Decision Framework, DF-14-2800
P. Lowber

Research Note
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Thin-Client vs. Fat-Client TCO

Enterprises deploying thin clients expect a substantial TCO benefit, but our analysis shows that there may be no TCO benefit at all, depending on PC management best practices and on thin-client migration costs.

Core Topics
Hardware Platforms: Client Platforms

Enterprise Management: Infrastructure and Application Management

Key Issues
How will vendors, technologies and user strategies affect desktop software management?

How will desktop and mobile client platforms evolve during the next five years?

Strategic Planning Assumption
Through 2005, enterprises can expect to achieve an annual TCO benefit of zero to at least 30 percent, depending on PC management best practices and on thin-client migration costs (0.8 probability).

Note 1
TCO for Thin-Client Desktops
We are assuming that thin-client applications are being deployed for the entire desktop. We are not providing TCO analysis for mixed desktops (PCs with both thin and fat applications) or for specific applications deployed as thin or fat applications.

Most enterprises deploy thin-client applications primarily to reduce their total cost of ownership (TCO) by centralizing Windows applications on Windows Terminal Servers. Our TCO analysis for thin-client desktop deployment (see Note 1) shows that the real TCO benefit depends on the extent to which best practices of managing fat-client PCs are adopted, as well as on the migration costs for moving to thin-client deployment. Because only a minority of enterprises employ best practices for managing fat-client PCs, thin-client deployment for targeted desktop users, as well as for targeted applications, will offer substantial savings to most enterprises. According to our analysis, the overall TCO benefit for Windows terminals over well-managed PCs is only about 1 percent, but it is about 32 percent compared with unmanaged PCs. Well-managed PCs are typically locked down (i.e., the users cannot install their own software), possess a suite of management tools (i.e., software distribution, remote control, inventory) and are maintained through an active asset management process. Thin-client deployment also offers a quick return on investment, with a payback period of three months for thin clients compared with unmanaged PCs, and eight months compared with managed PCs.

The analysis was performed using Gartner's Ti2 ("TI squared") software, with assumptions based on 2,500 desktops and 35 servers accessed by users from a central site and from two remote sites. The overall annual TCO is $12.9 million (or $5,160 per user) for thin clients (Windows terminals, or WTs), $13.4 million (or $5,360 per user) for "fat managed" Windows 2000 PCs, and $17.1 million (or $6,840 per user) for "fat unmanaged" Windows 2000 PCs.

Analysis

Most of our clients assume that the real TCO benefit for thin clients is in direct costs (software maintenance and distribution, and cheaper hardware). But the greatest benefit for WTs compared with both managed and unmanaged PCs is in indirect costs (which include peer support, casual learning, self-support, file and data management, and formal learning). The total annual indirect cost benefit for WTs is 32 percent for WTs compared with fat managed PCs, and 90 percent for WTs compared with fat unmanaged PCs. (See Figure 1 and Figure 2 for the data.) The large differential in indirect costs between managed and unmanaged PCs is because managed PCs are locked down, thus preventing major loss of productivity by end users.

