The Truth About Virtual Computing for CAD

By Nancy Spurling Johnson

If you're a user of graphics-intensive software such as 3D modeling, simulation and analysis, and visualization, you might be skeptical about moving to a virtualized computing environment. However, the Citrix XenDesktop virtualization solution with HDX 3D Pro graphics acceleration technology is not only delivering an excellent user experience, it's also delivering benefits that don't come standard on a traditional desktop computer.

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Moving 3D modeling, simulation, and visualization software to a virtualized environment can improve your productivity, support better project collaboration, enable easy mobile access to CAD data, and offer increased flexibility in your work life.

Change. The word can be cause for alarm for a CAD user, especially when the subject of the change is your computer. Your job demands uncompromised productivity, and your productivity hinges on having optimized hardware and personalized software. If your computer set-up is subpar, your eight-hour day will be filled with inconvenience, frustration, and even missed deadlines — and could become a ten-hour day.

So it's more than understandable if, as a CAD manager or user, you balk when your company considers a major IT transition. In particular, the prospect of moving to a virtual CAD computing environment can be daunting.

Virtual CAD computing is gaining popularity for the powerful benefits that it offers businesses, from increased data security to IT cost control to improved support for a mobile workforce. But

for users of graphics-intensive applications such as 3D modeling, simulation and analysis, and visualization, virtual environments can bring about fear of the unknown.

This article will shed light on the topic of virtual computing for high-end CAD applications. Focusing on Citrix® XenDesktop® with HDX 3D Pro graphics acceleration technology, it will help CAD managers and users understand the technology, explain how it can benefit you and your job, and address some common concerns.

VIRTUAL COMPUTING: THE BASICS

Built on any type of network and cloud infrastructure, a XenDesktop environment comprises computer desktops and Windows-based software (apps) that are hosted on a server in the company's data center rather than on users' endpoint workstations. When a user logs in to the network, he or she connects with an available desktop from the pool, and individual settings are loaded onto the standard software.

As software runs on the host computer, graphics (screen updates) are compressed and streamed via the Internet to the user. Mouse and keyboard input are streamed back to the server. Lower bandwidth requirements

ensure high performance over local- as well as wide-area networks.

All in all, XenDesktop with HDX 3D Pro optimizes the performance of demanding 2D and 3D applications, delivering a virtual experience equal to that of a traditional CAD workstation. And, the desktop is accessible using any type of device from any Internet-connected location, including standard PCs and laptops (Windows and Mac OS), thin clients, tablets, and even smart phones.

Companies can reap tremendous benefits in moving from a traditional workstation environment to a XenDesktop virtual environment, including the following:

- Hosting files and software in the company data center is inherently more secure than hosting on end-user workstations and eliminates the need to e-mail sensitive files or move them to an FTP or thumb drive.

- Centrally hosted data also supports real-time collaboration among users regardless of their location, which can significantly reduce design cycle times.

- Users in a XenDesktop environment share pooled hardware resources, whether they reside in the same office or across different time

zones. Because each user does not require a dedicated physical workstation, a company can reduce IT expenses.

• A virtual computing environment extends the full functionality of even high-end 3D software to all web-connected users, whether they're on the manufacturing floor, at a customer site, traveling, or working from home.

BENEFITS TO CAD USERS

So, your company stands to benefit greatly from the transition to virtual computing, but how much will you have to sacrifice for your company's gain?

The answer: Nothing. In fact, CAD managers and users who work from virtual machines find no difference from their experience using a traditional desktop workstation. And, virtual computing introduces extra workflow and personal benefits for CAD users that don't come standard in a traditional computer set-up.

