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WHITE PAPER

Thin Computing ROI: The Untold Story

Sponsored by: Wyse Technology

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IDC OPINION

Thin computing is the complete spectrum of hardware, services, and software solutions that allow people using thin clients, PCs, wireless devices, and other systems to securely access the information and the applications they need. Enterprise thin clients — the desktop component of thin computing — are one of the least understood hardware options available to today's IT managers, yet they are one of the most cost-effective — and secure — options. Thin clients and the server-based architecture that they require create an IT environment that offers security, manageability, and return on investment (ROI) benefits that can surpass tightly monitored PCs. Plus, they offer the flexibility and adaptability that today's IT environment demands, moving from fixed-function kiosks to full-performance desktop workstations. Thin clients have the ability to natively render HTML pages, run Java applications, and handle text terminal applications without the need for any additional back-end infrastructure. This flexibility also leads to reduced demands on IT support staff (and, therefore, lower costs).

Thin computing merits serious attention where security, availability, and serviceability are highly required. Companies that are using Citrix Presentation Server and Microsoft Terminal Services, in particular, for managing and delivering applications to client computing devices will find that enterprise thin clients offer a cost-effective solution. In addition, for large deployments of thin clients, software-based device management solutions, such as Wyse Technology's Device Manager software, increase the efficiency of the installation.

ROI Analysis Summary

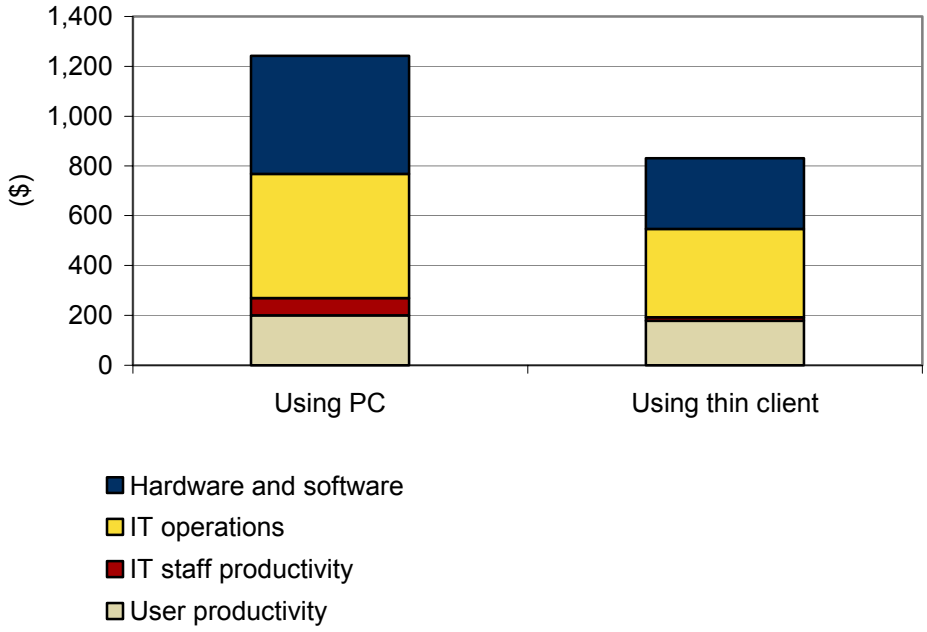
Wyse thin client users studied by IDC experienced significant business benefits from the migration of a portion of their PC users to thin clients. These benefits include:

- Reduction in hardware and software costs by 40%
- Reduction in IT operations costs by 29%
- Increase in IT staff productivity by 78%
- Reduction in worker downtime by 88%

Figure 1 compares the annual costs of workers using PCs and workers using thin clients as found in the study.

FIGURE 1

Average Annual Costs per User



Source: IDC, 2005

IN THIS WHITE PAPER

IDC analyzes the opportunity for enterprise thin clients, focusing specifically on how a thin computing model compares with a traditional client/server architecture with PCs when it comes to ROI.

SITUATION OVERVIEW

Today's IT managers are being forced to make some difficult choices. On the one hand, their internal customers — PC users — are demanding more capability and flexibility from their computing devices, while on the other hand, security-related concerns are driving them to institute tighter controls to safeguard their enterprises. They are being asked to extend the services they offer even further — whether it be adding wireless networks, integrating voice over IP (VoIP) communications systems into their networks, or much more — with slight or no budget increases to support these initiatives.

