Demystifying the Thin Client Operating System: Which Thin Client Is Right for Your Business?

The ability of thin clients to deliver on-demand access to data and applications in an easy-to-manage, cost-effective package is well known. To realize such benefits, however, you must choose the thin client operating system that best matches your application and technical environment. This Executive Brief explores the potential options and maps them to typical user scenarios, answering the vital question: which thin client operating system is right for your enterprise?

INTRODUCTION

Thin client, or server-based, computing is among the fastest-growing sectors of IT today. It is cost effective and easy to manage, providing lower ownership costs than PC-based solutions. Thin clients conform to the trend of centralizing IT assets while providing on-demand access to data and applications via a device that fits each user's job function. As the industry research firm IDC notes, "IT professionals are beginning to understand and appreciate the security, centralized control/management and return on investment of thin client environments."[1]

Thin clients can benefit any organization seeking a secure, stable and cost-efficient environment. They are especially well suited to environments in which users spend much of the workday accessing office productivity suites, browser-based applications for customer relationship management or enterprise resource planning or any task-oriented application. In short, thin clients can replace PCs in a variety of fixed and mobile applications—from the corporate desktop, retail kiosks and call center environments to healthcare, financial institutions, government offices or on the factory floor.

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[1]The Rise of Thin Machines: Worldwide Enterprise Thin Client Forecast and Analysis, 2002-2007, IDC, September 2003

To maximize the benefits, however, IT executives must choose a thin client that matches the intended use. Thin clients are available in a variety of form factors, such as standard desktop devices, zero-footprint monitors, industrial terminals, kiosks and more. Functionality, power and price/performance vary as well based on the operating system requirements. The options are:

- Proprietary OS in the basic thin-client terminal
- Microsoft Windows CE in the browser terminal
- Microsoft Windows XP Embedded (XPe) in the line-of-business (LOB) terminal
- Linux in the Linux terminal

This Executive Brief will explore the strengths and tradeoffs of each option toward helping you make the right choice for your unique needs and technical environment.

CASE STUDY:

BASIC TERMINALS HELP DREYER MEDICAL IMPROVE PATIENT CARE

When Dreyer Medical Clinic decided to adopt a paperless medical records system for its 12 service locations, it needed a reliable, cost-effective solution that would meet HIPAA regulations for privacy and security. Dreyer chose a pure server-centric environment with Wyse Winterm basic terminals running Blazer, Wyse's operating system.

Dreyer replaced dumb terminals at nursing stations with basic terminals as well as in exam rooms for on-demand access to medical records. This provided a highly reliable, secure, small-footprint client device to display server-based Windows and Web applications. Perfect for the healthcare environment, the basic terminals have proven to be more robust than handheld computers and easier to maintain than PCs.

As servers are centralized at company headquarters, the IT staff can handle all administration and maintenance in one location. This allowed Dreyer to implement HIPAA security protocols easily while lowering costs and improving patient care.

WHAT ALL THIN CLIENTS SHARE

Thin clients are broadly defined as diskless devices connected to a server-based computing environment. Using inexpensive Intel-based servers and access software such as Microsoft Terminal Services, Citrix MetaFrame, Tarantella New Moon Canaveral IQ or a browser, users enjoy the same level of productivity and application flexibility as PC users. The big difference is that all application processing and storage occur on a server, while screen views, mouse movements and keystrokes are passed to the thin client via Citrix's Intelligent Computing Architecture (ICA) or Microsoft's Remote Desktop Protocol (RDP).

All thin clients share the following characteristics:

- Built-in RDP, ICA or other protocol for server-based computing.
- An Ethernet connection and optional support for wireless LANs.
- I/O for keyboard and mouse, optional I/O for printers, USB and other peripherals.
- A video processor for strong graphics and colors—a major upgrade from the dumb terminal.
- Solid-state construction——no fans or disk drives means long life and high reliability.
- Centralized management and deployment provide easier administration and greater security.
- Firmware-based software and diskless construction limit vulnerability to viruses and other malware.

Beyond these commonalities, thin clients are divided into four groups by operating system, each with individual characteristic strengths and trade-offs.

BASIC TERMINALS FOR SERVER-BASED COMPUTING

Basic terminals feature a proprietary operating system that delivers simple server-based computing in a thin-client appliance. All application processing, including Web browsing, occurs on the server, with no local processing and limited peripheral options. Wyse, today's thin client market leader, offers its Winterm line of basic terminals. Based on Wyse's own Blazer operating system, the line features ICA and RDP software tuned for high performance. With a locked-down OS stored in flash memory, no local storage or browser, and no Microsoft OS for hackers to target, basic terminals are the most secure thin clients.

