



Georgia Tech Customer Spotlight

Georgia Institute of Technology, one of America's top research universities, deploys Citrix XenDesktop HDX 3D Pro technology within the College of Engineering to provide students with anywhere access to a virtual engineering lab that hosts the latest graphic intensive engineering applications.

At a Glance:

Customer Profile:

- Company: Georgia Institute of Technology
- Industry: Education
- Location: Atlanta, GA
- Size: 21,000 students

Summary:

- Internationally recognized science and technology-focused public institution
- Implemented Citrix XenDesktop HDX 3D Pro technology to virtually deliver high-powered graphics applications to students
- Mobilizing the student body with anywhere access to advance science and engineering programs from any device
- Consolidated on Citrix and Microsoft technology to simplify management and reduce costs

Software:

- Key applications: Solidworks, NX, Creo, Catia, and FEA/CFD applications
- Desktop & application software: Citrix XenDesktop 7.5 with HDX 3D Pro technology
- Hypervisor: Citrix XenServer & Microsoft Hyper-V

Hardware:

- Thin Clients: Dell WYSE D10/Z10 Thin Clients and student BYOD devices
- GRID boards: NVIDIA VGX K1 and K2
- Servers: Dell PowerEdge R720/R730

Storage:

- NetApp and EMC ExtremIO

Georgia Institute of Technology, commonly known as Georgia Tech, is one of the top public institutions in the United States and recognized worldwide, supporting more than 21,000 students, with a majority of those students enrolled in engineering, computer science and mathematics programs. Georgia Tech, located in Atlanta, GA, is one of the largest industrial and engineering research institutions in the South and acts as a centerpiece of the state's economic development strategy.

The Challenge

In order to support the education of this highly technical student population, Georgia Tech requires every student to have a personal computer as part of the institute's Student Computer Ownership policy, with 30% of the student population opting for MacBooks. However, some courses require students to leverage various Windows-only graphic-intensive engineering and mathematical software programs, such as AutoCAD or other complex tools from Intel, Broadcom and Texas Instruments which were only available to students within a limited number of physical computer labs located throughout the campus. At times, especially when end-of-semester projects were due, all the students from a particular class might need access to the lab, which only had a limited number of workstations, creating long wait times. In some instances, students might have to travel across the urban campus late at night to access a lab with a specific piece of engineering software for one course and then travel to another lab to access software for a different course.

In addition to the student impact, the physical computer labs were facing other challenges. Georgia Tech's recognition as a world class technology institute was attracting more students, which increased the demand for

new lab resources. While the existing labs required round-the-clock physical security and during lab hours, a lab admin was required to be onsite to assist with any support issues. The labs also consumed additional power, required constant cooling and occupied valuable real estate within the limited downtown Atlanta campus. With a growing student enrollment and increasing lab complexity, the College of Engineering decided to reassess their computer lab and application access strategy by turning to desktop and app virtualization as their answer.

The Solution

The solution was to virtualize the physical lab workstation to create a virtual lab, known as Vlab. Vlab would enable students to leverage their personal Windows and Mac laptops to remotely access a virtualized instance of the engineering software from anywhere, on any type of laptop device. The College of Engineering was able to virtualize some apps with Microsoft RemoteFX, but with Citrix® XenDesktop® HDX™ 3D Pro technology they could virtualize all their apps including OpenGL CAD/CAM applications and deliver them from a centralized datacenter, consolidating the number of physical workstations and ensuring every student has the same, high-end 3D graphics rendering experience they had in the former physical labs.

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Didier Contis

Director of Technology Services

The College of Engineering began the Vlab project in 2007, the first deployment was structured using a “condominium model, where several academic units invested in an infrastructure that would be able to support multiple technology stacks for virtual desktops. That meant different hypervisors and different general workloads, but they would share the common infrastructure around storage and network,” said Didier Contis, Director of Technology Services for the College of Engineering. While Vlab has gone through several iterations since 2007, with the ‘condominium model’ the common shared infrastructure was still hosting a variety of virtualization products, versions and hypervisors.

In 2014, the College of Engineering in partnership with the Office of Information Technology sought to optimize the Vlab architecture even more. The current app and desktop virtualization environment consisted of a variety of XenApp® and XenDesktop versions including XenApp 6.0, XenDesktop 5.6 and XenDesktop 7.5 for different academic units, including the Colleges of Engineering, Business, Science, Management, and Computing. The administration decided to streamline the environment to simplify management and leverage the strengths offered by running a mixed hypervisor environment with Citrix XenServer® for high-end graphics virtualization and Microsoft Hyper-V for more memory intensive workloads. Moving forward, all app and desktop virtualization will be consolidated using the FlexCast® Management Architecture of XenDesktop 7.5. This XenDesktop architecture increases flexibility by providing more granular delegation to each department participating in the federation. Now, departmental IT groups are able to refresh pools of virtual desktops with minimal or no intervention of the central Vlab Admin group.

Key Benefits

Vlab is able to deliver a virtual lab experience to any student, located anywhere on par with a physical computer lab. The student body is more mobile, powerful engineering software is more accessible, and Georgia Tech is able to rapidly address a growing student population without any real estate confinements. With an increase in distance learning education programs enrollment, students from across the U.S. and throughout the world, Vlab enables a distance learning student located thousands of miles away to have access to the same resources available to an on-campus student. “As an instructor, you can focus more on the instruction side of things and worry less about the logistical issues associated with your class,” said Contis. “It’s about being able to deliver the right tool at the right time, without the change-management process that requires two months’ notice or two weeks’ notice if you need a piece of software installed.”

With Citrix XenDesktop 3D Pro technology and XenServer Graphics Processor Unit (GPU) Pass through technology, students are provided with remote access to graphically intensive CAD/CAM engineering and simulation software programs from any laptop or thin client. With the 3D software application hosted in the datacenter on a server with a high-performance GPU, students can get high definition access to 3D software apps on standard laptops that don’t have advanced GPU capabilities. Making it easier for students to get the access to the engineering app they need, at any time, without being confined to a physical lab environment with restricted hours. Within the existing labs, Georgia Tech replaced the dated lab hardware with low-cost, high-performance Dell Wyse thin clients to reduce costs, save power and simplify management.

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Citrix XenDesktop includes the full power of Citrix XenApp, sharing a unified architecture, so by consolidating all the existing XenApp and XenDesktop environments into a single XenDesktop 7.5 solution, Georgia Tech was able to consolidate the number of management consoles, support both virtual app and virtual desktops from a single platform, while simplify IT operations.

“This technology has enabled us to provide faster service for software and applications,” said Contis. “If you have all of your resources aggregated and you layer on top of it some sort of virtualization, you’re creating a pool of resources that you can quickly repurpose,” said

Contis. “Then, during the summer semester when you don’t need as many machines to support regular instruction, you can create some large virtual machines with a lot of more memory, a lot more CPUs, and assign them to graduate students to support their research activities.” VLab currently provides over 1,500 Virtual Desktops and 50 shared session servers, with plans for expansion. Vlab had radically improved the speed at which the university can deliver new technology, dramatically streamlined university resource consumption, and most importantly made it easier for students to receive the technical instruction that makes Georgia Tech a world-class institute of higher education.

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