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Green Benefits Put Thin-Client Computing Back On The Desktop Hardware Agenda

by Euan Davis

for Sourcing & Vendor Management Professionals



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with Andrew Parker, Benjamin Gray, and Onica King

EXECUTIVE SUMMARY

The lure of 25% or more power savings and the growing importance of green IT have resurrected the thin-client debate. IT sourcing executives, though responsible for setting neither environmental agendas nor computing architecture road maps, must reacquaint themselves with the realities of thin-client provisioning to prepare a response to the various stakeholders who are pushing for or fighting its deployment. Sourcing will take on one of three roles: playing an investigative role and interfacing between suppliers and users; mapping out the true costs of a thin-client solution; or informing others within the business of the computing and user-experience issues that a deployment will generate.

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NOTES & RESOURCES

Forrester interviewed five vendors: BT, EDS, HP, Sun Microsystems, and Wyse Technology.

Related Research Documents

["Green Progress In Enterprise IT"](#)

December 17, 2007

["Virtualization On The Client . . . Finally!"](#)

November 21, 2007

["How Enterprise Buyers Rate Their PC Suppliers And What It Means For Future Purchases"](#)

November 12, 2007

["Energy Star Powers Up"](#)

July 31, 2007

["Why Green IT Should Feature In Sourcing Plans"](#)

April 5, 2007

["The State Of IT Infrastructure Adoption"](#)

October 17, 2005

["The Information Workplace Will Redefine The World Of Work At Last"](#)

June 1, 2005

THE THIN CLIENT COMES AROUND AGAIN

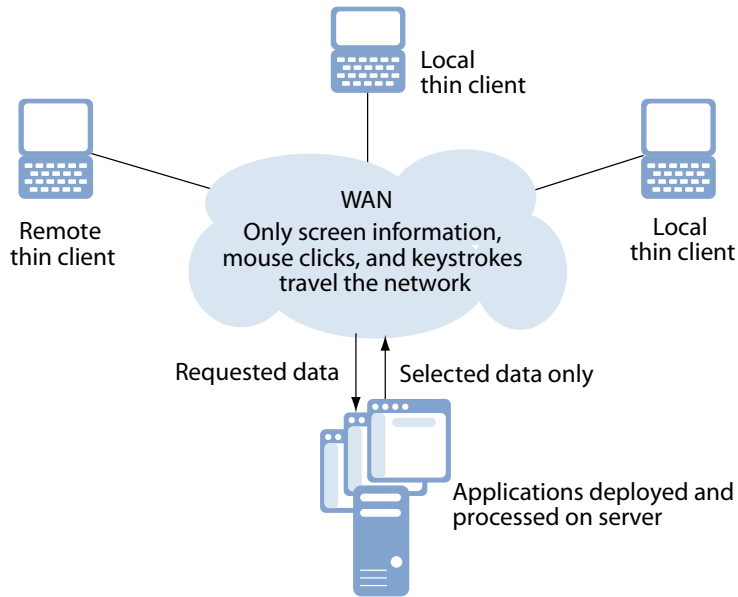
Organizations about to kick off their next major desktop hardware refreshes or upgrades will need their sourcing groups to be alert to the growing importance of green IT.¹ Corporate social responsibility (CSR) initiatives and the ever-expanding power consumption of IT systems cause buyers to raise the priority of sourcing greener, more energy-efficient forms of IT.² Recently, this set of issues has begun to prompt a few lateral-thinking businesses to reexamine the value of implementing thin-client hardware to replace traditional desktop systems. Advocates point to the gains the thin-client approach offers, including lower total cost of ownership (TCO) and lower power consumption, in comparison with mainstream PC environments with supporting-server architectures. But how realistic are these claims, and what part should the sourcing professional play in resolving the thick- versus thin-client discussion?

What's The Case For Reexamining Thin-Client Computing?

Large thin-client vendors (such as HP, Sun Microsystems, and Wyse Technology) have long evangelized the benefits of thin-client computing at the desktop for its lower TCO and streamlined administrative management and security. Grounded in a traditional server-based computing (SBC) model, thin-client terminals have no moving parts and work by simply providing users a connection to applications and data hosted on a server (see Figure 1). Moving the deployment, management, support, and execution of applications from the desktop to central server farms provides easier administration and lowers TCO over the long haul.³ Despite the potential benefits of thin clients, many end-user firms were reluctant to embrace the concept during the 1990s because it required upfront cost investments in back-end infrastructure technologies, such as servers, storage, and networking. Perceptions around the integration, critical response time, and end user acceptance of thin clients proved problematic when compared with those associated with traditional PCs carrying their own semi-autonomous applications (see Figure 2).

