

Trimming DOWN

Schools take different approaches to thin clients but see similar results: cost savings, simpler IT management and better security.

By Wylie Wong

School districts that have big computing needs but small budgets are turning to a more affordable solution: thin clients. Take Union School District in San Jose, Calif., which turned to thin clients to upgrade a computer lab full of aging notebook computers that broke down frequently and couldn't support new software the teacher wanted to use.

Thin-client computing is easier to troubleshoot and manage because, in most cases, the computing infrastructure and all the applications and data are housed centrally in the data center. Thin-client devices are less expensive and consume less power than regular PCs. And because thin clients have no hard drives, fans or moving parts, they last longer — five to seven years, twice the lifespan of PCs. The technology is also more secure because students can't change computer settings or install unauthorized software.

These benefits, which lower total cost of ownership, and the emergence of new thin-client technology that provides users with a near-PC experience or better is driving thin-client adoption in education, says Info-Tech Research Group analyst John Sloan. For example, today's thin clients are no longer just dumb terminals; high-end versions boast a processor and memory, which allow applications to run locally and improve web browsing and multimedia performance.

"The trend in thin clients is around new models for centralizing the processing and management of desktops," Sloan says. "The best scenario is to achieve savings from improved application deployment and desktop support, and provide users with a rich Windows computing experience that is the same or better than when they had PCs on their desks."

Here's a look at how school districts have deployed thin clients and how IT administrators, teachers and school administrators are benefiting.

WHAT'S THE SAVINGS?

Though Union School District standardizes on Apple, the tech department took a stab at a new Windows-based bundle by Wyse Technology called "Classroom-in-a-Box," which features a server appliance that uses OS streaming technology to deliver the full Windows XP operating system and applications to 20 Wyse R00L thin-client devices. The district spent \$15,000 on hardware, monitors and software licensing, which was \$10,000 less than the cost of purchasing new computers.

"This seemed like the most cost-effective way to meet our instructional computing needs without purchasing entirely new or refurbished computers," says Alan Fillmore, the district's technology director.

Elsewhere, Fremont School District #215 in St.



From left, Sean Mulligan and Alan Fillmore say thin clients will deliver fast access to information and applications to students in San Jose's Union School District.

Flavors of Thin Clients

In the traditional thin-client model, which is the one most widely deployed, keystrokes and mouse clicks are sent to the data center, where servers perform the processing and send a view of the screen back to users' thin-client devices. But in recent years, three thin-client alternatives have emerged.

- **Streaming OS:** This model delivers a computer image — with a full operating system and applications — onto thin clients over the network, and then the thin clients run the software locally.
- **Blade PCs:** Blades are actual PCs that are housed in data centers as if they were servers. Users connect to the PCs through thin clients.
- **Desktop virtualization, or Virtual Desktop Infrastructure (VDI):** With VDI, servers are partitioned into different virtual machines (VMs). Each VM shares server resources, such as processors and memory, but provides users with their own "virtual computer" with a full operating system and applications.

This model has received the most buzz and is expected to see rapid adoption in the next few years, according to John Sloan, Info-Tech Research Group analyst.

Anthony, Idaho, has saved even more money by switching to thin clients at its elementary schools. Three years ago, each classroom had a handful of PCs running Windows 98. To save money, Tracy Smith, the district's technology coordinator, bought each teacher a new computer running Windows XP, and then he purchased NComputing's desktop virtualization software that splits PCs into multiple virtual machines. Today, every teacher's computer powers three thin clients in a classrooms. Rather than spend \$132,000 on 240 new PCs, he spent \$16,000 to buy NComputing kits that turned 80 PCs into 240 virtual computers.

"For one-eighth of the cost, we fit three kids in front of a Windows XP environment in each classroom, instead of having broken down computers running Windows 98. The big benefit is less downtime," he says.

Union and Fremont school districts saw immediate savings, but in most cases, particularly in large deployments, the initial cost to implement thin clients is about the same as buying new PCs, analysts say.

Worldwide thin-client sales grew from 2.9 million in 2008 to 3.4 million in 2009, a **17 percent** increase.
SOURCE: IDC

While thin-client devices themselves are less expensive, there are additional upfront infrastructure costs in a thin-client deployment, such as buying new servers and upgrading network gear. "At best, the upfront capital costs [of thin clients] is 5 percent cheaper, and at worst, it's a wash," Sloan says.

But over the long term, schools will see significant savings — as much as 40 percent savings from reduced help-desk support and maintenance costs, he says.

Gregory Partch, director of information technology at Hudson Falls Central School District in New York, agrees with the assessment. Over the past four years, Partch has deployed 1,400 thin clients in classrooms and computer labs throughout the district's five schools.

Hudson Falls standardized on Hewlett-Packard's t5540 thin clients and deployed the traditional thin-client architecture using Citrix XenApp. Partch also uses application portal delivery software from ClassLink Technologies that allows the IT staff to build separate computer images for students so they can access the applications they need for their specific grade levels. Through ClassLink, students can also log in from their home computers to access school applications and files. On the back end, Partch installed 10 HP blade servers to power the thin clients and ensure uptime. If one blade goes down, users can immediately log back in and access their applications and data on another blade.

