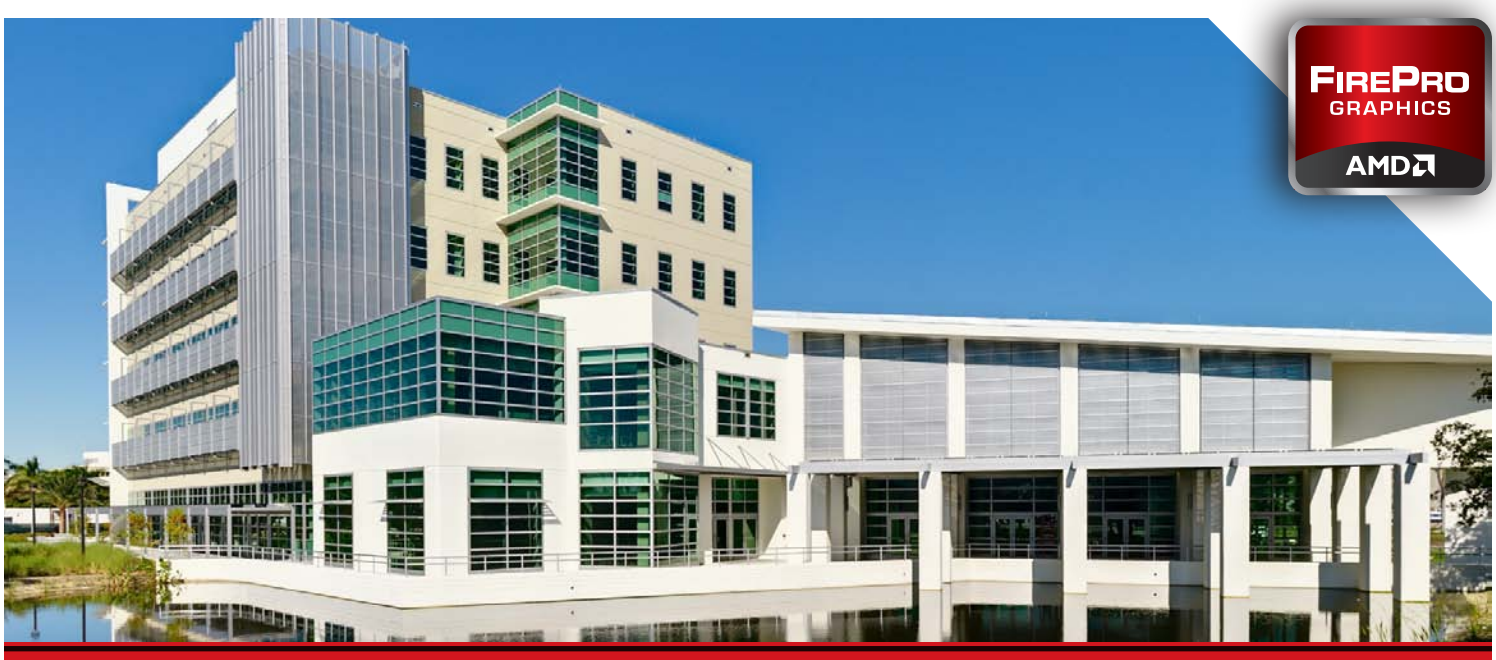


UNCOMPROMISED THIN CLIENT COMPUTING

ATI FirePro™ RG220 remote workstation graphics help FAU's College of Engineering & Computer Science deliver graphically rich computing experiences from the data center

Pushing boundaries

"It is time now...for a new, adventurous, imaginative, courageous breakthrough for a new revolution in education in America," challenged President Lyndon B. Johnson at Florida Atlantic University's dedication ceremony in 1964. With those words, FAU opened its doors as the first public university in southeast Florida and continued to push the bounds of higher education. Nearly 50 years later, it serves 28,000 students on seven campuses and sites.

FAU rose to the President's challenge many times – from instating the first woman to head a public university in Florida, to winning the first International Human-Powered Submarine Race, to the unique distinction of being the only university in the country to have its own recording label. In Nov. 2010 the College of Engineering & Computer Science opened one of Florida's most environmentally friendly buildings and one of the first academic buildings in Southern Florida to meet the highest Platinum LEED standards. Built on the Boca Raton campus, the new building places the University, College and local community at the national forefront of energy conservation and environmental stewardship efforts and acts as a catalyst for building sustainable infrastructures.