The resulting "Do more with less" conundrum has IT managers scratching their heads and sharpening their pencils, looking for ways to achieve these seemingly contradictory goals. One common answer is to reduce expenses in their bread-and-butter budget categories, such as PC clients, which is not always as easy as it sounds. While overall PC hardware average selling prices (ASPs) have been on the decline, increasingly stringent security requirements are leading to higher software licensing expenses per seat. Companies have quickly realized that they need to install a wider variety of application tools on each client to protect not only a particular client but also their entire network. The result? Total PC client costs are stable, if not increasing.

The support requirements for each PC are also increasing. Now, in addition to OS patch installations, companies have to worry about updates to antivirus definitions, firewall signatures, and adware blocking, and they have to apply these updates more frequently than ever before. To avoid this dilemma, companies typically deploy sophisticated software-updating application management services and the additional servers they require, adding yet more layers of complexity to their already dense network datacenters. This approach, in turn, requires more training for support staffs, adding to the challenges they already face.

In stark contrast to this picture, many companies have begun to realize that viable alternatives exist; notably, enterprise thin clients. Unlike traditional desktop or portable PCs, thin clients are inherently secure, stable client devices. The very architecture of the devices (think PC without a hard drive) and the server-based network model they demand enforce the tightest, strictest, and most secure IT practices possible, and they do so without requiring any anti-malware software on the client devices.

Thin clients are network-based computing devices that use the resources of servers to store applications and data and deliver them to users. Individuals who sit in front of thin clients may see a familiar Windows desktop environment that looks and feels virtually identical to that of a traditional PC; thus, no user training is necessary. However, unlike many PCs used in business environments, thin clients are in the complete control of the IT department, and all connections to the outside world happen through a centralized, easily managed source. Therefore, unlike traditional client PC/server IT environments, where each device has to be closely monitored for potential security breaches and the opportunity to create independent connections to the Internet is a very real possibility, all Web connections, email, applications, and data for thin clients on a given network come through a single point.

The practical benefits of this single connection point are tremendous. First, it greatly reduces the likelihood of rogue viruses, Trojan horses, and other malware entering into a network because the IT department can focus all of its monitoring tools and capabilities on a single connection. Second, it makes the process of distributing the inevitable OS updates (yes, even thin clients need OS updates — albeit less often than PCs) much simpler. Finally, it enables a simplified network topology, permitting the creation of a straightforward architecture that's easy to manage and easy to adapt to changing needs.

Directly related to these benefits is the ease with which many other critical functions can be performed, such as application updates and automatic backups of user data. Because data and applications are not stored on the client devices, everything is available in a single, centralized location, which greatly reduces the effort necessary to complete these tasks. Certainly, these capabilities are also available in networks with PCs and servers, but the simplicity of the tasks is greatly enhanced when IT needs to focus its attention on only a limited number of servers instead of thousands or tens of thousands of client machines. It's a simple question of efficiency and focus.

Microsoft Terminal Services

One of the most important challenges described above is application management, or the ability to control when and how new applications are delivered to end users (including custom-built, in-house applications) as well as keeping them up to date so that everyone using an application can be sure to have the latest version. Rather than install each application on each client and then try to keep each client machine up to date, many companies have turned to Microsoft Terminal Services, a capability built into Windows 2000 Server, Windows 2003 Server, and even Windows XP Pro desktop client operating system. With Terminal Services running on a server and a Terminal Services Client application installed onto a thin client (virtually all thin clients include a built-in Terminal Services client), individuals can launch applications on the server but have them display on the thin client. As a result, it appears to users that they are running applications locally, but in fact, they are running on the server and using the Remote Desktop Protocol (RDP) to deliver screen updates to the thin client.

Most standard office applications used in small and medium-sized businesses can run without modification with Terminal Services, making this a cost-effective, easy way to bring thin client computing to these businesses.

Citrix Presentation Server

Many companies that need a more advanced application serving environment turn to Citrix Presentation Server, a popular network-based software package that enables applications to be stored in and run from centralized servers. In a Presentation Server installation, client devices (either full Windows PCs running a simple Citrix ICA client software program or a dedicated thin client with an embedded ICA client) connect to the server and the graphics display generated by the application is sent over a network connection to the client device's monitor. The result is that the user perceives the application as running locally and the IT department can easily control access to and apply necessary updates to the application in a single, centralized location.