Better computing performance and user productivity. Citrix has tested many major CAD/CAM, imaging, and GIS applications and has designed the Citrix platform to ensure that these apps are not only easily supported but 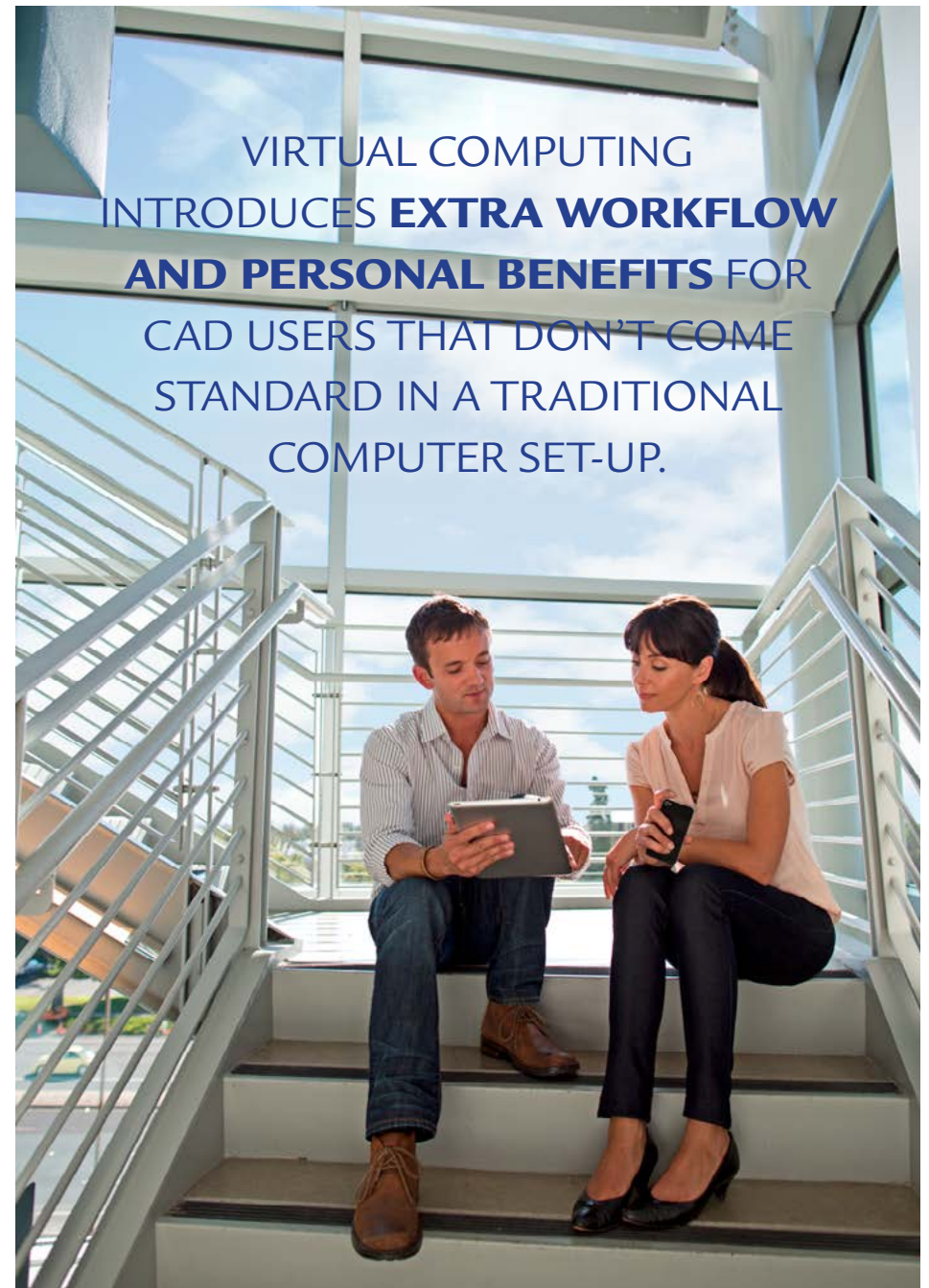also deliver an exceptional user experience. XenDesktop with HDX 3D Pro is the first software virtualization solution to support hardware-based GPU acceleration, meaning you can run design simulations and render large-scale images at speeds that were challenging using your old workstation — and you can do so from any device.

Working in a virtual environment means your CAD workflow won't hit a wall when a problem or question arises; key project members can view, mark up, and edit CAD data at any hour, even from their tablets. If there's a power or Internet outage or if your endpoint hardware fails at the office or on the road, XenDesktop lets you continue your work from any device in any other unaffected location.

Your work also won't be interrupted when it's time for IT to upgrade your hardware or software. Updates take place once, on the server. This also ensures that everyone in your organization is using the same software versions at all times.

All this adds up to CAD computing performance and personal productivity that's as good as, if not better than, what you find with your traditional workstation.

Better design collaboration. When was the last time you were able to open a 30-MB model instantly or

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share that file in real time with someone in the next city or halfway around the world? That's the norm in a virtual computing environment.

Virtual computing also supports follow-the-sun development, wherein project team members are spread across time zones so work is progressing around the clock. Access to centralized data in real time accelerates design cycles to keep customers happy and companies competitive. No more waiting for bulky 3D file transfers over the network or e-mail!

