New versions of thin clients can solve the many problems wrought by “fat client” PCs

By Diane Romm

The problems with networked PCs are a modern-day plague for both librarians and network administrators. PCs crash, they freeze, they require constant updating and patching. End users amuse themselves by finding ways to circumvent whatever safeguards the network administrator has put in place. Depending on the age of the machine and the operating system installed, PCs display different desktops, a constant source of confusion for patrons. End users often intentionally or unwittingly introduce viruses into the network through them. And every few years, the library has to find funding resources to buy newer machines, because invariably the PCs become outdated and can no longer run the programs the library wants to use.

Their maintenance is the source of endless headaches, but at the same time computers are the indispensable tool for the 21st century. Now, thin clients have reemerged as an excellent remedy for the ailing networked PC.

How thin clients work

More than a decade ago, libraries sought alternative solutions to these problems through the use of thin clients in public access areas. Thin clients differ from PCs or “fat clients” because their applications and data are stored on the server, rather than on the thin client itself. In a PC network, some applications and data may be stored locally on the personal computer itself and some may be stored on the server. In a thin client network, all of the applications and data reside on the server. The thin client is simply a device from which to send requests and on which to see the results. Thin clients are essentially empty boxes, much like the original “dumb” terminals that connected to a mainframe. Since they do not process anything themselves, thin clients do not need any internal memory. Furthermore, they run at the speed of the server rather than at the speed of an internal processor. Often no bigger than a trade paperback, today’s thin clients also come equipped with USB ports to support a variety of removable media including floppy disk, CD-ROM, and flash memory drives.

The earliest versions of thin clients were less than satisfactory in their performance. They were slow, unable to grapple with visual displays, and could not support the use of peripherals. However, advances in technology, coupled with increased bandwidth, have changed all that. Today, anyone who has a computer network in place probably has adequate

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Wire Watchers: Going thin means reducing the clutter of hardware and electrical lines that formerly ran PCs. The Bloomfield Public Library, NJ, has slimmed down in all the right places—underneath and on top of work surfaces.

Library capability to run thin clients whose performance will be virtually indistinguishable from that of PCs. In fact, in a recent “blind taste test” in the UK, end users could not tell which workstations were thin clients and which were PCs and actually preferred the thin clients over the personal computers. Libraries that have an 802.11g wireless network are also perfectly positioned to take advantage of thin client technology. Of course, the performance of the thin clients is completely dependent on the quality of the network, so when considering a move to thin clients, call in a knowledgeable expert to assess your network and recommend any necessary changes and upgrades to minimize bottlenecks.

In a thin client environment, the server does the heavy lifting. In fact, this type of network is often referred to as “server-centric computing.” For thin clients to operate effectively, the server must have enough memory to respond instantly to requests. The server must also have a program called “terminal services” installed. If your server is Microsoft-based, you may need Windows Terminal Services (Remote Desktop Protocol) or Citrix. If your server is Linux-based, look at the Linux Terminal Server Project (LTSP). Thin clients are also available that can access application servers using other terminal emulations such as TN5250, AS400, and IBM3270.

Ways to be thin
Thin clients come in two forms. Traditional thin clients have no internal storage but rely upon embedded software to give them the instructions needed to boot up. The presence of embedded software does make them vulnerable to the same need for patches and updates that plague PCs. This software is also based on a specific operating system, so among traditional thin clients you will find Windows and Linux versions.

Thinner thin clients, sometimes called diskless thin clients, have no embedded software and use a boot server to start up. Since they have no software in them, the same unit can often function with both Windows and Linux.

Both types of thin clients employ a server-centric computing architecture that centralizes the control of the software. This simplifies the updating and configuring of your applications, reduces the downtime of workstations, and means fewer complaints from patrons. For libraries, and indeed for any public access sites such as kiosks and Internet cafés, thin clients provide a multitude of benefits.
Why Network Administrators Love Thin Clients

**Easy To Manage**
A server-centric network solution means that programs are loaded onto and operate from the server rather than from each computer.

