NComputing™

Enterprise-class desktop virtualization with NComputing

Clear the hurdles that block you from getting ahead

Whitepaper

Introduction

Enterprise IT departments are realizing virtualization is not just for servers. Delivering more inexpensive desktop computing solutions through virtualization also drives down operational expenses. Corporations worldwide are turning to NComputing for virtualization solutions that are optimized for large scale use. NComputing delivers the secure virtual desktop infrastructure that simplifies PC support while reducing costs up to 90% per user. This whitepaper outlines the pragmatic deployment architectures for successful deployment. NComputing, the global leader in virtual desktop computing, transforms corporate IT to redefine the economics of desktop computing.

The consolidation challenge

Virtual server management

Over the past few years, enterprises have invested in making their datacenters more efficient through server consolidation. IT departments quickly realized that using 5% capacity of a server costs the same to maintain as a server operating at 85% utilization. This lack of efficiency needed to be addressed or risk straining the IT department's ability to meet the needs of their business owners—to deliver enterprise-class applications and services within an aggressive timeframe—without unnecessarily driving up operational expenses with new hardware and datacenter costs. In short, enterprises realized that they suffered from server sprawl and needed an antidote, which IT vendors provided—virtualization server management (VSM).

As enterprises raced to implement server consolidation solutions, they heavily invested in Enterprise License Agreements (ELAs) with major virtualization server management (VSM) vendors including VMware, Citrix, and Microsoft*. More often than not, an enterprise signed ELAs with not only one VSM vendor, but rather multiple VSM vendors to meet the needs of a heterogenous datacenter environment. In fact, the market demand for virtualization infrastructure has become so great that IDC says the market for virtual server management software will grow more than 21 percent—to $2.3 billion—by 2013.[1]

Virtual desktop infrastructure

As enterprises begin to achieve mature VSM solutions, they have expanded the organizational focus to include desktop PCs. Much like the problem of server sprawl, Enterprises are overwhelmed by the number of desktop PCs they must maintain and recognize that end-users typically only utilize 5% of the capacity of a typical desktop PC. Like server consolidation, IT departments immediately see an opportunity to better address business owner needs—to deliver inexpensive PC compute power to more employees than ever, while simultaneously driving down typical IT department operational expenses such as desktop PC hardware, maintenance and support costs.

However, as enterprises explore virtual desktop infrastructure solutions (VDI) they are realizing that virtual machines, hypervisors, and virtual machine management infrastructure are not enough. There are other technologies required to implement a successful VDI solution.

What other critical components are required for a complete, end-to-end VDI implementation?

NComputing has the answer.

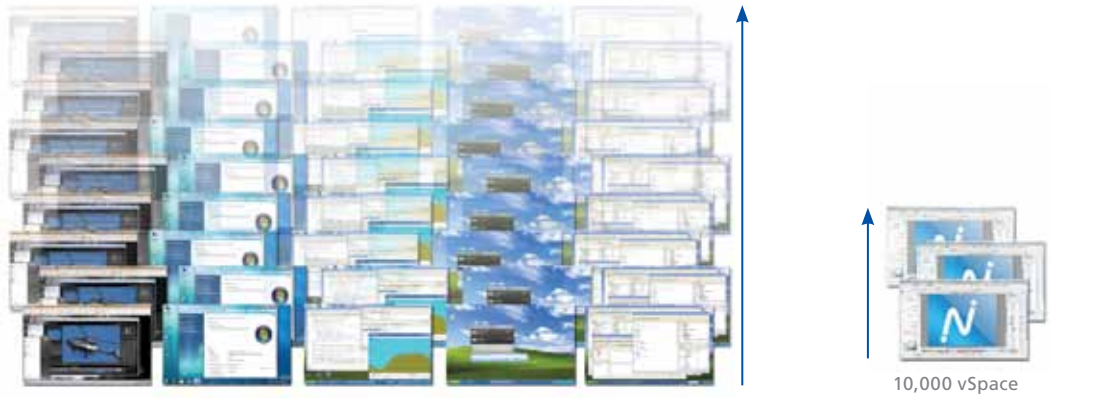
1 http://www.eweek.com/c/a/Virtualization/Virtualization-Management-Software-Market-to-Grow-IDC-Says-519252/

