Repurposing Old PCs as Thin Clients as a Way to Save Money

Mark A. Margevicius, Stephen Kleynhans

Tough economic times are forcing customers to re-evaluate their PC refresh strategy. Some customers are able to leverage existing PCs in new functionality by repurposing them as thin clients. Properly executed, repurposing can extend PCs an additional two to four years.

Key Findings

- Using old PCs as thin clients allows organizations to extend the life of PC assets near the end of their lives and avoid the immediate purchase of thin-client devices.
- Repurposing of PCs as thin clients is dependent upon several factors including accurate inventory, asset management, licensing and internal processes associated with certain IT functions.
- Successful repurposing of PCs as thin clients requires accurate and well-established PC management configuration tools and a skilled staff.
- Extending the life of PCs in this way is not an elimination of eventual PC or thin client acquisition; rather, it is a deferral to a later date, hopefully at least two to four years out. All hardware eventually fails, including repurposed PCs.

Recommendations

- To successfully redeploy old PCs as thin clients, enterprises must ensure solid PC and asset life cycle planning.
- Put in place processes to identify the right PCs, reclaim the applications and data that are associated with the PC, and properly account for the PC inventory and software in asset management systems.
- Understand and plan for continued management (patch and update) of repurposed PCs.
- Modify/augment your existing processes for PC deployment and installations, moves, adds and changes (IMAC) to ready your organization to best redeploy its inventory of hardware.
ANALYSIS

Eventually all PC hardware becomes obsolete, predominantly because systems do not possess the necessary memory, storage, graphics or processing required for newer operating systems (OSs) and/or applications. Traditionally this issue has meant that organizations must replace PCs even though they are in working condition, to ensure ongoing support with new software. For most organizations, this has meant replacing PCs every three to four years, often at significant expense and disruption to the organizations. New PCs do offer organizations the ability to start anew, and the new PCs typically are met with acceptance and positive feedback. The value of this approach, however, is under fierce scrutiny today because of the costs involved with PC refresh.

Many organizations, especially when cost containment is a major criterion for investment, are evaluating this "rip and replace" approach to PC life cycles. The repurposing of PCs as thin clients is one method to postpone the purchase of new PCs. In lieu of traditional PC deployments, customers are evaluating server-based computing (SBC) and hosted virtual desktops (HVD), which both offer organizations the ability to deliver PC functionality without the requirement of a PC. This approach is predominantly attractive to customers who already have SBC or HVD infrastructures in place; customers implementing either SBC or HVD will incur significant capital costs whether or not PCs are repurposed as thin clients (see "Total Cost of Ownership Comparison of PCs With Server-Based Computing" and "Total Cost of Ownership Comparison of PCs With Hosted Virtual Desktops"). A PC repurposing decision matrix is available in Figure 1.

Both SBC and HVD require only minimal compute resources to access their associated infrastructures. To do so, any device, PC or otherwise, needs to run a remote computing protocol (ICA from Citrix and RDP from Microsoft are the two most popular). Both RDP and ICA require only minimal hardware to function properly; both protocols are available for PCs, Macs, thin clients, smartphones and other handheld devices. And because the necessary hardware needed is minimal, many organizations considering SBC or HVD are well-served to consider using older PCs as the device for these protocols.
### Figure 1. PC Repurposing Decision Matrix

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Potential Benefit</strong></td>
<td>- How big is the cash saving if the action is implemented?</td>
<td>Deferral of approx. $400 per user</td>
<td></td>
</tr>
<tr>
<td><strong>Customer Impact</strong></td>
<td>- What impact will this have on customers?</td>
<td>A more controlled and fixed configuration</td>
<td></td>
</tr>
<tr>
<td><strong>Time Requirement</strong></td>
<td>- Can you capture the savings in this fiscal year?</td>
<td>3 to 6 months</td>
<td></td>
</tr>
<tr>
<td><strong>Degree of Organizational Risk</strong></td>
<td>- Will your leaders ensure the changes are made? Is your organization capable of adapting to the changes?</td>
<td>SBC/HVD environments can require a change of support and user expectations</td>
<td>Minimal changes in roles, structures and processes</td>
</tr>
<tr>
<td><strong>Degree of Technical Risk</strong></td>
<td>- Is there a risk that the change will undermine the ability of your systems to deliver?</td>
<td></td>
<td>Minimal as long as IT can adapt its processes to repurpose/redeploy</td>
</tr>
<tr>
<td><strong>Investment Requirement</strong></td>
<td>- Does the change require a large upfront investment before savings can be captured? Is the organization willing to make an investment at all?</td>
<td></td>
<td>None</td>
</tr>
</tbody>
</table>

Source: Gartner (March 2009)
Things to Consider

Repurposing an old PC to have new function as a thin client is a fairly simple thing to do. Simply reformatting the hard disk and installing a minimal locked, secured and well-managed PC image with the protocol embedded will enable a user to connect to an existing SBC or HVD environment. A proper configuration will yield performance that is as good as a traditional thin client (if not better). We advocate that before repurposing PCs, organizations put in practice the necessary steps to ensure all existing information, data and applications are safely backed up, accounted for and properly licensed. Specifically, users should take actions associated with:

- **Backup** — Most PCs being considered for repurposing will likely have three to five years of information on them. Users tend to store files in standard locations (such as `\my documents`) but less known folders such as `\temp` and `\my downloads` are also common but less-known locations for user data (including personalization data, such as `.pst` files, stored elsewhere, including the registry). Organizations are encouraged to properly train and educate users as to the need to properly back up their data, recognizing that files and information may reside in many locations on a hard disk. Backup storage can be external hard disks, CDs, DVDs or preferably centralized storage residing on a server or network. Organizations with more-advanced processes and tools may already have PC backup as part of their client management suite, which should be used as part of this repurposing.

