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Commentary

Linux Desktop TCO: Labor Details

Running Linux on the desktop has labor cost implications for enterprises considering it. Unless Linux can be locked down, savings will be a challenge.

Given similarly managed environments, we have not seen evidence of a significant differences in the direct labor cost of managing Linux desktops compared to Windows desktops. Opportunities for savings exist if the enterprise can lock down and manage Linux desktops better than it does Windows desktops. Productivity may be lost because of extended learning curves, and problems arising from document format compatibility with other internal or external users running Microsoft Office.

We have produced two new total cost of ownership (TCO) profiles (see Table 1 and Table 2) to help enterprises examine their alternatives. The first assumes that Windows will continue to be the client's operating system (OS), but instead of Microsoft Office, StarOffice will be used. Too often, enterprises try to link the client OS decision to the office product decision; we believe these are two separate decisions. The second profile assumes Linux with StarOffice. We will compare both profiles using Windows 95 and Windows XP. All our TCO profiles assume a hardware life cycle of three years.

Here, we present the detail behind the Linux desktop TCO model. An overview is provided in "Linux Desktop TCO: An Overview." "Linux Desktop TCO: Hardware and Software Details" examines the hardware and software components of the model.

Table 1
TCO Model. Part 1

Hardware Cost	Windows 95/ MS Office (Unmanaged)	Windows XP/ MS Office (Unmanaged)	Windows XP/StarOffice (Unmanaged)	Linux/StarOffice (Unmanaged)
Hardware				
Expensed and Depreciated	$446	$446	$446	$420
Upgrades	$14	$14	$14	$14
Spares/Spare Parts	$4	$4	$4	$4
Supplies	$17	$17	$17	$17
Total Hardware Cost	$481	$481	$481	$455
Software				
Personal Productivity and Personal Database Applications	$182	$182	$108	$108
Business and Engineering Applications	$426	$426	$426	$426
Database, Data Management and Development Tools	$149	$149	$149	$149
Messaging and Groupware	$60	$60	$60	$60
Others	$55	$55	$55	$43
Total Software Cost	$871	$871	$797	$785
IS Software				
Network, Systems, Storage and Asset Management	$25	$25	$25	$25
Service Desk Management	$17	$17	$17	$17
Training Software and Computer-Based Software	$10	$10	$10	$10
Test/Others	$18	$18	$18	$18
Total IS Software Cost	$70	$70	$70	$70
	$1,423	**$1,423**	**$1,348**	**$1,311**
Client and Peripheral Technical Services Cost				
Client and Peripheral Technical Services				
Tier II Problem Resolution	$20	$18	$18	$17
Tier III Problem Resolution	$7	$7	$7	$7
Traffic Management and Planning	$0	$0	$0	$0
Performance Tuning	$0	$0	$0	$0
User Administration (Add and Changes)	$10	$11	$11	$11
Operating System Support	$10	$8	$8	$8
Maintenance Labor	$10	$9	$9	$9
Software Deployment	$115	$113	$113	$113
Application Management	$44	$32	$32	$32
Hardware Configuration/Reconfiguration	$9	$7	$7	$7
Hardware Deployment	$12	$9	$9	$9
Disk and File Management	$8	$8	$8	$8
Storage Capacity Planning	$4	$4	$4	$4
Backup, Archiving and Recovery	$7	$7	$7	$7
Repository Management	$0	$0	$0	$0
Total Annual Client and Peripheral Technical Services Cost	$255	$233	$233	$232
Planning and Process Management Cost				
Planning and Process Management				
Account Management	$18	$18	$18	$18
Systems Research, Planning and Product Management	$32	$29	$29	$29
Evaluation and Purchase	$19	$19	$19	$19
Security and Virus Protection	$21	$20	$20	$20
Business Recovery	$6	$6	$6	$6
Total Annual Planning and Process Management Cost	$95	$92	$92	$92
Database Management and Administration	$65	$65	$65	$65
Service Desk (Tier 0 and I Support)	$246	$236	$238	$238
	$662	**$626**	**$628**	**$627**

Source: Gartner Research (June 2003)

Table 2
TCO Model, Part 2

Finance and Administration Cost				
Finance and Administration				
Supervisory Management	$62	$62	$62	$62
IS Administrative Assistance	$4	$4	$4	$4
Asset Management	$7	$7	$7	$7
Budgeting and Chargeback	$17	$17	$17	$17
Auditing	$5	$5	$5	$5
Purchasing, Procurement and Contract Management	$25	$25	$25	$25
Vendor Management	$30	$30	$30	$30
Total Annual Finance and Administration Cost	$150	$150	$150	$150
IS Training Cost				
IS Training				
IS Course Development	$9	$9	$9	$9
IS Training and Delivery	$57	$57	$57	$57
Total Annual IS Training Cost	$66	$66	$66	$66
End-User Training Cost				
End-User Training				
End-User Course Development	$17	$19	$17	$17
End-User Training and Delivery	$154	$152	$154	$154
Total Annual End-User Training Cost	$171	$171	$171	$171
	$388	**$388**	**$388**	**$388**
End-User Operations Summary				
End-User Operations Cost				
Peer Support	$1,688	$1,257	$1,276	$1,340
Casual Learning and Self-Support	$932	$831	$953	$980
Formal Learning	$340	$340	$340	$340
File and Data Management	$144	$140	$182	$182
Application Development	$138	$138	$145	$145
Total Annual End-User Operations Cost	**$3,242**	**$2,706**	**$2,896**	**$2,986**
Downtime Summary				
Downtime				
Downtime Annual Cost	$335	$142	$142	$135
Downtime Full-Time Equivalents				
Total Annual Downtime Cost	**$335**	**$142**	**$142**	**$135**
Hardware and Software	$1,423	$1,423	$1,348	$1,311
Operations	662	626	628	627
Administration	388	388	388	388
Total Direct Cost	$2,472	$2,437	$2,364	$2,326
End-User Operations	$3,242	$2,706	$2,896	$2,986
Downtime	335	142	142	135
Total Indirect Cost	$3,577	$2,848	$3,038	$3,121
TCO	**$6,050**	**$5,285**	**$5,402**	**$5,447**

