Florida Atlantic University – Teradici® PCoIP® Remote Workstation Solution & PCoIP Hardware Accelerator Case Study

CHALLENGE

When the College of Engineering and Computer Science at Florida Atlantic University (FAU) moved to a brand new LEED® (Leadership in Energy and Environmental Design) Platinum-certified building in 2010, the IT department began to explore the possibility of moving its desktops and workstations to the cloud as a means for delivering better service to a growing user base, while reducing maintenance costs and demonstrating its commitment to the tenets of a “green” building.

At the time, administrative staff, faculty and students frequently needed to drive to campus or across campus to access software available only in traditional computer labs. With courses in computer aided design (CAD), game programming and 3D graphics, the IT department needed a virtualization solution that could work for both VDI (administrative staff) and remote workstations (faculty and students), while enabling an excellent remote user experience for distance learners and remote researchers.

SOLUTION

After evaluating several virtualization solutions on the market, the IT team decided to implement the Teradici PCoIP Technology in VMware® Horizon View™ and PCoIP Remote Workstation, based on the AMD® FirePro RG220 remote graphics card. One of the main drivers for this decision was Teradici’s ability to provide seamless integration and management capabilities between office staff on zero client virtual desktops and power users on remote workstations. Leveraging Horizon View Connection Server to broker both types of back-end implementations enabled IT to unify all network optimization on a single remote display protocol for the College of Engineering and Computer Science building’s private cloud.

Today, staff, faculty and students enjoy the simplicity of logging in to the computing resources they need from anywhere on campus – or from home. Labs are no longer dedicated to specific courses, enabling a flexible, high quality, secure virtual workspace for staff and students, while dramatically reducing resource requirements and maintenance costs for the IT department.

From administrative staff on virtual desktops to engineering and computer science students and researchers on remote workstations, Teradici’s PCoIP technology solutions enable the highest quality virtual workspace experience at the College with the lowest IT maintenance costs.
College of Engineering and Computer Science goes green

The College of Engineering and Computer Science’s new building was the first academic building of its kind in southeast Florida to be designed, built and certified to LEED Platinum-level standards. As such, FAU and its local community were placed at the national forefront of energy conservation and environmental stewardship efforts, serving as a model for sustainable virtual computing infrastructures in business and academia.

The FAU facility hosts approximately 150 faculty and staff members, who provide teaching, research and lab services to more than 2,000 students. Notably, 80 percent of its computer resources are deployed and centralized in the building’s private cloud, for both desktops and workstations.

Remote end points are primarily based on PCoIP zero clients, affording users a quick, hassle-free installation in less than 15 minutes. Compared to thin clients, zero clients boast a longer shelf life, lower power consumption and dramatically lower hardware failure rates, at less than one percent (versus 20 percent). In 2011, the IT team took measures to further reduce power consumption by installing 14 Super Micro blade workstations with an x16 slot, thereby eliminating two thirds of the workstation rack space of the initial installation.

Performance boost

From the beginning, boosting remote user performance for workstation applications was a high priority for the College of Engineering and Computer Science. Having implemented a VDI solution several years before, the IT team recognized the need to bring workstation performance up to par.

Teradici PCoIP technology was the deciding factor for choosing the Remote Workstation Card offered by AMD (RG220) – and switching to VMware Horizon View for their virtual desktops.

Teradici’s Remote Workstation Solution combines an AMD GPU with Teradici PCoIP technology in a single PCIe x16 card. Installed in the workstation, the card enables power users to access computing resources locally or from the cloud without any loss of graphics performance. Sourced from a single location without replication of data, faculty and students can be productive anywhere within a secure, high-fidelity virtual workspace.

Following an extensive evaluation of implementation options, the team decided to unify all workstation and VDI back-ends using a single management interface (VMware View Broker), with network settings optimized on a single remote display protocol (PCoIP) and a single set of compatible end points. Since the initial deployment, the College’s IT team has also moved most of its end points to PCoIP zero clients.

Altogether, this unified approach supports a full spectrum of application requirements, within a seamlessly integrated environment at the College, for administrative office workers and engineering power users alike.

Hardware acceleration for desktops and workstations

The College IT team had virtualized the desktops in all of its classes and computer labs, in order to pre-empt any performance and quality issues for graphic-intensive workloads in the VMware Horizon View environment. They understood that if displays lagged, users were not only frustrated with application responsiveness but perceived that the computers themselves were also slow.

To address the issue, they evaluated and ultimately deployed the Teradici PCoIP Hardware Accelerator (APEX 2800). “Teradici offered the exact type of product we needed to manage higher graphic content,” says Mahesh Neelakanta, Director of Information Technology, College of Engineering and Computer Science, Florida Atlantic University. “Now, we can ensure a high-performance user experience without over-provisioning our server, even in peak workloads.”

With the recent release of shared GPU support on VMware Horizon View, the university is investigating the possibility of using the PCoIP Hardware Accelerator in combination with NVIDIA K1 and K2 GPUs to provide an accelerated 3D experience for virtual desktops. This will improve the user experience at the remote end point and maintain the consolidation ratio without sacrificing application performance.