NComputing solution—the Last Mile of VDI

NComputing addresses growing enterprise complexity with simplification. The NComputing solution separates a desktop PC environment from a physical machine to a client/server computing model. That is, a user's desktop is hosted remotely and accessed via a thin client device over the network. A user no longer has a physical PC. To achieve the last mile of success when implementing VDI, NComputing extends traditional VDI solutions to also include 1) access devices and 2) virtual desktop management software.

NComputing immediately augments the value of an enterprise's VDI investment by easily integrating with ALL traditional VDI vendor solutions including VMware, Citrix, and Microsoft. In fact, NComputing not only leverages all of the existing benefits of the VDI technology, but also enhances the value by changing the typical virtual desktop structure from one user, one operating system (OS), and one virtual machine to thirty users, one operating system, and one virtual machine. This has a direct, positive impact on operational expenses and immediately lowers overall desktop PC expenses such as support, maintenance, and desktop replacement.

Figure 1: 300,000 managed operating systems and devices can be reduced to 10,000 operating systems and devices using vSpace

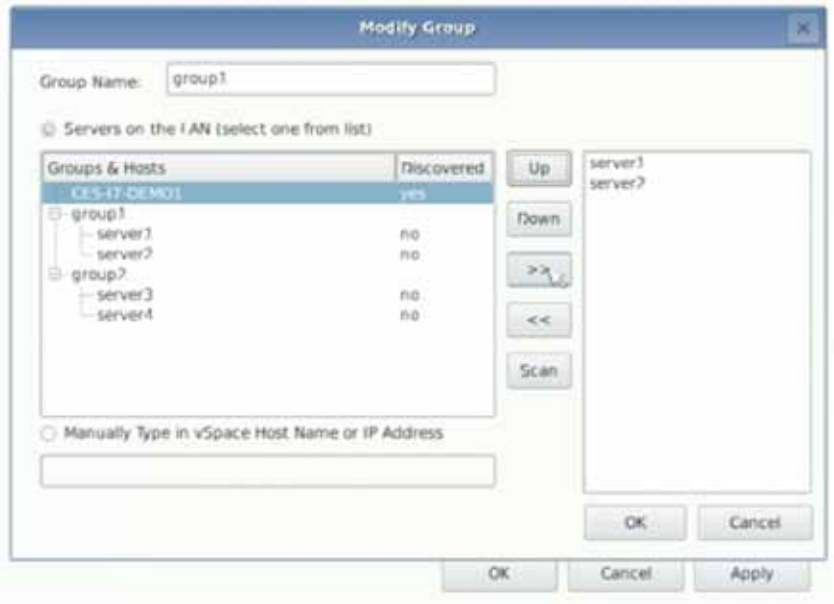


The following is a detailed overview of NComputing's vSpace™ management software and access devices.

NComputing vSpace management software

With vSpace, enterprises can optimize virtual desktop deployments by providing multiple end users simultaneous access to a single operating system instance of either Windows or Linux*. vSpace divides the computer's resources into independent virtual workspaces that give each user their own rich PC experience. vSpace handles the desktop display and remote activities from the user's keyboard and mouse (through the access device).

