

## "Thin" is In By Ron Schachter

*In more districts, thin clients are replacing "fat" computers. Is the time for a computing revolution.*

At New York's Hudson Falls High School, Tracy Jameson leads her Earth Science class into a computer lab. The 18 ninth graders take their positions in front of empty screens and sleek, identical-looking "thin client" devices. The aide for the lab is out sick today, but Jameson does not seem to mind. She encounters no technical glitches or questions she can't answer.

Within seconds, the same versions of PowerPoint and Photoshop are up and running. Each student gets busy coloring in bar charts and tweaking graphs for personalized slide shows on temperature conversion from Celsius to Fahrenheit. In this rural district about an hour north of Albany, N.Y.--and in a growing number of school districts around the country--"thin" is in. According to a recent study by educational research company QED, 15 percent of districts in the United States are using thin clients, and another 15 percent are considering them.

Hudson Falls' thin clients--at almost half the price of typical computers--have barely any moving parts and lack the software you would usually find on a desktop or laptop. Instead, the new machines connect directly to almost 100 applications, from Word to Reader Rabbit, installed on the district's central servers, and that, says Jameson, makes a world of difference.

"Everything's consistent," she points out. "Before we had the thin clients, you would hope that PowerPoint was loaded onto all the regular computers and you would hope that it was the same version. You could be demonstrating something, and five kids would be saying, 'I don't have that on my screen.'"

"In the olden days," adds Gregory Partch, Hudson Falls' director of education technology, "teachers had to spend time getting those five kids up to speed. The teacher doesn't have to be a technician now."

The "olden days" for Hudson Falls date back a scant six years, before Partch discovered thin clients at a National Education Computing Conference. Since pilot testing 50 of the devices, he's added hundreds more and has drafted additional hundreds of aging "fat clients"--Macs and PCs already in Hudson Falls' classrooms--for his thin client revolution.

### **Mixing Old and New Terminals**

"We do not throw away anything," Partch emphasizes, as he sits in front of a bank of the district's oldest classroom computers. "This is what I call a 'skinny,' " he says,

staring a beat-up-looking Dell. "It's a fat client that behaves like a thin client." A normal-looking desktop--with icons for the latest versions of Word, Outlook, and Excel--pops onto the screen. Again, there's no start-up time needed to get these applications running. Partch opens Excel and snaps his fingers. "Boom," he says. "It's running right off the server."

This "skinny" is also running Citrix software, which lets it access the programs on the server and allows thin clients and skinnies alike to process at high speeds. "I still have the first generation of iMacs," says senior systems analyst Maria Valente, who has converted plenty of those machines to thin clients for the Union City, N.J., public schools. "Once you load Citrix on the old computer, you're no longer using the processing thrust of the desktop. You're using the processing power of the server."

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Citrix also enables users to connect from remote locations. Working from home, for example, Jameson can access her gradebook online, and her students can finish working on their presentations.

Berj Akian, the founder and CEO of ClassLink, which provides software and services for thin-client users, notes that this kind of computing became widely available in 1998, when Microsoft included the functionality of thin-client technology in Windows NT servers.

"It goes back to the mainframe computing days of the 1950's and '60's, where everything was stored on a central computer, contrasted with the distributed client-server model of today," Akian explains. The noticeable results: increased reliability and decreased IT costs.

Hudson Fall's Partch says thin clients--at an average \$200 to \$400 apiece--are not only less expensive to buy than conventional computers, they continue to save his department money. "When I looked at what it was costing to maintain 1,000 fat clients compared to thin clients, it was a no brainer," he explains. "To upgrade from Microsoft Office 2000 to 2003, it took us four hours to replace the copy of the software onto each of our nine servers. In the old environment, if I had to make that upgrade on 1,000 individual work stations, it was literally a summer project."

Most problems can usually be fixed on Hudson Falls' servers, and the IT staff have become more like Maytag repairmen, seldom called into the field to fix balky traditional computers. That freedom has allowed the department to manage the data for the district's finances, as well as its special education, transportation and food services departments. The bottom line, Partch says, is that he can do more with fewer resources.

### **Portable Devices in Lemon Grove**

Eight years ago, the cost savings and reliability of thin clients prompted the Lemon Grove School District, near San Diego, to retool its plan to achieve a 1:4 ratio of

computers to students. "We'd ask how it was going," says Director of Information Services Darryl LaGace. "And teachers would say, 'Gee, it's nice that we have eight computers in the classroom, but it's hard to get enough computer time for my 32 students. And by the way, two of the computers don't work.' "

The district instead achieved a 1:2 ratio by amassing 5,000 thin clients, connected to a 60-server "farm," to go along with its 1,000 conventional computers. "The kids no longer needed to get up to use their computers," observes LaGace. "They had fingertip access to the new thin clients, which were as available as a pen and paper. This is an urban district, but the technology you find in our classrooms is what you might find in a wealthier district."

Lemon Grove has not stopped there and for the past three years has equipped students at one middle school with portable and wireless thin client devices with touch screen keyboards. The students can use them from home as well as in class. In choosing thin clients, Lemon Grove took a decidedly different direction from well-known programs in Maine and Michigan that have distributed laptop computers to students.

