ways:

1) Open Source Software is free. The library saves licensing costs. These costs are significant (examples: Microsoft Office, Server, Oracle)

2) Open Source Software runs on cheaper hardware. The library saves investment in new machines .

3) Projects developed with Open Source Software can be shared between libraries, giving all participants access to new services to offer patrons. Libraries do not compete. They seek to complement and cooperate. By their very nature, they are ideal users of the Open Source Business Model.

Deichmanske Bibliotek / The Oslo Public Library has used Open Source Software for both office support and as a platform for servers providing exciting multimedia services to its target public. If proprietary software had been used, the costs would have been significantly higher and would in most cases have been prohibitive, so that the projects would never have been realized.

This paper gives an overview of Open Source-based services at the Oslo Public Library, and maps out a plan for international cooperation between libraries to produce a customized Linux distribution for libraries modelled on the Norwegian 'Skolelinux' project.

Contents

Delivering Sizzling Services and Solid Support with Open Source Software

A spectre is haunting the library. Google and the Internet threaten our revelance. Our budgets are threatened by politicians who frequently underestimate our value. The market for our product: which is nothing less that the cultural and scientific heritage of our culture, is being provided by others who demand less of the patron. We can either ignore these developments or try to ride the wave by using the technology to provide a more exciting and modern product.

We at Deichmanske Bibliotek/ The Oslo Public Library decided three years ago that we wanted to branch out and experiment with multimedia Internet services to reach our target patrons, and at the same time develop our staff's skills to prepare for our projected « Library By the Fjord» that we hope to move into in 2008.

How to do this on a limited, and often shrinking budget?

INTERNET SERVICES ON LICENSE-FREE SERVERS

We did not have the funds to buy the commercial tools to implement web-based services. We might be able to raid the book budget one year to put the products in place, but we could hardly expect to be able to operate them while paying recurring license fees.

To provide a system based on IBM's Web Solutions or Oracle, or Microsoft's web server would have meant closing a branch to free up resources, which was a political impossiblity.

Our solution was to contract and implement new on-line services using Open Source Software, specifically the LAMP software suite (Linux, Apache, MySQL, Perl/PhP), along with a few other free products such as the Darwin Streaming Server, an Open Source version of Apple Computer's Quicktime streaming server.

The LAMP suite of Open Source Tools

Linux:the Open Source Operating system written originally by Linus Torvalds in Finland, and later enhanced by thousands of independent programmers and companies such as Red Hat in the U.S., SuSe in Germany and Mandrake in France, Red Flag in China. Linux can run on your desktop or your biggest server, it is free, and the source code is open for all to see.

Apache: the Open Source Web Server (http://www.apache.org) that powers some 70% of web sites worldwide.

MySQL: the Open Source SQL database system from MySql AB in Sweden. This database system is robust, flexible and scalable enough to replace commercial databases such as Oracle, Informix or IBM's DB2 on any library application. Another Open Source SQL database system is PostgresSQL which is functionally equivalent - but alas, doesn't begin with an 'M'.

Perl/PHP: two open source programming languages for programming web applications. Both are in widespread use, are easy to learn, and fortunately for lovers of acronyms, both begin with a 'P'.

The components of LAMP are independent. Each of them has multiple Open Source and

Proprietary equivalents that are compatible with the other LAMP components.

MySQL and Apache and Perl function well on Microsoft Windows platforms and on Free BSD, another free operating system, and if you don't like MySQL for some reason, Oracle and PostgresSQL are two excellent SQL database systems that are solid substitutions.

Postgress is Open Source and won't cost you a single krone. Oracle will set you back about the price of 100 books for your collection, and then there's that recurring license fee that comes once a year.

So, although there are alternatives to each of the 4 components of LAMP, the number of projects and packages that use all 4 of them dwarfs any other single combination of tools on the SourceForge repository of Open Source Software. They have come to the fore in the flora of Open Source tools because they are easy to implement, extremely efficient on all sorts of hardware, and they each have solid communities of active developers adding functionality and fixing bugs.