Despite the early limitations of thin-client computing, enterprise buyers are now giving it a second chance. Why? Businesses are looking more closely at management, security, TCO, and energy consumption, and, in turn, IT management is adjusting its agenda to make sure these items rank highly. Since most IT professionals indicate that they plan to include environmental concerns — such as energy efficiency and recycling — in their IT operations planning, a shift in desktop hardware sourcing aligned to environmental effects deserves further examination.⁴ Compared with their “thicker” PC peers, thin-client terminals, which lack hard drives and expansion slots, draw less power and require components that are less complex. A thin-client terminal also takes up less space on a worker's desk; many are even integrated into the back of the display unit. The combination of these benefits has caused some firms to reconsider their attitudes toward thin-client technology.

Figure 1 Traditional Server-Based Computing Supports 100% Server Execution Of Data And Apps



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Source: Forrester Research, Inc.

Figure 2 Key Thin-Client Shortfalls

<p>Incompatible applications</p>	<p>Not every application is equally suitable for utilization on a terminal server. Computing-intensive applications that require complex mathematical calculations and graphic-intensive applications, such as picture-editing systems or computer-aided design (CAD), face unacceptable latency between the server and the client.</p>
<p>Connectivity constraints</p>	<p>The absence of a hard drive and CD-ROM renders thin clients unusable without connectivity. Although this makes thin clients virtually useless to would-be thieves, professional road warriors caught without IP connectivity cannot access word processing, spreadsheets, databases, or other standard PC applications while on the move.</p>
<p>Lost computer sovereignty</p>	<p>Users accustomed to working in an unmanaged PC environment where desktops are configured to personal preferences often see thin-client deployment as a loss of personal control. Depriving user access to downloads, plug-ins, and a range of unnecessary noncorporate applications generates resistance against the controlling aspects of thin-client architecture.</p>

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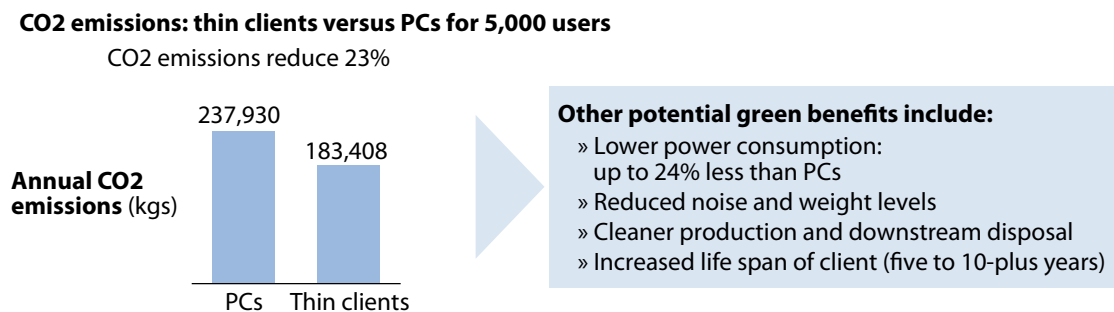
Source: Forrester Research, Inc.

Green Thinking Bolsters The Case For Thin-Client Procurement

When deployed in scale, a thin-client architecture driven by centralized servers in a traditional SBC model can offer functionality similar to that of desktops with local processing — but with significant power savings (see Figure 3). A desktop running routine office applications — such as a Web browser, document editor, or email client — often doesn't need the most advanced, bleeding-edge chipsets, which consume immense amounts of electricity. A well-scoped thin-client implementation connects cost reduction to the environmental agenda through:

- **Reduced power usage and lower emissions.** Thin-client terminals have much better energy efficiency than traditional thick clients. They consume anywhere from 6 to 50 watts — far less than the 150 to 350 watts used by typical PCs. In a representative conversion of 5,000 PCs to 5,000 thin-client terminals, with the required server and cooling infrastructure, Forrester's Desktop Power And Emissions Calculator identifies a conservative 24% power reduction.⁵ This reduced power demand promises a related 23% decrease in CO2 emissions.
- **Improved product life cycles and material sustainability.** Thin-client environments typically extend the life cycle of IT legacy investments by at least three years. Unlike PCs and laptops, which commonly have a three- to four-year replacement cycle, thin clients last an average of seven years. They slow down technology's inevitable slide into obsolescence because they have fewer points of failure and rarely need upgrades.⁶ Moreover, the absence of hard drives and the limited or absent microprocessor and memory requirements mean thin clients use fewer hazardous materials upstream, minimize packaging material during transport, and generate less ecologically damaging waste downstream.⁷ Further residual effects of having no moving parts also include reduced noise levels and decreased weight, both of which further substantiate the green badge of thin clients.

