



Industry  
Education

Location  
Taipei, Taiwan

Key Outcomes

- The use of VMware vSphere has shortened the environment preparation for a specific project from two weeks to one single day, thanks to the rapid creation of VMs, which in turn has enhanced the development efficiency and system quality too.
- VMware vSphere can help to manage resources dynamically. When a specific project has been closed or terminated, IT resources can be recycled directly to prevent over-procurement of hardware.
- Number of host is minimized for lower IDC hosting costs, which also leads to decreased power consumption, so they can save IT maintenance expenses directly.
- Automated management schedule established with the VMware vCenter Operations Management Suite helps to reduce manpower requirements while enhancing resource management and system reliability via its monitoring platform.

VMware Products Involved

- VMware vSphere
- VMware Virtual SAN
- VMware vCenter Operations Management Suite



# Tamkang University Software Cloud Enhanced with New GPU Functions and VMware Virtual SAN

Tamkang Software Cloud, built by Tamkang University's Office of Information Services in 2013, is designed to improve the university's software utilization and meet the mobile application needs of its faculty and students. By working with VMware, they deployed VMware Horizon View as the desktop interface and VMware Virtual SAN as the software-defined storage platform, enabling students to access software resources on the cloud, using their own mobile devices anytime, anywhere.

Today, Tamkang University has about 9,000 computers for daily using. Although most of the teaching and researching is still being conducted in computer lab, since the launch of the Software Cloud in September 2013, nearly 6,000 individuals have registered as users as of June 2014, recording nearly 50,000 log-ins. During phase I, the Software Cloud provides teachers and students applications including Microsoft Office, Adobe, Visual Studio, SPSS, and SAS. The university's Office of Information Services has kicked off phase II of this project in July with the addition of software used by the Faculty of Engineering such as AutoCAD and Pro/E, which will be added to the cloud service offering. The use of VMware's Horizon View (GPU version) and Virtual SAN has reduced the TCO of the storage devices dramatically.

## Software Cloud Broadly Welcomed by Users, Addressing Increasing Demand of Mobile Applications

In Issue 198 of the Tamkang Net News published on May 30, a journalist wrote: "Typically, students have to turn in papers in a few weeks before the semester examinations. What you hear most from the students is: 'Oh no! How am I going to



Tamkang University Software Cloud Desktop and Applications (1)



Tamkang University Software Cloud Desktop and Applications (2)



Tamkang University Software Cloud Desktop and Applications (3)

write my papers without Microsoft Office?" According to her report, this is very common among students. By the time they write their papers, many students may find



“VMware is the leading company which can provide us trusted products and technologies. Since the target users of the Software Cloud are 28,000 faculty members and students, we can not risk ourselves to use technologies that have not been market-tested.” From Phase II onwards, students will also be able to develop 3D applications through the software cloud, with Virtual SAN providing software-defined storage on the back-end for lower TCO.”

Hwang Ming-ta  
Professor & Head of Office of Information Services  
Tamkang University

that their licenses for essential software such as Microsoft Word, PowerPoint, etc., have expired.

She continued, “If a software cloud is available, we will be able to download and use Microsoft Office with ease. That means we’ll be able to write our papers at home without rushing to the campus just to borrow installation disks. We will never have to worry about failing to complete our papers on time due to the lack of software.” Another interviewee also said: “All I need to do now is to download Tamkang Software Cloud and then log in. It’s really simple and convenient!”

“Our investment in the Software Cloud is to serve all faculty members and students. We must get our students familiar with this just like the cloud service and email do,” said Hwang Ming-ta, who is in charge of the Tamkang University’s Office of Information Services. The purpose of building the Tamkang Software Cloud was to allow our faculty and students to install and use various software resources and services in the cloud whenever they need them, at any location and via any personal devices such as laptop, desktop, tablet and smart device. The cloud service would also eliminate previous worries about software installation, updates and software patches. The applications available through the cloud are licensed and up to date.