Finding the right solution

With its new sustainable building the College looked for ways to reduce its carbon footprint, including a commitment to 50% more energy efficiency than a conventionally designed facility. While making plans to outfit one of the student computing labs, Dr. Thomas Fernandez, senior instructor with the department of Computer & Electrical Engineering and Computer Science, considered thin client computing solutions instead of traditional desktop PCs. In line with the College's commitment to energy conservation, thin client solutions are deployed in a server room and consume less energy than PCs. Because there aren't any physical computers in the lab it's quieter, the ambient temperature doesn't rise when all of the computers are on and space previously taken up by PCs is freed up for more students or other equipment.

"The only real issue was my skepticism. I was less than impressed with the thin client solutions I'd seen in action and really didn't think video game programming could be done successfully. In addition to video game development, I teach classes on graphical application development, artificial intelligence and logic design, and any thin client PC solution we chose to implement needed to be powerful enough to accelerate real-time 2D and basic 3D graphics," said Fernandez.

Tasked with finding a thin client solution capable of meeting Dr. Fernandez's needs, Mahesh Neelakanta, director of the College's Technical Services Group, started researching and evaluating options. He decided on AMD's ATI FirePro™ RG220 remote workstation graphics cards, installed in Lenovo C20 ThinkStations and Supermicro DatacenterBlade Modules (SBI-7426T-SH) in a cabinet in the College's server room. In the lab, Wyse P20 and EVGA PD02 zero client PCoIP platforms were connected to displays, mice and keyboards. The deployed ATI FirePro RG220 remote workstation graphics cards compress and transmit data to and from the Wyse and EVGA clients, and because all three hardware solutions are based on PCoIP technology from Teradici, the combined solution delivers an uncompromised user experience to each desk in the lab while minimizing the inherent security risks associated with transmitting data across a network.

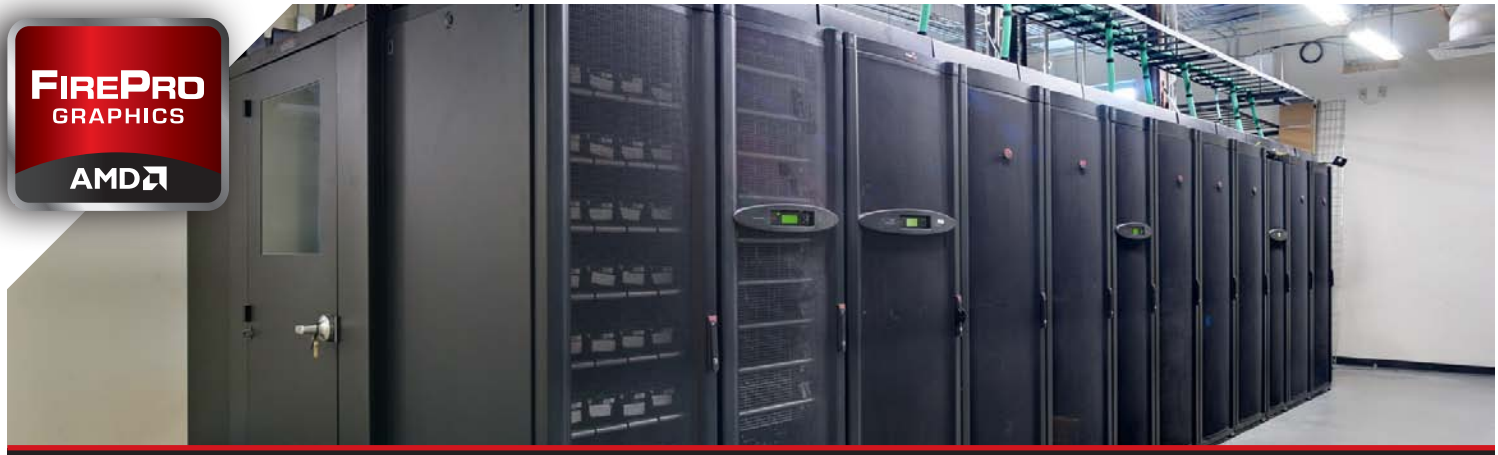


Image courtesy of Stuart Goby, Island Studio Photography.

