

SUCCESS STORY | UNIVERSITY OF ARKANSAS

UNIVERSITY OF ARKANSAS DELIVERS STATE-OF-THE-ART EXPERIENCES WITH NVIDIA VIRTUAL GPU TECHNOLOGY



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WITH A GRAPHICS-ACCELERATED VDI ENVIRONMENT, STUDENTS CAN ACCESS ALL THEIR APPLICATIONS—ANYTIME, ANYWHERE, FROM ANY DEVICE.



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REASONS FOR NVIDIA VIRTUAL GPU TECHNOLOGY

- > Improve students' access to lab applications regardless of location or device
- > Provide desktop-like performance on any type of device, even on low-cost PCs like Chromebooks and tablets
- > Lower latency when working with graphics-intensive applications and streaming video
- > Streamline maintenance of end points across the university

Founded in 1871 as a land-grant institution, the University of Arkansas is the flagship of the University of Arkansas System. The university has 10 colleges and schools offering more than 210 programs for its 27,000 students, who represent all 50 states and more than 120 countries. The University of Arkansas is consistently ranked among the nation's top public research universities and best values in education. It's known for its "students first" philosophy, and it works hard to ensure a low student-to-faculty ratio that promotes personal attention and mentoring opportunities. The Carnegie Foundation classifies the university as having "the highest possible level of research," placing it among the top 2 percent of colleges and universities nationwide.

CUSTOMER PROFILE



Organization
University of
Arkansas

Industry
Education

Location
Fayetteville, AR

Founded
1871

Size
27,000
students

Website
uark.edu



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SUMMARY

- > The University of Arkansas is ranked among the nation's top public research universities, with 27,000 students attending its 10 colleges and schools.
- > With a bring-your-own-device (BYOD) policy, the university wanted to provide its students with access to graphics-intensive engineering and design applications, anywhere, anytime, on any device.
- > The central IT organization also wanted to lighten the maintenance workload of the colleges' smaller IT groups, allowing them to focus on higher-value projects.
- > The university rolled out a new graphics-accelerated VDI environment leveraging NVIDIA Quadro® Virtual Data Center Workstation (Quadro vDWS) and NVIDIA GRID® to provide access to powerful lab applications and a desktop-like user experience for its students.

CHALLENGE

The University of Arkansas, with its 10 colleges and schools serving 27,000 students, is committed to putting its students first. As such, when the university recently brought on a new chief information officer (CIO), he mandated that the university's IT organization reevaluate how it approached the students' technology needs. The university allows students to use their own devices, but some classes required that students use certain applications located in a specific lab in a specific building, which was sometimes only accessible at a specific time. As Stephen Herzig, the university's director of enterprise systems explained, "This was problematic for some students, particularly for nontraditional students who lived off campus." Herzig and his team knew that implementing a virtual desktop infrastructure (VDI) environment could help solve the problem of accessing these applications anywhere at any time.

In addition, the university has a central IT organization that manages the enterprise-level infrastructure and applications, but each of the 10 colleges also has a "distributed IT organization" that manages its custom applications and infrastructure. These smaller IT groups were spending a significant amount of their time managing end points, whether it was a desktop, a laptop, or the lab. Herzig recognized that reducing the maintenance work would free up time and resources for these IT groups to engage in high-value projects for their organizations.

Similarly, the university's staff and faculty each have end points on their desks that require routine maintenance and upgrading. Herzig and his team realized that, if the central IT organization could streamline maintenance through a virtualized environment, they could deliver better service to faculty and staff across campus.

SOFTWARE

Graphics Acceleration:

NVIDIA Quadro vDWS, NVIDIA GRID Virtual PC (GRID vPC) and GRID Virtual Apps (GRID vApps)

Hypervisor: VMware View on vSphere

HARDWARE

GPU: NVIDIA® Tesla® M10

Server: Dell R730

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Steve Herzig
Director of
Enterprise Systems,
The University
of Arkansas

Finally, Windows 10 is being rolled out campus wide. The graphics-intensive nature of the operating system combined with the graphics requirements of powerful CAD, design, and animation applications in the labs, such as Autodesk, Rhino, Maya, and Adobe Creative Suite, posed a daunting challenge. The team knew that a GPU-accelerated VDI environment would be the only way to provide anytime-anywhere access to any application that a student, faculty, or staff member could possibly need.