"It always comes back to 'How do I support these machines?' " says LaGace. "I tried a laptop project with two classes, and I couldn't put enough technical people out there to keep it going. When you've got 2,000 notebooks using different applications, there's a lot of overhead that taxes the project's success. And the thin clients also are rugged. You can't break them."

Staff development at Lemon Grove has changed as well. While past training included pointers on how to fix balky computers and programs, teacher now focus on moving their instructional programs to an interactive model.

In Union City, N.J., meanwhile, Maria Valente has just equipped the first of eight new schools planned to open over the next five years with thin clients. Valente says that thin clients have made a practical difference during her tenure.

"When I came here to work nine years ago, there was a lot of infrastructure damage caused by students. I saw thin clients as a means to give 90 percent of the things they do everyday at close to 100 percent uptime. They would produce more, because they're not producing when the technology was down."

### **The Drawbacks of Thin Clients**

Despite the promise of thin clients becoming the next big thing in educational computing, the new technology has hit its share of speed bumps over the past decade. "The multimedia applications on which many schools depended did not fare well," recalls ClassLink's Berj Akian. According to Lemon Grove's LaGace, "The stigma is still out there about what thin clients can and can't do."

In recent years, though, the hardware and software have improved. The thin client devices made by companies such as Wyse and Hewlett Packard have become sturdier and even more compact. Servers running Linux, as well as Microsoft Windows now support the new technology. The servers themselves have become more powerful, and

networks have become more robust. Citrix has solved many of its multimedia problems and has a new software competitor in Tarantella.

"If you've heard about misgivings in the past, you'll want to take a look at thin clients today because the technology has absolutely grown," Akian points out.

Even so, promoting thin clients can still be a tough sell, especially to teachers. "Spreading the gospel is a challenge because it's a paradigm shift from 'my computer, my hard drive, my files,' " says Chapel Hill-Carrboro's Ray Reitz. "And another tough nut to crack has been convincing them of security, even though their files are extremely secure. Those files are password protected, backed up nightly and weekly, and stored off-site."

*"To upgrade Microsoft Office 2000 to 2003, it took us four hours. To make that upgrade on 1,000 individual work stations, it [would have been] a summer project."* Gregory Partch, director of education technology, Hudson Falls (N.Y.) Central School District Nor have thin clients rendered their fat counterparts obsolete, at least for the moment. "For teachers, we still leave a regular computer connected to projectors and for higher-level functions such as videoconferencing," says Lemon Grove's LaGace. "But we've even broken the barrier this past year with a program embedded in the Windows XP operating system and software for Web Cams that allow videoconferencing via thin client."

Thin clients also lack a DVD drive, and, Hudson Falls' Partch adds, still have trouble getting audio and video to run together when using the popular Flash plug-in. A song that teaches the alphabet, for instance, could easily go astray.

For those districts thinking of trying thin clients, the early adopters have some advice. "One thing I tell everyone--do a pilot," says LaGace. "Start in a managed environment where your staff can get up to speed. LaGace also recommends visiting schools already using the technology. "There are plenty of places happy to show you what they're doing," he says, noting that hundreds of schools have already visited Lemon Grove.

When it comes to installing thin clients and the necessary servers, Reitz suggests getting help from outside technical experts. "In order to set up, you do need to invest in some higher order engineering and server-based knowledge," he says. "Schools should really not try to do this alone."

But, Reitz insists, it's worth taking the plunge. "Our kids expect to be connected and have access to their stuff wherever they are--at a coffee house, school or home," he says. "And this step towards thin clients is really a step in that direction." DA

### **Related Information**

**The Skinny on Thin Clients** The thin client field is growing, and now you can get hardware and software from multiple vendors: Thin Client Machines Wyse Technologies, [www.wyse.com](http://www.wyse.com) Hewlett Packard, [www.hp.com](http://www.hp.com) TeleVideo (recently acquired by Neoware Systems), [www.televideo.com](http://www.televideo.com) Prices range from \$200 to \$400 Servers Thin client computing does not require special servers, and advances in

processing power and network robustness have allowed thin clients to proliferate. Be prepared to add servers as your thin client needs expand, and make sure that those servers have plenty of memory so they can run applications quickly and smoothly.

Server Operating Systems Microsoft Windows (with Windows Terminal Services software), [www.microsoft.com](http://www.microsoft.com) Linux (with Linux Terminal software), [www.linux.com](http://www.linux.com)

Microsoft has been the dominant player in this part of thin client computing, but Linux has become a viable choice. The terminal software allows the servers to connect with thin clients.

Additional Software Citrix Systems, [www.citrix.com](http://www.citrix.com) Tarantella (recently acquired by Sun Microsystems), [www.tarantella.com](http://www.tarantella.com)

These programs allow you to manage and expand thin client capabilities. You can adapt conventional computers to serve as thin clients and allow users to connect from home and other remote locations. Citrix was the first kid on the block and has come a long way after initial problems with multimedia applications. This software is preferred by those using Windows-based servers and it sits "on top" of the Windows Terminal Services software. Tarantella works especially well for servers running Linux or a combination of operating systems.

Consulting Services A number of companies offer services and additional software that help set up and maintain thin client environments. Many district technology directors using thin clients suggest getting outside expertise when converting to that technology.