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Free as in Internet:

Using Linux and Open Source Software on Public Workstations

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Public workstations in libraries are generally dominated by software from two companies: Microsoft or Apple. Every once in a while, you might see Mozilla Firefox, but Internet stations still predominantly run Windows or Mac OS. Debate about Windows versus Mac aside, all of these computers share a characteristic: they are proprietary.

There is an alternative. Public libraries in Coos County have migrated our public computers to the open source operating system Linux and other open source software. This change has saved us money, staff time, and ultimately resulted in better service for patrons.

What is Open Source Software?

First, we digress briefly for some explanation. Open source software (OSS), sometimes called free and open source software (FOSS), are programs where the underlying source code is published and freely available. People are able to use, share, and modify the software as they see fit. Ironically, such freedom is allowed through use of copyright law. OSS is released under licenses, the most popular of which is the GNU General Public License (GPL), that delineate these freedoms, putting OSS squarely within the “free culture” movement. Often, one of the terms is that modifications to source code must be released under a similar license.

Because of this openness, OSS is developed differently from proprietary software. Often, OSS is designed by geographically-dispersed groups of dedicated developers rather than one company, a quality greatly facilitated by the Internet. While some may scoff at this development model, OSS includes several reliable and well-known programs: Linux (operating system), Android (Linux-based mobile phone operating system), Mozilla Firefox (Web browser), WordPress (content management system), Apache (Web server), OpenOffice (office suite), and more.

OSS in Coos County

Frustrated with the slow speed, burgeoning trouble tickets, and security lapses of Windows XP, Coos County’s Network Administrator Sean Park began experimenting with open source workstations in early 2008. Library staff were pleased with the speed, stability, and features of these workstations, so individual libraries in our federated district started migrating to Linux. See Delozier (2009) for an excellent explanation of Linux written specifically for libraries.

Currently, seven of our eight public libraries use Linux-based public computers, approximately 90 workstations. Increasingly, staff workstations are being switched over as well. The software on our workstations breaks down as follows:

- Operating system: Ubuntu Linux 10.04 “Lucid Lynx” (<http://www.ubuntu.com>)
- Internet: Firefox 3.6 (<http://www.firefox.com>)
- Office suite: OpenOffice 3.2 (<http://www.openoffice.org>)
- Image editor: GIMP 2.6 (<http://www.gimp.org>)
- Media player: VLC 1.0 (<http://www.videolan.org/vlc>)
- Other: Brasero (disc burning), F-Spot (photo manager), PiTiVi (video editor), Simple Scan (document scanning)
- Proprietary software: Adobe Reader, Flash, Google Earth

Much of this software may be familiar; OpenOffice, Firefox, GIMP, and VLC run on Windows and Mac OS as well. The relative speed, reliability, and small CPU footprint of



this software has enabled the district to offer many software options for patrons that previously may have been too expensive or insecure.

Reactions

Anecdotally, reactions to the switch from patrons and staff have been remarkably ... absent. Only occasionally do we get questions or comments indirectly related to our changeover: "Why don't you have Word?" "Wow, your computers are really fast!" or "What system are you using? It doesn't look like Windows."

The lack of positive or negative comments is likely because most computer users are doing simple things: checking email or social networking sites, reading news, applying for jobs, writing letters, uploading photos. These functions work similarly no matter the operating system, so little adaptation is needed.

We have made efforts to help patrons familiar with other operating systems, however. All software is given generic names: "Internet" for Firefox, "Word processor" for OpenOffice Writer. GNOME, the window manager used on our workstations, also looks and acts similarly to Windows XP. Patrons familiar with Windows XP would likely have more difficulty adapting to Windows 7 and Microsoft Office 2007/2010 than a Linux-based operating system running GNOME and OpenOffice.

Why Did We Switch?

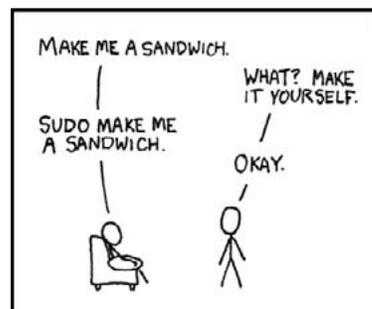
The district switched from proprietary to OSS for four primary reasons: cost, security, efficiency, and philosophy.

