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PHOTOGRAPH BY
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Think Thin

Thin client hardware is on the rise, moving beyond vertical markets.

Will it go mainstream?

HANS-JUERGEN NEUMAIER HAD FINALLY HAD ENOUGH. Last November, the CIO of Sparkasse Haslach-Zell, a small savings bank in the heart of Germany's Black Forest, pulled the Windows NT desktops off employees' desks and replaced them with Sun Ray thin clients.

"We were so tired and angry about the constant need to patch PCs and update our antivirus software," Neumaier says. "With all these huge virus and hacker attacks, ... we needed to do banking in a more secure way."

Using smartcards, the bank's consultants can log on to any workstation and access Microsoft Office and line-of-business applications stored on Sparkasse's Linux-based terminal server. The Sun Rays use an ICA (Independent Computing Architecture) client to access the terminal. A Citrix Metaframe session captures commands and keystrokes from users, and sends back images from each app as the screen changes. With no local storage or operating system, the ultrathin Sun Rays can't be misconfigured or infected with malware.

Although only one out of five Sparkasse employees currently uses a thin client, Neumaier's ultimate goal is to move all of them away from PCs and onto Sun Rays.

"I think we've learned our lesson," Neumaier says. "We're no longer able to handle PC administration."

Since they first began to replace "dumb" terminals in the late '90s, thin clients have always been niche machines in industries like healthcare, banking, education, and city government. Some are "ultrathin" with no OS at all, which exchange data with servers via an ICA or RDP (Remote Desktop Protocol) client. Others are merely "thin," sporting a firmware-based embedded OS like Windows CE or XP and a browser. A few are even ordinary desktops, stripped of local storage that use custom boot software or a terminal emulator. Although thin clients account for less than 1 percent of today's desktop machines, they're growing twice as fast as PCs and may account for 10 percent of all enterprise systems by 2008, according to IDC.

The reason? Like Neumaier, IT managers have discovered that thin clients give them greater security with far less hassle.

"Security issues have gotten absurd when it comes to desktop PCs," says IDC analyst Bob O'Donnell. "What thin client architecture does is force you into really good IT practices. All you have to do is monitor the servers — you never have to worry about the clients."

Dumping the Desktop

For Keith Courier, moving to thin clients isn't just a good idea, it's the law.

His company, Mosaic, an Omaha nonprofit that manages care for the functionally disabled and housing for independent elders, is switching from Microsoft Windows PCs to thin clients largely to comply with HIPPA (the Health Insurance Portability and Privacy Act), which requires healthcare firms to prevent unauthorized access to electronic medical records.

With patient records scattered across 1500 Windows PCs in 16 states, keeping the data secure is a job that never ends, Courier says. Instead of replacing the machines, however, Mosaic is sending teams of techies to its 50 agency offices to convert them into thin clients running off a Novell Suse Linux secure server farm across the Internet.

"We're taking all the hard disks out, confiscating all the floppies and thumb drives," Courier says. "We don't want anything out there that's not HIPPA compliant. That way, if somebody steals a computer, all they get is a piece of hardware."

Going thin also greatly simplifies IT administration for not-for-profit organizations like Mosaic, where Federal funding cuts have sliced budgets razor thin. Because nearly everything can be done at the server, there's no need for IT staff to travel to remote locations.

Such benefits, though, apply equally to nationwide companies such as Con-Way Transportation Services, a $2.6 billion freight transportation firm based in Palo Alto, Calif.

In 2000, Con-Way began rolling out some 4,500 Citrix-based thin clients to its 443 call center locations, allowing Con-Way employees to process orders and track shipments throughout the country using the company's homegrown freight management applications.

"We manage 60,000 shipments a day," says Jackie Barretta, CIO of Con-Way's parent company, CNF. "Our freight control app is the lifeblood of our operation. Everything depends on it."

In a company like Con-Way, with widely distributed office, Barretta explains, centralized deployment with thin clients on the edge makes the most sense. "We do software updates on a daily basis.

