Client virtualization secrets of a savvy IT director

Your users—both local and remote—demand unhampered performance and usability, but you need control and security. Learn how one IT director discovered a way to use Citrix® XenClient® with PCs powered by Intel® Core™ vPro™ processors to satisfy his diverse requirements while meeting the demands of today's users. The joint solution provides an excellent desktop virtualization option that offers users local, always-available operating systems and applications. At the same time, IT maintains comprehensive management and control of both centralized desktop images and remote PCs.

Confessions of an IT director

Rami is the director of IT for a large, multinational insurance provider. His company has offices around the globe, with both on-premises workers and a large contingent of mobile users who are constantly on the road and need to access their desktops, applications and data from anywhere at any time. He also has to accommodate a wide range of departments whose users have very different needs. Rami's team is always quick to respond to users' demands, but it can be a challenge keeping up with support issues, keeping users' systems up to date and ensuring secure access to corporate resources.

Rami did some brainstorming and realized he needed a way to manage both mobile and on-premises users while providing them with outstanding system and application performance. He then came up with the following list of goals for achieving those outcomes:

- **Image management**: Rami wants to reduce the number of images his IT staff needs to support. He also wants the ability to quickly bring new users on board and to deploy thousands of PCs without having to worry about a large number of device drivers.

- **Support**: Rami's team needs the ability to easily support thousands of users, including mobile workers, located worldwide. Users can't always rely on in-person visits from IT or support staff, but Rami needs to keep them productive.

- **Security**: Rami needs to ensure a secure environment, from hardware and operating systems to applications and data.

- **Productivity**: Rami also wants to be able to restore systems and quickly return users to productivity if their computers are infected with malware or have major hardware or software problems.

- **Mobility**: Rami needs to ensure an optimal, consistent experience for mobile users, with the same level of performance that his on-premises workers are used to.

Like many IT directors, Rami saw client virtualization as a way to address many of these goals and gain benefits such as easier deployment and management of multiple operating system images and faster recovery from system failures and device loss or theft. He was attracted by the fact that client virtualization lets administrators easily move existing users to new PCs because it uses images that are not dependent upon device drivers.

Rami also wanted to achieve all these goals with a computing platform that offers the flexibility to deploy new desktop and application delivery methods in the future. When combined with Intel Core vPro platforms, client virtualization offers a versatile environment that can accommodate future workloads and desktop delivery methods. With this solution, Rami was confident he could deploy local virtual machines (VMs), streamed applications and even server-hosted desktops. This versatility also would protect his PC hardware investment, since the Intel-based PCs work seamlessly with all virtualization implementations.

IT nirvana: making everyone happy

Rami discovered the best of both worlds: a way to provide outstanding individual performance and flexibility for users while maintaining effective administrative control. He adopted a joint solution that combines XenClient for fast, flexible and easy-to-manage virtualization with thin, lightweight Ultrabook™ devices powered by Intel Core vPro processors for high-performance mobility.

The following use cases illustrate how Rami achieved all his goals with the ability to:

More easily manage user hardware, software, and data

Rami's IT department easily manages and supports thousands of computers, while simplifying delivery and control of users' applications.

Reduce risk by securing computers, operating systems and data

Rami's team deploys safer, centrally managed images and more reliably secures corporate data.

Maximize users' productivity

Rami's help desk quickly returns users to productivity in case of malware infection, hardware failure or data loss. Users experience optimized performance and responsiveness through local execution of virtual machine images.

Enable anytime, anywhere access for employees

Rami can now better ensure an outstanding user experience regardless of network connectivity. He also has a great solution for providing remote access to users' Windows® desktops and applications from a tablet or smartphone.

Image management and support: more easily manage user hardware, software and data

As an IT director, Rami faces a wide range of challenges for managing users with different needs. Through the following use cases, we learn how his team provides image management for all computers in the enterprise, how they efficiently diagnose and troubleshoot remote systems and how they can easily deliver the right applications to different groups or individuals.

Manage and support thousands of PCs at a reduced cost

Managing configurations for different groups of workers used to be a nightmare for Rami's organization. But by using XenClient, the team simplifies management by creating group-specific images to deploy, update, back up, recover, secure and control. Virtual desktops can be moved seamlessly across different computers— even with different hardware or devices—so they can meet the requirements of individual workers and scenarios more easily and efficiently. With XenClient, there is no need to install additional device drivers, which frees IT from having to meticulously manage disparate images and device driver libraries.

