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Remember the days of schlepping 30 pounds of books around campus—and then sitting in a stuffy lecture hall with a hundred other people? Many educational institutions turned that notion on its head by making classes available online. Often, however, these are one-off courses that also require classroom attendance. This is all fine and well, but to have entire courses and curriculums available remotely—no matter where in the world students are located—elevates this idea to new heights.

That’s where Marist College is heading—to new educational heights—by offering cloud-based massive open online courses (MOOCs). For example, participants in its Institute for Data Center Professionals (IDCP) can enroll in free data center and enterprise-computing training programs over the cloud, no matter how far afield they are. Although students enrolled in this program aren’t necessarily on a degree track, they can get the training they need to help them and their employers improve enterprise data center operations—all by working on a Marist-located IBM mainframe at the pace and time of their choosing. “We see this as part of a social contract, to get as many people educated at the lowest cost available,” says William Thirsk, vice president of Information and CIO, Marist.

**Comprehensive and Broad Curriculum**

With its main campus in Poughkeepsie, New York, and a branch campus in Florence, Italy, Marist has about 4,700 traditional-age undergraduate students and 1,400 adult-age undergraduate and graduate students. Its curriculum, which Thirsk calls “very comprehensive and broad,” includes 44 undergrad majors, 12 graduate programs and 21 certificate programs. Its most notable programs encompass fashion and technology. Marist has a long history of using technology in education. The National Science Foundation (NSF) has recognized this by supporting the Marist-led Enter-

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**UP CLOSE**

**CUSTOMER:** Marist College  
**HEADQUARTERS:** Poughkeepsie, New York  
**BUSINESS:** Higher Education  
**CHALLENGE:** Addressing the lack of enterprise-computing experts in the workforce  
**SOLUTION:** Developing cloud-based massive open online courses  
**HARDWARE:** Two IBM zEnterprise 114s, a System z10, more than a dozen IBM Power Systems servers running AIX, hundreds of IBM blades, an IBM PureData System and two IBM PureFlex Systems  
**SOFTWARE:** IBM Linux on System z and IBM z/VM
prise Computing Community, which aims to increase undergrad interest in enterprise computing, assist in the ongoing development of the school’s computing research lab and provide several full scholarships for underrepresented students majoring in computer science and information technology.

This success in using computing to further educational pursuits came in part thanks to an IBM executive who, for years, drove past the college on his way to work every day.

As Thirsk explains, “It was about 25 or 30 years ago when he wondered what would happen if he could convince the school president to install what were then very powerful mainframes here. So the college received several machines on which students could write their papers, even before word processing became the norm. As it turned out, they actually started doing better in school because they could edit on the screen rather than use a typewriter and white out. Shortly after that, our card catalog went online and Web access was allowed via the mainframe.”

More significantly, however, Marist became a key player in the late 1990s and early 2000s in the development of Linux* on System z* (largely known as zLinux at the time). Working with IBM and SUSE, Marist engineers—including some students—proved the viability of running Linux on the mainframe in a distributed, virtualized environment.

Now the school is making good use of that important Linux contribution. The college currently has two IBM zEnterprise* servers, including a second z114 used in the college’s research laboratory. An IBM System z10* is used for open-source testing. Spanning those three boxes are more than 1,200 instances of Linux on System z on z/VM*, according to Thirsk. The organization also runs more than a dozen IBM Power Systems servers running AIX* and hundreds of IBM blades, as well as an IBM PureData* System and two IBM PureFlex* Systems.

Improving Everyone’s Situation

With its long history of being a leader in using technology, Marist was in the perfect position to spot a troubling trend. “Along with the NSF, we noticed there’s a huge shortage of professionals who know how to run enterprise systems—and this is true around the world,” Thirsk remarks. “So we set about challenging ourselves to educate more professionals at the lowest possible cost, and we felt that massive open online courses were the best way to do that.”

This is especially true considering Marist wants to reach out to students who can’t attend class, either because they’re already working in the field and don’t have the time or don’t have the ability because of geographic logistics to visit the Marist campus. This, Thirsk says, was the genesis of the school’s IDCP MOOC initiative, which has been dubbed zMOOC and operates as part of a Marist/IBM Joint Study partnership.

“This isn’t really about altruism, although some might see it that way, which is fine, but more, wanting to get our students involved with enterprise-class computing environments,” Thirsk notes. “We think that the more people we can put into this type of workplace environment, the better the economy becomes, the more stable society becomes. We’re doing this to improve everyone’s situation, especially our students, who can now get better jobs.”

To that end, the college is using its core product z114 as a centralized private-cloud hub with hybrid connectors bridging the gap between its IBM processors and storage devices within that cloud. Most of the behind-the-scenes cloud software is open source.

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Blowing Things Up
The actual zMOOC implementation was an exercise in a “fast-fail” deployment, as Thirsk describes it. Although the site itself is fully functional, the school decided to roll it out quickly, without fretting over the details. After all, the most important aspects were course offerings and student progression—not pretty pictures and unnecessary interactivity. Because the school took this bare-bones approach to zMOOC, it was able to bring it online within only two weeks, with the first MOOC, “Introduction to Enterprise Computing,” launching June 2013.

As part of this deployment, it took a hybrid approach to the MOOC structure, bringing AIX and even Windows* servers into the mix. For example, to access zMOOC, users go through an authentication process that’s coordinated within an AIX computing environment. Other resources, such as reading materials, videos and online collaborative spaces, are hosted on blades.

Once logged in, students can begin their online coursework, which includes working within a mainframe production environment. They can manage systems, load programs, administer workloads and “even blow things up,” Thirsk jokes. “This isn’t a simulation. They’re actually working on a mainframe, so everything they experience is what they’ll experience in an actual production environment. This is much more instructive than having them work within a simulated environment.”

Although not a degree-track curriculum, this cloud-based coursework allows students to receive certificates if they complete the program. They can then choose to move onto more rigorous courses to receive actual computer-science degrees (albeit at a cost, unlike the certification program). The first MOOC attracted around 1,200 students, with 125 completing the course and 27 of those gaining full certification.

Additional MOOC offerings, which ran in 2014, included “Mobile Application Development” using IBM Worklight* and “Software Defined Networking.” The initial MOOC, “Introduction to Enterprise Computing,” has since been augmented with additional courses. Thanks to the success of the enterprise-computing MOOCs, Marist’s fashion program also introduced its own cloud-based offerings (“The Future of Fashion,” “The Mobile Consumer,” “Textile Fundamentals” and “The Design Process”) that were largely managed by students within the program.

More Information
Enterprise computing MOOCs at Marist: mooc.marist.edu/web/ecc

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Experimenting for Free
Although Marist focuses on the educational aspect of cloud computing, it’s clear that clouds can be deployed and used for any number of purposes (and not just so students don’t have to carry brick-heavy books around campus). Additionally, as the school has demonstrated, it doesn’t have to cost a fortune or take months or years to deploy a cloud environment.

By cleverly using whatever computing resources are available—and tying them together—and using open-source components where applicable, organizations of all stripes can broaden their reach and create improved collaborative working environments. According to Thirsk, this is especially true on the System z platform.

“We can introduce new ideas at no capital cost, which allows us to experiment for free. I can provision software, take it back in, provision more and take that back in. Others who don’t operate in an enterprise on System z can’t do those things quite so easily, if at all,” he says. “And our core system, despite the heavy workload we have on it, including both hosting our MOOCs and managing the entire university, is only running at 6, maybe 7 percent capacity. It’s a workhorse.”

Jim Utsler is a senior writer for IBM Systems Magazine and has been covering technology for more than 20 years.