

CUSTOMER SUCCESS STORY | HKS, INC.

CONNECTING A GLOBAL WORKFORCE FOR DESIGN COLLABORATION



Image courtesy of HKS, Inc.



VIRTUAL GPUS HELP ARCHITECTS REMOTELY LEVERAGE DIGITAL RESOURCES TO SUPPORT FASTER INNOVATION.



Image courtesy of HKS, Inc.

INTRODUCTION

HKS, Inc. is a leading design firm with international recognition for its award-winning architectural and interior design projects. Since its founding in 1939, the company has expanded to 27 locations across the globe and has widened its expertise beyond architects and interior designers to include researchers, urban designers, and more. To enhance innovation, HKS recently prioritized improving worldwide team collaboration by upgrading its client computing environment to virtual workstations with NVIDIA virtual GPUs (vGPUs).

CUSTOMER PROFILE

HKS

Company
HKS, Inc.

Industry
AEC

Founded
1939

Location
Dallas, Texas

Size
1,400 employees

Website
www.hks.com



Images courtesy of HKS, Inc.

SUMMARY

- > HKS, Inc. wanted to upgrade its remote design environment for architects and designers.
- > New VMs needed to deliver a high-end experience for users collaborating on 3D applications.
- > The IT team deployed infrastructure installed with NVIDIA® T4 GPUs powered by NVIDIA® Quadro® Virtual Data Center Workstation (Quadro vDWS) software.
- > Today, NVIDIA vGPU-enabled VMs enable a global workforce to collaborate on large scale design projects in real-time.

SOFTWARE

- > **Hypervisor:** Citrix Hypervisor
- > **Graphics Acceleration:** NVIDIA Quadro Virtual Data Center Workstation (Quadro vDWS)

HARDWARE

- > **Server:** Cisco UCS C240 servers
- > **GPU:** NVIDIA T4

REASONS FOR NVIDIA

- > Remote access to high-end workstation performance for graphics-intensive 3D applications
- > Faster VMs increase productivity and accelerate innovation
- > Access to 3D applications from anywhere supports collaboration
- > Running simulation workloads on VMs frees up compute resources on physical workstations for other graphics intensive tasks

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CHALLENGE STATEMENT

HKS has built a reputation for designing imaginative, remarkable environments for work, play, and living. As the firm has expanded worldwide, it has maintained a belief that great design begins at the local level. As a result, it was an early adopter of virtual desktop infrastructure (VDI) to facilitate collaboration between regional and international offices. One of the first iterations of its VDI environment featured a shared pool of GPU-enabled virtual machines (VMs) for running resource-intensive 3D applications.

Early on, architects, designers, and engineers used these VMs to remotely work together on shared projects. They also used them on the road to access applications such as Autodesk Revit and Navisworks, Enscape, McNeel Rhino, and Trimble SketchUp on their laptops and tablets. Some users found them convenient for running 3D simulations so they could avoid tying up limited resources on their physical workstations. Over time, however, the VMs slowly fell into disuse. “Virtual workstations stopped delivering a high-end design experience,” said Michael Smith, director of infrastructure at HKS. “Software outpaced our infrastructure capabilities. Essentially, the environment was topped out. It couldn’t be updated, and it had grown unstable.”

Recently, as large scale projects at HKS ramped up around the globe, the lack of high-performance VMs was increasingly a challenge for architects and designers. “GPU resource-intensive programs are a part of our daily workflows. Our local teams needed to be able to generate real-time visualizations as they worked with their international colleagues on large scale projects like sports stadiums, hospitals, and hotels. This was no longer possible,” said Chris Weatherford, practice technology solutions manager at HKS. To ensure architects and designers could collaborate effectively, HKS needed to update its shared VMs to accelerate innovation.



Images courtesy of HKS, Inc.

“NVIDIA Quadro vDWS-powered VMs have really extended our ability to utilize our global workforce in a much more efficient manner.”

Michael Smith
Director of Infrastructure
HKS, Inc.

SOLUTION STATEMENT

The IT team’s goal was to deploy GPU-enabled virtual workstations that delivered a high-end experience for 3D digital Building Information Modeling (BIM) tools and other 3D design applications. “We wanted to build a remote design environment that was so good it would get architects and designers out of the modality of ‘I have to carry around my eight pound laptop to do high-end design’,” said Smith. The plan was to build the project in phases with the first phase serving as a proof of concept. HKS intended to expand the environment year after year. This meant the environment needed to be modular so that as adoption grew the IT team could easily scale up by simply adding another node.

The new VMs would be run on four Cisco UCS C240 servers installed with 16 NVIDIA T4 GPUs, four GPUs per server. “We chose NVIDIA T4s because we wanted to ensure a great user experience, and they were the most powerful cards available for virtual workstation workloads,” said Weatherford. “And the Cisco servers not only provided access to the newest processors, their architecture was also a good fit for our use case.” The IT team virtualized the T4 GPUs using NVIDIA Quadro vDWS software. For the first phase they purchased 100 Quadro vDWS licenses, assigning all users a 4Q profile. With this profile size, 16 users fit on each server.