Figure 2: vSpace server groups provide load balancing and hot spare back-ups for disaster recovery



In short, vSpace augments a traditional VDI deployment by providing the following additional benefits:

- **Centralized end-user management** – The vSpace management console allows an IT administrator to set up, configure, and manage shared computers and access devices. The administration console allows an administrator to remotely monitor and, if necessary, control a user's session. Access device settings can be configured centrally from the administrator console, including the ability to lock out connection of USB devices. The vSpace console also lets administrators assign host computer USB ports to individual users. The vSpace console is easy to use and requires no special training.
- **Optimized bandwidth** – Since typical processor utilization for productivity applications (e.g., Microsoft Office) is only about 1-10% of the processor's bandwidth, each individual OS powered by vSpace can support up to 30 users performing typical office tasks such as typing reports, entering spreadsheet data, or preparing presentations.
- **Broad multimedia support** – NComputing developed its unique User eXtension Protocol (UXP) for continuous use by end users demanding a full PC experience. As a result, multimedia applications including streaming video, Flash, and 3D graphics can be supported.
- **Broad peripheral support** – Unlike traditional thin-client solutions, the vSpace software can manage a wide range of peripherals from speakers and microphones to USB storage devices and printers. By leveraging the native device drivers loaded onto the host system, NComputing virtual desktops never require specialized management to extend peripheral functionality out to each user.

NComputing access device

The NComputing access devices do not use PC-based processors or chipsets and do not run a local operating system. All of the primary functionality is integrated into a single chip that has an optimal set of resources for working with the NComputing virtualization software and extension protocol. This System-on-Chip (SoC) contains patented technologies for delivering unmatched performance from a very low-power device. The device also contains DRAM used to perform local screen display.

Figure 3: The NComputing L300 access device provides broad peripheral support

The SoC in the access device executes several processes including boot management, initialization, network connection, protocol decoding, bitmap cache acceleration, and administration. This approach results in access devices with very low power requirements (less than 5 watts). This enables significant power savings when compared to individual PCs that draw over 100 watts each.

In short, vSpace augments a traditional VDI deployment by providing the following additional benefits:

- **Increased security** – Since the NComputing is a stateless device, that is all user, application, platform and storage data is stored remotely, the loss or theft of the access device poses little risk to an enterprise.
- **Simplified support & maintenance** – Virtual desktops are much easier to access, patch update and maintain than a traditional desktop PC. IT administrators have 24 x 7 access to the virtual desktop environment and can easily and quickly monitor, back up, recover, patch, or upgrade a virtual desktop environment. In addition, since the vSpace software optimizes an individual operating system so that it can be shared by up to thirty users, the IT administrator now can reduce the number of operating systems to maintain by up to 97%.
- **Reduced hardware costs** – Access devices start as low as $70 per seat. Also, since the devices don't have any moving parts, their expected lifetime is typically twice as long as desktops PC (6 years versus 3 years).
- **Reduced utility costs** – The energy usage per device is much lower than that of a desktop PC, leading to reduced utility bills. Since each device draws less than 5 watts, enterprises can reduce their energy footprints by as much as 90% per user. In fact, access devices have such a small energy footprint that enterprises get the additional benefit of leveraging electrical utility rebates to save money.

The remainder of this white paper focuses on how to best leverage the combined power of traditional VDI technologies with NComputing's cutting-edge access device and vSpace software technologies. The solutions outlined below describe repeatable, scalable, and affordable VDI infrastructure options for the enterprise. Each solution deployment emphasizes simplicity over complexity and ensures you don't deploy more than you need.

