

Open Source Public Workstations and Today's Library World

In a time where an economic downturn and concerns about climate change are influencing decisions, many libraries are looking for ways to save money and to reduce their impact on the environment. This report provides detailed information about the operating systems, software, and approaches used by three libraries and one academic institution that have implemented open source public workstations. It explains how open source operating systems and applications, when installed on appropriate hardware, can decrease power utilization while providing a reliable and satisfying customer experience. The report includes detailed case studies of two public libraries and brief case studies of an academic library and an academic institution. It will help library decision makers who want to find out about alternatives to Microsoft Windows-based PCs running Microsoft Office, not only as a means of cutting costs or reducing a carbon footprint, but also as a means of providing a better experience for library customers.

What Issues Can Open Source Public Workstations Address?

As libraries collect or provide access to more and more electronic resources, it is inevitable that there will be increasing demand for public workstations. Yet the cost of maintaining these computers is difficult for many libraries to bear. The Bill and Melinda Gates Foundation has generously worked to help public libraries acquire and maintain computers and software for public use, but it is clear that many libraries are still struggling to find the operating funds necessary to maintain their computing

systems and software over time. In the January issue of *Library Technology Reports*, “The State of Funding for Library Technology in Today's Economy,” Larra Clark and Denise Davis note that libraries have continued to increase connection speeds and add new Internet-based services, including e-books, audio, and video resources. Still, they note that funding for many libraries, even those with historically stable funds, is flat, or at least volatile because libraries are looking to “soft” sources like grants or donations to meet budgets.¹

The ongoing economic crisis, considered by many to be the worst in decades, has made financial restraint even more important. Recent branch closings by major libraries suggest that the state of library funding may get worse before it gets better.² In this context, it is imperative that libraries spend their technology dollars effectively. The use of low-cost open source solutions can contribute to these efforts.

Using open source software can help to reduce the cost of maintaining public-access workstations. The most obvious source of savings is in licenses. Using the Linux or OpenBSD operating system can reduce the need to license the Windows operating system when purchasing or upgrading computers. Using OpenOffice.org to replace Microsoft Office or using network-based productivity tools instead of locally installed applications can also save on licensing fees. Savings in licenses alone can be in the hundreds, thousands, or tens of thousands of dollars, depending on the size of the library, if the library can avoid just one operating system and office application suite purchase or upgrade,³ but licenses are not the only possible source of savings.

Going Green

The library's environmental impact is another concern for many communities. The use of open source software can, under some circumstances, help the library to reduce power consumption and heat, ultimately resulting in a reduction of the library's carbon footprint. Reducing carbon emissions is a goal of many local governments and libraries, and one way to do this is to reduce power consumption. In addition, reducing the heat generated by computer systems in buildings can reduce the load on air conditioning systems. When less air conditioning is needed, additional power savings are realized.

Open source workstations can help in reducing power and heat in two ways. First, the Linux and OpenBSD operating systems run very efficiently on older equipment with less powerful processors and less memory. Running a Linux distribution (or OpenBSD) on your public workstations can extend the life of older hardware. It can also make the purchase of smaller, refurbished computers feasible. Howard County Library, for instance, has had a practice of purchasing refurbished or used Dell OptiPlex GX150 (later GX270) computers for its public stations.⁴ This equipment may use less power than more recent hardware. It is important to remember that one cannot make blind assumptions about power utilization. Recent improvements in the efficiency of the newest processors from Intel and AMD make an analysis of the actual power consumption of the hardware necessary before any organization can be assured of savings due to lower power consumption by older equipment.

There are other ways that the use of open source software can reduce a library's carbon footprint. The use of a terminal server architecture like that offered by the Linux Terminal Server Project (LTSP) can allow libraries to replace PCs with smaller terminals that require less energy and produce less heat. These terminals run applications on a shared server. While the server may require more power than a typical PC, this is more than offset by the lower power consumption of the terminals. In addition, both Open Sense Solutions and Useful offer a non-LTSP solution for sharing a single system among up to ten users. Useful claims that users of its systems can "reduce CO2 emissions by up to 15 tons per year per system."⁵

While reducing power consumption may be a matter of social responsibility, it can also save libraries money. Open source software has the potential to reduce air conditioning and power costs, which are part of every library's budget.