Using the LAMP suite on our own servers we have made available internet services for Oslo's Library Patrons:

«Ask the Library» http://www.biblioteksvar.no

an on-line reference service - now merged and developed as a national service with chat and SMS: «Library Answers».

«City Diary» - http://www.bydagboka.no

A publishing system for young people which provides them an interactive forum for reporting on what's happening around town. What do you see, what do you think? Is there something you hate or think is great? Let your creativity loose in your own neighborhood - publish text and pictures on your own site in City Diary.

«Bazaar» http://bazar.deichman.no

A multicultural, multilanguage portal serving the immigrant population in Norway.

«Detector» http://detektor.deichman.no

Detektor is a general-subject net portal with quality-controlled, catalogued links to and descriptions of over 3000 useful sites. Detektor is a net portal for everyone, but has a special focus on resources of use to primary and secondary pupils.

«Is this Where I Belong?»

A joint effort with schools and branches to research and present neighborhood history on the net (http://www.erdether.no). «Is This Where I Belong?» is a local-historical project, focusing on identity and a sense of belonging in terms of one’s neighborhood.

«Reactor»

A low-threshold multimedia publishing system for all of the library's patrons (http://reaktor.deichman.no)

For each of these services, we either contracted with small software houses that specializes in OpenSource software development to produce them quickly and cheaply, or we used students from

the School of Library Science to program them. Our motto for these projects was «lean and mean». We kept specifications simple, and requested that only Open Source (free) software be used. In this way, we avoided recurring license costs and expensive maintenance agreements. Our services run on our own servers at the library. These servers, like the server for our ILS/OPAC, run on Linux. Our staff handles all the operation of the servers, and at the same time, provides support for our computer and network installation.

Without Open Source Software, and the LAMP software suite, these products would never have seen the light of the internet.

FREE CLIENT COMPUTERS!

Open Source is not just for servers. You can provide your staff and patrons workstations based on Open Source Software for substantially less than the cost of a workstation based on Microsoft products. A pleasant and economical benefit of using Linux on client workstations, is that they are virtually immune to viruses. In the three years we have used Linux workstations, we have never had a virus infection. To our knowledge, we have never been 'hacked'. No spyware ever infects our Linux-based public internet terminals. We certainly can't say that about the Microsoft Windows computers we have installed.

An important factor to consider when calculating Total Cost of Ownership (TCO) for a computer platform, is the cost of purchasing, installing, and administering licenses and virus protection. With Linux, this is practically nothing. How much do you pay Symantec or other vendors of virus protection for your Microsoft computers? How much time do you spend removing viruses or reinstalling Windows after an infection? How many books could you put on the shelf if you didn't have these expenditures?

The OpenOffice Suite for Staff and Public

In Oct. 2000 Sun Microsystems released its StarOffice suite as an OpenSource project. We had never had the funds to provide a full-fledged Office Suite such as Lotus or Microsoft Office, to all our staff, but with the release of the Norwegian OpenOffice 1.1 in 2003, an alternative became feasible. After testing OpenOffice at the main library for a month, we offered it on all our staff computers, and on our public access Internet computers. OpenOffice has been translated into hundreds of languages, including the two official languages of Norway. A project is also afoot to translate it to Northern Sámi. Our experience at Deichman with OpenOffice is that it is Good Enough, and we have saved over half a million kroner by using it instead of Microsoft Office. Many of our staff prefer it to Microsoft Office. These savings have come both in license costs, and in the possiblity of using cheaper - and in some cases -free hardware. This presentation, by the way, is constructed with OpenOffice Impress.

Free OPAC Computers

We upgraded our branch network to broadband speeds in 2002, and this gave us the possiblity to finally offer computers dedicated to OPAC access. Previously, the judgement of our branch managers was that with bandwidth available for only one or two public machines in each branch, it was not desirable to dedicate these to OPAC access. The public could access the OPAC on the Internet computer we had in each branch. But the long lines for the one or two public access machines, and the necessity for waiting until another user had checked his e-mail and surfed the Net, meant that most queries had to go through a reference librarian. But now that we had sufficient bandwidth to provide multiple dedicated OPAC terminals, where were we to get the money for the computers?

