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Server-Centric Computing Without “the Bill”!

For many years corporate America has been looking for ways to reduce the cost of ownership associated with Microsoft Windows®-based computing. One way that has become increasingly popular over the last three years is the deployment of Windows-based Thin Clients coupled with Terminal Server and Citrix. In the last twelve months a new trend has been developing. Enterprises are now trying to reduce costs even further by moving to “intelligent” Thin Clients.

“Dumb” vs “Intelligent” Thin Clients

In contrast to the previous generation of “dumb” thin clients, which simply acted as terminals allowing access from desktops to server-based applications, “intelligent” Thin Clients come with built-in emulation software plus e-mail; a full-function browser (e.g., Mozilla Firefox or full Internet Explorer) supporting JVM, Flash and XML, and pop-up window support. These intelligent Thin Clients are served up with Linux or Windows XPe operating systems, and allow access to a file server as well as Web-delivered applications such as Lotus Notes, WebSphere, etc.

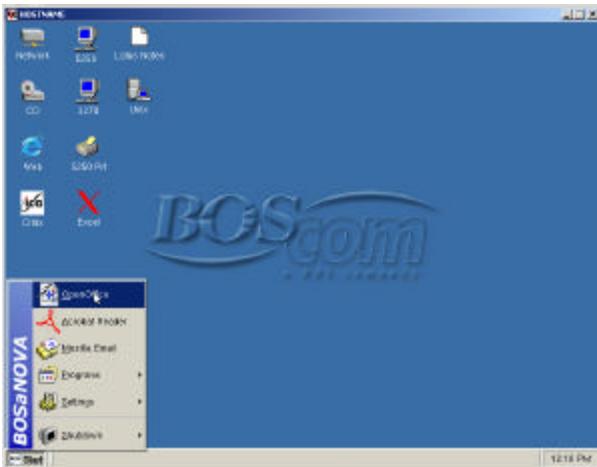


Figure 1: Linux-based Thin Client desktop. The appearance and functionality of the Linux desktop closely matches that of a Windows desktop, which should alleviate traditional Microsoft users' apprehension of the new computing environment.

Current Thin-Client Computing Options

Five options now exist for companies wishing to deploy Office-type applications for their employees via Thin Clients: Traditional, Hybrid, Local Linux, Versatile Linux, and Remote Linux. The following section explores the per-user software licensing costs of each of these approaches.

1. The **Traditional** option involves serving up Microsoft Office applications using Microsoft Terminal Server (2000 or 2003 server), Citrix, etc., delivered using a remote desktop protocol. The per user software cost associated with this method are:

a.	Terminal Server Client Access License	\$120
b.	Client Access License	\$30
c.	Microsoft Office Professional	\$395
d.	Citrix (if applicable)	<u>\$250</u>
	Total Software Cost per User	\$545 to \$795

2. The **Hybrid** option means keeping Microsoft Office and serving it up using a Linux server. This involves using a product from CodeWeavers (www.codeweavers.com) called CrossOver Office. This product allows some Microsoft products to be installed and served up via X-Windows to a Linux desktop or Linux Thin Client. The per user software costs for this method are:

a.	CrossOver Office	\$50
b.	Microsoft Office Professional	<u>\$395</u>
	Total Software Cost per User	\$445

(Note: CrossOver Office, based on the WINE development, allows Microsoft Windows applications to run in a Linux environment. Many Windows programs are supported, and many others will work but have not been thoroughly tested. Applications supported include Microsoft Office XP, LotusNotes, and many more.)

3. The **Local Linux** option involves installing OpenOffice (www.openoffice.org) on a Linux Server and using X-Windows on a Linux Thin Client. Both of these software components are open source and distribution is unrestricted. Per user software cost of this method are:

a.	X-Windows	\$0
b.	OpenOffice	<u>\$0</u>
	Total Software Cost per User	\$0

(Note: OpenOffice is a full-featured product suite providing word processing, spreadsheet, and presentation software. It can open Microsoft Word documents, Microsoft Excel spreadsheets, and Microsoft PowerPoint presentations, which can be edited and saved with standard Microsoft extensions. StarOffice (www.sun.com/software/star/staroffice), offered by SUN Microsystems, is based on this code with a few enhancements.)