Most thin client installations are done in conjunction with Citrix Presentation Server because the two solutions work well together. The stateless, storage-independent thin client leverages its network connection to access applications managed by Presentation Server, and any resulting data is stored on the server's storage devices.

Device Management Software

Like any device that sits on an enterprise network, thin clients need to be managed, particularly in large deployments. Asset tracking, status checking, and firmware updates, among other activities, need to be performed on thin clients. Most of the major thin client vendors offer centralized management tools to fulfill these functions. Thin client market leader Wyse Technology offers a thin client software management tool called Wyse Device Manager (formerly Rapport).

Wyse Device Manager enables centralized control of tens of thousands of thin clients, including those from competitors Neoware and HP (Compaq-branded thin clients only) from a simple management console interface. Wyse Device Manager can also be used to manage a number of handheld PDAs from Palm, HP, Dell, and Symbol, extending its usefulness for companies that use those devices.

ROI ASSESSMENT

Methodology

IDC interviewed 11 Wyse customers that had migrated some of their PC users to thin client solutions. The goal was to understand how the change had affected the users in terms of productivity and the organizations in terms of costs and IT operations. IDC used its standard business value interview and modeling methodology to gather the data and project the results over a three-year analysis period.

The customers in this study included hospitals, government agencies, retail stores, financial institutions, and a services company. Their users include professionals such as doctors, nurses, and financial analysts who need reliable information systems. The companies interviewed ranged in size from 3,100 to 30,000 employees. Only one company had 100% thin client users. On average the companies had migrated about 18% of their PC users to thin clients. They were widely distributed organizations (2,500 sites on average) that chose to widely distribute the thin client users to over a third of all the sites.

A summary profile of the companies studied is shown in Table 1.

TABLE 1

Study Profile

Industries	Healthcare, government, services, financial, retail, and manufacturing
Average number of employees	15,125
Average percentage of desktops that are thin clients	18%
Average number of thin clients	1,935
Average number of thin clients supported per IT staff support person (not including help desk)	2,352

Source: IDC, 2005

ROI Analysis

Customers in this study generally migrated to thin clients as part of their regularly scheduled upgrade/replacement cycle. For this reason their up-front costs of $609 per system were offset by not having to pay $674 for new PCs. Their investments in thin client technology supported by Wyse Device Manager management software totaled $22,893 per 100 users over three years and delivered $121,116 in benefits. The customers were able to generate an ROI of 421% on average and pay back the costs in 10.6 months once the thin client solution was deployed. The three-year ROI summary is shown in Table 2.

TABLE 2

Three-Year Summary of ROI for Thin Client Solutions (per 100 Users)

Average annual benefits	$40,372
Investment	$22,893
Net present value (NPV)	$80,170
ROI = NPV/investment	421%
Payback in months	10.6

Source: IDC, 2005

Over half (59%) of the investment took place at the start of the deployment, and the benefits grew annually as each company migrated more of its users to the thin client platform. To account for the time value of money, IDC discounted future cash flows using a rate of 12%. ROI and payback period calculations are based on the discounted cash flow.

Benefits in Detail

Thin client customers were able to quantify the benefits of migrating their users in the following areas:

- **Reduced hardware and software costs by 40%.** Thin clients deployed in this study cost 27% less to purchase, install, and maintain than the PCs that they replaced and support 50% more users (4.9 users per thin client).
- **Reduced IT operations costs by 29%.** Thin clients enable consolidation of hard drives in fewer locations, reducing the operations expenses associated with physical desktop support (site visits) as well as the help desk.
- **Increased IT staff productivity by 78%.** Heavily distributed environments incur an overhead tax associated with user support. The consolidated nature of thin clients leveraged by the deployment using Wyse Device Manager software not only enabled customers to reduce staff but also enabled the remaining IT staff members to spend 78% less time on low-value infrastructure support functions and more time on proactive or business-related activities.
- **Reduced worker downtime by 88%.** Downtime is defined as time that knowledge workers do not have access to the applications they need to do their jobs. Thin clients in a well-managed environment (e.g., Wyse Device Manager) suffer 51% fewer downtime events and require 72% fewer help desk calls, resulting in an increase in user productivity.