SOLUTION

Jon Kelley, associate director of enterprise innovation within the enterprise systems organization, led the architecture and development of the VDI solution for the campus. When Kelley and his team started building the university's VDI environment, they focused on optimizing Windows 10 with NVIDIA GPUs in mind from the very beginning. They purchased the NVIDIA Quadro vDWS for Education license, which provided access to GRID vPC and GRID vApps for the Windows 10 virtualized environment, and Quadro vDWS to virtualize the graphics-intensive CAD and design applications in the labs.

Working against an aggressive timeline, the team targeted three general-access computer labs for the initial rollout. While Kelley's team built the backend infrastructure, a support team and communications team vetted the changes required to transform the existing lab environment to the graphics-accelerated VDI lab. The teams worked through usability scenarios and conducted end-user testing, providing feedback to Kelley's team and fine-tuning the VDI settings. In a matter of 36 hours over spring break, the team rolled out 300 machines and the VDI lab went live.

Since that time, Kelley's team has continually improved the university's VDI environment to make it highly available and enterprise ready. And there's been an overwhelming demand to roll out VDI to additional labs across campus. The university currently has a 90 percent conversion rate of their labs. Out of 800 lab machines that existed, only 75 are left. The printer has become the loudest thing in the lab, and the lab is no longer hot. Herzig estimates that, within a year of the initial rollout, Kelley's team will have converted 100 percent of the labs to VDI. Their current cluster supports approximately 1,400, with peak concurrent usage ranging from 600 to 700.



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The increased use of video and multimedia across the university has benefited from GPU acceleration. The university enhances digital learning with interactive videos and even enables students to take tests online on their own devices, securely at home with ProctorU. Students also often create video presentations using Camtasia Studio. Even university staff uses video and multimedia in their day-to-day work. For example, the communications team performs a lot of video rendering. Because of the offloading of tasks from the CPU to the GPU, NVIDIA virtual GPU (vGPU) enables a much better experience. The rendering that once took more than 30 hours can now be done in three.

Beyond the labs, the university has expanded the use cases for virtualization: Their police department is using VDI to access important security resources used daily on campus as well as at large sporting events. They're also in a pilot using VMware Workspace ONE to deliver remote applications in their apps portal to approximately 5,000 students—making highly sought-after applications even more accessible to students.

In particular, the GPU-accelerated VDI for the university's game design lab was a game changer for its students. As part of the coursework, students design immersive learning experiences using 3D graphics software such as Maya and Unity. Previously, in order to play the games that they developed, students would need a high-end PC. Explained Kelley, “The gaming experience would vary wildly. Some students would try to play with older laptops and would have an awful experience. Now, with the ability to deliver the gaming applications on VDI, students can play the games on a Chromebook and have the same experience as a high-end PC.”

RESULTS

By offering a GPU-accelerated VDI environment for its students, the University of Arkansas is leading the way in democratizing access to essential educational resources. “No matter what device students using application delivery bring to school,” said Herzig, “they now have access to a Windows environment with GPUs in it. It levels the playing field—and it's critical for those students who may be the first in their families to go to college and don't come to school with many resources. Now when they go home on break, they can access all the same resources as if they were on campus.”

Kelley commented, “GPU acceleration is critical to us. We could not deliver the kind of quality services that we need on campus without it. We needed it for Windows 10, we needed it for students doing CAD and design, and we needed it for the gaming lab. Most of the applications across campus take advantage of the GPU-accelerated environment.”

Beyond the value that the graphics-accelerated VDI has brought to students, the IT and support teams are also realizing benefits. There have been fewer support calls, and the technicians managing the lab have had far fewer issues in servicing and maintaining the equipment. And now the smaller IT groups have more bandwidth to focus on projects that are important to their specific colleges. VDI with NVIDIA virtual GPU has dramatically simplified IT. The university has found that campus organizations that switch to VDI get one to two headcount back, which they can then deploy for other activities.

In the future, Herzig and his team are planning a campus-wide rollout of the VDI solution for all faculty and staff. And, as the university expands into areas such as machine learning and virtual reality, the team is looking into how GPUs in the VDI environment can support and enhance the faculty’s ability to teach those tools to students, no matter what device they use.

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