Figure 3 Thin Clients Reduce Power Draw And CO2 Emissions



SOURCING GROUPS MUST PREPARE THEIR RESPONSES TO THIN-CLIENT OPPORTUNITIES

It's not going to be sourcing's job to set the environmental agenda or to make the thick- versus thin-client decision, but sourcing and vendor management professionals will need to understand the debate. To prepare, ensure that you have an appropriate level of knowledge and access to the information you'll need to build a thin-client approach into desktop hardware sourcing strategies. Forrester expects that green considerations for implementing thin clients will come from one of three possible directions — or a combination of these:

- **The CIO or IT strategy group.** With intense pressure on IT spending — especially around ongoing operational costs — the CIO and IT strategy group may well see the next PC refresh cycle as an opportunity to capture TCO savings with a switch to thin-client computing in appropriate areas of desktop hardware usage. Firms have found that using thin clients in low-intensity, standard desktop hardware environments generates savings. Many factors contribute to this increased cost-effectiveness: extended hardware life cycles, lower power consumption, and the lower ratio of staff needed to manage, secure, and service a thin-client environment.
- **CxOs, such as the COO or CFO.** Whether their agendas include cost saving or a doctrinaire approach to CSR, many board execs today aggressively force the pace on IT sourcing decisions. For example, after the cost of PC power consumption has been measured, tracked across the business, and compared with the TCO of a thin-client solution, a CFO with responsibility for IT operations (which buys and maintains the desktop hardware) and facilities (which pays the power bill) could drive a thin-client project.
- **Functional or line-of-business (LOB) managers.** Energetic leaders in specific areas of the business may decide that thin-client computing offers a more cost-effective or even more functionally efficient solution for LOB application users. Increasingly, they will deploy the green argument to help build the business case for this pet project. BT, EDS, HP, Sun, and Wyse all reported that employees reacted positively to their internal green initiatives. Public relations and marketing managers also embrace the idea of green computing to aid green branding, and Forrester has seen HR directors work to entice young graduates by featuring recruitment strategies that promote their firms' green credentials.

Sourcing Needs An Organized Response To Thin-Client Campaigns

To get ready to respond to initiatives coming from any of the three directions indicated, sourcing will need to prepare the ground in general terms by:

- **Finding out the realities of thin-client computing.** It's important to understand that not all applications and users are compatible with a thin-client configuration. It especially doesn't help when computing-intensive applications meet insufficient bandwidth, because this results in poor performance. Corporate applications requiring complex mathematical calculations or

graphic-intensive applications such as computer-aided design (CAD) tools prove unusable.⁸ Sourcing must work to understand the dynamic between applications, users, and bandwidth requirements. On the user front, for example, software developers tend to make poor thin-client targets because they rely on software compilers and need to multitask — on top of having inflexible hours.

- **Gaining an understanding of the broad user picture across the business.** A company with a large number of users who require low-intensity, standard desktop environments is a better fit for thin clients than a company with complex workspace usage that varies widely from one user group to another. So which users provide a good fit for thin-client computing? Some examples are call center, finance, and human resource employees because they are rarely mobile and only run a limited set of applications, all of which require little bandwidth. Conversely, road-based employees without permanent locations or guaranteed connectivity will work best with laptops. Sourcing must understand the dimensions involved and work to produce a picture of the size of the main user groups and their usage patterns.
- **Selecting vendors.** An important role for sourcing is to identify the vendors that can supply not only thin-client terminals but also the management software, user displays, servers, storage, networking, and planning and implementation services. The decision is whether to go direct to a pure-play thin-client hardware provider, such as Wyse or Germany's IGEL Technology; to a reseller; or to a complete solution vendor, such as HP after its acquisition of Neoware in June 2007. Other key vendors competing in the space include Sun, Fujitsu Siemens Computers, and, of course, the interesting tie-ups emerging between the IT services firms — for example, Dell — that provide traditional desktop services.
- **Establishing dialogues with important influencers.** Become aware of how important colleagues in the enterprise architecture team, the IT strategy group, and IT operations view the thin-client discussion. Understand which of these influential constituencies takes a doctrinaire view and which are open to a reasoned discussion based on objective issues such as TCO.