Table 3 presents the quantitative benefits of the thin client implementations found within the companies studied.

TABLE 3

Benefits Analysis (per 100 Thin Client Users)

	Year 1	Total	Average
Equipment savings	$13,646	$46,023	$15,341
Operations efficiency	$1,845	$17,322	$5,774
IT staff productivity	$2,669	$9,969	$3,323
User productivity	$8,084	$47,802	$15,934
Total benefits	$26,244	$121,116	$40,372

Source: IDC, 2005

Reduction in the Total Costs of Desktop Computing

The most significant and measurable benefit of migrating to thin client technology is the reduction of IT costs, specifically hardware, software, facilities, and operations costs (primarily IT staffing costs). Reducing these hard costs directly impacts the bottom line. In this study, participants were able to reduce their annual spending on desktop hardware and software (OS) from $475 per system to $284 per system. Annual average operations costs were reduced from $498 to $354.

Lower capital expenditures and operating expenses resulted in average annual savings of $21,115 (per 100 users) and meant that companies could reduce their costs coincidental with deployment, which reduced the payback period to less than one year. The primary drivers for lower hard costs are as follows:

- **Lower hardware costs.** The average initial prices for a PC system and a thin client were $674 and $398, respectively. The costs for additional servers to support the thin clients added another $211 per system ($15,000 per server/ 71 clients per server). Total thin client initial costs were 10% less expensive than PC replacement costs.

- **Lower software costs.** The average software client license ran $250 per system per year for PCs and $80 per year for thin clients.

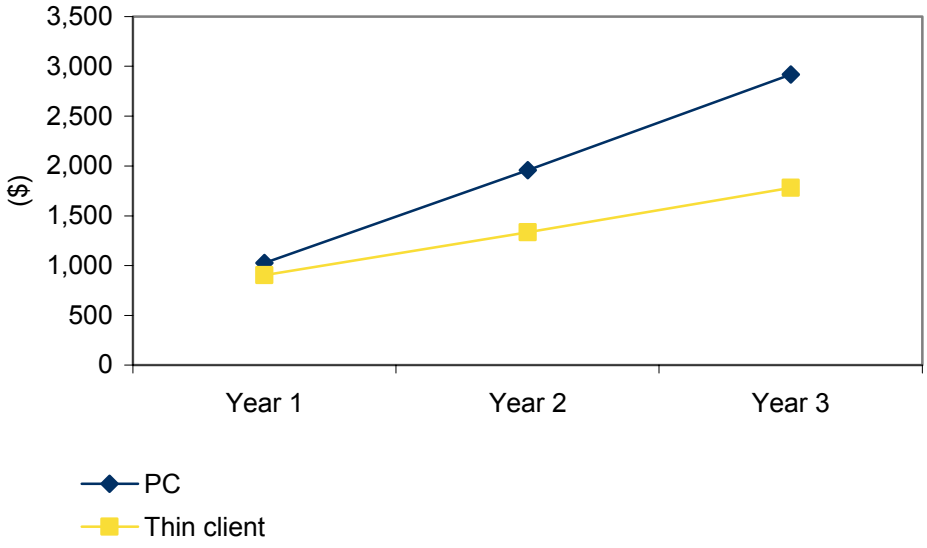
- **Higher user-to-system ratio.** Thin clients are best suited to supporting multiple users performing similar tasks or operations that require information to be passed from one user to another. The ratio of users to systems varied in our study from each user having 1.1 PCs on one end up to a single thin client supporting 8.6 users in a medical center on the other end. On average, thin clients were able to support 50% more users than PCs.

- **Lower IT operations costs.** Migration to thin clients enabled companies to reduce their desktop support staffs by 8% as central management created efficiencies. Over time the use of thin clients helped companies reduce support staff requirements by 16%, moving from a user-to-administrator (direct support and help desk) ratio of 317 to 379. This created the flexibility to support more users and deploy additional applications without adding staff.

Figure 2 compares the cumulative costs of using thin clients and PCs over a three-year period based on study findings.