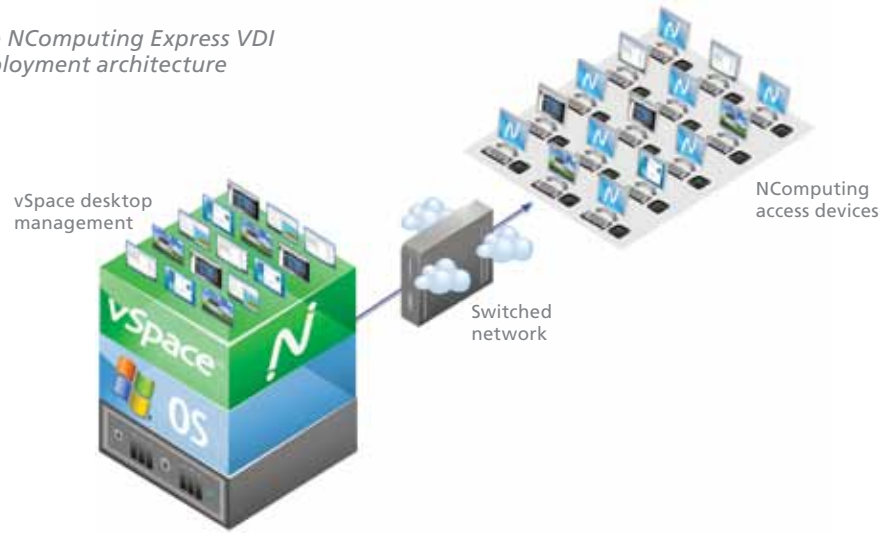
Common VDI deployment architectures

Express Virtual Desktop Infrastructure

Description: Express Virtual Desktop Infrastructure (VDI) deployments focus on PC replacement and distributed virtual desktop environments in regional datacenters and server rooms. This allows enterprises to ensure that desktop virtualization is an appropriate solution for end users without requiring expensive VDI management infrastructure investments, network bandwidth upgrades, and Storage Area Network (SAN) upgrades.

Use case: small regional deployments / proof of concept / evaluation
VDI Express deployments are the perfect starting point for exploring desktop virtualization. This deployment model does not require hypervisors, virtual machines, or VDI infrastructure management tools. It simply requires the NComputing vSpace software and access devices. Since this type of deployment does rely on centralized VDI management infrastructure, it is best suited for small regional or local deployments that are locally managed. This model is also a useful starting point for proof-of-concept or enterprise evaluations. It allows an enterprise to explore virtual desktops as good options for end users with minimal investment.

Figure 4A: The NComputing Express VDI deployment architecture



Core value:
The core value of a VDI Express deployment is that it is simple, fast and affordable. There is very little overhead for an enterprise IT department to implement a VDI Express solution, and key benefits, such as lowering IT department operational expenses, can be realized very quickly. This solution also allows an enterprise to experiment with virtual desktops without taking on significant investment/project risk.

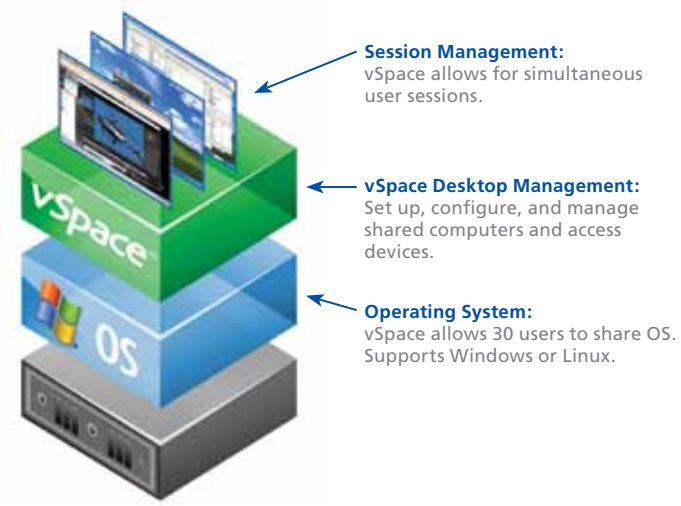


Figure 4B: Simplicity is the core value of the NComputing Express VDI deployment architecture

