



Whitepaper: Best Practices for Choosing the Right Thin Clients for your iSeries Environment

***Summary:** The benefits of thin clients are endless. Thin clients are easier to deploy, manage, and maintain than their PC counterparts. This whitepaper from iSeries Connectivity expert BOSaNOVA explains what you must consider before choosing the right thin client for your environment.*

Introduction

In the beginning, thin-client terminals booted from a server, had very slow CPUs with small amounts of memory, and relied on application servers to provide needed features. It is no surprise that these early thin clients didn't take off because delivery was poor (high bandwidth requirements, low color support, no sound, etc.) and the application servers themselves didn't support applications very well.

Over the last few years, the story has changed. Thin clients have been enhanced to support faster CPUs, faster video, and increased and faster memory. Today, popular software applications typically work well in a terminal server environment, application server software has improved significantly, and server hardware prices have plummeted. All of these factors have contributed to the surge in demand for thin clients.

Many Benefits

There are many benefits to implementing thin clients in today's iSeries environment. Thin clients are easier to deploy, manage, and maintain than their PC counterparts, and thin-client management software allows administrators to save time and money by maintaining all devices from the server. This means that upgrades, application deployments, and virus updates can be centrally managed rather than being managed at individual workstation locations.

Thin clients by design don't have any moving parts and therefore provide a much longer life expectancy than a PC. When it comes to security, thin clients prevent users from loading applications onto their devices, which significantly reduces the risk of viruses in your environment. In the small chance that a virus does occur, you can simply reboot the thin client device, which returns it to its original, virus-free state.

Other benefits of thin clients include a small footprint on the desk, lower power consumption, and server-centralized data storage.

Thin-Client Options

Now that we have addressed some of the benefits of deploying thin clients, it is important to understand your options as there are many factors to consider when looking for the best fit for your environment. These are the top three considerations:

1. Performance
2. Operating System
3. Environment

Performance

Ever since thin clients were introduced, there has been a misconception that the CPU on the thin client is unimportant (unlike PCs), the thought being that the thin client merely animates the screen content and sends the keyboard and mouse data to the server, where the processing is actually done. But this isn't always the case. Just as thin clients have evolved so has the demand for the processing power required to handle higher-end applications. In particular, server applications that use multimedia are impacted by low-performance thin clients. Tests reveal that

thin clients with low-spec CPU are simply unable to keep up with the demands for both audio and video. Even PowerPoint can be enough to cause unacceptable performance problems. Embedded applications such as 5250 emulation are particularly susceptible to poor CPU performance.

Operating System

The operating system is an important consideration when researching thin clients for your environment. Two different thin clients that have the same OS are not alike—and it is not just the hardware that may be different. Some manufacturers sell the base OS image, and others spend the time to add additional features to that image to enhance the thin client. Do your research and you'll be able to determine the best fit for you. When purchasing thin clients, you'll be faced with a choice of CE.Net, Linux, and XP Embedded.

CE.Net

This OS starts life with a stock set of features provided by Microsoft in the platform builder. The browser is Internet Explorer Compact Edition, which does not support pop-up windows or Active X. In addition, the ability to right-click and edit the applications' properties (desktop mode) is missing. Some thin-client manufacturers add functional enhancements to the OS while others do not. There are several other small differences, such as the version of ICA (Citrix), network share ability, etc.

Although it appears to offer many useful applications, CE.Net often falls short of what users expect because of OS limitations. Windows XP, for example, has hundreds of resident fonts. CE.Net usually contains three to five fonts. This can negatively affect Web browsing and file viewing. If you need a full-featured browser, HTML support on email, or file viewers, CE.Net is not the right choice for you. If you are looking for an inexpensive thin client with a simple user interface, CE.Net may be one option to consider.

Linux

Implementations of Linux on thin clients can and do vary tremendously from one manufacturer to another. Some of the most important differences include user interface, Web browsers, email support, network shares, etc. In some models of Linux thin clients, you can find support for Lotus Notes, Sun JVM, full-featured email client, full-function Web browser, OpenOffice, Adobe Acrobat Reader, file server access, and much more.

Linux is by far the most efficient OS for 5250 emulation. One consideration when evaluating Linux options is printing: Text works fine, but if users need to print images from the embedded browser, Linux may not be the right fit.

XP Embedded (XPe)

This operating system is a derivative of XP Professional and is similar to the CE.Net platform builder. XP Embedded utilizes a target designer. It is a purpose-built OS utilizing XP Pro components. To enable deployment on the small storage capacities that exist in thin clients, the components must be selected with great care. The end result (the image) is dependent on the image builder. XP components are built in and taken out as required. If you experience a problem with a Windows 32-bit application not working with XPe, the reason is probably that a component was not included by the manufacturer when the XPe image was created. Although more expensive than other OS offerings for thin clients, XPe offers a number of advantages for companies that have specific needs. With XPe, you can have limitless device drivers, most Windows applications can be installed (with the notable exception of "Office Automation" products like Word, Excel, etc. because of restrictions from Microsoft), Lotus Notes is supported, and the OS works with any Web site. If you have specific needs, some manufacturers offer the option to customize your XPe thin client to meet those needs.

Environment

In order to determine the best thin client for you, you must evaluate your environment to be sure that your specific needs will be met. If you are an iSeries shop, then it is likely that 5250 emulation is important to you; therefore, you need to find a manufacturer that understands and can deliver on your needs.

The manufacturer of the OS and software image for the thin client can make a significant difference; for example, if the creator of the image is also the creator of the 5250 program, the processor/memory priority given to the 5250 can be tweaked. Many thin-client companies rely on R&D from Taiwan, where generic images are created to cater to the mass market.

Third-party emulators are added afterward to provide additional functionality for host access. Often, these emulators are a "jack-of-all-trades" offering that emulates not only 5250 but also 3270, ASCII, SCO, Wyse, VT, ANSI 5250, etc. While this type of approach is economical in space, it often does not provide the enhanced features iSeries customers have come to expect and rely on—for example, IBM Client Access. Terminal users are also often left wanting, since familiar features like keyboard-enabled "record/playback" now require a mouse. The screen is cluttered with menu and status bars where there was once a clean green-screen. Users may also find that split-screen capabilities have disappeared.

In addition, when generic emulators are supplied with thin clients, the release of the 5250 emulation session doesn't always occur properly. TN5250 uses TCP/IP to create a two-way communication session with the host system. If a user powers down the thin client without first exiting from the emulation (as is typical with a "dumb" twinax terminal), the host system will often not release the session because it does not recognize that the user is no longer connected. Manufacturers that focus on the iSeries market are well aware of this issue and perform a soft power-down that allows the application to send a termination message to the host before powering off the unit. This way, the host computer knows to close the session so that it is ready to be used when the terminal is powered up again.

The Benefits of Thin Clients Are Endless

Thin clients have evolved tremendously over the past few years and as a result are much more complex than the restricted devices they once were. The benefits of deploying thin clients are endless. However, it's important to understand that not all thin client configurations are created equal. Spend the time to determine which OS and software will provide the most benefit to your users and then look at which manufacturer's thin-client implementation can best meet these needs.

BOSaNOVA, Inc. is a leading developer of enterprise-class thin client and network appliance solutions for Linux, XP, and CE.Net.

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