Nowadays, hundreds of users logging into the cloud simultaneously every day, which requires to keep consistent performance and service quality. Hence, the Office of Information Services has conducted a service test among 100 students in order to ensure the quality of the cloud service.

### 3D Applications Can be Developed in The Future, with Virtual SAN Providing Software-Defined Storage

People throughout the campus can benefit from the Software Cloud, this is an IT investment by the university that is intended to enhance its core competencies as well as digital learning and internationalization on campus. According to Mr. Hwang, after this service launched, user can use it for various purposes, just like faculty members can use tablets to approve official documents. The Office has also received many



**VMware Virtual SAN is built within vSphere 5.5, by checking the related box you can activate it if you have the proper software license.**

encouraging feedbacks regarding the service. During phase I, lots of general software are transferred into the the Software Cloud, while phase II added some professional softwares for the students of Engineering, including Pro/E and AutoCAD. This is expected to benefit 4,000 to 5,000 students.

The virtualization architecture for the Tamkang Software Cloud in Phase I includes: 200 desktop virtualization applications running on five Intel Xeon E5-2620 processor-based 1U servers, with 192 GB memory. In other words, each server runs 40 VMs, with two additional servers manage the virtualization environment.

During the launch of Phase I of the Software Cloud project, the Office of Information Services at Tamkang University did not choose any storage products available in the market. According to Mr. Hwang, while he develop the plan, no solutions can meet our cost effective and scalability needs, so we made a decision that the school would stick with hard drives on the x86 architecture. For phase II, as the software resources to be made available would utilize comparatively more resources, storage virtualization technologies would be required badly. The VMware Virtual SAN, which officially launched in March this year, was a perfect solution for phase II.

The functions of VMware Virtual SAN embedded into the core of VMware vSphere. All you need to do is to check a box to activate Virtual SAN and done. With Virtual SAN, all disks in x86 servers and flash devices can be managed in a central location, achieving a more efficient, scalable shared storage space for the VMs. “VMware is the leading company which can provide us trusted

products and technologies. Since the target users of the Software Cloud are 28,000 faculty members and students, we can not risk ourselves to use technologies that have not been market-tested.” said Mr. Hwang.

In his opinion, the newly introduced concept of storage virtualization is similar to the server virtualization we familiar with. He noted, “Auto Scaling is long exit, what happened is a conceptual change in fact. At the beginning we just wait-and-see, once we get the concept the acceptance would follow.”

The distributed data storage process performed by VMware Virtual SAN makes use of the policy-based management architecture within vSphere to provide storage services and functions with virtual machines at the core. The administrator can specify storage settings by linking each VM and its corresponding virtual hard disk in the policy with storage resource allocation and automatic configuration realized immediately in accordance with stipulated policies. When the workload conditions change, Virtual SAN is able to make adjustments dynamically in order to achieve load balance in accordance with the policy of each VM. In this way, the personnel of the Office of Information Services are now able to configure storage settings to meet the expected service-level agreement (SLA).

### **The Cloud Service and Computer Lab Facilities are Complementary but Should Not be Mixed-up**

No one can prevent us from using cloud computing and mobile applications. Leading by Mr. Hwang, Tamkang University’s Office of Information Services has built Taiwan’s first “small & beautiful” campus software cloud. Mr. Hwang emphasized that the cloud would continue to grow in the future, and the utilization rate among students would steadily increase too. For schools that are interested in mobile applications or cloud services, Mr. Hwang suggested that cloud technologies can be used to complement the traditional computer lab. However, he also said that cloud services cannot fully replace the computer lab, adding that the two cannot be mixed in the form of a “cloud classroom”. Doing so, he said, would prevent us from maximizing the advantages of the mobile cloud.

Except from expanding the scope of software resources and the target users, the Office of Information Services will also build a larger cloud depending on specific requirements of the entire school population and of specific groups. Additionally, the Office will make good use of the statistics provided by the cloud management software to better understand user behaviors.

