Chapter 5

# Case Studies in Brief

In the spring of 2007, the author became aware that two libraries within the region of his employer, PALINET (the region covers Delaware, New Jersey, Maryland, Pennsylvania, and West Virginia), had begun to work with open source software on public workstations as well as on their servers. Since open source public workstations were at that time, and still are, relatively rare within the library community, the author began a series of formal and informal contacts with the libraries to collect additional information. The libraries were Howard County Library in Maryland (HCL), and the Meadville Public Library, administrative center of the Crawford County Federated Library System in Pennsylvania (CCFLS). These contacts resulted in the recording of a podcast interview with John Brice of Meadville and another with IT staff at Howard County (forthcoming on the PALINET website). The decision to engage in more formal case studies followed soon after. The author's research suggested at least two approaches to open source public workstations that might be helpful to some libraries.

*Podcast interview with John Brice*
http://blog.palinet.org/podcast/?p=17

To round out the information about open source public workstations provided by the initial libraries and to provide examples of a non-LTSP multi-user workstation site and a browser-only LTSP site, two additional organizations were contacted for telephone interviews. To ensure consistency, all of the libraries included in table 1 were asked to answer the same questions. The table shows the questions and their answers.

The University of North Carolina, Chapel Hill does not use open source workstations in its libraries, but does install them in various other locations on its campus. Its experience highlights the value of LTSP as a tool for creating specialized kiosk workstations in public areas and should be of interest to libraries that create specialized Internet browsing stations. The University of Vermont, Burlington (UVM) uses a Groovix Linux distribution from Open Sense Solutions on its open access public workstations. UVM's workstations have been configured by Open Sense Solutions for use by up to four users per workstation. This example of a fully open source multi-user computing solution is similar to that offered by Userful, but without utilizing any proprietary tools.

| | Crawford County Federated Library System | Howard County Library | University of North Carolina, Chapel Hill | University of Vermont, Burlington |
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| ***First started using open source software in*** | 2000. | Early 2000. | Late 2003. | About 2005. |
| ***What prompted you to look into the technology—what problems were you trying to solve?*** | CCFLS had older PCs that needed upgrading. LTSP allowed the library to improve services while extending the life of the library's older hardware. In some locations, CCFLS has also purchased low-power-utilization diskless workstations from DisklessWorkstations.com. | HCL wanted to improve the customer experience. There were two primary issues. First, its Windows machines were frequently out of commission due to security and reliability issues. Second, if it could save money on operating system and application licenses, it could install more computers. | UNC needed an easy way to create low-maintenance kiosks in the Student Union. It didn't want to deal with the security issues that Windows presents. It started testing and found the LTSP software very easy to manage. It has since expanded the use of LTSP terminals to Campus Health, Campus Recreation, and the School of Pharmacy. | UVM wanted to reduce maintenance load for public workstations and to provide more public Internet access for less money. It chose to go with a four-user-per-workstation configuration offered by Open Sense Solutions. Most are standup workstations used primarily for Internet access by the public. |
| ***Other solutions considered*** | Using PCs to run Linux. | HCL started by replacing a limited number of Windows machines with LuMix, an in-house custom Linux distribution. When that solution appeared to be too resource-intensive, the library ultimately settled on Open Sense Solutions' custom Linux solution, Groovix. | None. | None. |
| ***Number of public workstations*** | CCFLS libraries currently have 5 low-power terminals, 51 PC-based thin terminals, 4 Linux workstations, 13 Windows PCs, and 1 Apple Macintosh in public areas. | As of November 2008, HCL had 307 public-access workstations in 6 locations, all running the Groovix Linux distribution from Open Sense Solutions and a full suite of open source applications. | UNC started with 5 LTSP terminals and has worked up to 22. They are used whenever a single-purpose kiosk is needed. Uses include Internet access, surveys, and programmable signage. | UVM runs a combination of Windows and Linux workstations in the library. The current breakdown is about 170 Windows and 45 Linux. The Windows workstations are full service, with a full application suite and access to the university's network and disk storage. UVM user authentication is required on the Windows workstations. The Linux workstations at UVM are used for open-access workstations and do not require authentication. They are designed primarily for Internet browsing, but UVM now loads the OpenOffice.org office productivity suite as well as browsing software. |

