

When Thin Clients Can Narrow Your TCO

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Thin-client computing has a lower total cost of ownership than even the most well-managed PC environments. But, in some scenarios, the trade-offs can be too great.

WHAT YOU NEED TO KNOW

The TCO of a Windows-based terminal (WBT) thin-client environment is modestly lower than that of a well-managed, locked-down PC. However, most PCs are not that well managed and companies that lock down their users too tightly will prevent them from doing their jobs. Companies that don't address the political and cultural issues of locking down and managing their PCs or WBTs will also fail. Our model shows that thin clients can be 41 percent less expensive to run than unmanaged PCs, but only 8.5 percent less expensive than well-managed PCs. However, money spent on server hardware and software actually increases direct costs by almost 5 percent in a thin-client environment compared with well-managed PCs.

ANALYSIS

The hype around thin clients has always been that they can drastically lower total cost of ownership (TCO). We continue to find that thin clients, when used as desktop replacements, can substantially reduce TCO when compared with an unmanaged or typically managed fat-client PC. However, when compared with a locked-down, well-managed PC, the savings are much more modest. Our model shows that the thin-client solution will actually have higher direct costs than the well-managed traditional PC, although the significantly lower indirect costs more than offset them. Overall, our model shows that the TCO of a thin client is about 8.5 percent lower than that of a locked-down, well-managed, traditional PC. However, many users cannot work within the constraints of a locked-down PC and would also likely be poor candidates for thin clients.

One of the most important factors of platform selection — specifically, a choice of a traditional desktop-based platform or a server-based computing platform — is a cost analysis of each platform. Each platform has its own unique cost structure. In this research, we compare the TCO of a traditional desktop (at several different management levels) and server-based computing.

As with all of our TCO models, Gartner employs the use of a “stalking horse.” Stalking horses are conceptual models used by Gartner analysts to stimulate dialogue with enterprises. Stalking horses do not necessarily reflect the reality of any particular IT organization, and thus, enterprises should perform their own analyses when using our model to determine the site-specific impact of a particular change. Differences in end-user proficiency, installed-base size and implementation strategies can significantly affect an enterprise's TCO costs.

Four Scenarios

For the purposes of this study, we examine four scenarios from a TCO perspective. Three are traditional, fat-client desktop PC deployments — one unmanaged, one typically managed, and one locked down and well managed. We compare these desktop deployments against a thin-client Windows-based terminal (WBT) and terminal server infrastructure. Management of the user device is a huge factor when analyzing TCO, and enterprises can lower the TCO of their PC environment by locking down and managing the PCs. However, users whose PCs cannot be locked down and managed because of political or cultural issues or a real business need for the user to add hardware or software will likely not be successful implementing thin-client solutions. In this research, we assume all desktop PCs run Windows XP and have a four-year product life. We also assume a four-year life for servers, and a five-year replacement cycle for WBTs (see Table 1).

To make a true comparison between the desktop PC and WBT environments, we have added server costs to the well-managed and typically managed desktop TCO models. The well-

managed desktop model includes the cost of five servers to run the management software, and the typically managed desktop includes the three management servers. While these servers would be sufficient for many 2,500-user environments, some would require more or fewer servers depending on the number of sites, number of users in each site, and network bandwidth. For the unmanaged desktop model, we assume that no server is involved with the platform. The WBT model includes 100 terminal servers for 2,500 users, assuming that most users will use a variety of applications that are installed across two server farms of 50 servers per farm, for an average of 50 concurrent users on each server. We are trying to concentrate only on the differences between the scenarios, so we will ignore application servers and file and print servers that would exist in both environments. Users should customize our research to match their requirements.

For the many users that run old PCs in thin-client environments instead of using WBTs, the WBT numbers should be used and the hardware cost adjusted (perhaps adding maintenance). That would assume that the thin client software is the only software running on the old PC. If fat-client applications will also be run, the cost would actually include both a traditional fat client and the servers and software used in the thin client scenario.