Specific Steps Respond To Different Stakeholders

Whether a thin-client initiative starts with the executive board, the director of IT operations, or a line-of-business manager, sourcing will need to respond with clear and appropriate steps that are specific to the initiating party's needs. The important roles sourcing should consider include:

- **Supporting the CEO or main board by investigating the value of initiatives.** Strong board-level interest in thin-client computing calls for sourcing to investigate thin-client initiatives, working to prevent an ill-advised leap to thin-client computing. Sourcing can support decision-making by explaining the limitations of thin-client initiatives and mapping out the needs of the user base and also by exploring thin-client suppliers' green options, feeding findings

to the board. Additionally, sourcing should question current desktop hardware suppliers to understand what offerings they have that respond to the green IT agenda and to firms considering moving to thin clients.

- **Mapping the true cost for the CIO or IT strategy group.** Look to build a true cost-reduction picture set against thin-client limitations and corporate requirements. Forrester's Desktop Power and Emissions Calculator is a tool that helps determine potential power savings, but it's important to look beyond these savings to the wider TCO. Calculating and comparing the TCO of a thin-client deployment (including strengthening or reconfiguring the server environment or increasing data center capacity) with the current method of desktop hardware sourcing helps senior IT management decide if the change in TCO is significant enough to warrant a move to thin-client computing.
- **Supporting the IT operations team to find the best-of-breed solutions provider.** Because thin-client computing involves much more than simply swapping out thick clients for thin, it's important that sourcing professionals look beyond pricing to determine which solutions best fit their organizations. Supporting thin clients requires best-of-breed infrastructure technologies that span clients, servers, storage, and networking. Given the philosophical differences in supporting thick versus thin environments, it's also important to find a vendor that will be responsive to client questions and requests. Sourcing professionals should also investigate the strengths and weaknesses of services offerings for each vendor because IT operations professionals often require significant support in planning, building, and maintaining alternative computing models.
- **Sanity-checking for the LOB executive initiative.** IT sourcing must step in to scrutinize the business value of thin-client provisioning and inform the relevant LOB executives of its findings. Sourcing should be prepared to educate and provide alternatives, making sure that the LOB executives involved understand why a potential deployment cannot be rushed into action before decision-makers have assessed all the options. Sourcing should also provide support to LOB executives by establishing a green story that they can take back to their specific areas — for example, “we use eco-labeled PCs rather than thin-client terminals” — and use to fulfill their own objectives.⁹

RECOMMENDATIONS

BE PREPARED WITH FACTS AND FIGURES AT HAND

Thin clients provide a viable way to provision desktop hardware in low-intensity, standardized desktop environments and appeal to stakeholders eager to push the green button. Sourcing and vendor management professionals must prepare in advance for the role IT sourcing will play in the assessment and deployment of thin clients by formulating appropriate steps that respond to and back up each specific stakeholder. Comparing the TCO of thin-client and current desktop hardware provisioning proves extremely important in evaluating the value of thin-client initiatives, and you should widen cost analyses of thin-client strategies to include product life span considerations. But don't be too nearsighted — be sure to consider the ongoing operations benefits that thin clients will bring to management and security for IT operations professionals. You should:

- **Create a “thin-client suitability” template.** Begin internally: Assess the pattern of desktop use around your firm and build a template to capture it. Document the dynamics between your corporate applications and the employees that use them in their day-to-day jobs to understand which applications and employees work most effectively in a traditional PC environment.
- **Map the usage of PCs according to the template.** Fill in the template to calculate how many employees could switch to thin clients and what the potential power and emissions savings would be. This information provides a strong platform for decision-making as and when the stakeholders ask for it. Some firms' sourcing teams might have enough PC usage data on record to do this exercise without external help.
- **Question suppliers and do your homework.** Identify which of your company's preferred desktop hardware suppliers have viable thin-client offerings and find out if any of them will deliver resources — such as ROI models or TCO calculators — to help you evaluate your migration options. Start by doing background research on current-generation thin-client technologies to familiarize yourself with all the relevant issues.
- **Dig down deeper to integrate green criteria into the total cost analysis.** Acquisition costs alone should not drive the sourcing of desktop hardware. If you can, widen the cost analysis to include product life span considerations around the manufacture (material resources), operation (power consumption), and disposal (landfill tax) of the product in question. If the main consideration is emissions, then Forrester's Desktop Power And Emissions Calculator can help you gain an understanding of the power use and CO2 emissions implications of desktop hardware provisioning.