Proprietary software requires licenses. Licenses cost money. On Newegg.com, a popular technology vendor, licenses for Windows 7 Professional cost over \$250, while Microsoft Office 2010 professional costs over \$400. Certainly libraries are able to get better deals than this through educational discounts and programs such as TechSoup and the Organization for Educational Technology and Curriculum (OETC). Still, license costs are significant.

OSS generally does not require paid licenses. Most of the software we use on our public computers is free, to libraries and patrons alike. North Bend Public Library recently purchased seven additional public workstations. We estimate that we were able to purchase an additional two computers by using OSS. License savings translated directly into more service for patrons.

But free does not imply a lesser product, leading to our second reason for switching: security. Linux is inherently more secure than Windows or Mac OS. By default, users are

given fewer administrative privileges. Applications are more isolated from the operating system, making security failures in particular programs, such as Flash, less likely to compromise your entire system. There is no need for third-party antivirus or firewall programs (another savings in licensing costs). And finally, security updates are pushed out to Linux-based systems quickly and continuously, a benefit of the community-oriented development model of OSS.



Security in Linux: It's that cool.

<http://xkcd.com/149/>



Another consideration when the district moved to Linux was efficiency. At the time, we had older hardware designed for Windows 2000. These computers were starting to choke on the increasing requirements of Windows XP. Linux, by nature, uses hardware more efficiently. Because it has a “lighter” approach to managing applications, it uses processing power and RAM more efficiently. Thus, it runs noticeably faster on older hardware. When upgrading to newer hardware, the speed increase is even more evident.

Finally, and perhaps most broadly, OSS matches the overall philosophy of the public library. As the GNU Project, a pioneer of the open source movement, states, “‘Free software’ is a matter of liberty, not price. To understand the concept, you should think of ‘free’ as in ‘free speech,’ not as in ‘free beer’” (2010). While much open source (and proprietary) software is *gratis*, that is, has no price, free software is also *libre*: open to all for all purposes. We want the information in our libraries to be freely available to patrons. Why shouldn’t the software we use to deliver that information be free as well?

Free as in Kittens

In addition to being free as in beer and speech, OSS is also popularly known as being “free as in kittens.” That is, getting the kitten is free, but you have to care for it. There is little evidence indicating that mature open source applications are more expensive to maintain than proprietary counterparts. But using software that is not considered mainstream has other, non-monetary costs. While we have a smoothly-running system now, we ran into some issues.

One of the most difficult challenges was printing. We had several instances where jobs would take a long time to print, or be dropped altogether. This problem ultimately boiled down to support: some hardware simply is not as well-supported on Linux. Drivers for hardware may be underdeveloped or absent. Because of our experience with a particularly fiendish color laser printer, we now carefully research compatibility before purchasing new hardware.

Another issue was PDF files; some files would not open in the default PDF viewer in Ubuntu, others would not print, and PDFs with fillable fields could not be saved or printed. We ultimately found an undesirable but necessary solution to these problems: using the proprietary Linux version of Adobe Reader.

Flash, the technology behind such sites as YouTube and pogo.com, occasionally proved problematic. Web designers who use Flash sometimes have their sites ask for specific versions of it, such as the Windows version. If your system lacks that particular version, the object will not open. This poses a problem for Linux and Mac users alike. Fortunately, Web developers are becoming better at considering multiple systems and Web browsers when designing sites. This problem is declining, and we have not had reports of Flash problems for several months. Moving to more open standards for online videos and games will further alleviate this issue.

A deal-killer for many of you, our Linux-based system currently also means we lack time- and print-management software; we still use the tried-and-true clipboard method of computer scheduling. We have investigated options, including Linux-based public desktops provided by Useful (<http://www.userful.com>). Begg de Groff (2009) details another library system’s experience with a similar company, Groovix. Ultimately, we decided to keep control of our overall software environment and are researching other options: Libki (<http://libki.org/>) and powerline (<http://code.google.com/p/powerline/>).