User Profile

The user profile of this cost model is based on a typical enterprise with 2,500 client users. User types are equally divided into two categories: data entry workers and structured-task workers. High-performance workers and knowledge workers are not included in this model. Our assumption here is that the WBT model may be adopted by an IT organization for users that perform relatively simple tasks and use relatively few applications. It is less likely that knowledge workers or high-performance workers would use the server-based computing architecture unless there is a specific requirement for their task; for example, a high-security requirement. The WBT scenario is basically forced lockdown, and in most cases we have not seen knowledge workers locked down to the extent dictated by a WBT solution. Similarly, these users would be difficult to configure in a well-managed environment, which is locked down similarly to WBTs. Since salary level is a key determining factor in our TCO model, and salary level differs depending on a worker type, the TCO result will vary based on the makeup of a specific enterprise's end-user population. We encourage organizations to perform their own analysis using our models to determine the site, salary and end-user-specific impact of a particular change.

Table 1. Platform and User Profile

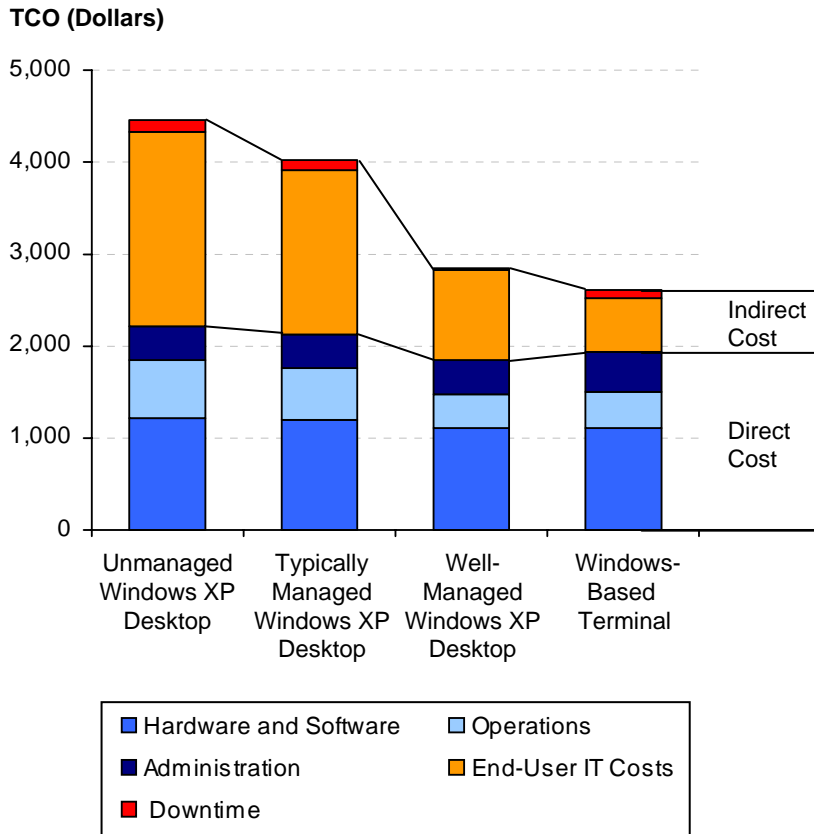
	Unmanaged Windows XP Desktop	Typically Managed Windows XP Desktop and Management Servers	Well-Managed Windows XP Desktop and Management Servers	Windows- Based Terminal and Terminal Servers
Number of Users	2,500	2,500	2,500	2,500
Number of Servers	none	Three servers for Management	Five servers for Management	100 terminal servers
Server's Product Life	NA	Four years	Four years	Four years
Client's Product Life	Four years	Four years	Four years	Five Years
	50% task workers	50% task workers	50% task workers	50% task workers
User Types	50% data- entry workers	50% data-entry workers	50% data-entry workers	50% data-entry workers

Source: Gartner Research

TCO Analysis

A summary of TCO analysis for each model is shown in Table 2. Overall, the WBT model and the well-managed desktop model have very similar TCO results. However, the cost structure differs because the WBT model has lower indirect costs compared with the well-managed desktop model. Also, the WBT scenario shows higher direct costs, mainly because of the higher hardware and software costs. But when compared with the typically managed and unmanaged desktop models, the WBT model has a 35 percent to 40 percent lower TCO.