Rami's help desk is also enjoying a significant savings in time and cost for supporting thousands of users. With the Citrix and Intel solution, IT can reduce costly desk-side visits by remotely managing, diagnosing and supporting PCs, regardless of the operating system condition or power state.

With Intel® Active Management Technology (Intel AMT) that comes with PCs powered by Intel Core vPro processors, Rami's IT department can use hardware-based keyboard-video-mouse (KVM) to take complete control of remote systems and launch an application or force sleep, wake or boot a PC. Technicians can remotely troubleshoot PCs without user participation, even to resolve BIOS issues, blue screens or operating system freezes.

Simplify delivery and control of users' applications

In addition to operating system images, Rami wanted greater control of applications used by groups and individuals. The Citrix and Intel solution gives his IT staff the granular control they need to manage groups, sub-groups and even individuals. Common, shared applications can be deployed as part of group-wide images with XenClient. At the same time, IT administrators can use Citrix® XenApp® to virtualize Windows applications to be instantly delivered as a service to users on any device, while maintaining centralized management and control in the datacenter.

Both methods allow IT to manage applications with controlled access, which keeps costs down and improves security while providing the ability to deliver

Citrix XenClient and Intel Core vPro platforms

Citrix XenClient enables IT administrators to deliver each employee's corporate desktop as a secure VM that runs directly on that user's computer. XenClient ensures that corporate applications and data are completely isolated from personal data, greatly increasing security and simplifying regulatory compliance.

IT administrators can quickly deliver a new desktop or move an existing one to any XenClient-enabled device. Also, because the desktop and applications execute locally, users are free to work online or offline with all the rich performance and experience of a traditional computing environment.

Intel Core vPro platforms provide enhanced security and manageability and improve remote maintenance and support through Intel Active Management Technology.

With Intel AMT, administrators can diagnose software and hardware problems more accurately, regardless of the PC's power state. These capabilities enable dramatic cost and energy savings through out-of-band management, remote troubleshooting, asset tracking, power on/off and more.

applications instantly to users anywhere. Because the applications are executed locally, users experience outstanding performance that is similar to the performance of locally installed programs.

Security: reduce risk by securing computers, operating systems and data

Security is always a top concern for Rami and his company. He needed a way to keep the enterprise safe by ensuring that enterprise PCs are always up to date. He also wanted a way to automatically protect sensitive data traveling outside of the office and to more easily address unprotected or stolen laptops. These use cases demonstrate how Rami protects users' systems and their data.

Protect the enterprise with a centrally managed image

By running a local desktop with locally executed applications, users enjoy flexibility while IT retains security and control. For Rami, that means IT can standardize on a set of corporate-defined desktop images that can be deployed to every PC to meet corporate and regulatory mandates.

Centrally managed images also make it easier to reliably patch PCs—even those of mobile users. Once IT makes changes to a master image in the datacenter, the image can be automatically deployed to XenClient devices when they are connected to the network, without user intervention. These transparent background updates keep the enterprise safe without disrupting the end user.

Because it is easy to manage and distribute images, IT can deploy multiple virtual desktops on the same computer without the risk of conflicts or the spread of malware.

Rami's team takes advantage of this capability by providing multiple, isolated virtual desktops to employees for business and personal use. They can even provide multiple virtual desktops to address different use cases, all on the same PC. With this solution, IT maintains control and high levels of security while offering greater freedom and productivity for users.

Easily and reliably secure corporate data

Like any good IT director, Rami wanted to ensure a corporate desktop that provides the rich environment users need to do their work, but also protects critical data and eliminates the risks that can be caused by users' changes to their desktops. Rami accomplished that goal by taking advantage of several features of the Citrix and Intel solution.

The solution protects data while optimizing the user experience by encrypting the VMs on the PC and by using Intel® Advanced Encryption Standards-New Instructions (Intel® AES-NI) technology to accelerate encryption and decryption. On PCs powered by Intel Core vPro processors, AES-NI embeds AES encryption instructions in the processor to speed up encryption significantly. This helps keep users' data secure while delivering optimized performance.

Provide a more secure virtual desktop with Citrix XenClient XT and Intel Core vPro platforms

Designed for organizations with extreme security requirements, including public sector customers, Citrix XenClient XT delivers client-side virtualization with enhanced levels of isolation and security.

Jointly developed by Citrix and Intel, XenClient XT is a special, hardened version of the Citrix client hypervisor. It provides the highest levels of security, isolation and auditability needed by highly regulated industries.