Security Concerns and the Need to License Third-Party Lockdown Software

Many sites in the case studies discussed later in this report said that enhanced security and reliability as reasons for utilizing open source software. Most libraries find it necessary to lock down their public workstations in order to prevent rapid degradation of the system configuration or inappropriate activity on the part of the computer user. While recent versions of Windows do have many security features built in, most libraries seem to find it easier to protect their Windows workstations by using proprietary third-party software such as Fortres 101 or Deep Freeze. These security applications can restore the system to a default configuration and remove any user-generated files after a user session. However, this software is not free and must be licensed for every workstation.

Reliability

Most viruses target the Windows operating system. This is no surprise, as Windows is the most common desktop operating system, holding an estimated 90 percent market share.⁶ Some viruses and worms do target Linux, but Linux was designed from the start to be a multi-user, networked operating system. Most distributions come with all the tools necessary to create a secure environment if the system is properly configured. For example, Howard County Library, one of the case studies in this report, saw a reduction in trouble tickets for its computers after it shifted to a Linux-based software distribution on all its public workstations, and it installed no virus scanning software.⁷

In 2004, Richard Wayne wrote in *Computers in Libraries* about the software that libraries typically need to manage public-access workstations.⁸ He listed ten categories of software. It is interesting to note that four of those categories consist of software for which libraries would typically purchase licenses: security programs, integrity maintenance software, antivirus software, and anti-spyware software. None of the libraries included in this study reported either needing or utilizing any software from these categories, apart from utilities normally included with any Linux, OpenBSD, or FreeBSD distribution.

A Better Customer Experience

Some libraries simply believe that they can offer a better experience for their customers by using open source software. Brian Auger and Amy Begg De Groff of Howard County library have argued that open source software solutions can be used to provide a better experience for their customers.⁹ They cite reliability and the ability to customize the software to meet user needs as being important advantages. In addition, they can afford to purchase and maintain more computers because they spend less per machine for both software and hardware.¹⁰ Roger Evens made a similar argument in a 2006 article about open source software in use at Deichmanske Bibliotek (The Oslo Public Library).¹¹ While the topic may still be open to debate, there is clearly a contingent of library professionals who feel their user experience is better with open source software.

Notes

1. Larra Clark and Denise Davis, "The State of Funding for Library Technology in Today's Economy," *Library Technology Reports* 45, no. 1 (Jan. 2009): 6-7.
2. American Library Association, "Branch Closings and Budget Cuts Threaten Libraries Nationwide," American Libraries Online, www.ala.org/ala/online/currentnews/newsarchive/2008/November2008/branchesthreatened.cfm (accessed Jan. 3, 2009).
3. Brian Auger, "Living with Linux," *Library Journal* (April 15, 2004): 16, 18.
4. Chuck Wilson, hardware engineer, Howard County Library, interview with author, Nov. 20, 2008.
5. Useful Corporation, "Useful Is the Green Solution: Reduce CO2 Emissions and Electronic Waste," <http://www2.userful.com/green-pcs> (accessed Jan. 3, 2009).
6. Net Applications, "Operating System Market Share," <http://marketshare.hitslink.com/report.aspx?qprid=8> (accessed Dec. 19, 2008).
7. Amy Begg De Groff, "Using Open Source to Give Patrons What They Want," *Computers in Libraries* 28, no. 3 (2008): 9.
8. Richard Wayne, "An Overview of Public Access Computer Software Management Tools for Libraries," *Computers in Libraries* 23, no. 6 (June 2004), www.infoday.com/cil-mag/jun04/wayne.shtml (accessed Jan. 9, 2009).
9. De Groff, "Using Open Source": 8-9; Brian Auger, "Open Sourcing at Howard County Library" (paper presented at the ALA Annual 2008, Anaheim, CA, June 30, 2008).
10. Amy Begg De Groff, "Open Source Software Means More Computers for Library Customers," *The Business Monthly* (Dec. 2007), http://209.116.252.254/12_2007_focus/f_12.shtml (accessed Jan. 9, 2009).
11. Roger Evens, "Delivering Sizzling Services and Solid Support with Open Source Software," *IFLA Journal* 32, no. 1 (2006): 22.