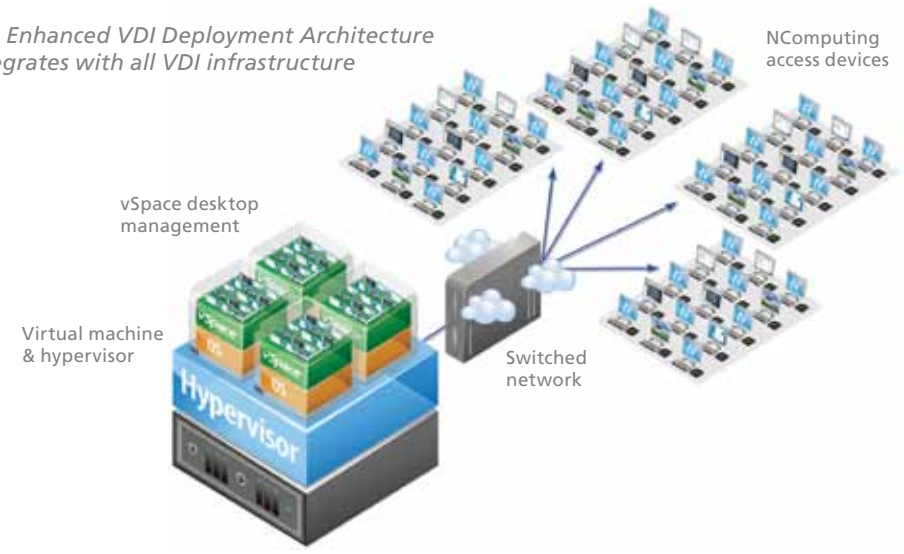
Enhanced virtual desktop infrastructure deployment

Description: Enhanced virtual desktop infrastructure deployments unleash the power of a complete end-to-end VDI solution. It provides an enterprise with all the technology components needed for successful VDI including a hypervisor, virtual machine (VM), VM infrastructure management software, operating system desktop virtualization management software, and access devices. This deployment scenario is the most flexible and allows an organization to centralize the management of their VM infrastructure, while deploying powerful solutions to a broad array of enterprise end-users.

Use case: medium & large scale VDI deployments

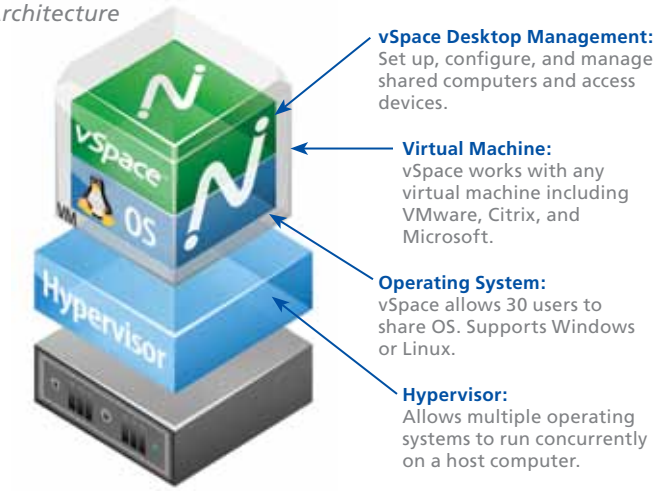
Enhanced VDI deployments target medium and large desktop virtualization deployments. The enterprise implementing this type of scenario typically has virtualization management infrastructure from a virtualization server management vendor such as VMware, Citrix, or Microsoft. This scenario focuses on the enterprise that wants to deploy virtual desktops to a large number of users, but also wants the centralized management infrastructure needed to automatically provision, manage, and monitor virtual machine environments.

Figure 5A: The Enhanced VDI Deployment Architecture integrates with all VDI infrastructure



Core value:
The core value of this scenario is the ability to deploy an end-to-end centralized desktop virtualization solution. Using NComputing's vSpace software, enterprises can optimize virtual desktop deployments by providing multiple end users with simultaneous access to a single operating system instance of either Windows or Linux. In addition, this deployment architecture is heterogeneous and runs on Windows and Linux platforms. Finally, this deployment model provides the best price-to-performance ratio by significantly lowering traditional IT operational expenses associated with desktop PCs.