- **Inventory** — Applications that have been purchased with the PC should be accounted for. Organizations with strong asset management practices can associate the software with the physical PC on which they run, thereby allowing them to legally reuse software licenses. Enterprises without these tools and disciplines often struggle getting accurate inventories of the PC portfolio, which may result in either overbuying or noncompliance. As part of a PC repurposing, organizations should look for all applications residing on a user's PC, because this will prevent overbuying software and facilitate a more complete understanding of which applications exist on a PC. All PC life cycle tools have software and hardware inventory capabilities, which can be used to populate asset management systems (see "Magic Quadrant for PC Life Cycle Configuration Management").

- **Hard Disk Preparation and Imaging** — Once backup and inventory are complete, hard disk preparation has to occur. Hard disks need to be prepared properly, because normal use causes severe fragmentation on hard disks, which affects performance. Organizations should wipe the disk completely, performing a low-level format to erase the disk and identify bad sectors in advance of a new image being deployed on the disk. The disk image for the hard disk should be a locked-down configuration of Windows XP. The version of the OS is dependent on the version that was purchased with the PC, which will likely be Windows XP. The right to reimage a PC is eligible only to customers that are enrolled in a Microsoft Volume Licensing Agreement, such as Open or Select. Further, reimaging is limited to the version of the OS pursuant to the licensing rules established by Microsoft. The image should include the OS, all the necessary device drivers, management and security software, and protocols (ICA and/or RDP) necessary to connect to back-end infrastructures. Image creation tools such as Symantec Ghost, Acronis True Image and Paragon Drive Backup allow organizations to quickly build and deploy images. Images should also be locked down with management tools installed as part of the configuration. The OS will still need to be patched, but being locked down and managed will simplify the management significantly.

- **Logistics** — Ideally, PCs that have been identified for repurposing are centrally configured and stored. This allows technicians to quickly deploy images to many PCs
simultaneously, thereby reducing cost and overhead. Organizations should designate location, power, storage and work space to enable these activities to occur. Further, organizations are encouraged to facilitate the repurposing of PCs so that spare reconfigured PCs are ready for deployment on short notice. Doing so will require coordinated logistics among various IT groups, including help desk, break/fix technicians and IMAC field personnel.

Another option for Microsoft Software Assurance or Enterprise Agreement customers is to leverage the seldom-considered Windows Fundamentals for Legacy PCs (WinFLP). WinFLP is based on Windows XP Embedded Service Pack 2. The Windows Fundamentals program was put in place by Microsoft to allow customers to migrate old PCs to a newer version of Windows without the requirement of new hardware. Most organizations implementing Windows Fundamentals increase control and manageability by using Group Policies to automate the deployment of patches and fixes (albeit not as efficient as using stand-alone patching tools). IT organizations also employ the use of the Windows Managed Desktop Service on repurposed PCs, which can be configured to automatically log in and provide hard-disk security. Because the hardware is older and the user requirements are limited, most customers configure PCs with security, Web browsers and terminal emulation software in a locked-down configuration. Windows Fundamentals allows customers to extend the life of their PC investments.

Organizations should also be aware that not all software is freely transferable to others or different hardware within the organization. In some instances, applications may be transferred dynamically; others require a waiting period (60 to 90 days of nonuse) before applications can be reprovisioned to a different user. Each software vendor handles this issue differently, and organizations are encouraged to contact their vendors regarding the compliance requirements of their software licenses.

All hardware will fail — eventually. Organizations must recognize that repurposing of PCs is only a temporary reprieve on the eventual purchase of new hardware. Faltering motherboards, crashing hard disks and failing power supplies are all typical catastrophic issues affecting PC hardware. Repurposing an already old PC (3 to 5 years old) can yield another two to four years of usable life; organizations should keep this mind as they annually budget for new hardware.

To be successful, organizations must carefully plan and synchronize the activities required with repurposing of PCs. There are many touchpoints that must be accounted for: the user, help desk, asset management, desktop engineering, IMAC, break/fix technicians and system administrators. Provided the right tools and processes are established, organizations should be able to repurpose a PC in about an hour. This hour of effort will yield a completely functioning locked-down PC acting as a thin client with outstanding performance. Bear in mind that repurposing PCs is a labor-intensive task, and that organizations must weigh the cost of labor against the expected cost savings that extended life of PCs will provide.

**RECOMMENDED READING**

"Best Use Scenarios for Hosted Virtual Desktops"

"Best Use Scenarios for Server-Based Computing"

This research is part of a set of related research pieces. See "ATV: Cost Optimization Opportunities Abound in Client Computing" for an overview.
REGIONAL HEADQUARTERS

Corporate Headquarters
56 Top Gallant Road
Stamford, CT 06902-7700
U.S.A.
+1 203 964 0096

European Headquarters
Tamesis
The Glanty
Egham
Surrey, TW20 9AW
UNITED KINGDOM
+44 1784 431611

Asia/Pacific Headquarters
Gartner Australasia Pty. Ltd.
Level 9, 141 Walker Street
North Sydney
New South Wales 2060
AUSTRALIA
+61 2 9459 4600

Japan Headquarters
Gartner Japan Ltd.
Aobadai Hills, 6F
7-7, Aobadai, 4-chome
Meguro-ku, Tokyo 153-0042
JAPAN
+81 3 3481 3670

Latin America Headquarters
Gartner do Brazil
Av. das Nações Unidas, 12551
9° andar—World Trade Center
04578-903—São Paulo SP
BRAZIL
+55 11 3443 1509