

Doing More with Less

Maximizing Your Hardware and Your Budget

by Jason Griffey

One of the harsh realities of library work today is dealing with funding. Some libraries have higher budgets than others, but at some point every librarian will find themselves trying desperately to do more with less. When that “more” is technology, it becomes difficult to move a library forward during a negative financial period. With some basic guidelines for purchases and some creativity, you can make your hardware work for you long after its shelf life is over.

There are many steps that librarians can take regardless of technological proficiency to ensure that hardware lasts as long as it can and that the library gets the maximum possible use from it. First of all, the truth that most computer software manufacturers don't want you know is that the aging of your computer is as often due to “software bloat” as it is to physical wear-and-tear. With today's computers, there just isn't much inside that sustains major physical damage over a normal lifespan (the exception here is the hard drive, which is a mechanical device that inevitably will deteriorate). A modern computer, barring an electrical surge, water damage, or other major trauma, is likely as good 5 years from purchase as the day you opened the box.¹

The real secret to helping your hardware help you in an economic downturn is to buy smart when you can, and make the machines as flexible as possible for the future. While the PC in the ultra-mini case that straps to the back of the monitor might be really attractive and might be nice for saving desk space, when you need to replace its parts you will find yourself spending more time and money than with a more standard machine. What if you decide you want to add an extra monitor to it and discover that none of the dual-head video cards will fit because the case is too small? In a situation where we truly want our technology to last as long as possible and perform as well as possible during that time, sticking with standard tower

or desktop cases will ensure that you never have compatibility problems when swapping out hardware.

When you do purchase hardware on a budget, you can often find amazing after-market savings on certain upgrades. For instance, upgrading the RAM in an Apple iMac direct from the Apple store can cost 4 times as much as buying the RAM separately from a reseller and installing it yourself. Instructions for replacing the RAM are just a Google away, and it won't even void your warranty.

The modern PC is a complicated machine, but it is designed around a few easily replaceable parts. Upgrading just the necessary parts of the system, instead of buying whole new machines, is a great way to stretch your IT budget. RAM gives you the most bang for your buck in terms of improving computer performance and is also the easiest thing to replace physically. Upgrading the amount of RAM in a system can stretch the usefulness of a PC significantly. Most modern computers running a current operating system will perform best running between 2 and 4 gigabytes of RAM, so if you are below that threshold, an upgrade to the RAM will make a huge difference in the speed of your system. Currently, the cost of RAM is around \$20 per gigabyte, so you can max most systems for less than \$80—a great investment in your everyday computing experience.

Buying an inexpensive external hard drive in order to corral the stampede of files drowning your old computer is another great way to stretch the life of the system. Documents pile up over time and most people are not diligent about deleting them. As your hard drive fills, less and less of it is available for the system to use, and at a certain point it will slow your system. Backing up files that are no longer needed on a regular basis is a good practice, and an external hard drive makes that process easier. It will also make the primary disk, and therefore the operating system much more stable.

It's not just hardware that can make a huge difference in the lifespan of your PC. The software that you run can have a huge effect in two different ways: you can upgrade beyond the scope of the hardware, or you can trash the system with junk software. Upgrading beyond the hardware happens when, over the course of four to five years, all of your programs have iterated two or more versions, each with increasing burdens on the underlying hardware. Or perhaps you've upgraded operating systems, something like the transition from Windows XP to Vista. The hardware that was perfectly happy running XP and Office 2003 will complain mightily when you decide to run Vista and Office 2007. Not to mention Acrobat 6 to Acrobat 9, and the dozens of other upgrades that happen over the course of a system's life.

What can you do about software bloat? The most important thing is to recognize that if an upgrade isn't going to give you significant advantages in either productivity or compatibility, it probably isn't worth doing. You can't avoid software upgrades for security reasons, but maintaining a known set of programs that run well will go a long way towards making your computing experience on older hardware a good one. If your computers are struggling, don't force more and different software on them unless you are sure that they will be significantly less secure if you do not upgrade.

