SUCCESS STORY

EDUCATION

# National Tsing Hua University Implements a Cloud-Based Disaster Recovery Solution

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## PROBLEM SOLVED

In 2020, National Tsing Hua University, In 2020, the university deployed the NetApp AFF C190 all-flash storage array. The new technology improved the efficiency and stability of the university's information system operations, made the system architecture more cost effective, and paved the way for future hybrid cloud trends.

## CLIENT OUTCOMES

Today, collaborative academic and industry research projects are being supported by the university through reliable and scalable DR processes that make large volumes of data available.

REDUCED BACKUP TIMES FROM 4 HOURS TO

**20 minutes**

**Improved performance**

OF COURSEWORK SELECTION APPLICATION

**Scaleable today**

TO MEET EXPANDING BACKUP DEMANDS AND FUTURE USE OF THE CLOUD

NetApp®

> “NetApp devices are more stable than other competing products. They have longer service life and can keep the machine running properly without too many human interventions, which is ideal for long-term operation.”
>
> Dr. Juntian Zhang, Technical Assistant, Academy IT Group, Computer and Communication Center, National Tsing Hua University

## Drastic backup efficiency supports a data-intensive environment

National Tsing Hua University (NTHU) ranks second among Taiwan universities, according to the 2020 QS World University Rankings. Students regard it as a top school due to its academic reputation, teacher-student ratio, research citation rate, and number of international students.

The Academy IT Group of NTHU is responsible for developing and maintaining all university information systems. This office handles NTHU's most fundamental data, which all university departments use to make administrative decisions or develop application services. IT therefore must ensure the efficiency and stability of critical systems, such as education, learning, general affairs, and personnel systems.

Dr. Juntian Zhang, technical assistant of the Academy IT Group at NTHU's Computer and Communication Center, took over the development and maintenance of the university's information systems 4 years ago. He soon discovered that the original SAN disk storage equipment was about to reach end of support, and he needed to introduce new equipment as soon as possible to host the core database and supported applications.

Zhang regarded the replacing disk systems as a chance to lay a stronger foundation for the development of NTHU's information systems. Advances in hybrid and all-flash storage system would improve latency, throughput, space efficiency, and virtualization support capabilities.

Initially, Zhang built two types of hybrid storage systems to meet budget and service level demands. One was equipped with an 800GB SSD to support the core database, and the other provided block storage services with the capacity to support the access of massive virtual machines (VMs). Both devices had shortcomings. The former entailed high maintenance costs: it supported file storage, but the performance was mediocre. The latter did not support network-attached storage and could not meet the file storage needs.

Zhang sought a better option: an all-flash system supporting SAN and NAS applications and offering economic advantages. Not many options meet these criteria. System integration partner Tatung System Technologies Inc. proposed the NetApp AFF C190 storage array, and NTHU officially selected it.

### ALL-FLASH STORAGE MAKES RPO 2 TO 12 TIMES FASTER

In 2016, NTHU formally merged with Hsinchu University of Education, leading to additional financial support for system expansion from the Ministry of Education. But when the merger of two schools was complete, the IT budget returned to normal. IT needed to take precautions and look ahead to the best allocation of limited resources. It needed to replace software and hardware systems that had high maintenance costs.

NetApp AFF C190 storage, positioned as the entry-level all-flash option that supports both SAN and NAS, was very attractive. Zhang saw that it could be used to host the core database and provide archival storage services. NTHU plans to deploy its data warehouse sequentially to produce various reports in response to the needs of each department, and the database used to store the reporting system's metadata and objects will be placed on the AFF C190 system. NTHU also uses two VMs to run the software firewall service, and their firewall images are stored on the AFF C190 system too, providing a failover mechanism. A single AFF C190 array can be used for multiple applications, so it is very cost effective.

Being able to work on all-flash storage and converting storage protocols (from NFSv3 to NFSv4) has provided many benefits. For example, during course selection,

there used to be over 20 queues waiting on the web server, but now there are no wait queues, so performance is greatly improved. And thanks to NetApp inline data deduplication and compression, combined with NFS features, IT can obtain VM image files without a VM host, which greatly accelerates VM image backup. This combination also significantly reduces the recovery point objective (RPO) from 4 hours to as little as 20 minutes—a 12x decrease.

## SVM ENABLES SOFTWARE-DEFINED CLOUD ARRAYS

Zhang highly praised the NetApp storage virtual machine (SVM) architecture. All settings are stored in the SVM. If a volume needs to be converted to a different SVM, everything—including the worldwide port name (WWPN), access control list (ACL), and so on—must also be reset. But because the SVM can easily be backed up or moved to the cloud, IT can transfer all relevant settings seamlessly into the backup center or cloud. IT plans to purchase more AFF C190 units in the future or subscribe to NetApp Cloud Volumes ONTAP storage to flexibly establish a disaster recovery mechanism for the existing AFF C190 systems.

The AFF C190 system has 4TB of raw capacity and up to 12.7TB through compression and deduplication. The overall deployment process was generally smooth; the only challenge was the default setup. The array's 4TB are split into two 2TB aggregates, but some NTHU applications needed more than 2TB of capacity. However, the IT engineers were able to change the array's settings so that these two aggregates could be combined into one large pool to meet the applications' needs.

Zhang says that the era of all-flash storage has arrived, and only by using this technology can organizations effectively break through I/O performance bottlenecks. The NetApp AFF C190 storage array combines the advantages of high performance, high stability, and efficient space utilization in one system, while also supporting data services in the cloud.

## SOLUTION COMPONENTS

### NETAPP PRODUCTS

NetApp AFF C190

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