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**Abstract:** The article reports that "thin client" computing is an old idea that has been made new again. According to Stephen A. Dukker, the chairman and CEO of NComputing, the increased power of standard desktops and laptops has paved the way for a thin-client strategy with a different twist. Dukker said average computer users employ less than 10 percent of the processing capacity of their desktop and laptop machines. The company has sold its technology to schools through systems-integration companies.

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### 'NComputing' Developers Tout Savings for Schools

One of an emerging array of choices for low-cost computing in schools, "thin client" computing is an old idea that has been made new again.

The term refers to a decades-old arrangement in which many low-capacity computers — or "thin clients" — depend on a powerful central computer server to do most of their data processing. The data is passed back and forth between clients and servers over a network.

By contrast, in a "thick client" setup — by far the most common in schools today — separate computers perform nearly all their own data processing and use the servers only for communications and data storage.

In recent years, thin-client has been considered outmoded and too inflexible for schools.

Educators may remember the debut in 2000 of the New Internet Computer, a thin-client system for education that was the brainchild of Larry Ellison, the chairman of Oracle Corp. That system flopped, partly because it relied heavily on the Internet to connect thin-client devices. And in 2007, PC World magazine dubbed the New Internet Computer one of "the 10 worst computers of all time."

But the increased power of standard desktops and laptops has paved the way for a thin-client strategy with a different twist, according to Stephen A. Dukker, the chairman and CEO of NComputing Inc., based in Redwood City, Calif.

### Multitasking

Mr. Dukker said average computer users employ less than 10 percent of the processing capacity of their desktop and laptop machines. NComputing's system allows schools to use a few such computers — those they already own — as servers for clusters of new, low-cost thin-client devices.

"The lowest-end desktop has now become a mainframe" computer, Mr. Dukker said.

After an inexpensive modification, that computer can act as a server for six other workstations — consisting only of a screen, keyboard, mouse, and a small hub device — at an equipment cost as low as \$70 per user.

Using that system, Mr. Dukker said, seven users — including one working at the main computer — could simultaneously watch a movie on DVD, watch compressed video of the quality typically found on the YouTube video-sharing Web site, prepare a digital presentation, watch TV online, read a "PDF" document, surf the Internet, and use a spreadsheet program.

Some of those uses are more data-intensive than others. If the users' mix of activities created a load greater than the system could handle, performance would "degrade gracefully," Mr. Dukker said.

Another variant of NComputing's technology allows up to 30 users per desktop machine, at a cost of about \$150 per user.

Mr. Dukker said the system is easy to deploy and maintain — because the terminals have no central processing unit, memory, or moving parts — and is compatible with Microsoft Windows or Linux operating systems. It also reduces the energy consumption of computers by 90 percent, compared with standard PCs, he said.

The 5-year-old company, which since 2006 has sold its technology to schools through systems-integration companies, says its systems have been adopted by 25 school districts in North Carolina, as well as other U.S. districts and schools in Brazil, Eastern Europe, and Mexico.

PHOTO (COLOR): THIN CLIENTS': With NComputing's wireless option, up to 30 users each have their own keyboard, monitor, mouse, and speakers connected to small access terminals on their desktops, which are linked to the software in a single personal computer.

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By Andrew Trotter

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