Figure 5B: The Enhanced VDI Deployment Architecture creates a one to many operating system to user ratio



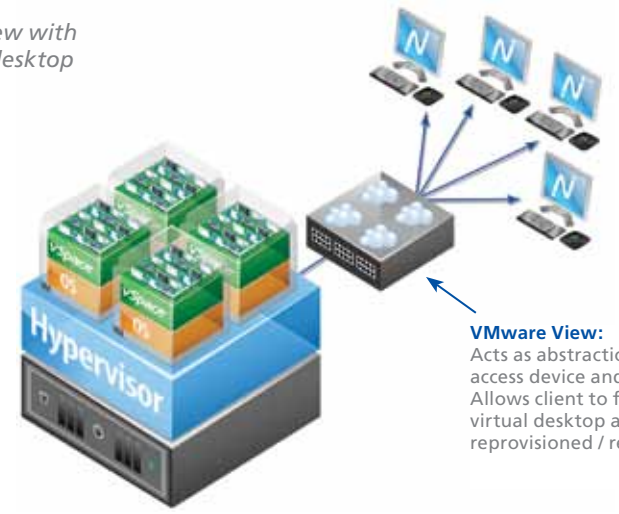
NComputing integration with VMware View

Description: Many organizations are using VMware infrastructure to deliver desktops as a managed service. This allows enterprises to deliver virtual desktops through a centralized management console for rapid provisioning of virtual desktops across the datacenter. This deployment architecture outlines how to
implement NComputing's access devices with VMware View for one-to-one desktop virtualization.

Use case:
This deployment approach targets enterprises that have licensed VMWare View and are using it, along with VMware's vManage, to auto-provision virtual machines on the fly.

Core value:
The core value of this scenario is the ability to leverage View as an abstraction layer between NComputing's access device and the VMware and NComputing infrastructure. With the help of View, NComputing's vSpace software can find each end user's virtual desktop, regardless of where it is running the datacenter. In short, an enterprise that wants the combined power of NComputing hardware with VMWare infrastructure has a nicely integrated offering. It is important to note, however, that this scenario provides one-to-one desktop virtualization ratio rather than one-to-many desktop virtualization ratio (as shown in the Enhanced VDI deployment architecture). That is, this deployment architectures requires that each individual user has a standalone virtual desktop, operating system, and virtual machine.

Figure 6A: Integrate VMware View with NComputing vSpace desktop management and access devices

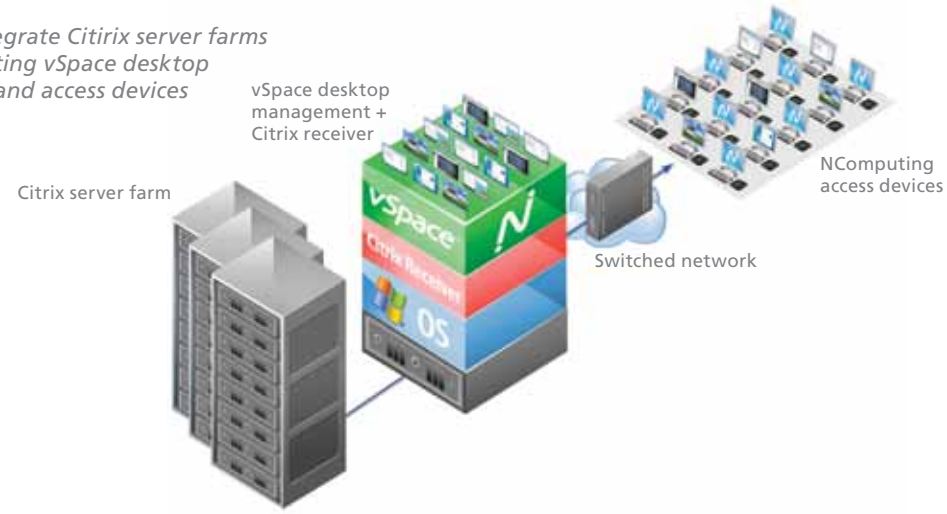


Citrix server farm with NComputing deployment

Description: Many organizations have Citrix server farms deployed across their datacenter. These solutions are complex, costly, and are particularly burdensome when it comes to desktop PC maintenance, due to the fact that each desktop PC requires locally managed client software to access the Citrix-enabled applications. This deployment focuses on addressing this challenge by providing access devices for Citrix-enabled applications.

