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Jose Chan,
Head of IT Department,
Macau Polytechnic Institute

Macau Polytechnic virtualizes next generation learning

Macau Polytechnic Institute is a government funded higher education establishment committed to providing student-centered education and training that combines rigorous learning with the excitement of discovery, promoting academic freedom, integrity and creativity. It supports a diverse research culture in a dynamic environment, and instills a spirit of service to improving society.

The institute’s IT facilities are a key instrument in the provision of advanced learning as well as the processing of data-intensive administration procedures. The institute is keen to build an IT infrastructure that incorporates the latest advances in technology and caters to the ever evolving needs of the individual faculties. It turned to Citrix to implement a dynamic virtualization solution that could consolidate applications with a state-of-the-art application delivery model that allowed secure access from any location.

A maze of applications

The institute has 22 computer laboratories across four campus locations, which provide over 1,500 computers for students to use. Each laboratory has a vast and varied number of applications according to the separate requirements of each faculty, e.g., the Art Faculty has many design-based applications such as Adobe® CS, while the Business School needs Microsoft® Office as well as analytics software such as SPSS. The university employed up to 33 applications, resulting in increased complexity and putting a huge strain on IT resources who have to continually manage and troubleshoot problems with the performance of the applications.

“The teachers of the individual faculties all have their own very different expectations on what software and applications are appropriate for them,” said Jose Chan, Head of IT at Macau Polytechnic Institute. “Of course our job is to accommodate their needs as much as possible so we needed to find a solution that could support a large number of applications as well as save storage space and staff resources.”

The IT department conducted considerable research to identify a solution that would work for the institute’s specific requirements. This included attending informative seminars and even trialing vendor systems to obtain the latest information on how products and solutions could best serve them.



A concise application delivery infrastructure

Following an initial trial, the IT department opted for a Citrix end-to-end virtualization solution, which ultimately proved to be more effective than the incumbent VMware systems. The solution enabled the number of applications on local PCs to be cut by 75 per cent. The remaining applications now sit on back-end servers and use XenApp to streamline application delivery to individual PCs as required.

Key benefits

- Cut the number of applications on PCs by 75%
- Cut the number of servers by 67%
- Increased user satisfaction
- Reduced power consumption
- Deployed solution in two weeks
- Faster application upgrade or deployment
- Better capacity management and resource sharing
- Cheaper computers through use of thin clients

The complete Citrix end-to-end infrastructure, incorporating XenApp, Citrix® XenDesktop™ and Citrix® XenServer™, was the core component of the solution. A small pilot is currently being conducted in a private PC lab with a view to rolling out into public PC labs when testing is complete at the end of the year. The solution will then be rolled out through the computer labs and then through to the administration departments.

In total, the solution comprised 40 Citrix® XenDesktop™ 3.0, Advanced Edition and 40 Citrix® XenApp™ 5.0, Enterprise Edition solutions with three instances of XenServer and three Citrix Essentials™ for XenServer™ 5.5 Enterprise Edition for deployment of 40 XenDesktop seats. The entire solution runs on just three IBM x3950 M2 physical servers with an IBM storage DS4700 disk system.

By virtualizing the server hardware, the university was able to consolidate the number of required servers into a smaller number of physical servers, optimizing the use of hardware resources. The high availability feature of XenServer offers zero fault tolerance for the entire solution without modifying the applications. XenDesktop enables user desktops to be moved from individual PCs into the datacenter, helping to prolong the PC lifecycle without compromising user satisfaction. In addition, the provisioning of new desktops can be accomplished with just a few simple clicks, freeing up resources to cater more dynamically and rapidly to user requests.

Applications delivered

- Microsoft Office
- SPSS
- Adobe CS
- Macromedia® Studio
- Adobe® Acrobat® Professional
- Visual Studio
- Mix of other web-based and Win32 applications

XenDesktop is proving to be an extremely valuable component of the end-to-end virtualization solution. Enabling PC users to access their own virtual desktop across any network or device simplifies the traditional desktop lifecycle. This is achieved by centralizing all virtual desktops in the datacenter, not on individual PCs, meaning that fewer physical resources are needed to install patches or security updates on to each PC—it can all be managed from the centralised datacenter. XenDesktop also allows students greater flexibility to access their own personalized dynamic desktop wherever they are—at the PC lab, in the library or even at home.