Another stroke of good fortune: the city's tax office, a Microsoft user, was at the end of its product cycle with Microsoft-based computers. The tax office is rich - they channel Norway's generous tax revenues to its politicians, so they never suffer from budget cuts. They can afford Microsoft. They magnanimously offered us their cast-off Pentium 200-class machines, albeit with disks completely wiped clean of operating system and data (and viruses, too!). We took these machines and loaded Linux onto them, and restricted access to our OPAC. So -for no investment at all (except for the time spent cloning the machines), we were able to provide dedicated OPAC access at all branches. Thank you, Mr. Taxman!

Linux-Based loan desk

We have found other uses for these cast-off machines: our Integrated Library System from a Norwegian vendor, although not open source, is written in a cross-platform OpenSource language: TK/TCL, so it is portable across Windows PC's,Linux For the marginal cost of the scanners, we could offer extra circulation desks for peak time service and replace our old virus-prone Windows 95 computers.

Linux Based Public Internet Access Machines

We have also made these free computers available as public Internet access machines with Linux and KDE and the Firefox web browser. If you visit the foyer of our main library, you can check your e-mail on these computers which are limited to 15 minutes per patron. No reservations are required. And these e-mail computers were free for the library - thanks to the generosity of the Tax Office and the miracle of Open Source Software! We also have Windows and Apple Macs used as public computers throughout our system, and these certainly haven't been 'free'.

LINUX-BASED IP (INTERNET PROTOCOL) INFRASTRUCTURE

At the 'down-and-dirty' technical level, we have used these 'free' Linux machine as firewalls, routers and DHCP (internet-address) servers. The tools for doing this are included with any standard Linux distribution: iptables, bind, route, dhcpd, ipsec.

SUMMARY OF EXPERIENCES

Deichman's Experience

Our experience at the with Open Source Software has shown us that we can save money which can be used for acquisitions and enhanced opening hours. We can also deliver exciting new services on a shoestring. Free and inexpensive used clients and servers costing 70-80% of a similarly powerful Microsoft server mean we can deliver more with less. License costs for clients typically are no more than 6-7% of the TCO for a client, but the big savings come in the possibility of using cheaper hardware to provide the same service, and the fact that a linux computer has a product cycle of 6-10 years as opposed to a Window's computer's 3-4 year product cycle.

What are the hurdles we have encountered with Open Source Software? Fully utilizing Open Source demands leadership support, and an enthusiastic staff and some Linux knowledge, or the willingness to learn Linux. Deichman's dedicated and competent staff has had fun while learning about LAMP and Open Office. However, the necessity of supporting legacy Windows and Mac platforms has made it a challenge to find time to exploit the possiblities of Open Systems.

Other libraries might have computer support personnel who are trained on Microsoft and who might resist the process because they do not want to learn something else, or merely because they do not have the time to learn the skills involved.

Government bureaucrats will often discourage or even forbid the use of Open Source Software because they are used to spending megabucks on software, and apparently derive great pleasure from doing so. There are many reasons to waste public funds. We have been subjected to an IT strategy document that dictates Proprietary software on computers that use the city's administrative applications. Microsoft and other vendors have extensive lobbying efforts to keep OpenSource out of public entities, so frequently these decisions are not the library's. Without strong support and commitment of our library administration to responsible stewardship of scarce library resources, we could not have resisted the blandishments of salesmen and the dictates of vested interests in the city administration.

Arizona State University, West Campus

Another documented Open Source library conversion is the West Campus of the University of Arizona, Glendale. They have documented their conversion to an all-linux library at

http://www.ala.org/ala/lita/litaevents/2004Forum/CS_Linux_West_Library.pdf

An interesting feature of ASU's conversion is that they have developed a 'fat' diskless client for student use in the library. Typically, a 'thin' diskless client manages its own screen and keyboard, but runs its programs on a central server, a division of labor that wastes processor cycles on the client, and demands an expensive server. The 'fat' diskless client that ASU has implemented downloads a local disk image to memory, and executes its programs on its own processor. This solution should be scalable upwards to hundreds of diskless workstations with even a modest server. The technical details are documented by ASU's Library Technology Coordinator, Perry Horner on the ASU library website.