By running on Intel Core vPro platforms, XenClient XT provides the following benefits:

Ensures a secure boot platform for the virtual desktop image by taking advantage of Intel Trusted Execution Technology (Intel TXT).

Enables multiple isolated environments, with different access permissions, on a single platform. For example, users can access networks with different security classifications from different images running on a single system.

Accelerates encryption operations when protecting sensitive data by using Intel Advanced Encryption Standards-New Instructions (Intel AES-NI) technology.

Isolates network traffic into separate VMs and uses access control technologies such as Xen® Security Modules.

In the event a laptop is lost or stolen, Rami's team can automatically and remotely disable the virtual desktops on the device based on policies defined with the XenClient Enterprise Synchronizer. With a lockout policy, IT can specify how long computers can remain out of contact with the XenClient Enterprise Synchronizer before their users are automatically locked out of their XenClient desktops.

IT administrators can even go one step further, if necessary, by issuing a remote kill pill from the XenClient management backend to the XenClient laptop. This kill pill makes the corporate computing environment completely inaccessible to the device until the IT department chooses to restore access.

The solution can also take advantage of Intel® Trusted Execution Technology (Intel® TXT), which is embedded in the hardware of PCs powered by 3rd generation Intel Core vPro processors. This technology enhances security by detecting attempts to compromise system integrity and verifying the integrity of the hypervisor on every boot.

Also, with XenClient, each VM image running on a PC is completely isolated from the rest of the PC environment, which prevents security issues within one VM from spreading to the rest of the system.

Finally, the XenClient Enterprise Synchronizer can provide additional, granular control with policies that control data flow. For example, IT can disable USB devices or even specifically restrict mass storage devices to ensure sensitive data does not leave the device.

Productivity: maximize users' ability to work effectively

Another of Rami's goals was to maintain high levels of productivity for users. He needed a way to eliminate or quickly remediate problems from hardware or software failures, or from malware. It was important to find a way to give users—especially mobile workers—a high-performance desktop meeting their computing needs while online or offline. The following use cases demonstrate how Rami now meets these needs with the joint Citrix and Intel solution.

Quickly return to productivity in case of infection, hardware failure or data loss

By deploying XenClient to users, Rami can protect their data and applications with the ability to reboot to a "golden master" image. Users retain the experience of running a local desktop on their computers, but gain the ability to recover quickly in the event of a major problem. If a virtual desktop is compromised by malware, for example, it can be rebooted to start from the last known good image. This is especially useful for mobile workers who cannot easily swap out hardware or request the assistance of an onsite help desk technician.

Even if there is an issue at the BIOS level, the joint solution makes it possible for Rami's IT department to diagnose the system defect by using remote out-of-band troubleshooting capabilities of Intel vPro technology. IT technicians can use hardware-based KVM remote control functionality to repair the issue and quickly get users back in business—even if they are mobile workers hundreds of miles away. In a worst-case scenario, IT can remotely boot a laptop to a clean state.

Intelligent desktop virtualization: management with flexibility

Client virtualization, such as that provided by Citrix and Intel, is an example of intelligent desktop virtualization (IDV), which enables IT control while delivering an exceptional user experience.

IDV is based on three principles:

Execute locally: Client virtualization works with any network connection or even disconnected to deliver respon-siveness, great graphics and plug-and-play simplicity. This native experience is consistently achieved on a PC when execution is local, where the compute resources are closest to the user.

Centrally manage Windows image layers: The traditional approach to desktops is to deploy and manage a monolithic Windows image on each PC. With technologies available today, IT can divide that image into a flexible series of layers, and then deliver those layers as services to a wide range of devices. This approach lets IT centrally manage the layers from the datacenter while the image executes on the local device to ensure the best possible user experience.

Leverage hardware-based capabilities for managing and securing devices: Hardware-based management capabilities allow IT to manage and secure PCs remotely, even if the operating system or software agents are unresponsive. For example, IT administrators can wake and patch PCs based on Intel Core vPro processors remotely from the datacenter, even if the PC is powered off. These hardware-based capabilities can also enhance security. For example, admini-strators can remotely lock down a stolen laptop to protect sensitive corporate data.

Optimize performance and responsiveness through local execution of the desktop image

Because the virtual desktop images are executed on the local device, users enjoy highly responsive systems and applications. The Citrix and Intel solution achieves this by taking advantage of local platform capabilities and hardware-based Intel® Virtualization Technology (Intel® VT) to deliver an outstanding user experience. For example, Intel VT speeds up the transfer of platform control between the guest operating systems and the VM manager/hypervisor.

