Citrix & Intel Working Together to Deliver Local Virtual Desktops

The face of desktop computing will change fundamentally over the next few years. Enterprises are constantly searching for solutions to help them meet user demands for flexible computing while at the same time control costs, improve security and simplify manageability. Achieving these goals requires the right technology as well as a shift in how IT and the user view desktop computing.

In January 2009, Citrix announced a formal agreement to develop a Xen®-based bare metal client hypervisor technology in conjunction with Intel. The results of the joint collaboration will be the delivery of Citrix® XenClient™, a client hypervisor providing new levels of security, management, and user flexibility for enterprise desktops.

CITRIX®

Citrix XenClient

At the heart of Citrix XenClient will be a bare-metal Xen-based Type-1 client hypervisor optimized for Intel® Virtualization Technology (VT), Intel® Trusted Execution Technology (TXT), and other features of Intel® vPro™ technology. Citrix is integrating these technologies into their client hypervisor, providing customers the benefit of desktop virtualization solutions leveraging the virtualization and management capabilities of vPro-based desktop and laptop PCs.

XenClient will enable IT professionals, for the first time, to deliver a centrally managed, dynamically assembled corporate desktop with its related applications directly into a secure, isolated client-based virtual machine (VM). The hypervisor serves as a foundation and allows the corporate desktop to be executed locally and will provide off-network mobility. XenClient enables devices, desktops, applications and people to operate more independently but provides all of the benefits of centralized management.

XenClient will deliver key benefits to mobile/offline users including:

- Extend the benefits of hosted virtual desktops to mobile and offline users
- Allow running isolated business and personal desktops on the same device
- Provide a high definition user experience with bare-metal virtualization performance
- Allow IT to lockdown business desktops to reduce desktop management TCO
- Simplify laptop provisioning and reduce the burden of managing multiple OS images
- Provide a secure mobile computing platform with backup, policy control, and remote kill
- Provide faster recovery from field laptop failures or loss/theft

> "We are seeing a fundamental shift happening in desktop computing. Issues such as the rising costs of desktop management, the increasing computer savvy of enterprise users are forcing IT organizations to consider a new service model for the desktop.
>
> The BYOC model goes a long way to solving these issues for the enterprise. What organizations need are the virtualization technologies to make this shift happen. With its core competency in application and desktop delivery, Citrix is in an ideal position to enable this transformation."
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> Andi Mann,
> Research Director,
> Enterprise Management Associates

High performance local desktop virtualization

XenClient provides maximum flexibility and performance by allowing a mix of total isolation and sophisticated device passthrough. The technology aims to enable a whole new set of use cases for rich client execution with all of the benefits of centralized management and delivery of executables—desktop workloads and applications to users to leverage client side virtualization.

XenClient can run in a mode where all the underlying hardware is isolated and virtualized for the virtual machines running on top of the platform. This mode of operation creates truly hardware independent virtual machines that can be moved between different versions of laptops from one vendor or even between different vendor laptops. This allows IT to drastically reduce the burden of managing multiple OS images to cover their heterogeneous hardware.

By leveraging Intel VT-d (Virtualization Technology for Directed I/O), XenClient can also run in a mode of operation where the majority of the devices on the system are isolated and virtualized by Xen but then also passthrough targeted devices such as the graphics hardware directly to a virtual machine. In this case, the regular Windows drivers would run and provide the fasted graphics performance possible.

Type-1 versus Type-2 hypervisors

The difference between Type-1 and Type-2 virtualization generally relates to the type of technology deployed. In Type-2 a base multi-operating system such as Windows® or Linux™ is installed on the hardware and an application containing the virtualization technology is installed on top to allow hosting of one or more additional guest virtual machines. Type-1 hypervisors are different because there is no base OS installed instead there is just a very thin layer of virtualization right on top of the hardware—a hypervisor which owns the hardware itself.

These significant differences dramatically increase performance and provide high levels of assurance and security. In the case of a Type-2 hypervisor, if the base OS is compromised, any of the virtual machines running on top of it are subject to compromise. A Type-1 solution provides a secure locked down hypervisor which owns all of the hardware, providing a fundamentally trusted platform to build multiple virtual machines with varying levels of privilege and trust. Additionally, with a Type-1 solution the virtual machines are totally isolated from each other so performance or security issues within one environment will not affect the other desktop environments on the system. In short, Type-1 provides greater control of security, a finer degree of arbitration over system resources, and higher levels of performance

Optimized for Intel vPro technologies

XenClient is based on the award winning Xen hypervisor and Intel Virtualization Technology (VT) is a key underpinning of the Xen technology. This is the same mature Xen technology that is used in the Citrix® XenServer™ server virtualization platform.

Two distinct Intel Virtualization Technologies (VT) play an important role in XenClient: Intel VT-x and Intel VT-d. Intel VT-x technology provides CPU virtualization support and is required by Xen to run Windows virtual machines. Intel VT-d is a technology that allows for direct and secure assignment of devices to virtual machines reducing overhead and increasing the overall reliability of the platform.

Further, Intel's Trusted Execution Technology (TXT) allows the hardware to verify integrity of the hypervisor and its support components on every boot so that the hypervisor becomes part of the trusted compute base. This provides a chain of trust from the hardware up to the virtualization layer ensuring that the hypervisor has not been compromised.

Enabling Citrix's vision to transform desktop computing

With partners like Intel, Citrix is working to deliver on our vision for the future of desktop computing. XenClient strengthens Citrix's vision of a local desktop virtualization solution and is a complementary solution to Citrix's hosted desktop virtualization solution—Citrix® XenDesktop™.

XenClient ties together the best of two worlds—IT gets centralized management and control and users get responsiveness and flexibility. The technology provides workloads and applications to users with rich client execution and guarantees the fidelity, trust and protection of the workload—even in cases where the other components of the local system are not trusted. It enables a broad set of rich, mobile, offline use cases in which enterprises can deliver their users trusted corporate workloads in a protected fashion never before possible.

Learn More

Citrix has developed a showcase for XenClient within the Citrix Community. The XenClient Underground features a variety of information, including videos, demonstrations, discussions, beta information and more.

Visit http://community.citrix.com/citrixready/xenclient to learn more.

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About Citrix
Citrix Systems, Inc. (NASDAQ:CTXS) is the leading provider of virtualization, networking and software as a service technologies for more than 230,000 organizations worldwide. Its Citrix Delivery Center, Citrix Cloud Center (C3) and Citrix Online Services product families radically simplify computing for millions of users, delivering applications as an on-demand service to any user, in any location on any device. Citrix customers include the world's largest Internet companies, 99 percent of *Fortune* Global 500 enterprises, and hundreds of thousands of small businesses and prosumers worldwide. Citrix partners with over 10,000 companies worldwide in more than 100 countries. Founded in 1989, annual revenue in 2008 was $1.6 billion.

About Intel
Intel, the world leader in silicon innovation, develops technologies, products and initiatives to continually advance how people work and live. Additional information about Intel is available at www.intel.com.

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