Citrix® HDX™ technology was implemented to deliver a blazing fast, high definition multimedia user experience that surpasses the speed of everyday desktops, regardless of the capabilities of the endpoint device.

Networking environment

- The gigabit ethernet campus network ensures smooth delivery of high definition user experience for virtual desktops and applications. The XenServer NIC bond feature improves the infrastructure's resiliency.

“It didn't take long to realize that the Citrix solution is exceptionally powerful and that it worked perfectly for us. Since installation, we have managed to reduce the number of applications on local PCs from 33 to 8. This is a great achievement and benefits our operations immensely. We will continue to implement Citrix solutions across the whole of the campus. Our end goal is to have a virtualized IT infrastructure across the entire campus. This facilitates not only remote learning for students but also enables teachers and administration staff to access the systems from any location.”

Benefits

Minimizing the number of applications on individual PCs has brought the institute many immediate, tangible business benefits. Less complexity in the application infrastructure results in significant savings on IT implementation, system maintenance and technical support.

Consolidating applications on to back-end servers also results in less system downtime as IT staff only need to resolve issues at the server itself, rather than travel to a PC on location at another computer laboratory. This means they no longer have to focus on keeping applications running smoothly and have time to engage in more front-line support as well as adopt new technologies to further enhance the institute's IT infrastructure for students, educators and administration staff alike.

“One of the key benefits has been the ability to centralize systems so we have fewer installations to maintain. This helps control application management and minimize support requirements,” said Chan.

The virtualized application delivery model is also highly scalable so it can easily accommodate future growth of the Polytechnic and its IT services. This will include increased capacity to support a broad variety of multimedia and IP-based features.

“Once we have implemented Citrix end-to-end virtualization solutions throughout the campus, we will have an ‘access anytime, anywhere’ environment. Teachers will be able to access teaching materials for lesson preparations in the comfort of their own homes, students can access critical resources remotely and administration staff can log in to servers from any location. We will have truly implemented a next-generation infrastructure,” said Chan.

An additional advantage to the application delivery model is increased environmental protection. Server consolidation has resulted in a reduction of 67 percent of the servers across the 22 computer laboratories, resulting in reduced power consumption and a lower carbon footprint.

The entire system was remarkably easy to implement, taking only two weeks for full deployment. The institute was pleased with the simplicity and maturity of the solution, which accommodated its immediate and future business needs.

“The benefits have been enormous. In addition to minimizing IT support requirements and enabling greater application control, Citrix has enabled us to increase user satisfaction, reliability and increase manageability while simultaneously decreasing downtime and costs,” said Chan.



Worldwide Headquarters

Citrix Systems, Inc.
851 West Cypress Creek Road
Fort Lauderdale, FL 33309, USA
T +1 800 393 1888
T +1 954 267 3000

Americas

Citrix Silicon Valley
4988 Great America Parkway
Santa Clara, CA 95054, USA
T +1 408 790 8000

Europe

Citrix Systems International GmbH
Rheinweg 9
8200 Schaffhausen, Switzerland
T +41 52 635 7700

Asia Pacific

Citrix Systems Hong Kong Ltd.
Suite 6301-10, 63rd Floor
One Island East
18 Westlands Road
Island East, Hong Kong, China
T +852 2100 5000

Citrix Online Division

6500 Hollister Avenue
Goleta, CA 93117, USA
T +1 805 690 6400

www.citrix.com

About Citrix

Citrix Systems, Inc. (NASDAQ:CTXS) is the leading provider of virtualization, networking and software as a service technologies for more than 230,000 organizations worldwide. Its Citrix Delivery Center, Citrix Cloud Center (C3) and Citrix Online Services product families radically simplify computing for millions of users, delivering applications as an on-demand service to any user, in any location on any device. Citrix customers include the world's largest Internet companies, 99 percent of *Fortune* Global 500 enterprises, and hundreds of thousands of small businesses and prosumers worldwide. Citrix partners with over 10,000 companies worldwide in more than 100 countries. Founded in 1989, annual revenue in 2008 was \$1.6 billion.

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