



Deliver Virtualized Desktops to Your Most Demanding Power Users



With hosted remote workstations, users can now access sharp, responsive 3D graphics applications from anywhere and on any device.

Design Challenges in a Global World

Design and manufacturing companies are facing increasing challenges in today's global workplace. They must be able to securely collaborate and manage design lifecycles effectively with offshore, mobile, and remote employees. Yet, sharing complex 3D and 2D data across a global environment is challenging.

Email, FTP, and physical media remain the most common methods for large-scale data sharing. However, these technologies are slow and cumbersome. They generate multiple versions of the data that must be managed and synchronized, and they increase the exposure of critical intellectual property (IP). As file sizes continue to grow and the need for global collaboration increases, faster and more secure strategies are needed.

Close the Gap with Hosted Remote Workstations

Intel and Citrix can help you address the global design challenge with a cost-effective desktop virtualization solution that delivers rich applications to any user on any device, including demanding 3D graphics applications. Data and applications are hosted in the data center for reliable high performance and strong data security. Users around the world can work from the same data set, with no need for high-volume data transfers. They can also enjoy workstation-class visual performance using any device, whether it's a dedicated graphics workstation, a tablet, or a smart phone.

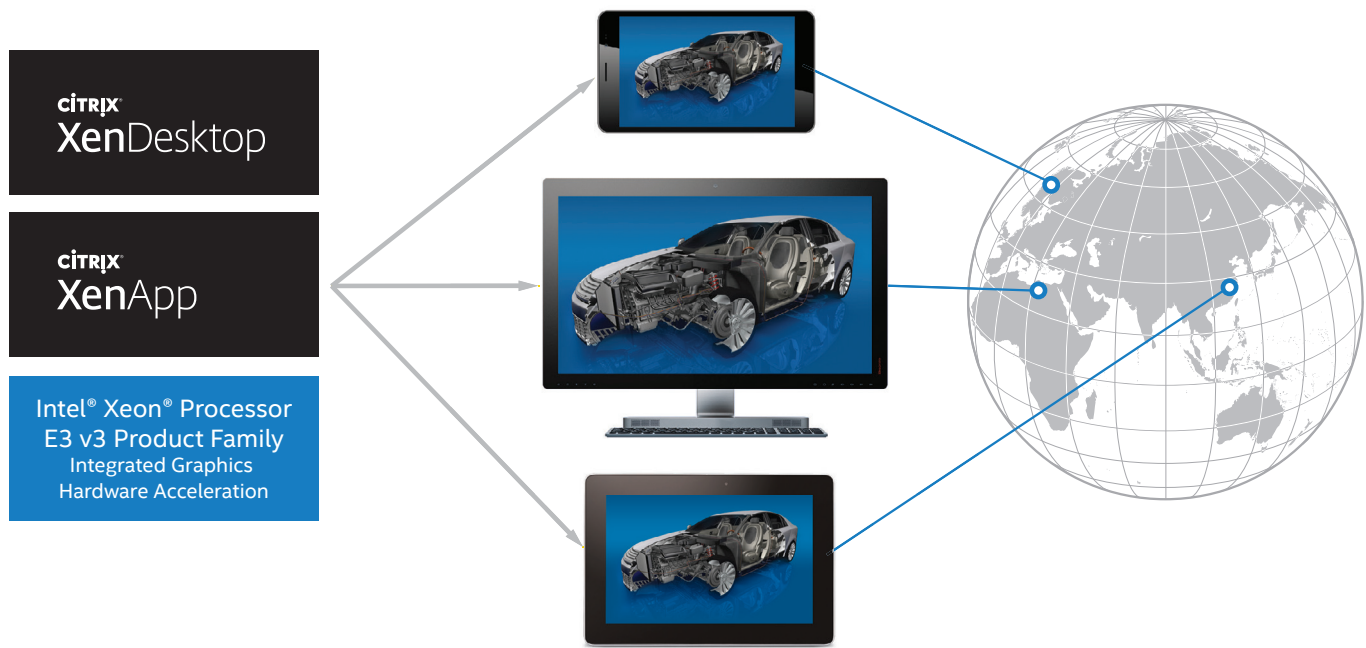
"There's a new paradigm for supporting global design teams. Host the big data and applications in the data center and ship the pixels to remote devices. It's a better and more secure way to collaborate."

