SUCCESS STORY | STEVENS INSTITUTE OF TECHNOLOGY

FAST REMOTE ACCESS TO GRAPHICS-INTENSIVE APPLICATIONS

Upgrading their virtual environment with NVIDIA GRID™ technology is yielding cost savings and expanding opportunities at Stevens Institute of Technology.

NVIDIA

Students and faculty can access the graphics-intensive applications they need from any location on any device, thanks to NVIDIA GRID technology.

AT A GLANCE

CUSTOMER PROFILE

Company: Stevens Institute of Technology

Industry: Education

Location: Hoboken, New Jersey

Size: Approximately 7,200 students and faculty

SUMMARY

- Renowned private university in Hoboken, New Jersey.
- Issuing individual laptops to students was costly and inefficient.
- Non-GPU-accelerated virtual environment could not run graphics-intensive applications.
- New GRID-enabled environment delivers performance rivaling high-end workstations.

SOFTWARE

Hypervisor: Citrix XenServer

Desktop and Application Remoting: Citrix XenDesktop and XenApp

Key Applications: Dassault Systèmes SolidWorks, Mathworks Matlab, and Adobe® Creative Suite®

HARDWARE

NVIDIA GRID Boards: Quadro K3100M, GRID K1

Servers: HP WS640c Gen8

Clients: Various desktop, laptop, and mobile devices

Founded in 1870 in Hoboken, New Jersey, Stevens Institute of Technology (Stevens) has grown into a premier private research university. Its three schools and one college employ over 380 faculty serving more than 6,800 undergraduate and graduate students in an interdisciplinary, student-centric, entrepreneurial environment to advance the frontiers of science and leverage technology to confront global challenges. Stevens is consistently ranked among the nation's elite for return on investment for students, career services programs, and mid-career salaries of alumni.

CHALLENGE

Technology is extremely important to the Stevens experience. In the past, the university issued workstation-class laptops to all of the 800-900 freshmen arriving each year. Every laptop was loaded with the applications they needed for their courses, such as Dassault Systèmes SolidWorks, Mathworks MATlab, and Adobe® Creative Suite®—an expensive proposition from both a hardware and maintenance perspective. Students used these laptops throughout their time at Stevens, which could easily exceed the normal four years because of work experience or graduate-level studies. The rapid pace of technology meant a steady decline in performance and usability as applications and operating systems continued advancing.

"Many students are enrolled in a variety of engineering courses," said Frank Filogamo, Mobile Computing Technologist at Stevens. "This was the best solution available at the time, but it was not without significant problems. First, the laptops are expensive. Second, each laptop weighs between seven and ten pounds, not counting the charging block. Third, computers become harder and harder to maintain over time. We needed a better way to guarantee access to applications while ensuring performance. Virtualization and remote access seemed like a promising road to take."

Our laptop program was draining funds that we could better use elsewhere, but the lack of GPU acceleration in the virtualized environments was just not working. The engineers at Citrix recommended that we reach out to LANStatus because of their expertise with NVIDIA GRID technology.

David Dodd
CIO and VP of IT
Stevens Institute of Technology

5 REASONS FOR GRID

1. Immediate cost savings from not having to issue individual laptops.
2. Greatly simplified management and maintenance.
3. Graphics performance that rivals workstations.
4. Users can access any application from any device in any location.
5. Expanded opportunities to deliver innovative educational solutions to local and remote students.

SOLUTION

One of the key challenges facing incoming VP of IT and CIO David Dodd was the need to perform a comprehensive refresh of the Stevens IT environment. Their first visualization experiments used HP WS640c Gen8 blade servers running the Citrix XenServer hypervisor to deliver virtualized desktops to users. The environments themselves worked well; however the lack of GPU acceleration rendered graphics-intensive applications unusable.

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Stevens began working with IT solutions provider LANStatus in 2012 to architect a scalable and flexible virtualized infrastructure that would provide fast, reliable access to the environments and applications needed by students and faculty from any desktop, laptop, or mobile device. The university wrote and received a highly competitive grant in 2013 that provided the budget for moving forward. NVIDIA® Quadro® K3000M and K3100M GPUs were installed in the HP servers, with NVIDIA GRID cards added later. LANStatus worked closely with the Stevens IT team to roll out an initial proof of concept followed by a larger test environment and ongoing rollout.

The graphics-accelerated virtualized environment currently consists of 10 blade servers equipped with NVIDIA Quadro K3100M GPUs for users running SolidWorks and other graphics intensive applications. Each server can accommodate up to 17 concurrent users; however, Stevens limits actual concurrency to around 7 to 10 users to allow a wide performance margin. Four additional blade servers equipped with NVIDIA GRID K1 cards allow access to Adobe Creative Suite. Additional

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Frank Filogamo
Mobile Computing
Technologist
Stevens Institute of
Technology

servers provide non-accelerated access to Windows desktops with standard office applications. As part of this effort, Stevens also revamped its WiFi access and network back-end to increase bandwidth and ensure access from any point on campus.

Students access a storefront using the Citrix client. The storefront provides access to a Windows desktop served by Citrix XenServer plus any graphics-intensive application(s) needed by that student. These applications are served directly via Citrix XenApp. This gives students and faculty who prefer to work on specific platforms full access to these applications without forcing them to use any specific environment. HP 3PAR storage with a combination of 15,000RPM and SSD drives further reduces latency.

The deployment encountered a few challenges. Compatible K3100M drivers were not immediately available, which limited performance; however, the graphics acceleration still delivered much improved performance. Another challenge was training users to think beyond traditional desktop and local storage environments—a big change for most people, but one they quickly warmed to once they saw the benefits of fully accelerated access from any location on their personal devices.

RESULTS

"Our first major rollout was in the fall of 2014 when we had 550 freshmen using the new system instead of Stevens-issued laptops," said Karen Swift, Director of User Support Services at Stevens. "We soon realized that XenApp requires a very robust network and installed a new, very fast WiFi system with the best equipment available. Our access points now offer load-balanced access to our 10Gb backbone, which delivers performance rivaling the best laptops and workstations we've used in the past. Getting people accustomed to this change had its challenges, but people don't look back once they've seen the power and flexibility of the GRID-enabled virtual environment."

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Karen Swift
Sr. Director of
User Support Services
Stevens Institute of
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"This major change to how we deliver technology to our students will easily save us more than a million dollars per year," added Dodd. "Beyond that, not having to focus on supporting hundreds of individual machines means that we can think far more strategically. New Jersey funded this program to help develop a stronger workforce that will improve our economy by expanding science, technology, engineering, and mathematics (STEM) education and making that education available over any 4G wireless connection. With this new system, there are few limits to how we can innovate education and delivery. We are actively working with our administrators and faculty to keep identifying new opportunities to expand how we use our GRID-enabled virtual systems."

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