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| ***Hardware*** | CCFLS is using a combination of diskless workstations with LTSP, older PCs with LTSP, PCs running Linux, and servers running Linux and OpenBSD. Terminals cost about $300 each. The LTSP server is a dual processor, AMD Opteron 2.0 GHz, with dual cores and 6 GB RAM, which cost about $2,000. | HCL has standardized on older Dell desktops, mostly GX150 or GX270 models. The current standard is a GX270 with 1 GB RAM. | UNC uses diskless workstations from the HP T5700 series (about $400 each). The LTSP server is a dual processor, Intel Zeon 2.6 GHz, with dual cores and 3 GB RAM, which cost about $5,000. | The oldest of UVM's Groovix machines are AMD Athlon 2 GHz class machines with 2 GB of RAM and no hard drives. The newest ones are Intel Core 2 Duo 2.33 GHz machines with 2 GB RAM and no hard drives. They run from a live CD with the disk image loaded completely into RAM. |
| ***Applications*** | CCFLS loads Firefox, Mozilla, Opera, and OpenOffice.org on its public-access workstations. | HCL loads OpenOffice.org, Firefox, MPlayer, RealPlayer, Adobe Reader, and a large game selection on all public-access computers. | UNC uses LTSP to run Firefox (Web browser) kiosks. Some are limited to a single page or website, for example, to present an online survey. UNC uses the Firefox add-on R-kiosk to control what the user may do on a workstation. | UVM loads Firefox, OpenOffice.org, and Adobe Reader on its public-access workstations. |
| ***Management or monitoring tools*** | A CCFLS programmer wrote an open source tool, libKi, for session management. All other management is done with standard Linux utilities. | HCL developed its own utility called PACMon that displays a map of each branch library and shows the status of each workstation as On, Off, or Printing. Open Sense Solutions has since incorporated a version of this utility into its Groovix offering. | UNC has found that nothing is needed beyond standard Linux utilities for managing its LTSP terminals. | UVM uses Open Sense Solutions' utilities for workstation management plus Pharos for print management. |
| ***Security problems*** | CCFLS reports no security issues since moving to LTSP. | HCL found a significant increase in reliability after switching from Windows NT to Linux. It reports no virus or Trojan horse problems at all since moving to Linux. | One user crashed a terminal out to a console prompt, but had no permissions to do anything from there, so no damage was done. Problems can generally be resolved by killing the user processes on the server and restarting the terminal. | UVM reports occasional problems with physical vandalism, but no software-related security issues. |

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| ***User reaction*** | No customer reaction reported. | Most customers appear not to know or care that they are using open source software. The library's increase in the number of full-service workstations has been positively received. Staff received no more complaints than would be expected from any major change. | No customer reaction reported. | There has been little public reaction, other than heavy use. |
| ***Project a success?*** | Yes. CCFLS is happy with the cost savings it has achieved, as well as the improvement in services for its library patrons. | Yes. HCL believes it has achieved a significant improvement in the customer experience. | Yes. UNC continues to add additional terminals wherever a kiosk is needed. | Yes. |
| ***Approach recommended by users?*** | Yes. However, libraries wanting patrons to be able to display video should probably run a separate copy of Linux on each workstation rather than use LTSP. | Yes. | Yes, although it is important to invest in good server hardware. "It's been a really good solution for us. We have low budgets, and being able to do things at low cost is key."* | Yes. The approach has been very successful for the open-access public workstations. |

*Brian Payst, telephone interview by author, Nov. 21, 2008.

**Table 1**