OPEN SOURCE AND INTELLECTUAL PROPERTY

Librarians are taught to respect and protect intellectual property. The use of Open Source Software helps protect against software piracy. The Free Software licenses: General Public License, Copyleft, etc. openly encourage the copying and distribution of these packages. To the extent that people refrain from copying proprietary software illegally, and use the free equivalents, FOSS is a powerful antidote to software piracy. We at Deichman are very protective of Microsoft's intellectual property rights. We have Windows computers in addition to Linux, and we scrupulously avoid installing any proprietary package without a license.

HOW IS Open Source Software POSSIBLE - AND WILL IT LAST?

If a library is going to go with Open Source Software, how can we know it will be here in 10 years? Economists tell us again and again that there is no such thing as a free lunch. That's certainly our experience here at IFLA in Oslo. Microsoft's salesmen and paid publicists use a lot of money to denigrate Open Source, and to spread Fear, Uncertainty and Doubt about the viablility of an Open Source Strategy.

But every day we take advantage of Google, Project Gutenberg, and Open Access Journals without paying anything for the privilege, or without violating Intellectual Property Rights. To know why Open Source Software will persist, it is instructive to look at how it comes into being from the public or the private sector. .

Contributions from Public Institutions

A group of programmers working for a tax-supported government entity produces a piece of software that they make available to everyone by putting the source code into the public domain.

The Horowhoena Library Trust in New Zealand contracted with a consulting company to produce Koha, a LAMP-based Open Source Integrated Library package. Koha is the Maori word for 'Gift'. And Horowhoena offered a generous gift to the libraries of the world. Thank you Horowhoena. Thanks to your forsight and generosity, a small library can be up and running for the price of a small server.

Public libraries do not compete with each other. If you have a piece of software that you are developing, please consider basing it on the LAMP software suite and releasing it as part of LibraryLinux. It will take on a life of its own. And, like the Horowhoena Libarary Trust, your library will become famous as a benefactor of mankind for generations to come.

Contribution from Private Corporations

A corporation releases its product under an open source license, in the hopes of creating a market for its consulting services, or to tap the community of open source developers to enhance a parallel commercial product.

Thus MySQL AB in Sweden wrote and maintains the MySql database source, licenses it both under the GPL for open-source products, and a commercial license for organisations that want to include MySQL in another commercial package. In return for making the source code available, it always has a world-class product with many thousands of users and developers. It is the premier (and profitable) provider of training and consulting services using this outstanding product.

Similarly, Sun Microsystems developed StarOffice and then turned the code over to the OpenOffice consortium. Sun realized that it could never successfully compete with Microsoft in the integrated office suite mass market, so it essentially gave up that market. But rather than throwing their product away, they gave it to the community to create good will, and to draw on the resources of the community to enhance a product that otherwise would have disappeared. And for organisations requiring specialized Office Packages, Sun can still sell Star Office, with all the internationalisations and enhancements provided by the Open Office community.

Apple Computer makes an open source version of its QuickTime Streaming Server to tap the resources of the Open Source programming community. In this case, Apple's motivation was probably defensive: making Darwin available as an OpenSource product strengthens its Quicktime format to counter Microsoft's Windows Media Player, and it creates a voluteer programming staff to enhance Darwin that would cost Apple dearly if they had to pay them a salary. Clever licensing (Apple's own 'AGPL') ensures that changes to Darwin can be incorporated into Apple's proprietary streaming server.

There are sound business reasons for a corporation to release a product as an open source package, either to promote the sale of a parallel product, or to press an advantage against a competitor. Unlike a free program released as an executable ('shareware'), a product released with source code under the under the GPL, can never be taken back and made proprietary.