REDUCING SUPPORT COSTS

Hudson Falls' IT staffers install applications or software patches simply by loading them on one server and replicating them to the other nine servers. In the past, they had to manually install the software on each computer. "We don't have to manage 1,400 computers. We manage 10 servers," Partch says. "It's a huge savings."

Thin-client devices also take just minutes to install. IT administrators plug them in and configure them on the network, Partch says. If one goes down, they simply install another one without having to re-image a new computer because the computer image is on the server.

Because thin clients have no moving parts that can break down, such as hard drives, IT administrators don't have to regularly visit classrooms or labs to troubleshoot hardware problems, says Union School District's Fillmore. "We really shouldn't have anywhere near the number of maintenance calls for support," he says.

Thin clients also consume less power, which results in lower electricity bills. According to Forrester Research, thin clients consume between six to 50 watts of power, much less than the 150 to 350 watts required by PCs. When server, networking and cooling requirements in the data center are factored in, thin clients can reduce power by up to 24 percent, the Forrester study found.

Thin clients also improve security. Users can change computer settings during their thin-client sessions, but their changes are never permanent, says Trent Doan, Union School District's IT technician. Once the thin client is rebooted, the server appliance will stream a computer image with the original, default settings. Thin-client devices also cannot spread viruses and malware. "At the end of the day these machines will be refreshed to their original settings," he says.

CLASSROOM BENEFITS

At Union School District, sixth-grade teacher Cathy Bailey says her new thin-client computer lab at Dartmouth Middle School is a god-send. Previously, with the old notebook computers, students could use Microsoft Office but couldn't run new applications correctly, including a new drawing tool. She'd visit online forums to troubleshoot but realized her computers didn't have either an adequate operating system or enough horsepower to run the applications smoothly.

"I needed to go beyond PowerPoint, and those laptops were really on their last legs," she recalls. "It was just a very bad experience."

Now, with the new thin clients, students are able to use the drawing application and a new version of video-editing software.

The students adapted to Windows quickly, Bailey says. The IT staff wrote scripts that connected the thin-client technology to the directory server and the students' network file folders. That way, when students enter the lab, they can log in like they normally do and access and save their files. The only difference is that students have to save their work at the end of class; if they don't, the session logs out and deletes their work,

Energy Cost Savings

Schools can reduce desktop energy costs by deploying a thin-client architecture. Here's an estimate of how much schools could save in a classroom or computer lab per year using Wyse's "Classroom-in-a-Box" offering, which features the Wyse WSM Appliance and 25 Wyse Zero Clients.

Annual electricity cost:

For 25 PCs — **\$523.43**

For 25 Wyse thin clients — **\$79.26**

Savings per year: **\$444.17**

SOURCE: WYSE TECHNOLOGY

she says. All in all, students were unfazed by the switch.

"The students are so tech savvy, and they pick up things so intuitively," she says. "I like that they are learning the PC and the Mac because realistically, they will have to go back and forth in real life."

Another benefit is that students can no longer change computer settings or accidentally throw things away in the trash, she says.

Because thin clients are more environmentally friendly than traditional computers, teachers can also point to thin clients as an example of green practice, says Sean Mulligan, Union School District's network engineer. The district recently partnered with the city of San Jose's Go Green Schools Program and is teaching students to recycle during lunch time.

"This lets us play a role in the Go Green Program," Mulligan says. "They can learn that going green doesn't just involve the cafeteria and lunch, but also technology."

School district administrators are taking notice of thin-client benefits. As Union School District braces for more budget cuts, Superintendent Jacqueline Horejs says she will consider deploying thin-client technology when it's time to replace computers or add more labs in the district's eight schools.

"At this juncture, when all the schools are facing monumental fiscal challenges, we need to rein in costs and be able to provide state-of-the-art technology for our students at a reasonable cost," she says.

The thin-client deployment at Union School District is a pilot project, and Bailey, the sixth-grade teacher, says it deserves a passing grade; she gives it an A.

"We feel it's been a good investment," she says. "The computers are much faster and more powerful, and we've had no glitches." ■

Helpful Hints

1. Upgrade the tech infrastructure, so it has the capacity to handle thin clients. That includes having redundant servers and a network that can handle bandwidth requirements. This will ensure quality of service and a good user experience.
2. Users — particularly teachers and administrators — are attached to their PCs, so you must explain the benefits of thin clients, such as improved performance. If explained well, users will see thin clients as an upgrade.
3. Work out the cultural issues. Traditionally, help-desk staff manage PCs, while server administrators handle the data center. Who will now handle thin-client support?
4. To save money, IT departments can use old PCs as their thin-client devices.
5. Districts no longer have to purchase one copy of software for every PC. Instead, they can purchase fewer licenses, and when users need the software, they access it over the server. IT departments can track software usage to ensure that users don't go over their allotted number of licenses at any one time.

SOURCES: Info-Tech Research Group; Gregory Partch, Hudson Falls Central School District.



Greg Partch of the Hudson Falls Central School District in New York likes thin clients because they simplify his life. "We don't have to manage 1,400 computers. We manage 10 servers."

PATRICK HARRISON