ATI FIREPRO™ RG220 PROFESSIONAL GRAPHICS

Seeing is believing

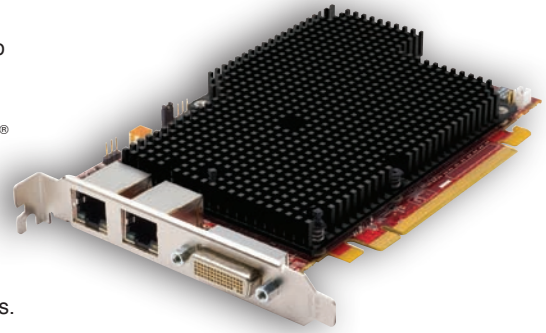
"Our new sustainable building is a field of dreams and the possibilities are endless and exciting. The University is gung ho on new technologies like remote computing and the College of Engineering & Computer Science was the first college on campus to pursue it. With the ATI FirePro RG220 remote workstation graphics cards from AMD and the Wyse and EVGA portals, not only were we able deliver the computing power Dr. Fernandez needed, we also made him a believer in thin clients," said Neelakanta.

The College finished deploying the remote graphics solution and completed testing near the end of May 2011. When designing and playing games the scenery and characters are constantly changing and moving, putting a lot of pressure on the PCoIP processors in the ATI FirePro RG220 graphics cards. "The results were remarkable. I loaded up numerous sprites (two dimensional images/animations) and they moved around so fast. When we tested 3D elements or when an entire screen was changing at once, instead of bogging down the entire system and freezing everything, only a handful of tiny pixelated squares appeared in a few sections. When working with real-time graphics I truly believe this is a good fix when a problem occurs because programming doesn't come to a complete halt. The pixelation only lasts for a few seconds and the fact that a problem is occurring is almost imperceptible," said Fernandez.

It was decided to put everything through a real world test during summer break when Dr. Fernandez and other professors at the College would lead a three-week summer camp for middle-school kids recommended by their math and science teachers. The lab was used for the game programming class, and Microsoft® Visual Studio and XNA Game Studio were installed on the blades in the server room. Thirty-six kids working in teams used the remote computing systems to create side scrolling games, where the characters start at a fixed point and moved forward through scenes.

"The other solutions we'd tested were useless for real-time graphics. Audio was delayed and we experienced corruption issues. We didn't experience any of these issues with AMD's ATI FirePro RG220 remote workstation graphics cards," said Neelakanta.

For system management the College uses Teradici's PCoIP management console. It allows IT administrators to update device firmware from the server room, even when the lab is in use, and then remotely shut-down and restart the systems once class is over. "Instead of going into the lab and turning off each system one by one, we can do it all at once easily from the server room, which helps us to conserve energy when the lab is not in use," said Darin Jamraj, student assistant, who helped Neelakanta deploy and test the implementation. "This solution is definitely more convenient for us, the students and faculty. We're no longer at the mercy of class schedules and can make updates when it's convenient for us without interruption. Not to mention the lab is much quieter and cooler without noisy, hot PCs, which helps the students to focus more on the task at hand."



Uncompromised computing

"My only complaint is that we don't have enough of the ATI FirePro RG220 remote workstation graphics cards. I really didn't think it was possible to program or play video games on a thin client solution, and during breaks the kids would play flash games and watch videos online without issue. I truly didn't believe robust thin client computing was a possibility today and I have to say it's so nice to be proven wrong," said Fernandez.

The College plans to purchase several more ATI FirePro RG220 remote workstation graphics cards to round out the graphics lab, and during the fall semester the College plans to set up a similar lab for the Department of Transportation. The lab will be powered by a server room at least a half mile away and Neelakanta is confident AMD professional graphics will deliver the sub-millisecond experiences they need to deliver uncompromised computing experiences.

For more information, visit www.amd.com/firepro

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