Figure 1. TCO Summary



Source: Gartner Research

Table 2. TCO Summary (Dollars)

	Unmanaged Windows XP Desktop	Typically Managed Windows XP Desktop and Management Servers	Well-Managed Windows XP Desktop and Management Servers	Windows-Based Terminal and Servers
Hardware and Software Total	1,228	1,201	1,109	1,113
Operations Total	611	550	377	383
Administration Total	374	371	364	443
Direct Cost Total	2,213	2,121	1,850	1,940
Total End-User IT Costs	2,113	1,801	969	584
Annual Downtime Costs per User	129	95	31	83
Indirect Cost Total	2,241	1,897	1,000	667
TCO	4,455	4,018	2,850	2,607

Source: Gartner Research

Hardware and Software Costs

Hardware and software costs are shown in Table 3. The expense, depreciation and lease fees in the hardware costs are calculated by the product life of each platform. The table also shows basic configuration and annualized hardware costs of each platform. For the WBT model, Citrix license and maintenance costs and Microsoft terminal license costs are included in the others category under purchased software costs.

The capital costs of WBTs are commonly perceived as relatively low compared with desktop PCs. That can be a key decision factor of server-based computing adoption. In hardware costs, the WBT model are about 33 percent to 34 percent lower than the desktop model because of the relatively lower thin-client terminal hardware cost and longer product life compared with desktop PCs. However, because of additional license fees for Citrix and Microsoft terminal services client access licences, the annualized software costs for the WBT model is 16 percent higher than the well-managed desktop model. The additional license costs offset the lower hardware costs on the well-managed desktop model. Also, additional server costs do not exist with traditional desktop environments. As a result, the WBT model has hardware and software costs similar to the unmanaged desktop model, while typically managed desktop environments have higher hardware and software costs compared with well-managed desktop environments.

Table 3. Hardware and Software Costs (Dollars)

	Unmanaged Windows XP Desktop	Typically Managed Windows XP Desktop and Management Servers	Well-Managed Windows XP Desktop and Management Servers	Windows- Based Terminal and Terminal Servers
Hardware				
Expense, Depreciation and Lease Fees	306	306	305	194
Upgrades	4	5	5	2
Spares/Spare Parts	3	3	3	3
Supplies	16	18	19	11
Post-Warranty Maintenance	15	15	15	20
Purchased Software				
Personal Productivity and Personal Database Applications Business and Engineering Applications	172	164	137	137
Database, Data Management and Development Tools	377	360	312	312
Messaging and Groupware	158	151	131	131
Others	60	57	51	51
IT Software	51	52	47	138
Network, Systems, Storage and Asset Management	-	-	-	-
Service Desk Management	24	27	36	61
Training Devices	15	16	19	19
Test/Others	9	10	11	18
Hardware and Software Total	17	17	17	17
	1,228	1,201	1,109	1,113

Source: Gartner Research

Operations

Details of operation cost comparisons are shown in Table 4. In a comparison between the well-managed desktop and WBT models, the total annualized operations costs are similar. However, the details of each cost vary slightly. The WBT model has higher costs for hardware configuration/reconfiguration (because of server management costs) while the desktop models have higher costs for user administration, software deployment, and security and virus protection. The differences in these costs offset each other. The comparisons with the typically managed and unmanaged desktop models and the WBT model show a much greater difference. These desktop models have 30 percent to 37 percent higher operation costs compared with the WBT model (and well managed thick client model). The major differences come from the technical services, including Tier 1 support.

