



Virtualized Graphics Processing Enhances Collaboration

Virtualized graphics processing enables global architecture firm Gensler to deliver outstanding user experiences with complex graphics.



Collaboration Is Critical to Success

The need for dedicated graphics processing, once exclusive to high-end design or manufacturing engineers, is now pervasive. Even common modern applications, such as web browsers and office productivity software, tax the graphics capabilities of the systems on which they run. At the same time, as users have become increasingly mobile, they expect a responsive user experience on any device, anywhere they go. They also want an environment that allows them to easily and effectively share and collaborate on projects.

All of these needs—mobility, an outstanding user experience, and seamless collaboration—require unencumbered access to data. To provide that access with simpler workloads, IT organizations might implement centralized solutions that focus on security, efficiency, and simplified access. However, some IT pros and users are skeptical about centralized solutions when it comes to graphics. Historically, multiple remote workers using graphics-intensive applications from shared system resources could have a detrimental impact on performance.

Without a solution, employees can resort to collaborating by exchanging files through e-mail, FTP servers, USB drives, or even by traveling to work on projects with colleagues face to face. These practices undermine productivity and create even greater workflow delays.

It doesn't have to be this way. Graphics virtualization technology, which is available today, can turn skeptics into believers because it lets employees work faster and collaborate in real-time while eliminating the dependency on, and the incremental cost of, expensive dedicated graphics cards.

"It's not just high-end CAD. We need the GPUs for everything. The big surprise has been that browsers have actually been using even more GPU than the high-end applications."

— Thomas Poppelgaard

Real-World Collaboration Challenges and Solutions

Jason Dacanay sees the power of virtualized graphics processing (VGP) every day. In fact, he states that, "without VGP, we couldn't be successful collaborating with the projects that we do today."¹ Dacanay is an IT/server systems administrator and the Citrix virtual-desktop-infrastructure (VDI) manager at Gensler, an international architecture firm with 46 offices worldwide. Gensler's architects were accustomed to working with large files from deskbound workstations running Autodesk Revit* and other graphics-intensive applications. To collaborate, the architects were regularly traveling to other offices and transferring large files using an FTP server, e-mail, and even traditional mail.

This outdated approach was costly, time-consuming, and risk-prone, and it hampered productivity and collaboration as architects and consultants waited up to two weeks for files and data. Thomas Poppelgaard, an enterprise 3D graphics expert and IT consultant in several industries, confirms that such delays are a common problem in many companies like Gensler. In his experience, some users wait half a day for the data and files that they need to do their jobs.



Jim Blakley, panel moderator and general manager of the visual cloud space at Intel



Jason Dacanay, IT server/systems administrator and Citrix manager at Gensler, a worldwide architecture firm



Adam Jull, founder and CEO of IMSCAD, the first company to advocate 3D graphics and VDI



Thomas Poppelgaard, a pioneer of 3D graphics in virtual and hosted desktop environments



Derek Thorslund, director of the HDX Product Management* group at Citrix

Gensler needed a solution that would enable remote collaboration between globally dispersed offices, architects, and consultants—without delays and with an outstanding user experience. Gensler began to address the problem by using Citrix XenDesktop* instead of individual file servers at each office location. This initial phase “was good enough to let architects collaborate from their offices [remotely],” Dacanay says, even though it lacked virtualized GPU (vGPU) technology. Then, when vGPU became available, Gensler implemented this technology in what became “a major, pivotal moment in our company,” according to Dacanay. “We were able to push out more projects on this platform.” Even more critical, the two-week waits are gone because Gensler architects and consultants now work in real-time on shared graphics files.

“When vGPU became available, we integrated it with XenDesktop and that was a major pivotal moment in our company.”

— Jason Dacanay,
IT/server systems administrator
and Citrix VDI manager, Gensler

Virtualizing the GPU can revolutionize how IT enables people to operate when requirements include data visualization and the need to collaborate efficiently amongst multiple users. This new approach is especially impactful in graphics-intensive industries such as architecture, finance, or healthcare.

Adam Jull, whose company, IMSCAD, deploys virtualized graphics solutions for customers across multiple verticals, observes that users often don’t understand the value that a GPU adds to a virtualized environment until they have experienced the before-and-after difference in a virtualized graphics deployment.

This holds true in Dacanay’s experience; Dacanay’s users were highly satisfied with their ability to collaborate and with system performance. “When we introduced vGPU, [the users] were feeling like, ‘This is as close to a physical desktop as possible,’” Dacanay explains. The architects loved the ability to collaborate in real time.

Considerations in a Virtualized Graphics Deployment

To ensure users have a positive experience, implementing virtualized graphics solutions requires thoughtful consideration of a number of factors, including overall infrastructure and an organization’s unique combination of use cases and applications. Poppelgaard advises that IT organizations test different use cases thoroughly to determine what level of GPU performance an infrastructure might require within the context of the available network capacity, protocols, and endpoints.

General infrastructure is critically important, especially when dealing with long distances over the WAN, according to Jull. He and Poppelgaard recommend 10-gigabit network adapters, solid-state drives (SSDs) for local servers, and that compute, storage, CPU, and GPU all be together in the same rack, if possible, and certainly in the same data center. Organizations lately are deploying hyper-converged infrastructure to achieve the benefits of having CPU and storage in the same enclosure.