“Teradici PCoIP Remote Workstation solution simplified our daily activities. We’ve had to do more with less. We have to support an increasing number of students and staff with the same number of IT staff. If we had continued with our regular PC infrastructure, we wouldn’t be able to keep up-to-date. Software updates, patches, new revisions, upgrading to Windows 7...any of these would’ve been near impossible. By using VMware View, PCoIP and the zero client technologies, we are able to respond faster to the changes required by our faculty, students and staff.”

Mahesh Neelakanta, Director of Information Technology
Location independence for workstations

Today, the College’s virtual environment affords administrative staff, faculty and students the freedom of a flexible workspace and access to computing resources anytime, anywhere.

“We used to have labs specifically for computer science students, specifically for ocean engineering students, specifically for mechanical engineering,” explains Neelakanta. “This was needed because the lab computers had the specific software they needed. With the cloud, it doesn’t matter because users are just logging into a virtual machine. So they log in to a zero client, connect to a pool and choose which workstation virtual machine they want to connect to. With that flexibility, it doesn’t matter where they are sitting, they can access the cloud desktop from anywhere.”

Simple, easy, system maintenance

Initially, the College installed 200 thin clients and only 60 zero clients, predicting that zero clients might quickly become outdated. Ultimately, they’ve proven far simpler and cost effective to set up, deploy and maintain. Setup is simply a matter of opening the box, plugging in the zero client or integrated monitor, and registering it to the network with an IP address – all in about 15 minutes. Firmware updates are also easily implemented via the Teradici PCoIP Management Console.

In contrast, thin clients consume more power and hardware failure rates are dramatically higher, at 20 percent versus one percent for zero clients. Moreover, the thin client installation at Florida Atlantic University has reached end-of-life earlier than anticipated and is no longer supported by the manufacturer, which has accelerated migration to Dell P20 zero clients and P25 zero clients.

Project achievements

- **Seamless Integration.**
  The transition to a simplified, centralized computing infrastructure is meeting the demands of a diverse population, ranging from zero client virtual desktops for day-to-day office work to virtual workstations for graphic-intensive engineering applications (AutoCAD, SolidWorks, etc.) and research labs.

- **Simplicity**
  The College’s IT team is delivering superior service and support to a growing population of users at a significantly lower maintenance cost, with fewer staff members.

- **Location Independence**
  Students and researchers now have immediate access to computing resources from anywhere, at any time, eliminating the need to commute back and forth to traditional labs on campus or across campus.
ABOUT FLORIDA ATLANTIC UNIVERSITY

Florida Atlantic University, established in 1961, officially opened its doors in 1964 as the fifth public university in Florida. Today, the University, with an annual economic impact of $6.3 billion, serves more than 30,000 undergraduate and graduate students at sites throughout its six-county service region in southeast Florida. FAU’s world-class teaching and research faculty serves students through 10 colleges: the Dorothy F. Schmidt College of Arts and Letters, the College of Business, the College for Design and Social Inquiry, the College of Education, the College of Engineering and Computer Science, the Graduate College, the Harriet L. Wilkes Honors College, the Charles E. Schmidt College of Medicine, the Christine E. Lynn College of Nursing and the Charles E. Schmidt College of Science. FAU is ranked as a High Research Activity institution by the Carnegie Foundation for the Advancement of Teaching. The University is placing special focus on the rapid development of three signature themes – marine and coastal issues, biotechnology and contemporary societal challenges – which provide opportunities for faculty and students to build upon FAU's existing strengths in research and scholarship. For more information, visit www.fau.edu.

ABOUT FAU’S COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

Florida Atlantic University’s College of Engineering and Computer Science is committed to providing accessible and responsive programs of education and research recognized nationally for their high quality. Course offerings are presented on-campus, off-campus, and through distance learning in bioengineering, civil engineering, computer engineering, computer science, electrical engineering, geomatics engineering, mechanical engineering and ocean engineering. For more information about the College, please visit www.eng.fau.edu.

ABOUT PCOIP TECHNOLOGY

The PCoIP® (PC-over-IP®) protocol is a revolutionary display, encryption and remoting technology. The PCoIP protocol compresses, encrypts and encodes the entire computing experience at the data center and transmits it 'pixels only' across a standard IP network to stateless PCoIP desktop devices.

PCoIP technology allows an organization's PCs and workstations to be centrally managed in a data center while providing high resolution, full frame rate 3D graphics and HD media, with full USB peripheral interoperability, locally over a LAN or remotely over a high-latency WAN.

ABOUT TERADICI

Teradici technology is the fabric of the virtual workspace. We power the spectrum of local, remote, mobile and collaborative workstyles, fundamentally simplifying how computing is provisioned, managed and used.

Our PCoIP technology is deployed end-to-end in virtual environments, delivering a secure, high-definition computing experience.

Teradici customers benefit from a broad product ecosystem, and include Fortune 500 enterprises, governments, and cloud providers.

PRODUCTS USED

- VMware Horizon View 5.2.1
- Dell Wyse P20 Zero Clients
- Dell Wyse P25 Zero Clients
- AMD ATI FirePro RG220 remote graphics cards
- NVIDIA K1 & K2 GRID GPUs
- Teradici PCoIP Hardware Accelerator (APEX 2800)
- Teradici PCoIP® Management Console