Table 4. Operations Costs (Dollars)

	Unmanaged Windows XP Desktop	Typically Managed Windows XP Desktop and Management	Well-Managed Windows XP Desktop and Management Servers	Windows- Based Terminal and Terminal Servers
Technical Services				
Tier 2 Problem Resolution	17	13	4	4
Tier 3 Problem Resolution	6	6	4	7
Traffic Management and Planning	-	0.1	0.1	7
Performance Tuning	-	0.1	0.1	3
User Administration (Adds and Changes)	11	24	29	5
Operating System Support	7	7	7	8
Maintenance Labor	9	8	6	13
Software Deployment	98	71	30	15
Application Management	30	26	15	21
Hardware Configuration/Reconfiguration	32	35	30	69
Hardware Deployment	7	6	6	7
Disk and File Management	8	8	7	1
Storage Capacity Planning	4	4	4	1
Backup, Archiving and Recovery	6	6	5	2
Repository Management	-	0.2	0.3	
Planning and Process Management				
Account Management	17	17	16	9
Systems Research, Planning and Product Management	27	27	25	33
Evaluation and Purchase	17	17	15	16
Security and Virus Protection	18	16	10	3
Business Recovery	5	4	2	2
Data Support				
Database Management and Administration	62	62	61	61
Service Desk (Tier 0/I)	230	192	101	95
Operations Total	611	550	377	383

Source: Gartner Research

Administration

The administration costs of each platform are shown in Table 5. The desktop models and the WBT model have similar cost structures for the client side. However, the total administration costs for the WBT model are about 20 percent higher than the desktop models because of higher server administration costs.

Table 5. Administration Costs (Dollars)

	Unmanaged Windows XP Desktop	Typically Managed Windows XP Desktop and Management	Well-Managed Windows XP Desktop and Management Servers	Windows- Based Terminal and Terminal Servers
Finance and Administration				
Supervisory Management	60	58	49	76
IT Administrative Assistance	4	4	4	9
Asset Management	6	5	3	5
Budgeting and Chargeback	17	16	15	28
Audit	5	5	4	16
Purchasing, Procurement and Contract Management	24	21	16	17
Vendor Management	29	29	28	49
IT Training				
IT Course Development	9	9	10	10
IT Training and Delivery	55	58	64	64
End-User Training				
End-User Course Development	16	16	14	14
End-User Training and Delivery	148	149	156	156
Administration Total	374	371	364	443

Source: Gartner Research

End-User Operations and Downtime

End-user operations and downtime costs are shown in Table 6. The cost structure of end-user operations is very different between the desktop models and the WBT model. The WBT model has lower end-user operations costs, ranging from 40 percent to 72 percent lower, compared with the desktop models. The lower end-user operations cost for the WBT model is the result of several factors, including no user customization, more simplistic OS configuration and greater consistency between clients.

For downtime costs, the WBT model is about 170 percent higher compared with the well-managed desktop model. The higher downtime costs result from dependency on infrastructure servers. If one of the servers is down, all the users attached to it would need to reconnect and may lose some work. One of the risks of the WBT model is that it has to depend heavily on the servers. In the loosely managed or unmanaged desktop environment, the downtime costs are higher than those of the WBT model because the systems are more prone to users making changes that might cause problems, while in the well-managed and WBT profiles, users are restricted from many tasks that can cause problems.

Table 6. End-User Operations and Downtime Costs (Dollars)

	Typically Managed Unmanaged Windows XP Desktop Management	Well-Managed Windows XP Desktop and Management Servers	Windows- Based Terminal and Terminal Servers
End-User Operations			
Peer Support	1,025	793	73
Casual Learning and Self-Support	652	583	183
Formal Learning	282	279	311
File and Data Management	99	93	9
Application Development	54	54	8
End-User IT Cost Total	2,113	1,801	584
Annual Downtime Cost per User	129	95	83

Source: Gartner Research

Key Issues

Which technologies will play prominent or disruptive roles?

This research is part of a set of related research pieces. See "Evaluate if Server-Based Computing Is Right for You" for an overview.

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