While user experience is paramount, IT managers must also consider the return on investment (ROI) from vGPU technologies. Gensler found ROI in time savings and productivity improvements when vGPU eliminated the two-week delay in collaborating on complex architectural graphics. Real-time collaboration and an outstanding user experience allow employees to work faster and more productively, which can result in dramatic cost savings. That ultimately counted for more than the price tag at Gensler. Poppelgaard agrees, stating that “the really big money is when you can let people work faster.”

At Gensler, the VGP solution grew in popularity—so much so that Dacanay had to scale out across two data centers and implement an expanded solution. Gensler has seen a dramatic return on time investment for Citrix XenDesktop* with vGPU because these solutions help Gensler and its employees eliminate the churn involved with collaboration. It is because of this success that Gensler is looking forward to extending its use of vGPUs into cloud infrastructures, especially for users in countries with limited Internet access.

Virtualized Graphics Delivery

Intel® Xeon® processors provide graphics and compute capabilities on the processor. By placing the CPU and GPU side-by-side in the same silicon, performance improves, and power consumption and data latency decrease. Other embedded technologies further support graphics-intensive applications:

- Intel® Graphics Virtualization Technology (Intel® GVT) provides built-in hardware support for graphics virtualization, which enables enterprises to give remote users hardware-accelerated access to Intel® Iris™ Pro graphics.
- The Iris Pro graphics API provides the flexibility to dedicate graphics processing resources based on user need. For example, a single remote designer or engineer using a dual-monitor setup might require the dedicated resources of an entire GPU, whereas a larger pool of users with lower processing and graphics-resource requirements might share graphics processing resources.

With Intel GVT-g, a single physical GPU can be shared by up to seven simultaneous users, depending on applications and usage models.² The Citrix HDX 3D Pro* optimization in Citrix software makes use of Intel's graphics acceleration to deliver a smooth, responsive experience to remote users. Consistent, high-quality user experiences can be provided with as little as 1.5 megabits per second (Mbps) of network bandwidth and with round-trip latency as high as 200 milliseconds (ms).³

Application Delivery

Citrix technologies like Citrix XenApp* and Citrix XenDesktop*, running on high-density servers powered by the Intel Xeon processor family with integrated Iris Pro graphics, can provide IT organizations with a flexible remote desktop or a virtual app-delivery method for multiple users, even when graphics-intensive applications are involved.

- XenDesktop and XenApp can deliver full desktops or single applications, including graphics-intensive programs, to any device. These desktops and applications, delivered as services, provide the same capabilities that users experience when using native workstations.
- HDX 3D Pro is a set of graphics-acceleration technologies designed to optimize the virtualization of rich graphics applications. It extends the capabilities of Iris Pro graphics to XenDesktop. HDX 3D Pro enables IT to deliver rich graphics to any device—over any network—with the equivalent experience of working on a desktop PC.

Conclusion: Employees Can Work Faster and Collaborate Seamlessly with Transformational VGP Technology

The Intel and Citrix VGP solution enables user collaboration and mobility while supporting IT's need to balance efficiency and security with user experience. Whether users are working with computer-aided-design (CAD) software or more common browsers and office-productivity applications, they can enjoy the graphics processing and acceleration normally associated with dedicated workstations while working remotely and collaborating with coworkers.

VGP promises to change the way that work gets done when graphics are involved. It's not just about seamless collaboration, it's about dramatic improvements in how quickly and smoothly that collaboration can happen.

“The performance is excellent because the CPU and GPU are integrated on the same silicon, so you get that really snappy performance even across the WAN.”

— Adam Jull, founder and CEO, IMSCAD



Learn More

Find out more about how Citrix software takes advantage of Intel® Graphics Virtualization Technology (Intel® GVT-g) on Intel® Xeon® processors and see if the solution makes sense in your environment.

To hear more about virtualized graphics processing from Gensler's Jason Dacanay and others, listen to the full Citrix Synergy 2016 panel: http://live.citrixsynergy.com/2016/player/ondemandplayer.php?presentation_id=5ffc42f4-2502-484b-b112-443254280b48

Find out how Intel and Citrix support graphics-intensive applications:

- "Enterprise 3-D Visualization Everywhere": intel.com/content/www/us/en/enterprise-mobility/enterprise-3d-graphics-everywhere.html
- "Server-Hosted Workstations Made Easy": intel.com/content/www/us/en/workstations/xeon-e3-1200-iris-pro-graphics-citrix-paper.html



¹ All direct and indirect quotations come from a 2016 Citrix Synergy panel discussion featuring Jim Blakley, Derek Thorlund, Thomas Poppelgaard, and Adam Jull. http://live.citrixsynergy.com/2016/player/ondemandplayer.php?presentation_id=5ffc42f4-2502-484b-b112-443254280b48.

² Jim Blakley. Intel IT Peer Network. "Enabling Anywhere, Anytime Design Collaboration with Intel Graphics Virtualization Technology." May 2016. <http://itpeernetwork.intel.com/enabling-anywhere-anytime-design-collaboration-with-intel-graphics-virtualization-technology/>.

³ Citrix. "HDX 3D for Professional Graphics." http://support.citrix.com/servlet/KbServlet/download/23011-102-642443/HDX_3D_Pro_Graphics_1.1_-_Administrator's_Guide_0070.pdf

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