Source: Gartner Research (June 2003)

Cost of Labor — Because hardware and software costs are typically less than 30 percent of the annual TCO of a PC, the other categories of support labor and end-user operations are more important to the analysis. For support labor, we would not expect Linux to have a significant advantage over Windows XP, assuming the same level of desktop lockdown and management. We believe standardization, lockdown and tools generally contribute significantly to reduced technical support costs, and in our base models, we assume neither platform will be locked down or managed. "Linux Desktop TCO: An Overview" provides sample costs in managed environments.

Microsoft continues to add features in the OS to make it more stable and reliable. Windows XP includes technology to help eliminate Dynamic Link Library (DLL) conflicts, protect system files and restore a system to a previously known good configuration. However, these are more-reactive features and some

(for example, system restore) require technicians to actively perform the task after the system has been compromised.

With Linux's Unix heritage, proponents claim that libraries are generally protected from one another, but there is still a reliance on application developers to correctly implement this function. Further, Linux applications generally have many dependents in terms of versions of applications. Utilities such as Red Hat Package Manager and Ximian's Red Carpet help ensure that all dependents are present before an application is installed.

We expect Linux to have a slight edge over Windows for three reasons: 1) Fewer viruses target Linux desktops. 2) Fewer problems are caused by conflicting applications. Although Windows 2000 and XP include technology known as side-by-side DLLs to reduce this problem, many independent software vendors do not yet support it, and the sheer volume of legacy software that does not support this feature prevents the full benefit from being realized. In Linux, as in Windows, specifications such as Linux Standards Base (www2.linuxbase.org/spec/) can help reduce these conflicts. Because there is less legacy software, there is a greater likelihood that new desktop software produced will avoid such conflicts. 3) Although the Windows registry has helped give structure to Windows applications, it is difficult to understand and repair. Because Linux is purely file-based, administrators may be able to troubleshoot application problems more easily.

However, this edge may be nullified by support issues concerning the incompatibility between StarOffice and Microsoft Office. So, assuming users in both Windows XP and Linux environments have administrative (root) privileges, there will not be a significant difference in the amount of technical support either one will require. Our base model assumes totally open systems, so most line items have been left the same from Windows XP to Linux. We expect Linux will save enterprises $35 per user per year compared with Windows 95, but its cost will be about the same as Windows XP support.

Enterprises that compare unmanaged Windows environments to managed or even locked-down Linux (users do not have root access), need to be careful, because cultural and political issues that prevent Windows lockdown and management can also prevent Linux lockdown and management.

End-User Operations — These are known as hidden costs, because they represent lost user productivity of users fixing their own problems and helping one another. They are related to direct labor costs, because the underground end-user operations support network is often a substitute for help desk and other formal support mechanisms. End-user operations generally account for more than 50 percent of TCO.

Given an unlocked environment, we believe that end-user operations will be about 10 percent higher under Linux than under Windows. Unfamiliarity will extend past the migration phase into real life, as people unfamiliar with the OS try to find and install applications or utilities from the Internet to customize their desktops or replace the myriad of utilities and toys that they had in their Windows environments. Specifically, we expect minor increases in categories of peer support and self-support. We believe that the best way to reduce end-user operations is to not provide users with the ability to install applications on their desktops. However, in many enterprises, cultural and political realities, coupled with an inability to maintain sufficient tech support staff to install any applications that users find they need quickly, continue to force enterprises to provide their users with administrative/root access.

Other issues that will increase Linux end-user operations costs are the lack of maturity for plug-and-play devices and personal digital assistant support. As these areas improve, Linux end-user operations costs will approach the level of Windows. We believe end-user operation will be nearly 8 percent lower for Linux

than for Windows 95, but slightly higher than for Windows XP, which is largely the result of users having to deal with data compatibility issues.

Downtime — Windows XP is generally stable; Windows 95 is much less so. Linux generally has a reputation for being stable. In many cases, the issue of stability has to do with the implementation, policies and procedures employed. For the most part, we draw no distinction between the two in desktop stability. However, we believe Linux will have slightly less downtime because of the relative scarcity of viruses attacking Linux systems. We estimate a $200 savings compared with Windows 95 and a 5 percent decrease compared with Windows XP.

Bottom Line: Enterprises should examine the expected total cost of ownership gains Linux may provide on the hardware and software side, along with the migration cost to get there. Unless enterprises can lock down their desktops, we believe the labor cost of managing Linux desktops will not be significantly different than the labor costs of managing Windows desktops. In addition, issues with plug-and-play support and extended learning curves mean that there may be significant productivity issues for users moving to Linux on the desktop. Enterprises that have not been able to lock down their Windows desktops and are planning to lock down Linux desktops should ensure that this is a realistic possibility and should consider if similar lockdown and management of their Windows desktops could provide similar savings without incurring the cost of migration.