Once a PC has run its natural lifespan in standard productivity mode, it isn't necessarily ready for decommissioning. It depends on the manner in which the hardware has been used, of course; the average public PC will be in far worse shape in four years than a single-user staff system. There are many ways to reuse older PCs that may not be apparent to some librarians. Some of these suggestions will rely on a significant amount of tech knowledge, but most are capable of being done by anyone who can follow a simple recipe. There are dozens of walkthroughs for these on the Web, only a short Google away.

Turn your old PC into a print server
www.ehow.com/how_2034850_build-server-computer.html

Revive your old PC with Linux
www.wikihow.com/Revive-an-old-PC-with-Linux

Turn your old PC into a file server
www.techmanifesto.com/archives/2005/08/10/turn-your-old-pc-into-a-file-server/

Make your PC a webserver
www.instructables.com/id/Make-a-Server-Out-Of-An-Old-PC/

Use an old PC as a firewall
www.linuxsecurity.com/content/view/full/142641?rdf

As it turns out, a modern computer spends a lot of its effort to present the user with its Graphic User Interface (GUI). The GUI is the interface between the user of the computer and the actual code running the system; since most of us would be hard-pressed to do everything we wanted via command line, having buttons and windows and scrollbars is a nice way to control the system. Even older computers can suffice as low-level servers where a GUI isn't needed, like a print server or a basic file server. While it wouldn't be prudent to try and use an old PC for truly mission-critical aspects of your library, you can certainly use it to perform these background tasks. Another good use for older PCs is to use them as miniature test servers for your Web development librarians, as nearly any older PC can serve as a basic, local webserver for testing scripts and installations of new software.

Anytime you can reduce the amount of work that a computer is forced to do, you increase its speed. Using this principle, computers that seem too slow to use for everyday tasks can be repurposed for public use, as long as this use is of limited functionality. While one might hesitate to put computers with limited functionality on a public floor, there are definitely areas where they can be useful. One fantastic use is as a walk-up catalog/database search terminal, where the user isn't expecting to be able to write a paper or answer e-mail, but just wants to see if the library has access to a piece of information.

A huge advantage of reusing older computers this way is that you don't need any particular operating system for a terminal setup. You are going to be limiting the access that the user has to the machine, so the OS underneath isn't particularly important. To stretch your budget even further, you can get away with using Linux instead of Windows, saving money on the cost of the Windows license. In addition, most research machines of this sort are going to be focused on the web browser (accessing your catalog and databases), and the open-source browser Firefox 2 can be set up in kiosk mode that makes setup and maintenance a breeze. There are several plugins that allow you to enforce various security protocols with the browser running full-screen available for Firefox 2 (and soon for Firefox 3) that, when combined with an installation of Ubuntu, would make a very robust Internet Kiosk station for a library.

Another option for older systems is to use them as communications stations, setting them up with nothing but an IM client directed at your Reference department IM account and a background that says "Need help?" Throw in a cheap wireless card, and you can throw one anywhere you have a power outlet as a help station for the lost patrons who just want to know why they can't find a copy of Harry Potter in the HP section.

Make a bootable CD for Internet Kiosk use
www.ehartwell.com/InfoDabble/HowTo:_Create_a_boot-from-CD_browser_kiosk_with_Firefox_and_Linux

Hacking Firefox for your library
<http://librarytechtonics.info/bits/533/hacking-firefox-customizations-for-my-library-nablopomo-8/>

OpenKiosk for Firefox
<https://addons.mozilla.org/en-US/firefox/addon/509>

R-Kiosk for Firefox
<https://addons.mozilla.org/en-US/firefox/search?q=kiosk&cat=all>

Note

1. To get an idea of the average lifespan of a motherboard, for instance, see the article at www.gigabyte.com.tw/FileList/NewTech/2006_motherboard_newtech/article_02_all_solid.html that discusses the differences between capacitor types and their longevity.