LIBRARY-SPECIFIC OPEN SOURCE PACKAGES

The last 3 to 4 years have seen the development of a number of outstanding Open Source library packages, Two in particular have reached the critical mass of users and developers that ensure continued survival and refinement:

First - two blockbusters from New Zealand:

1. Koha, (Horowhoena Libarary Trust, New Zealand) , the Open Source, Marc-based ILS as mentioned above. Now released as version 2.2.

2. the Greenstone system based on Dublin Core (University of Waikato, New Zealand) for digital collections. Current version, 2.60.

Other OpenSource efforts in libraries include:

phpMyLibrary.org, which, as the name suggests, is a php/MySQL project using strictly US Marc. (http://www.phpmylibrary.org)

OpenISIS and 'Malete' an open source version of UNESCO's CDSIS/Winisys library system and its database system. CDSIS/Winisys itself is 'free', but not 'open source'. OpenISIS is a project to provide an upgrade path to Linux for the many libraries in the developing countries that use CDSIS/Winisys.

YAZ and ZAP! - Z.39.50 toolkits and applications from indexdata.dk

brushtail - a ready-made library intranet that you can use for all kinds of common library tasks.

Links to all of these and more can be found at http://www.oss4lib.org

A PATH TO THE FUTURE

To develop Open Source further in the library, we propose an initiative to establish the LibraryLinux Custom Debian distribution. Based on the free Debian Linux distribution, and modelled on the Debian-edu project, otherwise known by its original Norwegian name 'Skolelinux', LibaryLinux will be a single CD that can be used to install several types of Linux-based computers:

Main Library Server

A server with all of the library-specific applications mentioned above installed with a basic working configuration. This can be a small server with 10-20Gb disk and a 1 Mhz processor. It does not need any widowing system, as it can be managed from another workstation.

Branch Library Server

A server for diskless workstations for public Internet access, and a file server for staff. Diskless computers can be added by configuring these to boot from the branch library server. This server is the most demanding for hardware. It should be have at least 1 GHz processor and ideally, 2 processors, and 2 Gb of internal memory. The diskless workstations should have at least 256 Mb of memory, and preferably have a bios for booting from the network. For a small library with a powerful server, the Main Library Server and Branch Library Server can be combined.

Back Office and Reference Workstation

A workstation with OpenOffice and the Firefox web browser with restricted (staff) access to the ILS. These can be any size. We have have been satisfied with second-hand pentium 233 Mhz. with 3 Gb. disks.

Public Internet Access Terminal with OpenOffice

A more complete public Internet access computer with OpenOffice, and other applications that the library might want to make available to its patrons. These can also be pentium-class computers with limited memory and disks, or like ASU's fat clients, large memories and no disks.

The motivation for LibraryLinux is to make it easy to start using Linux in your library. All of the packages for LibraryLinux can be used on other Linux distributions. But a custom library distribution would make it easy to set up a whole library with a single CD.

We need others to work on this product, so if you are willing to help, let me know. We also need a libraries that are willing to serve as a production test site for LibraryLinux.

The trend is clear: Open Source Software is a snowball that will soon be an avalanche. There is real money to be saved, and real benefits to be gained from Open Source for public libraries. If your library is well-funded and your IT staff feels comfortable with Microsoft, stay proprietary! But libraries with pressed budgets and enthusiastic staff can do extraordinary things with Open Source Software and the LAMP software suite. By opening up to the exchange of library-specific packages, libraries can benefit from each other's development expenditures.

Librarians of the World, Unite - you have nothing to lose but your license fees!

BIBLIOGRAPHY AND RESOURCES

A Google search for 'library linux' will give millions of hits - but these will mostly concern the gnu subroutine libraries that linux progams call for getting a job done - something entirely different from what we are after.

Fortunately, a few sources provide excellent gateways to the worldwide web of active libary users of Open Source.

http://oss4lib.org -

A focal point for Library Open Source projects

The Linux in Libraries Mailing List

is also an important source for news and ideas. To subscribe, go to the webpage and follow instructions.

http://www.ohio.lib.in.us/staff/atate/lil/

A recent article specifically about the LAMP software suite:

Computers in Libraries, «Open Source Software with LAMP» May, 2005