In addition, performance-enhancing features on Intel Core vPro processors help enhance user productivity. Intel® Turbo Boost Technology allows processor cores to run faster when workload demands it, and Intel® Hyper-Threading Technology improves multi-tasking performance on the virtual desktop.

Mobility: enable anytime, anywhere access for employees

Today's workforce is increasingly mobile, and Rami's workers are no exception to that trend. Users need access to corporate data from a wide range of locations and devices. The following use cases show how Rami is now able to provide a rich user experience on Ultrabook devices while maintaining secure control of images and assets.

Deliver an outstanding user experience regardless of network connectivity

With local execution of the desktop image, Rami's mobile workforce can productively work from anywhere, at any time—even without access to the corporate network. As described earlier, local execution takes advantage of enhancements offered by Intel Core vPro processors to deliver outstanding performance. This means users can continue to work productively even as they move from office to airplane to hotel.

With XenClient, mobile users do not have to deal with the disruption of installing patches and updates manually when they regain access to the network. After the master image has been updated, it deploys automatically the next time the user is connected. This keeps the system up-to-date while minimizing loss of productivity, even for Rami's highly mobile workforce.

Enable remote access to Microsoft Windows desktops and applications from a tablet or smartphone

The modern workstyle is vastly different from the days of having one dedicated workstation for each employee. Today's savvy, mobile workers want to access applications and data from any device or location. Rami previously struggled to provide fast, secure access to corporate resources for demanding mobile users. He and his team found that configuring access for a wide range of tablets, smartphones and laptops was a complex endeavor requiring costly hardware appliances and virtual private networks (VPNs).

Rami was ecstatic to discover a much easier way to provide users access from mobile devices by using Citrix Remote PC. Remote PC, like XenClient, is part

of Citrix® XenDesktop®, Enterprise Edition. Administrators can quickly configure Remote PC capability by installing it on the golden master image that is deployed to users' Ultrabook devices and workstations. Users can then easily download and install a Citrix Receiver™ client on their tablet, smartphone or another computer (Apple® Macintosh® or PC) at their convenience.

When the user logs on from a mobile device using Receiver, a secure connection to his Remote PC-enabled laptop is made automatically, and he has full view and control of his desktop. The connection uses end-to-end encryption and provides a fast, high-definition user experience with Citrix® HDX™ technology. HDX employs network and performance optimizations to deliver an exceptional user experience—even over wide area networks with low bandwidth or high latency.

With the combination of Remote PC and XenClient running Intel Core vPro platforms, users can begin reading a document on a workstation or Ultrabook, head into a meeting and access the same document from a tablet device and then continue reading from a smartphone on the bus on the way home from work. For Rami, the best part is that the secure, optimized connections are all handled automatically with minimal configuration required by his IT department.

Bringing it all together with XenClient and Intel Core vPro platforms

Rami learned that he could move to a virtualized environment and still fully manage and secure desktops, apps and devices and increase the productivity of users—including mobile workers—by deploying a solution built on XenClient and Ultrabook devices powered by Intel Core vPro processors.

With the joint solution, he leverages local computing capabilities that ensure a responsive, high-quality experience for users, even when they are disconnected from the network. At the same time, he maintains security through encryption, image isolation and control of both images and hardware. IT can quickly restore a compromised system, or remotely troubleshoot and repair problems, even when the remote operating system is unresponsive. And with Remote PC, users enjoy remarkable access and flexibility without compromising security or experiencing a significant impact in performance.

The Citrix and Intel solution provides Rami a level of performance and control that is essential in today's complex, evolving computing environment, while giving users the freedom and high-quality experience they are accustomed to.

Resources

Download and try XenClient: http://www.citrix.com/xenclient/tryit

For more information on XenDesktop, please visit:
http://www.citrix.com/xendesktop

For more information on XenClient, please visit:
http://www.citrix.com/xenclient

For more information on Remote PC, please visit:
http://blogs.citrix.com/2012/08/09/remote-pc-faq

For more information on Intel Core vPro processors and technology, please visit:
http://www.intel.com/content/www/us/en/architecture-and-technology/vpro/vpro-technology-general.html

For more information on Intel Trusted Execution Technology, please visit:
http://www.intel.com/content/www/us/en/architecture-and-technology/trusted-execution-technology/malware-reduction-general-technology.html

For more information on Intel Active Management Technology, please visit:
http://www.intel.com/content/www/us/en/architecture-and-technology/intel-active-management-technology.html

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About Intel

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