Compatibility

Our final and most recurring issue is compatibility. Most of the world unfortunately does not use Linux or OSS. File formats, Web technologies, and even fonts can pose problems, chiefly that they will not open on Linux-based systems. There are several workarounds for such issues.

First and foremost is OpenOffice. This powerful office suite enables us to open a variety of file formats: Microsoft Office (including 2007 and 2010), Microsoft Works, WordPerfect, and others. This wide-ranging ability to open files is one of OpenOffice's benefits over proprietary alternatives. To alleviate potential compatibility issues when patrons transfer documents to other systems, we set OpenOffice to save in Microsoft Office 2003 formats (.doc, .xls, etc.) by default. We have also installed the proprietary Microsoft fonts (Times New Roman, Verdana, etc.), for which we have licenses, to ensure formatting continuity. Unfortunately, we do not have the default Microsoft Office 2007/2010 fonts installed (Calibri, Cambria, etc.), which does result in some formatting issues.

Another simple solution is a Firefox add-on called the User Agent Switcher. Every Web browser identifies itself to a Web site. The browser will say "I'm Firefox 3.x," "I'm Safari 4.x," etc. Some Web sites ask for a specific browser (such as Internet Explorer). The User Agent Switcher allows Firefox to "pretend" it is another browser. Instead of saying "I'm Firefox 3.x," it will say, "I'm Internet Explorer 8.x." For many sites seeking a specific browser, changing Firefox's user agent enables them to work.

For files that will not open at all in Linux, we have two solutions: Wine (no, not the alcoholic variety) (<http://www.winehq.org>) and VirtualBox (<http://www.virtualbox.org>). Wine allows other operating systems to emulate Windows, allowing it to run Windows-only applications. On older hardware, we use Wine to run Internet Explorer and Microsoft Office 2003.

More advanced hardware, particularly that with dual- or quad-core processors and plenty of RAM, can take advantage of VirtualBox (VB). VB allows you to run an operating system within another operating system. That is, you can be logged in to, for example, Ubuntu but open a session of Windows XP. Running VB can drain system resources, so it does require more current computers. Still, because VB runs the full version of another operating system, it avoids problems experienced by Wine or Linux-native applications.

Since we still have Windows XP licenses, we legally can use VB for obstinate compatibility issues. Currently, we have an instance of Windows XP installed on our Linux-based machines that includes Internet Explorer and Microsoft Office 2003. This is a particularly important solution for those Web sites that require Internet Explorer and ActiveX. As with Flash, however, it is becoming less necessary to use VirtualBox as cross-platform compatibility improves with documents and Web sites.

Recommendations

Despite some challenges, we have not regretted our decision to switch to OSS. The change has resulted in a system that is faster, cheaper, more stable, and with more features. We have adopted the "perpetual beta" ethos: we constantly test new software, seeking ways to improve our already well-functioning setup. That being said, we hope that other libraries seeking to make their computers more open can learn from our experiences. In addition to the challenges mentioned previously, we recommend the following:



- Make sure you have an open-minded staff. Many of the difficulties that will arise fall on frontline staff. Ensure that they are willing to learn new software and go through a few rough spots as you iron out kinks.
- Try (or at least research) hardware before you buy it or use it. Some hardware does not play well with Linux. Reading customer comments on tech Web sites helps immensely. Many Linux distributions also include live CDs that allow you to try the operating system without having to install it.
- Help your patrons by making things look familiar. Linux is very customizable. Lay out your desktop and name applications in ways that do not force your patrons to fumble around.
- Trial and error is a given. Some software may not meet your library's needs. Be willing to try different software or change settings.
- Try not to upgrade your operating system as soon as new versions become available. Many Linux distributions update frequently. If you are not experiencing problems with your setup, wait to upgrade until you have sufficiently tested the new version.

Good luck with your own experiments in open source! We hope that you will discover tools to help you deliver better, more open public computing for your patrons. And yes, this article was written using open source software: Chromium (Web browser), Fedora Linux (operating system), and OpenOffice Writer (word processor). 🌿

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