SUPPLEMENTAL MATERIAL

Companies Interviewed For This Document

BT

EDS

HP

Sun Microsystems

Wyse Technology

ENDNOTES

- ¹ In 2007, PCs accounted for the largest slice of North American and European enterprises' hardware spending when compared with other key IT technologies such as servers, storage, network equipment, systems management, the data center, and mobile technologies. So how can enterprises lower spending but get the same level of service? Continue down the path of thick clients, but focus on standardization or explore alternative computing models to ease imaging, management, and security burdens. See the November 12, 2007, "[How Enterprise Buyers Rate Their PC Suppliers And What It Means For Future Purchases](#)" report.
- ² The shift in consumer opinion and the creation of new government regulations in favor of protecting the environment have pushed green issues onto the boardroom agenda. As a result, firms are incorporating issues such as hardware energy consumption and IT asset disposal into their IT strategies. See the April 5, 2007, "[Why Green IT Should Feature In Sourcing Plans](#)" report.
- ³ In a traditional PC environment, each user's machine requires upgrades and patches for critical applications, data, and security software. In thin-client computing, only the server ever needs software maintenance. Also, because clients only use their individual user stations to access applications and not to store information, these individual user stations seldom become obsolete and are more protected from viruses that can attack PC environments.
- ⁴ Forrester's October 2007 Global Green IT Online Survey posed the question: "How important are environmental concerns in planning your company's IT operations?" The vast majority of the 130 IT procurement and operations professionals who responded indicated that environmental concerns were somewhat (59%) or very (35%) important. See the December 17, 2007, "[Green Progress In Enterprise IT](#)" report.

Forrester's Enterprise And SMB Hardware Survey, North America And Europe, Q3 2007 revealed that 20% of the 565 PC decision-makers at North American and European enterprises we interviewed are interested in server-based computing as an alternative to traditional PC technologies and another 5% are in the process of implementing it in the next 12 months. When asked what aspects of the traditional PC environment were driving interest in alternatives, one-fifth cited reducing electrical consumption costs and 19% cited reducing environmental impact. See the November 21, 2007, "[Virtualization On The Client . . . Finally!](#)" report.

- ⁵ Use Forrester's Desktop Power And Emissions Calculator to customize and identify potential power savings and CO2 emissions reduction for a thin-client desktop hardware migration. In addition to the actual power and CO2 consumption of the desktop hardware devices, the model also considers changes in server and network critical infrastructure required in support of the thin-client deployment. See the February 26, 2008, "[Forrester's Desktop Power And Emissions Calculator](#)" tool.
- ⁶ In 2004, firms replaced 25% of their PCs on average, which indicates a four-year PC refresh cycle. PC and laptop failures increase sharply at the end of year two largely due to hardware failures and obsolescence. PC and laptop shelf life can be extended by being restrictive with regard to the software and hardware introduced onto them as well as by implementing programs that train users to protect their equipment, but these measures seldom extend shelf life beyond another year. See the October 17, 2005, "[The State Of IT Infrastructure Adoption](#)" report.
- ⁷ On average, thin clients use 55% less electronics, 36% less plastics, and 25% less metal in their manufacture compared with comparable PC systems. Source: "Environmental Comparison Of PC And Thin Client Desk-Top Equipment," Fraunhofer-UMSICHT (Hrsg.), October 18, 2006 (http://it.umsicht.fraunhofer.de/TCecology/docs/TCecology_en.pdf).
- ⁸ While commercial end users continue to bemoan the sluggishness of thin clients for rendering sophisticated graphics, sourcing professionals should keep an eye on this space. VMware and Citrix Systems currently have projects in place to speed up performance to enable 3-D, CAD, computer-aided manufacturing (CAM), and other graphic-intensive tasks in SBC environments. The technology is already in limited proprietary use with Boeing: It designed its 787 Dreamliner using thin clients and Citrix Presentation Server.
- ⁹ Energy Star continues to gain visibility as IT sourcing and vendor managers grow increasingly aware of IT performance per watt. The program's focus on energy efficiency without the loss of functionality provides IT sourcing and vendor managers the confidence to use Energy Star as a quick win on the path to Green IT. See the July 31, 2007, "[Energy Star Powers Up](#)" report.

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Headquarters

Forrester Research, Inc.
400 Technology Square
Cambridge, MA 02139 USA
Tel: +1 617.613.6000
Fax: +1 617.613.5000
Email: forrester@forrester.com
Nasdaq symbol: FORR
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