– Jon Peddie, jPR

Citrix XenDesktop,* with built-in XenApp,* provides a flexible, unified platform for delivering Windows* desktops and applications as a service, and future Linux* support has been announced.¹ Combined with the power and scalability of servers based on the Intel® Xeon® processor E3 v3 product family, XenDesktop and XenApp deliver a high-quality user experience on a dense, energy-efficient, and cost-effective infrastructure. The Intel Xeon processor E3 v3 product family includes integrated graphics hardware acceleration, so there's no need for add-on graphics cards. You can deliver graphics-rich applications with cost models that support broad delivery to hundreds or even thousands of users.



Improve Collaboration Across Global Design Teams



Deliver a workstation-class visual experience to any user on any device, while protecting your data and applications behind your data center firewalls.

Improve End-to-End Collaboration while Reducing Risk

The performance and cost advantages provided by XenDesktop, XenApp, and the Intel Xeon processor E3 v3 product family open the door to broader and more effective collaboration. Detail engineers and designers, production teams on the factory floor, engineers collaborating with third-party design teams, business analysts, and sales and support staff at customer sites can all benefit from access to complex data and visualizations. Even users who have dedicated workstations can benefit from the ability to switch seamlessly to a tablet or smart phone for meetings, travel, and consultations.

Centralizing data and applications in the data center delivers many additional advantages.

- **Stronger security and compliance.** Sensitive data remains in the data center, behind corporate firewalls. Citrix provides strong identity management and communications are encrypted by default.

- **Higher reliability.** Data center infrastructure can be architected for high availability and disaster recovery. If a client device fails or users can't make it to work due to weather conditions or other issues, they can connect securely from home using their personal PC, laptop, tablet, or smart phone.

- **Better resource utilization.** XenDesktop and XenApp dramatically simplify desktop provisioning and management, and have been used successfully to support remote users across continents and oceans? Depending on requirements, the same centralized infrastructure and staff can be used to support multiple teams in global, follow-the-sun work scenarios.

Delivering Reliable High-Performance to Remote Users

WAN performance limitations have traditionally prevented IT organizations from hosting graphics-rich client applications in the data center. Citrix overcomes these limitations with Citrix HDX,* a broad set of technologies integrated across the entire end-to-end delivery system. Only user commands and display data have to traverse the

network. Deep compression and quality of service (QoS) controls optimize the end-user experience over narrow WAN links, and multiple WAN optimization technologies further reduce network bandwidth requirements. Citrix HDX can also offload processing to remote client devices as needed to maintain performance levels. With these optimizations, high-quality voice, video and multimedia experiences can be delivered across high-latency, low-bandwidth networks.

HDX 3D Pro extends these optimizations to support the remote delivery of demanding 3D graphics applications. Hardware-level GPU acceleration with Intel® Iris™ Pro Graphics provides fast frame rates and smooth visual performance, and HDX 3D Pro optimizes delivery across the network. Consistent, high-quality user experiences can be provided with as little as 1.5 Mbps of network bandwidth and round-trip latency as high as 200 milliseconds.³ Even higher latencies can be sustained for short periods, without impairing the user experience. HDX 3D Pro provides full support for OpenGL and DirectX* applications, so it supports existing applications without modification.

Smooth, Accurate Visuals with Integrated Graphics Acceleration

Discrete graphics processing units (GPUs) may be appropriate for designers and engineers working on large models and simulations, but are too expensive for delivering hosted remote workstations to hundreds of users. To provide high performance at lower cost, Intel integrated Intel Iris Pro Graphics directly into the server-class Intel Xeon processor E3 v3 product family. By reducing the communications latency between the CPU and the GPU, on-die graphics acceleration provides better performance and energy-efficiency than a comparable add-on card.

Intel Iris Pro Graphics is Intel's most advanced graphics acceleration technology. It includes dedicated on-die graphics memory (eDRAM), so the graphics processing units do not have to compete with processor cores for memory. This helps to ensure exceptional graphics performance, even in combination with compute-intensive workloads.

The Intel Xeon processor E3 v3 product family is designed specifically for high value in virtualized desktop environments. It provides:

- **Workstation-class performance for multiple users.** With four server-class processor cores and integrated graphics acceleration, the Intel Xeon processor E3 v3 product family provides a premium experience for demanding users and applications. A single processor can be used to deliver rich applications to a single user or to as many as 50 simultaneous users, depending on applications and usage models.⁴
- **High density.** Currently available solutions support up to 10 physical instances in 1U of data center space, with just 19 watts of power consumption per instance.^{4,5}
- **High-performance video encoding and decoding.** Intel® Quick Sync Video dramatically reduces user wait times when storing, playing, and transferring video content.