Trying to manage 400 different versions of this immense application in 400 locations would be crazy, a

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maintenance nightmare. It really makes sense to run the app centrally in our datacenter."

For a Few Dollars Less

Lowering TCO was once the meat and potatoes of choosing a thin client solution. Now with the security advantages as the main course, it's more like gravy. Across disparate enterprises, there's no standardized way to measure the cost savings from going thin, but the anecdotal evidence is compelling.

Back in 2002, Keystone Automotive saved a cool $2 million in hardware outlays simply by choosing Neoware clients over Windows PCs, says Jesus Arriaga, CIO for the $560 million auto parts supplier in Pomona, Calif. Although the price differential between desktops and TCs has narrowed, thin machines save money in myriad other ways.

For example, Bill Hill, IT director of the City of Dayton, Ohio, figures he saves $60,000 on electricity for every 1,000 thin clients he deploys. With no moving parts and no fans, his Wyse nodes suck down far less juice than your average desktop.

Buddy Gillespie, CIO of Wellspan Health in York, Penn., estimates that moving to a Citrix-based solution saved his hospital management firm $500,000 in fees it no longer had to pay for licensing Windows on the desktop (though it still pays to license Microsoft Office on the server).

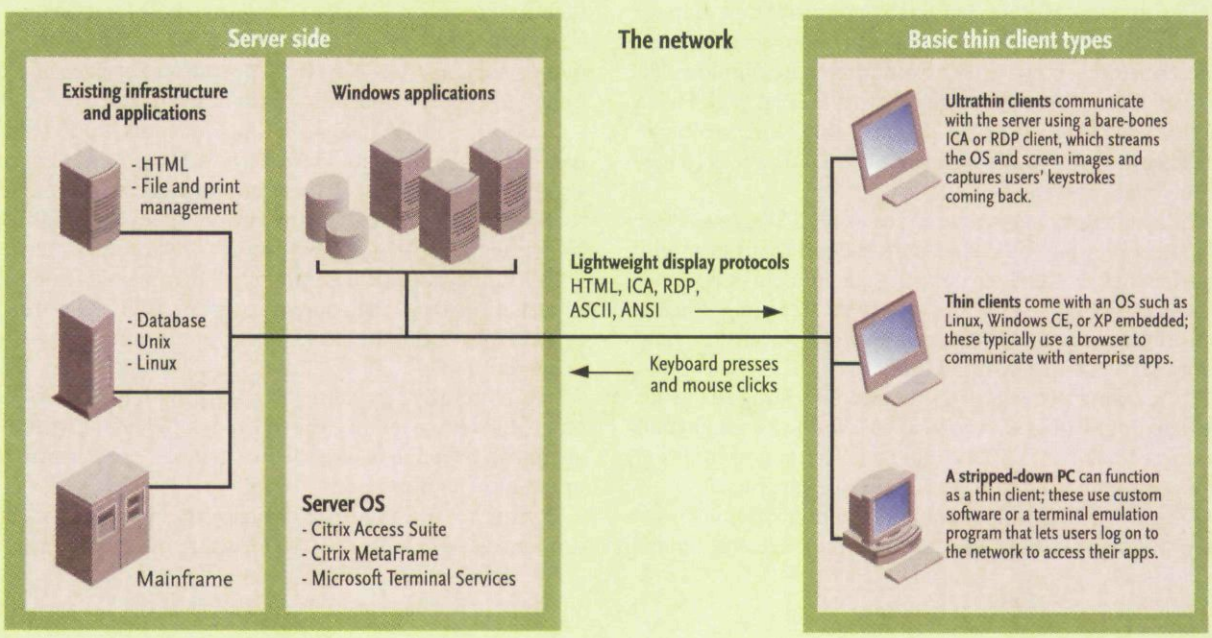
With lifecycles two to three times that of PCs, thin clients help enterprises avoid costly upgrades. When the Cook County Clerk's office in Illinois decided to upgrade from '70s-era terminals in 2000, they chose Neoware machines, which cost half as much as Windows PCs, says Dorothy Brown, Clerk of the Courts. Now they're reaping additional savings thanks to the machines' 10-year lifecycles. When other state agencies are rolling out new PCs every three years, the Clerk's office spends the money on bigger, faster servers.