FIGURE 2

Cumulative Cost Comparison of PC Environment Versus Thin Client Environment (per System)



Source: IDC, 2005

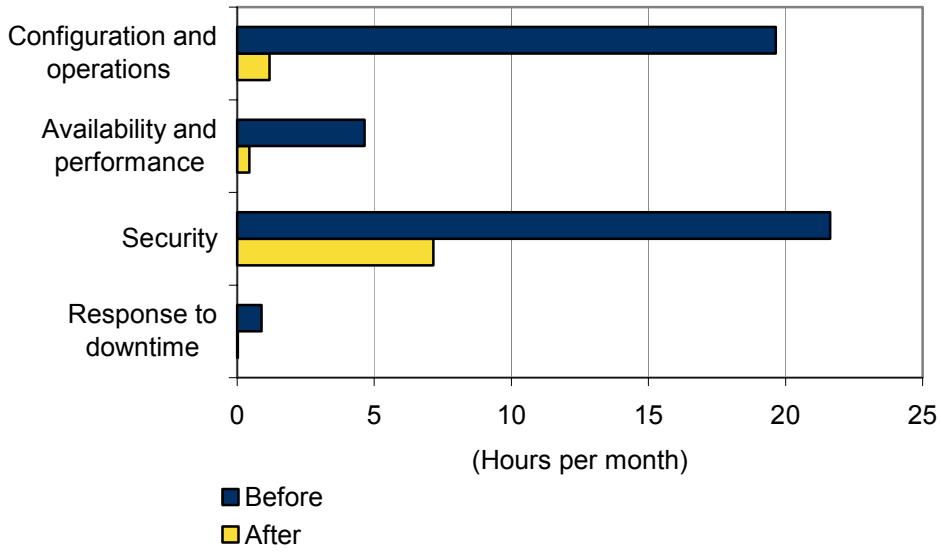
IT Staff Productivity

As shown in this study, thin client architecture creates efficiencies by requiring less IT operational support. Wyse Device Manager management solution optimizes the value of the architecture by automating many of the management tasks. Time required for configuration and operations tasks (most notably, hardware setup and configuration as well as software installation and upgrade and asset management) was reduced by 93%. Availability and performance tasks (mostly application administration) were reduced by 91%. Security administration and management tasks probably benefit the most from optimized thin clients. These tasks made up nearly half (46%) of IT staff desktop operations. With most of the desktop computing assets centralized in a secure environment, security task requirements were cut by 67%. IT no longer has to position IT staff resources at multiple sites. Before migration to thin clients, companies in the study relied on remotely positioned asset to resolve problems 72% of the time and responded from a central point only 28% of the time. Now they respond without having to travel 95% of the time.

Figure 3 illustrates the time savings following thin client implementation.

FIGURE 3

IT Time Spent on Desktop Support Before and After Thin Client Migration



Source: IDC, 2005

User Productivity

User productivity accounted for 41% of total benefits and is directly tied to uptime. When a worker's client was down completely or suffering less-than-optimal performance to the point where the worker contacted the help desk, companies estimated the workers to be only 56% productive. The Wyse Device Manager management solution enabled a more stable environment and reduced the causes of performance problems. For example:

- Downtime events were reduced by 51%, and MTTR was reduced from more than 1 hour to less than 15 minutes.
- Help desk calls and time needed to resolve problems were reduced by 72% and 56%, respectively.

In addition to experiencing reduced downtime, companies estimated that users were 2.3% more productive because of rolling upgrades and less time spent on nonproductive activities.

Overall, each user realized an additional 22.4 hours of productivity annually.