The pilot phase started in the fall of 2019. To help the IT team understand the capabilities and limitations of the new infrastructure, power users on the old environment were invited to help with testing. Soon the new shared VMs were released company-wide, and by March 2020 there were approximately 60 regular users. “We only had 50 licenses for the old VMs, which were very underutilized. In essence, we’ve already seen a 200 percent improvement in adoption over what we had before,” said Smith. “Once we get adoption up around the 75th percentile, we’ll scale up. We expect to add at least 100 more NVIDIA Quadro vDWS licenses within the next 12 months.”



Image courtesy of HKS, Inc.

RESULTS STATEMENT

Today architects and designers at national and international offices log into HKS's new shared remote design environment whenever they need to work together. "The ability to work on large projects in real-time with people based in geographically disparate locations—such as New Delhi, Singapore, and Shanghai—has been incredibly powerful. Now teams can collaborate on platforms like Revit instead of engaging in an iterative design process. We're already seeing the benefits of this approach. For example, right now our Dallas team is working on a new Texas Rangers baseball stadium. Even though it's a very large model, our architects in Singapore and New Delhi can easily contribute their expertise," said Smith. "NVIDIA Quadro vDWS-powered VMs have really extended our ability to utilize our global workforce in a much more efficient manner."

NVIDIA technology enables HKS global team collaboration because vGPUs significantly speed up the virtual environment. As a result, remote architects working on large projects don't have to spend a lot of time waiting for files to load and save. "Autodesk told us that one of our models was the largest they'd ever seen. We've heard that multiple times specifically with some of our sports stadiums, which feature a lot of seating and entourage. With the old environment, the largest models could take up to an hour to open on a local desktop in a remote location. On our new infrastructure, files are more stable, they open quicker, and saves to central are much faster. Depending on model size and complexity, we've probably seen a 70 percent increase in open and save speeds with our NVIDIA Quadro vDWS-powered VMs," said Weatherford. "All of this increases productivity and reduces downtime."

Another benefit of the new infrastructure is that architects and designers can stay productive on their physical machines while running simulations. With a software app like IESVE, architects can create models to predict the effects of interior lighting as well as sunlight during various times of day. "With the old environment, it would take between six and eight hours to render those studies and the process would consume all of the resources on the chain," said Smith. "Now architects can multitask by running those simulation workloads on NVIDIA vGPU-powered VMs to get quick results, and in the meantime they can use their physical workstations to complete other critical deliverables."

Beyond the benefits of NVIDIA vGPU technology, the IT team really appreciated the hands-on involvement and technical coordination provided by the NVIDIA team. "People don't typically think: 'NVIDIA can help me realize my technology goals.' But from my experience—compared to all the technology companies I've worked with—NVIDIA has some of the best and most dedicated folks that I've ever worked with on a project," said Smith.



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Chris Weatherford
Practice Technology Solutions
Manager
HKS, Inc.

LOOKING AHEAD STATEMENT

When the latest NVIDIA Quadro RTX 8000 GPU was released in late 2019 the IT team was eager to try it. “We got an RTX 8000 GPU for the Dallas team working on the Texas Rangers stadium. The team is using Revit and custom tools built in Unreal Engine. To date, it’s the largest model we’ve ever built. After they worked on the model with the RTX 8000 GPU, the feedback we got was phenomenal. One of the architects said that being able to show the entire model with ray tracing on an application that utilizes RTX is unprecedented within our industry,” said Smith. “RTX is really a game changer for us.”

The NVIDIA RTX GPU features CUDA, Tensor, and RT Cores. Its Turing architecture is designed to efficiently handle multiple simultaneous tasks to accelerate a variety of complex workloads, including graphics, deep learning, artificial intelligence (AI), rendering, simulations, ray tracing, and more. “As we look ahead at further infrastructure upgrades, we’re talking about adding RTX GPUs to our servers to take advantage of RTX for rendering and simulation workloads,” said Weatherford. “RTX-enabled servers would make it possible for us to offer server-based rendering to everyone.”

HKS is also considering how [NVIDIA Omniverse™](#) might assist with its future projects. “NVIDIA Omniverse has capabilities that look absolutely amazing. Essentially, it enables you to edit any aspect of any 3D model and then watch updates happening in real-time. That makes it an incredibly powerful collaboration tool for remote teams, which could significantly speed up the design iteration process,” said Weatherford. “Another compelling use case is for architects and designers creating charrettes—essentially sketching out ideas in front of clients as they’re discussing them. NVIDIA Omniverse is a very impressive tool, and we can definitely envision integrating it into our production pipeline in the future.”

To learn more about NVIDIA virtual GPU solutions, visit: www.nvidia.com/vgpu
www.nvidia.com