Figure 1

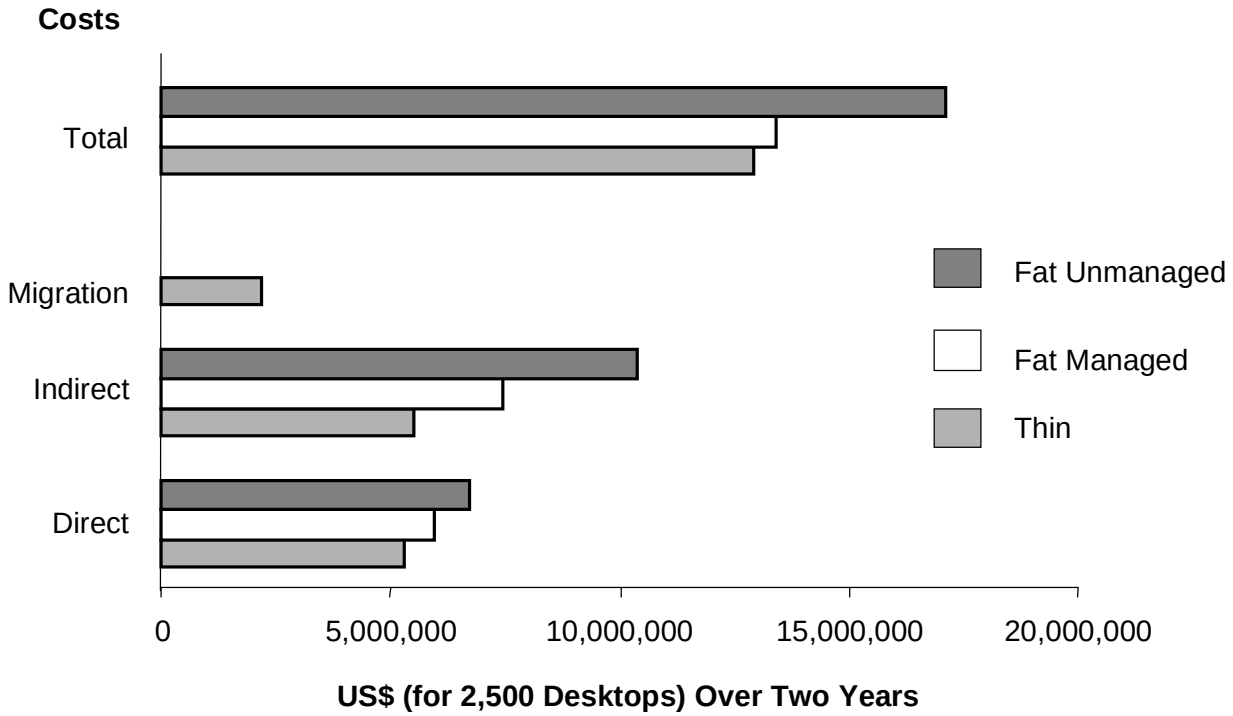
TCO Results: Thin vs. Fat

TCO	Thin	Fat Managed	Fat Unmanaged
Direct	$5,276,197	$5,943,658	$6,710,772
Indirect	$5,478,388	$7,424,767	$10,402,545
Migration Costs	$2,176,204	0	0
Total TCO	$12,930,789	$13,368,426	$17,113,318
Payback Period		0.84 months	0.34 months

Source: Gartner Research

Figure 2

TCO Comparison: Thin vs. Fat



Note: Loosely managed and well-managed PCs (Windows 2000) compared with Windows terminals.

Source: Gartner Research

The benefit in direct costs for WTs over fat managed PCs is 13 percent, and for WTs compared with fat unmanaged PCs is 26 percent (see Figure 1 and Figure 2). Direct costs include staffing and administration costs for hardware and software, as well as acquisition and maintenance costs for the hardware (including network equipment). Costs of managing fat-client applications for managed PCs are somewhat offset by costs for managing the applications on the Windows Terminal Server farms for thin clients. Many fewer people are needed to manage the server farms than for the 2,500 fat clients, but their labor costs are higher for those managing the servers compared with those working on the help desk.

We assumed best practices for WT deployment, so we included the license cost for Citrix MetaFrame XPe (which includes load balancing, resource management and installation management services). We also assumed that the ratio of users to active users is 1-to-1, so we included 2,500 MetaFrame XPe licenses. Also, the hardware acquisition cost differential between WTs and PCs is negligible, because the acquisition cost of the Windows Terminal Servers offsets the lower costs of the Windows terminals compared with the PCs.

The inclusion of migration costs for thin clients is crucial. Without including migration costs, the TCO benefit for WTs would be significant for both managed and unmanaged PCs. The total annual migration cost for this analysis is $2.2 million. The migration costs for WT application deployment include testing and optimizing the applications (the 225 applications that were not optimized), training and implementation.

Loopholes

As with any measurement analysis, enterprises are encouraged to perform their own due diligence by using their own numbers and assumptions. Our analysis here provides a crude benchmark, but TCO comparisons for each enterprise environment will vary greatly. Some enterprises may experience greater TCO benefits for thin-client deployment than what we have shown, but some may even experience increased TCO for thin-client deployment. One enterprise reported that its TCO actually increased when it moved to a thin-client deployment because of additional costs for complete server hardware and software, and networked redundancy that it implemented to guarantee 100 percent uptime.

On the other hand, our analysis may err on the conservative side of thin-client TCO benefit. We included the costs for 2,500 Windows terminals in our thin-client analysis. But many enterprises are deploying thin clients to avoid PC upgrades — in

which case they would have zero WT costs, thus significantly improving their thin-client TCO. We also used 35 four-way Intel servers (supporting 71 active users per server), but scalability will vary greatly by application and usage. And many of our clients are using much less expensive rack-mounted two-way Intel servers. Another very significant difference is in the migration costs. We assumed a fairly high cost with 225 unoptimized applications for Windows Terminal Server deployment, but this cost will vary greatly according to the number of applications and the level of optimization required.

One final example of the model used here is our assumption that the 2,500 desktops are installed at only three sites — one site that is local, and the other two remote. In fact, many thin-client deployments have desktops deployed at tens and hundreds of remote sites, over WANs, over satellite communication links and with workers at home over dial-up communications. The more sites with only a few users, the greater the TCO benefit for thin clients, especially for comparisons with unmanaged PCs, because of increasing staffing costs associated with managing hardware and software upgrades at many very small remote sites, and because of low-bandwidth availability at these sites.

Benefits/Challenges

Enterprises considering thin-client deployment are heavily focused on TCO issues, but deployment decisions must be based on the trade-offs between overall benefits and limitations of thin-client vs. fat-client deployment (see “The State of Thin Clients,” M-12-5984):

Benefits:

- Remote access over low-bandwidth networks
- Central desktop administration
- Roaming access

Challenges:

- No offline work
- Heavy office use
- End-user perception (traditional PC users will resist the move to thin clients)

Bottom Line: Thin-client deployment will offer substantial savings for enterprises without best practices for managing fat-client desktops, with a quick return on investment. Enterprises planning to deploy thin-client applications for TCO benefits they expect to achieve must do a comprehensive analysis of costs for thin-client and fat-client deployment pertaining to their own

particular environment. Analysis of direct and indirect costs, as well as of costs for migrating to thin-client applications, must be included. Next to people, the network is the biggest ongoing cost in an IT budget. Thin clients — which provide remote access over low-bandwidth networks — can exploit the existing network infrastructure.

Action Item: Enterprises should determine their own TCO before deciding whether to deploy thin clients. Decisions to deploy thin or fat clients should not be made on acquisition cost alone.

Through 2005, enterprises can expect to achieve an annual TCO benefit of zero to at least 30 percent, depending on PC management best practices and on thin-client migration costs (0.8 probability).