The biggest savings, however, come from slashing support costs. IT shops no longer have to send techies out to replace a dead drive or disinfect a virus-plagued OS.

"Most problems we have are from lightning strikes, power surges, or

Blueprint for a Thin Enterprise

With no local storage and persistent high-speed network connections, thin clients enable server-centric administration, with SNMP and vendor-specific tools handling what few client configuration chores remain.



when somebody drops a client and runs it over with a forklift," says Keystone's Arriaga. When a Neoware machine does fail, he simply swaps in a new one. A similarly afflicted PC would require one to two weeks' downtime, he adds.

That, in turn, allows organizations to offer higher quality support, says Sparkasse's Neumaier. "With thin clients, we have more time to support the applications and needs of each user, and not just their PCs."

Too Rich, Too Thin?

If thin clients are so great, why don't all enterprises ditch those troublesome security nightmares on their desks?

One obvious reason: Network-based computers can't match PCs for performance, especially with graphics-intensive applications. "If you're doing 3D solid modeling, digital video editing, or any other highly graphics intensive apps, you'll want a dedicated high-performance PC," admits Michael Kantrowitz, CEO of Neoware.

Compatibility problems with delivering line-of-business apps to thin clients have largely disappeared, says IDC's Bob O'Donnell, but trying to integrate in-house or custom apps with Citrix or Microsoft Terminal Services can still be a bear. Support for peripherals such as scanners and PDAs can also be spotty, depending on the client, but machines running embedded XP can support more than 9,000 devices.

Thin clients may be cheaper than PCs, but they aren't necessarily cheap. The money IT departments save on desktops often translates into higher server costs, as well as higher salaries for network-savvy support staff.

For example, when the Chapel Hill-Carrboro City school district moved from PCs and Macs to a Citrix-based solution, it jumped from just a few servers running specialized applications to 42, says Ray Reitz, CTO of the North Carolina district. Yet Reitz says maintaining 42 servers is easier than managing 4,000 unique desktops.

Another big downside, unlike those with desktops, employees with thin clients can't keep working offline when the network goes down. For Garrett Martin, IT Director of Cayonlands Community Health Care in Arizona, that was a real problem.

During the past year, Canyonlands converted from Windows PCs to Hewlett-Packard thin clients in five health clinics spread across a remote part of the state. The clinics communi-

The Skinny on Mobility

TRUE THIN CLIENTS, BY DEFINITION, REQUIRE A CONSTANT NETWORK CONNECTION. To untether a thin client and use it for anything more than an expensive fashion accessory, it must travel within a pervasive wireless cloud.

In circumscribed areas such as warehouses, manufacturing plants, hospitals, and corporate campuses, mobile thin clients can be an excellent fit. At Wellspan Health in York, Pennsylvania, for example, nurses and doctors are trying out thin tablet PCs as well as COWs (computers on wheels) instead of paper charts. These Wyse thin clients and LCD displays sit on carts powered by a huge 14-hour battery; doctors and nurses wheel a COW into a patient's room and record their vitals; the data is uploaded through an internal Wi-Fi network to a central database.

For traveling executives, mobility and thin client computing make for an uneasy compromise between the power of working offline and the insecurities it brings. The result is frequently a hybrid solution using conventional hardware. When notebook toters log into the City of Dayton's terminal servers, for example, all their offline work is copied back to the City's MetaFrame servers and scanned for viruses. Dayton IT director Bill Hill is mulling a solution that would allow him to put a local OS on a thumb drive; travelers would check out the drive when they leave, plug it into their mobile thin client when they need to work offline, and hand it back when they return.

Even when executives who work for thin client vendors take standard Windows laptops with them when they travel, they continue to log into their company's thin client servers.

Bob Gardner, director of corporate development at Citrix, says it's a rare day when he can't find some way to connect to his company's servers. "Worst case scenario, I can still get along fine at 56K," he says, noting that Citrix sessions consist of keystrokes and screenshots that require little bandwidth.