FUTURE OUTLOOK

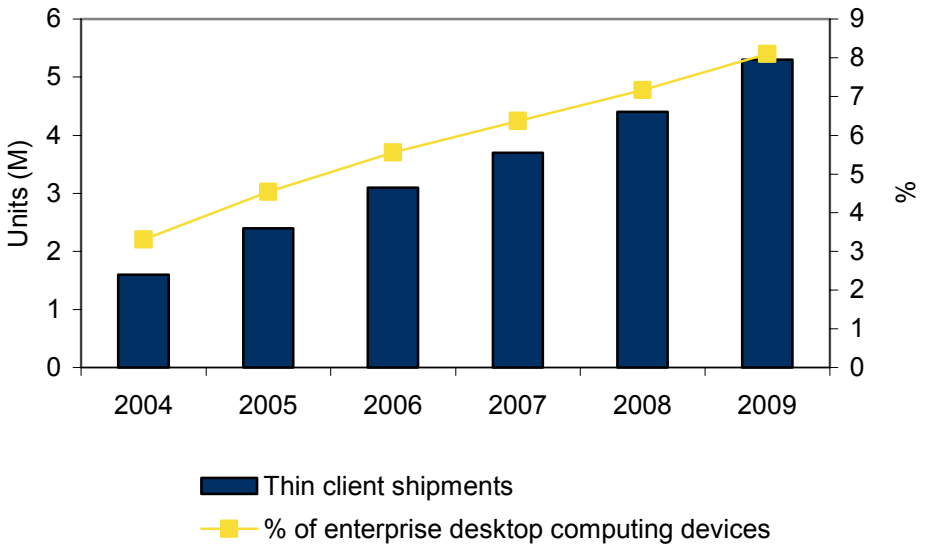
Scenarios

The compelling benefits that thin clients can bring to IT departments have led the devices to a position of growing prominence in the worldwide IT marketplace, particularly over the past year. A nearly constant stream of stories about security breaches and Trojan horses bringing down entire enterprise networks has led to a heightened sensitivity to security issues with traditional PCs. In addition, a general understanding of the benefits of server-based computing models is finally starting to sink in with IT managers. Together, these two trends have led to almost 50% year-over-year growth in worldwide thin client unit shipments between the first half of 2004 and the first half of 2005. That rate of growth is about four times higher than that of the admittedly much larger PC market and represents one of the highest growth rates of any IT hardware category. IDC's most recent forecast projects the compound annual growth rate (CAGR) of thin clients will be around 18% through 2009, nearly double the PC CAGR.

The story is even more compelling when we compare enterprise thin client shipments with enterprise desktop PC shipments. Although total enterprise thin client shipments represented only about 3% of enterprise desktop computing device shipments in 2004, IDC believes that by 2009 over 8% of such devices sold into medium-sized and large businesses and government and education segments will be thin clients. Figure 4 highlights these results.

FIGURE 4

Thin Client Percentage of Enterprise Desktop Computing Devices



Source: IDC, 2005

The message of thin clients has begun to resonate with IT decision makers and will continue to grow stronger over time, largely because of the compelling ROI story that thin clients offer versus traditional PCs in networked client/server environments. In addition, the thin computing model will continue to expand over time, with software-based application and OS streaming solutions now coming to market. These types of products will open up thin computing to even more environments.

CHALLENGES

Thin clients offer an excellent value to IT customers looking for secure, easily managed, cost-effective computing devices, but they may not be the ideal choice for all situations. First, as with any network-based computing device, they require environments with robust and reliable networks. Given the move to 1Gb and even faster networks in many companies, as well as the increasing reliability of most networks, this isn't a significant issue for most IT managers, but it still needs to be considered. Second, there can be some resentment and pushback from users in environments where thin clients are replacing PCs as the primary computing device. Many workers are used to having the flexibility to install whatever software they choose on their work PCs — despite IT policies to the contrary — and they may have concerns that an inherently locked-down thin client is a step backward. The increased reliability that thin clients can provide over finicky PCs may eventually win them over, but IT managers need to be prepared to address the "perceived downgrade" concerns that some of their internal customers will raise.

One of the key trends in enterprise clients is the growing percentage of notebook PCs and the increased mobility that they allow. Notebook form-factor thin clients are available, but they are more expensive and limited in their capabilities than full-function notebooks. As a result, current and potential notebook PC uses are less well-suited for migration to thin clients.

CONCLUSION

Thin clients and the thin computing model can be an effective solution for companies looking to optimize their IT investments and create more secure and easier-to-manage IT infrastructures.

Compared with desktop PCs, thin clients feature lower acquisition costs, lower support costs, slightly higher worker productivity, and greatly enhanced IT staff productivity — all very positive factors that IT managers need to consider when choosing between desktop PCs and thin clients.

The companies studied for this research realized significant savings and enjoyed an average ROI of 421% for their investments in thin clients. But the benefits for thin clients extend beyond purely monetary ones. In these days of heightened security threats, the thin computing model offers distinct architectural advantages that companies can use not only to strengthen their defenses but also to simplify their IT infrastructure. Companies may perceive the initial leap to thin clients as a bit challenging, but there's no question that making that transition can reward IT departments in many significant ways.

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