Fast, Low-Risk Implementation

Citrix and Intel are working with multiple hardware vendors to produce complete desktop virtualization solutions designed to deliver the best balance of performance, cost, and density for enterprise deployments. One example is HP Moonshot* hosted desktop infrastructure, which is available today. This production-ready solution provides dedicated, multi-core hardware resources for up to 45 users per chassis. When sharing hardware resources using XenApp, that same chassis can provide a high-quality, rich application experience to as many as 1,500 to 2,000 simultaneous users.⁴ All hardware and software are preconfigured and optimized for remote desktop delivery, and HP provides full service and support to enable fast, reliable implementation in complex environments.

Increasing Value over Time

Citrix and Intel have been collaborating for years to help businesses deliver better and more cost-effective user experiences across a wide range of usage models. The two companies worked closely together to ensure optimized performance and reliability for XenDesktop and XenApp running on the Intel Xeon processor E3 v3 product family with Intel Iris Pro Graphics.

Collaboration continues on a number of fronts. One near-term goal is to collaborate on the use of Intel® Graphics Virtualization Technology (Intel® GVT-g) with Citrix XenServer* to provide full virtualization of hardware graphics acceleration at the hypervisor level. This will complement the OS-based resource sharing provided by Citrix XenApp, so IT organizations have additional flexibility for maximizing the utilization of data center resources. Citrix and Intel plan to contribute this enhancement to the upstream, open-source version of XenServer, which will help drive broader industry innovation and new usage models for graphics virtualization.

Intel is focused on increasing the performance and efficiency of Intel Iris Pro Graphics in future processor generations, and Citrix is working to ensure these enhancements deliver maximum benefits to remote users across low-quality network connections. Citrix Framehawk* technology, for example, automatically adapts the graphics data stream to deliver the best possible experience based on user heuristics. An interruptible graphics layer works in combination with a QoS signal amplifier to prioritize the display updates that are most important to each user's real-time experience.

These and many other innovations will continue to deliver dramatic improvements in the quality and reliability of the end-user experience and the efficiency of data center infrastructure.

About Citrix

Citrix (NASDAQ:CTXS) is a leader in mobile workspaces, providing virtualization, mobility management, networking and cloud services to enable new ways to work better. Citrix solutions power business mobility through secure, personal workspaces that provide people with instant access to apps, desktops, data and communications on any device, over any network and cloud.

This year Citrix is celebrating 25 years of innovation, making IT simpler and people more productive. With revenue in 2013 of \$2.9 billion, Citrix solutions are used at more than 330,000 organizations and by over 100 million users globally.

Learn more at www.citrix.com.

Find Out More

Learn more about how Citrix XenDesktop, XenApp, and the Intel Xeon processor E3 v3 product family with built-in Intel Iris Pro Graphics can transform the way your business collaborates, while reducing cost and risk.

- Citrix XenDesktop: www.citrix.com/products/xendesktop/overview.html
- Citrix HDX 3D Pro: www.citrix.com/products/xendesktop/features/high-def-experience/hdx-3d-pro.html
- Intel Xeon processor E3 v3 product family: www.intel.com/content/www/us/en/processors/xeon/xeon-processor-e3-family.html
- Intel Iris Pro Graphics: www.intel.com/content/www/us/en/architecture-and-technology/hd-graphics/hd-graphics-developer.html



¹ See the Citrix Announcement: "Citrix Offers Technology Preview of Linux Virtual Apps and Desktops Deliver from XenApp and XenDesktop." <http://www.citrix.com/news/announcements/aug-2014/citrix-offers-technology-preview-of-linux-virtual-apps-and-deskt.html>.

² For an example of long-distance remote workstation delivery, see the Citrix case study for ABB Schweiz AG at http://www.citrix.com/customers/abb_schweiz_en.html?solution=desktop_virtualization.

³ Source: "Citrix HDX technologies for optimizing the virtualization experience." http://www.citrix.com/content/dam/citrix/en_us/documents/products-solutions/citrix-hdx-technologies.pdf.

⁴ Source: "The Eagle has Landed: Citrix XenApp is now available on HP Moonshot with Intel graphics!" a Citrix blog by Tony Sanchez, October 23, 2014. <http://blogs.citrix.com/2014/10/23/the-eagle-has-landed-citrix-xenapp-is-now-available-on-hp-moonshot-with-intel-graphics/>.

⁵ Source: "Optimized infrastructure for your mobile workforce," an HP solution brief. <http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA5-5507ENW&cc=us&lc=en>.

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