Others say it's merely a matter of time before wireless net connections are inexpensive and ubiquitous enough to make such questions moot.

"I have a thin client in my office, but I still carry a laptop," says Robbie Robinson, senior vice president of worldwide sales at Wyse. "But in two years' time I see the day where I can fly to Singapore with a thin client laptop and pull down data and applications to refresh the machine, just like you can do with a Blackberry today. Over the next two years, I believe a portable thin client will become the most common mobile executive device." — *D. T.*

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— Hans-Juergen Neumaier, Sparkasse Haslach-Zell

cate with the datacenter by microwave link. When the link goes down — which seems to happen once a week, says Martin — the clinics can't access their patient charts, which means they can't treat anybody.

Martin's solution is to install HP servers in each office containing the clinic's medical records. Now, when network outages occur, the clinics can keep operating, then synch back up with the servers in his Page, Ariz., office when they come back online.

Yet for some IT managers, the biggest problem is prying the PCs from the clutches of users convinced that going thin means getting something less in return.

"We had some people who considered themselves 'power users' who had to have a PC because they're special," says Dayton's Bill Hill. "They managed to put up a good political fight, so they still have a desktop. But they're running a [Citrix] metaframe session, so they have PCs that are really just thin clients."

A Phat Future

Not everyone believes that thin clients are the holy grail of enterprise computing.

The Gartner Group's Martin Reynolds sees thin clients as a natural choice for niche markets and companies moving operations offshore, where data security can be an especially thorny issue, but he doesn't see them replacing mainstream business desktop computers. In part because they're less powerful and flexible than PCs, and partly because many businesses are moving away from desktops and toward notebooks, which can pose problems for traveling execs who need to log in to the corporate LAN to access their apps.

Wyse CEO John Kish predicts thin clients will continue to enjoy strong growth in enterprises, but believes the real revolution will take place in the consumer market, as telcos and ISPs provide low-cost appliances that deliver digital services to the home.

"New consumer devices are being designed that have the same characteristics as the enterprise thin client — no persistent storage or memory or operating environments — which will forever alter the consumer economic landscape," Kish says. "As devices become less expensive, services will proliferate and the big winner will be the consumer, as it should be."

But for CIOs like Sparkasse's Neumaier thin is definitely in, and Windows PCs are on their way out.

"When the PC first came out, it was great for lowering our costs, ... but those days are over," Neumaier says. "I think the whole IT world now sees it's not really such a good idea to have a PC on every desktop. We're an enterprise; we need enterprise computers. We must go back to where we started, go back to the roots, back to the host."

Desktops on a Diet

These popular thin clients account for a large slice of deployments. So-called "integrated" thin clients build all hardware into the monitor or its base; stand-alone units are boxes typically no bigger than a four-port router.

Vendor	Selected models	Pricing	Comments
Hewlett Packard hp.com	Thin Client t5125 (Linux) Thin Client t5520 (Windows CE) Thin Client t5700 (Windows XPe)	$239 $299 $499	HP serves up low-cost clients running Linux and two flavors of Windows but no integrated models, so factor in the cost of a monitor
Neoware neoware.com	Capio One (Linux) Eon e100 (Windows CE) Eon e350 (Windows XPe)	$199 $379 $1,149	The No. 2 thin client maker offers a range of operating systems and form factors; the e350s integrate into an LCD display
Sun sun.com/sunray	Sun Ray 1g (ultrathin) Sun Ray 170 (ultrathin)	$359 $1,049	Sun offers both a stand-alone (the 1g) and integrated (the 170) model of its ultrathin client; just don't ask for an embedded OS
Wyse wyse.com	Blazer 1200LE (ultrathin) Winterm S30 (Windows CE) Winterm V90 (Windows XPe) Winterm S50 (Linux)	$299 $399 $599 $379	This market leader makes just about any kind of solution you can imagine, from ultrathin stand-alones to LCD-based units with XP embedded