Better accessibility and mobility.
Whether users are working from the main office, branch office, manufacturing facility, offshore location, job site, or hotel room, access to CAD data via XenDesktop is fast and easy. Now you can go mobile without a second thought. No matter how large your files or how graphics-intensive your software, you can view and edit your data in real time regardless of location, time of day, or computing device.

Want to skip your commute one day a week or work from home on the weekend or when a child is ill? Now you can, even if your home computer is a low-end laptop or your Internet service is slow.

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Q&A
COMMON CONCERNS OF CAD MANAGERS AND USERS

Perhaps your interest in virtualized CAD computing is piqued, but you still have specific concerns. The section that follows addresses questions of common interest to CAD managers and users. If your own questions are not addressed here, complete this brief online form to request a call from a Citrix sales representative.

How reliable is the Citrix XenDesktop infrastructure?

XenDesktop is very reliable as long as the deployment architecture is designed properly with appropriate capacity planning and system redundancy.

What happens if a user is on a job site that has no Wi-Fi, or working from home or a hotel that has a slow Wi-Fi connection?

XenDesktop supports the latest wireless networking technologies including mobile wireless (3G, 4G) and Wi-Fi networks; if Wi-Fi connectivity is unavailable, mobile wireless is a valid alternative. XenDesktop's remoting protocol includes network compression and application optimizations to address the network variability of wireless networks. Slower connections can impact graphics performance,

but users have told us that they can spend five to six hours a day using graphics-intensive applications with as little as 2 megabits per second of bandwidth and 200 milliseconds of round-trip latency.

I've spent years becoming an extremely productive power user. My workstation, my software, my peripherals — everything is optimized for my working style and speed. Will this change?

No. With a hosted desktop, you maintain your custom settings as well as support for multiple monitors, 3D navigation devices, and other peripherals. XenDesktop contains a powerful tool that manages profiles independently from the operating system and delivers profile data on demand, speeding log-in times and delivering a personalized user experience.

Our CAD software has subtext (right-click) menus, dropdown menus, and other functionality you never see on touch-based mobile devices. Will they work?

XenDesktop includes a lightweight client that installs on the latest tablets and smart phones to touch-enable most Windows application functions, including right-click menu and dropdown menu functions, plus native mobile device functions including pinch and zoom and inertia scrolling.

Can we run more than one CAD application at once?

With XenDesktop, you can run multiple CAD applications at a time. You are limited only by your system memory and GPU processing resources — similar to physical workstation delivery.

We've been using a data management system to control CAD file versioning, sync data, control user access, and increase data security. Will this software translate to a virtual CAD environment?

XenDesktop requires no special hooks to use most CAD data management, design, and visualization applications because of its full support for the latest OpenGL®, DirectX®, OpenCL®™ and NVIDIA® CUDA™ APIs.

IN CLOSING

Adam Jull has experienced more Citrix-based virtual computing deployments than he can count. As CEO of IMSCAD, an Autodesk partner that specializes in implementing and supporting CAD applications virtualized on the Citrix platform, he has seen first-hand the resistance of many CAD users to the idea of virtual computing.

"There's a big culture shift," he says. "Users trust their (traditional) workstations. They don't believe a virtual solution will work or that performance will be good enough."

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CEO, IMSCAD

IMSCAD introduces users to the technology by providing access to Autodesk applications via a generic server, then providing access to their in-house CAD software (customizations included) via an in-house server. "The majority of skeptics are surprised (by system performance)," Jull says. "Attitudes change 100% once they experience it."

To draw in users even more, the company highlights how virtual computing means users can work from home with the same CAD performance as they experience in the office, enabling greater flexibility in their work lives.

"The CAD manager's life gets massively easier as well," Jull adds. CAD staff becomes more productive because they're not waiting for files to open and close or spending time transferring them, and tasks such as

rendering speed up significantly. And CAD managers no longer spend time managing workstations when hardware and software reside in the data center. A few months into a virtual computing transition, Jull says, the CAD manager can forget about workstation and data distractions "and focus on what he needs to do."

Citrix was the pioneer in virtualizing 3D graphics applications more than five years ago. Today, the technology is mature and robust and is delivering great benefits for CAD managers and users of demanding design, simulation, and visualization software. There's no time like the present to tap into the power of virtual computing for CAD. ◆

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Learn more about Citrix XenDesktop with HDX 3D Pro graphics acceleration technology at www.citrix.com/xendesktop/3D.