

# PC Replacement for Education

## The Problem

Maintaining older PCs raises several challenges. As hardware components like fans and disk drives age, failure rates go up. Older PCs may not have the processing power or memory to run newer programs or the latest OS. And with the end of support for Windows XP, upgrading to a new OS often means replacing older PCs by purchasing new ones with the latest OS preinstalled.

But even maintaining new PCs has its challenges. For each PC you still need to patch Oses, update applications and anti-malware software, and manage configuration issues. And the rapid pace of technology will make the newer PCs obsolete sooner than the last set of PCs that were replaced.

## The Solution

The alternative to the endless refresh and maintenance cycle of individual PCs is moving to a desktop virtualization solution. With desktop virtualization a Windows or a Linux server can be used to host and deliver virtual desktops to multiple users simultaneously. Users can access their virtual desktops through client software running on an older repurposed Windows PC, or through compact, solid state thin client devices.

Thin client devices replace PCs at the student desks. They have the required electronics and ports for driving monitor, mouse, keyboard, audio, and Ethernet. But instead of the student's desktop environment running on the local thin client device, it runs on the centralized server and is delivered to the thin client over a LAN. The thin client just needs the intelligence to connect to the right server, relay the user input (keyboard, mouse, microphone), receive the system output (video and audio), and broker any USB device communication between the server and thin client.

With virtual desktops, all OS and software upgrades are applied to the host server and not to individual PCs. Upgrades to thin client device firmware are needed only occasionally and can be centralized and automated. This simplifies the upgrade and maintenance process tremendously. And thin client devices have the additional advantages of lower power consumption, lower noise, reduced space requirements (can be mounted on the back of a monitor), higher reliability, higher physical and technical longevity, and lower acquisition cost.

Virtual desktops also have data security advantages. Since all data resides on the server, there is less risk of data loss. And since all programs are running on a centralized server, virus protection can be focused on that server and not many PCs. The following table compares PC-based computing to virtual desktops accessed from thin clients.

| Table 1:<br>PC Replacement Alternatives  | PC-BASED COMPUTING           | VIRTUAL DESKTOPS ACCESSED FROM THIN CLIENTS |
|--|------------------------------|---|
|  | REPLACE WITH NEW PCS         | SESSION-BASED DESKTOP VIRTUALIZATION        |
| OPERATING SYSTEMS                        | One per PC                   | One per host server                         |
| APPLICATIONS                             | One set per PC               | One set per host server                     |
| HARDWARE RELIABILITY                     | PC components fail over time | Thin client MTBF > 100,000 hours            |
| SOFTWARE UPGRADES                        | Required on each PC          | Only on host server                         |
| ACQUISITION COST                         | 3 times that of thin client  | One-third of PC                             |
| TYPICAL HW/SW MAINTENANCE AGREEMENT COST | 3 times that of thin client  | One-third of PC                             |
| ENERGY COST                              | 60+ watts per station        | 5 watts per station                         |
| DATA SECURITY                            | Each PC is an attack target  | Only host server needs protection           |

## Abstract:

Older PCs have higher failure rates, and may not support the latest OS and applications you need. Even new PCs have labor intensive maintenance due to software updates, and malware and configuration issues. PC replacement is an opportunity to say goodbye to these issues by using thin clients and session based desktop virtualization instead. A session based desktop virtualization solution lets you: lower both acquisition and ongoing costs; reduce power consumption, heat and noise; and simplify maintenance, upgrades and troubleshooting.