Ideal applications: Basic terminals are ideal for transaction workers or knowledge workers who use server-based applications with a persistent network connection. They are also useful for kiosks used in retail and other service environments. The simplicity makes basic terminals the least expensive thin clients.

Real-world examples: A large retailer deployed basic terminals to power employment kiosks in its HR offices. Kiosks at each store allow job applicants to input data, which the HR application then sorts and sends along to HR personnel. Basic terminals are also popular in healthcare applications, where nurses and doctors equipped with wireless thin clients can get on-demand access to patient information. In either environment security is tight as all the data resides on the server.

BROWSER TERMINALS FOR LOCAL WEB COMPUTING

Moving up the ladder of functionality and cost is the more powerful browser terminal. Based on Microsoft's Windows CE embedded operating system (formerly CE .NET), browser terminals are the best-selling thin clients. Windows CE features Internet Explorer for local Web computing and has the power

to run a local terminal emulation suite. In addition the operating environment can be customized to a degree as CE supports a wide range of Windows drivers and peripherals, including wireless, USB, CD-ROM, smart cards and others. The browser terminal cuts user training and the learning curve as it can provide a familiar Windows-like desktop shell.

Ideal applications: Because of the network efficiency and performance of a local browser, browser terminals work well where many knowledge or transaction workers need to access the Web or Web-based applications. The terminals are well suited for green-screen replacement via the locally running terminal emulation suite, and for kiosks running Web-based applications. However, due to limited local processing, browser terminals require a persistent network connection.

Real-world examples: Browser terminals are suitable for office workers who use server-based business applications while surfing the Web; for call center operators needing access to Web-based information; for customer service reps needing access to business apps and databases; for shared workstations on a factory floor; and for retail and other kiosks with a Web component. A Canadian retailer, for instance, deployed a browser terminal in a retail kiosk so customers can order out-of-stock merchandise while in the store. Behind the scenes the browser terminal performs the transaction via the company's Internet storefront.

CASE STUDY:

BROWSER TERMINALS DELIVER FOR PUERTO RICO'S COURT OF JUSTICE

In Puerto Rico, the General Court of Justice (Tribunales) handles 400,000 cases each year in 70 courthouses across the island. To improve response time and improve the citizen's experience with the justice system, Tribunales deployed server-based computing. It choose Wyse Winterm thin-client browser terminals, based on Microsoft Windows CE, to provide low-cost, low-maintenance access to existing mainframe systems as well as the latest e-mail and productivity software.

The Tribunales' 4,500 employees had been using dumb terminals connected to a mainframe. To provide staff with e-mail and Internet capabilities would have required adding PCs and the IT staff would then have two systems to maintain. Ditching the mainframe terminals, and opting for just PCs, would have cost millions of dollars for a new case management system. The powerful thin clients offer a built-in browser to access Web-based applications without adding to the server burden, and support legacy terminal emulation. Each site deployed a Windows 2000 application server to run server-based productivity applications.

The result is a secure, reliable and cost-effective system that is easy to deploy and use across the island. And as centralized thin-client computing is easy to manage, the small IT staff can focus on improving the system rather than day-to-day management headaches.

LOB TERMINALS WITH FLEXIBLE POWER

More flexible than basic or browser terminals, line-of-business (LOB) terminals run Windows XP Embedded (XPe), Microsoft's most powerful—and costly—embedded OS. Features include everything in the browser terminal, as well as a local Java Virtual Machine (JVM), the option to embed local applications, the power for local processing, top-line graphics and colors, and full Win32 API application support. An LOB terminal also supports the full catalog of Windows peripherals and management tools—which means PC-like flexibility and easy integration into Windows environments. And because XPe is a componentized operating system, LOB terminals can be customized to meet the exact needs of any application. The downside, though, is a less secure system. Since XPe shares the same kernel with Windows XP on the PC, LOB terminals may be vulnerable to security breaches.

Ideal applications: LOB terminals make sense for Microsoft shops whose applications require a powerful, customizable thin client with a local browser and local Java applications, or the power to quickly run embedded local applications, such as Word or a pricing database for a point-of sale terminal. Local processing delivers the ability to compute while offline—essential for unreliable network connections or for users outside network coverage.