**RESULT**
Total control of the network from the server room

**Easy To Secure**
Thin clients are essentially empty boxes with no drives of any kind.

**RESULT**
Useless if stolen
No administration at the user’s desk
No local machines to secure from viruses and hackers

**Easy on the Budget**
Thin clients have no moving parts and no built-in obsolescence. You can use machines as old as Pentium 1s, and programs run at the speed of the server.

**RESULT**
No need to replace your workstations every three years
Reduced costs for software licensing and electricity
You can reuse outdated hardware with no impact on user experience

**Management ease**
The complexity of network management has grown geometrically in the past decade. With the server-centric approach of thin clients, programs are loaded onto and operate from the server rather than from each computer. That means the network administrator has to worry about only one machine—the server. The librarian does not have to wait for a technician to fix the workstation or upgrade the programs on it. And the technician’s time translates into money. The Gartner Group estimates that one third of the costs for PC networks are spent on technical support.

Computer viruses, hacker attacks, and security threats have become a nightmare for network administrators. The thin client approach eliminates many of these issues because the network administrator needs to secure just the server, not every workstation. Technicians no longer have to visit each PC to do patches or software updates. In the end, you gain in productivity, reduce your costs, and strengthen your network security.

You also never have to worry about the physical workstations themselves. Thin clients work only when they are connected to the network, so they are useless if they are stolen.

**Real budget benefits**
Every major computer analyst group has pointed to the reduction in total cost of ownership that the adoption of thin client technology brings with it. When libraries create a computer network, they must consider a variety of costs, not just the initial outlay for the hardware and software. Other costs range from the salaries of the technicians to annual software licensing fees and even the price of electricity. All of this is referred to as the total cost of ownership. It's much like buying a dry clean-only shirt. The total cost of owning the shirt over five years is the initial price of the shirt plus all of the accumulated dry cleaning costs. Over time, that shirt could prove to be very expensive.

MSRP prices for thin clients suitable for library use range from $149 to over $400 without a monitor. Even though the initial outlay for thin client hardware may not be much less than for a comparable number of PCs, the savings over time are dramatic.

Indeed, the Gartner Group has estimated that capital equipment costs, including software, account for only 20 percent of most annual costs for a PC network. The other 80 percent goes to administration and technical support associated with troubleshooting, customizing, or tinkering with end users’ PCs and application software.

Thin clients can often reduce the amount of money that must be spent on annual licensing fees as well. Even though the library may still have to pay for server-based licenses for applications such as Microsoft Office, it may not have to pay for licensing Windows on each desktop.

With no moving parts and no built-in obsolescence, thin clients also rarely break. “I used to joke with vendors that if I had a support call about a thin client, my answer was either ‘Turn it off and turn it back on’ or ‘Hit the Enter key,’” Andy White, associate director for the Health Sciences Library at the State University Library at Stony Brook, says in “Is Thin In?” (University Business, June 2004). “When you’re dealing with thin clients, it really is that easy.”

Thin clients get their power from the server, so they run applications at that speed. Personal computers, on the other hand, are limited to the speed of their processors. That’s why PCs become outdated so quickly. In fact, thin client technology offers the opportunity to reuse old machines. Libraries can dust off those old PCs they have in the basement, remove their hard drives, and turn them into thin clients. It’s an easy way to improve the patron/workstation ratio without extra budgetary expense.

Even in an area as mundane as electricity, thin clients offer savings. With no need to power internal devices and fans, thin clients consume only ten percent of the amount of electricity needed to run a PC. Units are available for under $200 that need only five watts of power and will still display in 24-bit color with a 1600x1200 resolution. And they function silently and generate no heat at all.

With life spans two to three times that of PCs, thin clients help libraries avoid the constant need to replace their workstations. Instead of spending money on getting new PCs every three years, the library can allocate a smaller amount of money to buying bigger, faster servers.