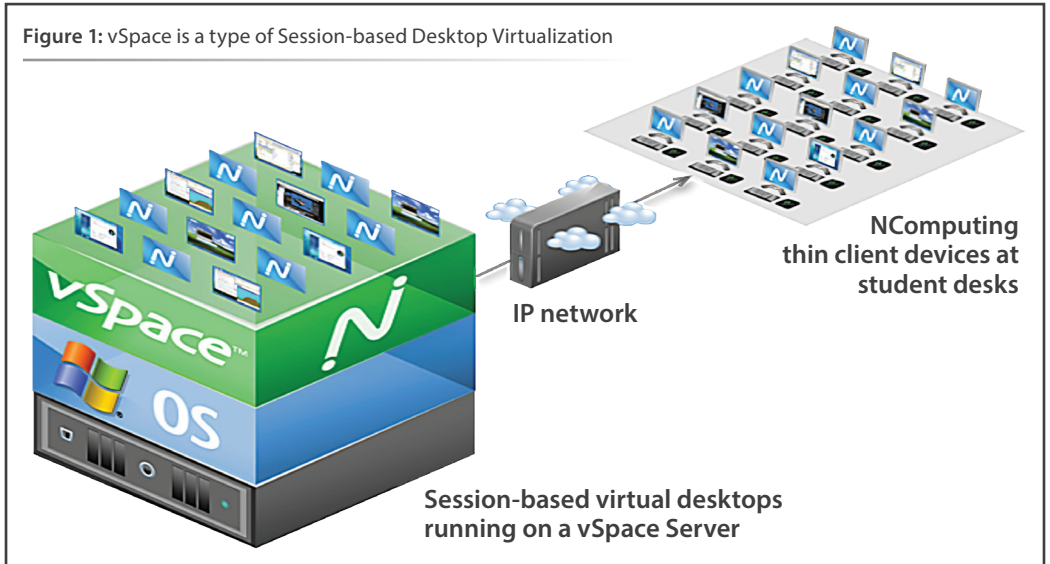
## Benefits of the vSpace solution

With *NComputing's* vSpace server and thin client devices, PC refresh now becomes a thing of the past. Computing power and data are centralized on servers for simplified maintenance, upgrades, and troubleshooting. The labor cost saving of maintaining software on a handful of vSpace servers versus a plethora of student PCs is significant. In fact, the head of technology and computing for a private K-12 school stated "We reduced our software maintenance time by almost 80 percent" using *NComputing*.

The lower acquisition cost of vSpace thin clients versus individual PCs also means schools on tight budgets that could not afford a PC refresh cycle now have a viable option to upgrade their classroom computing infrastructure. One school district Director of Technology said "We're saving \$400 per seat by using *NComputing* instead of a traditional PC. That includes replacing the monitors, keyboards and mice".

Other benefits of using vSpace thin clients include less power consumption (less than 5 watts per unit), less heat and noise (due to fan-less design), and less desktop clutter (mounts on back of monitor). Moving to *NComputing* can also be done with minimal IT resources and just a basic understanding of Windows Server technology. For education, this means that a PC refresh cycle does not have to equate to getting newer PCs with all the associated acquisition and maintenance costs. It means that education could save a tremendous amount of money, time, and resources by deploying the *NComputing* vSpace thin client desktop virtualization solution instead.

Figure 1: vSpace is a type of Session-based Desktop Virtualization



## The NComputing vSpace Solution

*NComputing* is the leader in low cost, high performance desktop virtualization. *NComputing* vSpace (Figure 1) is a complete end-to-end desktop virtualization solution that includes:

- **vSpace Server:** Is installed on a Windows Remote Desktop Services Host (RDSH) or a Linux Terminal Server Project (LTSP) server. It manages connection requests from thin client devices and software clients. It implements the server side of our proprietary multimedia protocol, User eXperience Protocol (UXP), to deliver virtual desktops with full HD multimedia capabilities over a LAN to up to 100 thin clients and software clients simultaneously.
- **L300 Thin Client:** (Figure 2) Replaces a single PC at the student desk. Supports full HD video up to 1920 x 1080 pixels, USB 2 devices, and audio in and out. Designed to mount on back of LCD monitor. Uses only 5 watts of power.
- **M300 3-in-1 Thin Client:** (Figure 3) Replaces PCs at three student desks. Only one LAN connection is needed for all three workstations. Each workstation uses < 2 watts. Up to 1440 x 900 video resolution.
- **vSpace Software Client:** Enables an older repurposed PC or a BYOD Windows laptop receive a vSpace virtual desktop. All data and programs reside on the central server, not the end user PC, improving data security.

Figure 2: vSpace L300 thin client

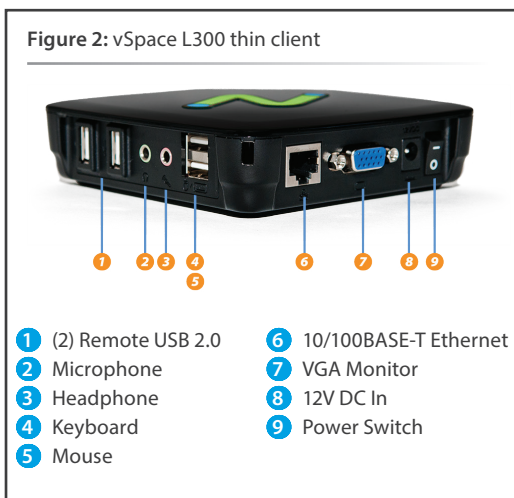


Figure 3: vSpace M300 3-in-1 thin client