Real-world examples: XPe is behind most thin clients with embedded 32-bit Windows applications, such as those used by package delivery services, major retail operations and airlines. It is the one Windows thin client that can operate if the network goes down, making it suitable for cash drawers and other business-critical terminals. It is ideal for custom deployments such as multimedia stations for training purposes and any situation that requires PC-like flexibility. As an example, Wyse's Winterm line of LOB terminals offers expansion options such as multiple USB ports, CD-ROM drives, a PCI slot and internal expansion slots.

LINUX TERMINALS CAN ADAPT TO ANY SITUATION

When Linux comes to the enterprise desktop—and many experts think it will soon—it will most likely arrive in the form of a thin client. An emerging category with strong support overseas,[2] the Linux terminal is most flexible due to the adaptability of its open source operating system. A very thin version of Linux can power a basic terminal, while a full-featured version can create a robust LOB terminal,

[2] "Enterprise Thin Client Q-View," IDC, June 2004

customizable to meet most business needs. Linux terminals can run 32-bit Windows applications, Unix and Linux applications via server-based computing, as well as access the Web through a browser. Linux terminals can be designed to support terminal emulation, a local JVM and custom applications and a wide range of peripherals.

Ideal applications: Linux terminals deliver all permutations of server-based computing to Linux shops, and to those looking to fulfill open source mandates or experiment with desktop Linux. In addition, Linux thin clients support adoption of Web services-type applications. Since Linux is inherently Internet friendly, it is easier to integrate Linux terminals than PCs into Web-centric environments. Benefits include the cost advantage of open source software, as well as the flexibility, manageability and security of Linux.

Real-world examples: Capital Cardiology Associates converted a 200-user Windows network to a Linux terminal network and, according to a published report on the project, the effort improved application performance, reduced costs and increased stability. The company estimates it's saving 37 percent in operating costs due to the Linux clients.[3]

CASE STUDY:

THE RIGHT TOOL: CHAMPION LABS DEPLOYS BROWSER AND LOB TERMINALS

Champion Laboratories, a major supplier of automotive crankcase valves and filters, reduced its IT management and maintenance cost by deploying two different thin clients: Wyse Winterm browser terminals and Wyse Winterm LOB terminals.

Champion deployed the browser terminals, based on Microsoft Windows CE, to replace legacy dumb terminals that could not stand up to grueling conditions on the factory floor. To replace existing PCs used to run desktop manufacturing applications, Champion chose flexible LOB terminals based on Microsoft Windows XPe. The LOB terminals combine the durability and security of a thin client with support for local applications and Internet Explorer. As an added benefit, Wyse's LOB terminals support wireless networks, which allows Champion to move the devices without re-routing cables across the factory.

"Thin clients stand up to the constant heat and stress on the shop floor and allow us to significantly reduce IT management costs," says Rich Sherrick, a PC analyst at Champion. "Furthermore, the Windows terminals have increased our productivity because they are so easy for employees to use."

A WORD ABOUT SECURITY

A key benefit of thin clients is the ease of securing a centralized environment. Yet security options for thin clients vary widely among vendors so it's critical to evaluate not only the security options for each thin client but the vendor's ongoing commitment to security management.

Look for thin clients that run the latest software versions on solid-state flash memory, write-protected to guard against code modification. Support for Point-to-Point Tunneling Protocol is needed to secure virtual private networks. In addition, the most secure thin clients support a range of security features, such as secure ICA, smart cards, biometric devices, multiple user accounts and access levels, multi-level security, auto-connect, and auto-failover to backup devices. Also investigate the vendor's commitment to keeping its thin clients patched with the latest security releases—especially critical in XPe deployments.

CENTRALIZED MANAGEMENT

To reap the benefits of centralized management and deployment, thin clients require robust management tools—a key differentiator among manufacturers. As an example, with every thin client it sells, Wyse supplies Wyse Rapport, device management software that centrally controls intelligent devices—local and remote, wired and mobile, desktop and handheld. Scalable to hundreds of thousands of devices, Rapport allows remote deployment and configuration and easily distributes software and firmware from a central location. These and other remote management capabilities will simplify IT management, reduce TCO and improve return on investment.

CONCLUSION

Clearly, no single thin client is right for every enterprise. What works for a hundred-seat call center may not meet the needs of mobile healthcare workers, retail kiosk users or clerical staff working at a desk all day. In fact, the wealth of situations where thin clients deliver value means that many organizations will find it impractical to standardize on a single thin client.

Whether you're considering the basic terminal, the browser terminal, the LOB terminal or the Linux terminal, there is a combination of functionality, form factor and price/performance likely to meet your application and technical requirements.

Sponsored by Wyse

[3] "Doctor Prescribes Linux for More Reliable Networks, Lower Costs," DeskopLinux.com, November 2003