4. The **Versatile Linux** option involves purchasing a Thin Client with embedded OpenOffice. Files are accessed/stored on a Linux or Windows file server. This option incurs an additional cost for a hardware upgrade since it requires more disk space and more memory. It is best suited to remote users, as X-Windows can be bandwidth-intensive and is therefore not recommended for WAN use. The per user cost of this method is:

a.	OpenOffice	\$0
b.	Additional memory	<u>\$125</u>
	Total Cost per User	\$125

5. The **Remote Linux** option involves installing OpenOffice on a Linux Server and serving up applications using the Tarantella Enterprise 3 product (www.tarantella.com). This option supports compression and encryption of the X-Windows protocol, allowing applications to be served up efficiently on a WAN. The per user software cost of this method is:

a.	X-Windows	\$0
b.	OpenOffice	\$0
c.	Tarantella Enterprise 3	<u>\$100</u>
	Total Software Cost per User	\$100

Figure 2: Total Cost of Procurement Table. Software and hardware component costs are calculated per user for both LAN and WAN environments.

Option 1: Traditional

<i>Microsoft Server</i>	LAN	WAN
CAL	\$ 30.00	\$ 30.00
TSCAL	\$ 120.00	\$ 120.00
Citrix	N/A	\$ 250.00
Microsoft Office	\$ 395.00	\$ 395.00
Windows CE Thin Client	\$ 399.00	\$ 399.00
Total	\$ 944.00	\$1,194.00

Option 2: Hybrid

<i>Linux Server</i>	LAN	WAN
Microsoft Office	\$ 395.00	\$ 395.00
Tarantella	N/A	\$ 100.00
CrossOver	\$ 50.00	\$ 50.00
Linux Thin Client	\$ 450.00	\$ 450.00
Total	\$ 895.00	\$ 995.00

Option 3: Local Linux

<i>Linux Server</i>	LAN
OpenOffice	N/A
Linux Thin Client	\$ 450.00
Total	\$ 450.00

Option 4: Versatile Linux

<i>File Server</i>	WAN / LAN
OpenOffice*	\$125.00
Linux Thin Client	\$450.00
Total	\$575.00

Option 5: Remote Linux

<i>Linux Server</i>	WAN
OpenOffice	\$ N/A
Tarantella	\$ 100.00
Linux Thin Client	\$ 450.00
Total	\$ 550.00

Conclusion

With the advent of intelligent Thin Clients, the variety of ways to implement Thin Clients has broadened, and a real alternative to the Microsoft desktop computing platform has emerged: Linux-based Thin Clients. Until now, the Linux desktop never quite delivered the user interface (UI) users were seeking. However, the UI on some of the Linux Thin Clients on the market today is so similar to a Windows-based desktop PC that deployment is at last conceivable to the mainstream. In addition, the simplicity of the Linux Thin Client gives a managed environment with the Windows look and feel.

While Thin Clients were originally designed to work solely with server-based applications, they are increasingly being deployed for embedded emulation alongside server-based or Web-delivered applications. This trend--along with serious security, virus issues, and TCO concerns about the PC operating environment--has generated new interest in terminal computing, specifically in Thin Clients.

Linux Thin Clients, in particular, allow server-based computing without additional licensing fees and provide file server access. They enable complete independence for applications, while maintaining sharing and back-up control. This new direction is proving a very interesting alternative for many forward-looking companies. In other words, Linux Thin Clients provide server-centric computing, without "the Bill"!

Figure 3: Total Cost of Procurement Graph. Summary of software and hardware component costs per user by option.