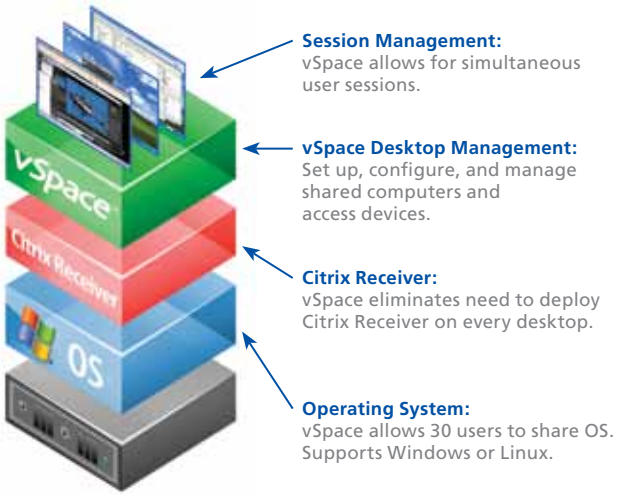
Use case:
This deployment approach targets enterprises that want to reduce operational expenses associated with Citrix server farms and eliminate maintenance time and costs associated with deploying Citrix client applications to every desktop PC.

Figure 7A: Integrate Citirix server farms with NComputing vSpace desktop management and access devices



Core value:
The core value of this scenario is the ability to replace end-user desktop PCs with inexpensive access devices to access Citrix-enabled applications. The performance demands required to access Citrix-enabled applications often leads to enterprises having to invest in high-end, expensive thin clients for a successful solution. However, running the Citrix receiver on a remotely managed server appliance with NComputing's vSpace software maximizes performance and enables each user to have a desktop PC experience on an access device. In short, this solution eliminates the need to deploy local Citrix client applications on each desktop, avoids having to invest in high-end thin client devices, and delivers a high performance end user experience via a device.

Figure 7B: NComputing eliminates the need to deploy Citrix clients to every desktop



Conclusion

As enterprise IT departments shift their focus from server consolidation to desktop virtualization, they can rest assured that end-to-end virtual desktop infrastructure solutions have matured. Corporations worldwide are turning to NComputing for proven virtualization solutions that are optimized for large scale use. NComputing, the global leader in virtual desktop computing, transforms corporate IT to redefine the economics of desktop computing.

Talk to us today

Learn more about enterprise-class virtual desktop infrastructure solutions from NComputing. Go to ncomputing.com or call for more information.

About NComputing

NComputing, Inc. is the fastest growing desktop virtualization company in the world with over 20 million daily users in 140 countries. The company's award-winning, patented technology lowers desktop computing costs, improves manageability, and reduces both energy consumption and e-waste. It is the perfect solution for leveraging the power and potential of PCs and cloud computing.

The NComputing solution takes advantage of the fact that today's PCs are so powerful that the vast majority of users only need a small fraction of the computing capacity. NComputing taps this unused capacity so that it can be simultaneously shared by many users. Each user's monitor, keyboard and mouse are connected to a small and highly reliable NComputing thin-client device, which is then connected to the shared PC. NComputing's award-winning vSpace desktop virtualization software provides each user with a rich multimedia computing experience and their own computing session.

* Please refer to the Microsoft operating system licensing requirements and technical details at www.ncomputing.com/mslicensing. Specific Linux support information is available in the NComputing Knowledge Base. Application software, client access and operating system licenses for the shared PC and access devices may be required by the respective software vendor and must be purchased separately. Windows is a registered trademark of Microsoft Corporation in the United States and other countries. Additional software licenses may be required by the software licensors. Please check your software user license agreements to ensure your continued compliance with such agreements.