

VIRTUAL WORKSTATIONS PROVIDE A LOW-COST OPTION

By Jim Baumann, Esri

Talbot Brooks was faced with a dilemma. As the longtime director of the GIS center at Delta State University, he had carefully constructed a program around the university's Esri site license. That program had become a lighthouse installation for other colleges developing their own GIS programs. However, he was becoming the victim of his own success.

Brooks' online GIS courses were increasingly popular among both off- and on-campus students. He found himself in an annual struggle with his administration for funds to maintain the servers for his teaching lab. Because his online students were located in many different parts of the world, they required access to ArcGIS when and where they needed it. In addition, his students were progressively moving away from desktop computers in favor of tablets that let them learn anywhere. Students who used desktop computers often had older models that couldn't properly run ArcGIS for Desktop.

"We were probably dropping \$10,000 a year on server support and another \$15,000 or so to maintain an up-to-date computer lab," said Brooks, director of the Center for Interdisciplinary Geospatial Information Technologies at Delta State University in Cleveland, Mississippi. "So, I began to look for other options that were more cost-effective for both the students and the university."

Brooks began exploring the Bring Your Own Device model for both his online and on-campus courses. He determined that he could set up virtual machines in the Amazon Cloud for about \$35 per month per student.

"So, I'm looking at about \$25,000 per year to run my 20-seat teaching lab as well as the cost of tech support and maintenance, as opposed to a \$35 monthly per seat rate and there was just no argument," continued Brooks. "Using ArcGIS for Desktop on a virtual workstation is incredibly cost-effective and convenient all the way around. By setting up virtual machines in the cloud, I've unburdened myself of a huge headache of maintaining the computer infrastructure, and I'm saving my university a truckload of money."

Students can log in to their virtual workstations with their smart tablets and immediately



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start learning and experimenting with GIS by following the ArcGIS tutorial lessons Brooks provides. Data from the lessons is loaded on the virtual machines, and, after the students complete their work, they can export the maps they create as PDFs and e-mail them to Brooks at the end of each class. If for any reason a virtual machine goes down, Brooks can copy the student's work onto another virtual machine, and the students are back to work in less than 20 minutes.

Brooks believes that virtual workstations have great potential to lower costs for the online educational community. For example, there are different price models that can be applied to virtual computing. An English major who doesn't have heavy computing needs could use a virtual machine only when needed, which would keep costs down. The old computers in a learning lab could be used as terminals to access virtual workstations, eliminating the need to refurbish the lab with new computers.

“For my GIS courses, my instructions to students are, ‘bring your own device and here is your GIS-issued virtual PC for the semester,’” said Brooks. “The savings in time and money will be absolutely tremendous. Because it's not just the cost of the physical resources but also the service and support that goes with them. There is also a huge convenience factor. Students with their iPads or Android tablets can do their coursework wherever they are. They're not tied to the learning lab or a desktop computer. Also, because of the costs involved in setting up and maintaining GIS learning labs, this could be a real opportunity for those departments interested in expanding their GIS offerings. I think the convenience and cost reduction opportunities can be a distinct competitive edge for universities in the future.”

