SUCCESS STORY

" HDS helped Ocean University of China implement a campus cloud drive project with active-active data center and HCP Anywhere solutions. This project not only improves working and learning efficiency of teachers and students significantly, but also simplifies the information management of the university. "

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Ocean University of China Builds Next-Generation Private Cloud Infrastructure on Hitachi Technologies

Ocean University of China is a comprehensive university under the direct administration of the State Ministry of Education (MOE). In the era of big data and cloud, modern universities place higher demands on information services, thus presenting new challenges to IT. To meet these demands, the university created a robust, high-performance, private cloud and file sharing infrastructure based on Hitachi Data Systems solutions. With enterprise, virtualization and data protection solutions, HDS helped Ocean University of China set a new benchmark for IT implementation at universities.

Ocean University of China offers studies in all major branches of technical and social sciences, and is especially renowned for its marine sciences and fishery sciences departments. It is one of the key universities included in the list of "Project 985" and "Project 211," two of the Chinese government's endeavors to facilitate the development of higher education. Ocean University has over 40,000 students and 3,000 faculty members, three campuses and two data centers located in Laoshan and Yushan Campus.

The Challenges

The campus network of the Ocean University of China was built over time. In the past, the data center of the university consisted of distributed and isolated systems centering around some applications based on a traditional business model. This resulted in many data silos, multiple storage devices, unbalanced resource utilization, and difficulty in resource sharing. These isolated systems also presented challenges to the unified disaster recovery of its data centers, and the resources could not be shared. There was only one copy of online data for all business in the data center. Much of this data involves critical scientific research and teaching results of the university. In case of device failures, consequences associated with data loss were immeasurable. The system was also unable to respond to new business demands flexibly and quickly, and its management became increasingly burdensome.

Ocean University of China

INDUSTRY
Education

SOLUTION
Private Cloud, Data Protection

HARDWARE
Hitachi Virtual Storage Platform (2), Unified Storage 130 (2), NAS Platform 3080 (2), Content Platform, Content Platform Anywhere, Compute Rack 210H

SOFTWARE
Hitachi High Availability Manager, Dynamic Tiering, NAS Platform and Virtual Storage Platform recovery bundles, Content Platform Anywhere, TrueCopy

Benefits at a Glance
- Secure, flexible cloud-based file sharing.
- Maximized efficiency, zero data loss.
- Reduced cost, improved productivity.

The teaching staff, scientific research teams and administration of the university increasingly rely on the IT system. The failure of core devices in the data center affects the normal operation of the university. A proven clustered redundancy solution was deployed at the host layer, but the university still required ways to realize business continuity at the storage layer.

The university enabled homework assigning and submission, and information sharing as well as file sharing for scientific research via FTP servers. However, this process required approvals from supervisors and permissions to be set by IT administrators for each task, a process that was inefficient, complex and inflexible. More seriously, there was no security protection for the data on the FTP servers.

Teachers often work from home or off campus, and some of them must work on the road. The university needed to allow teachers to manage and share their documents securely, reliably and easily from their computers or mobile devices anywhere, anytime.

The existing low-end and midrange storage arrays such as IBM® DS4300 and DS4800 failed to meet the increasingly critical requirements in terms of performance, reliability and availability.

The leaders of the IT center proposed a next-generation cloud data center for the university. Building a cloud service platform for resource sharing, virtualization, security, reliability and big data cloud service, consolidates the existing infrastructure to provide unified management, allocation and protection of resources. This approach creates a more flexible, dynamic and reliable infrastructure, which offers a better service platform for the file storage and sharing services frequently used in the teaching and scientific research.

The HDS Solution: Build the Cloud

According to the project objectives of the Ocean University of China, HDS offered an outstanding solution after analyzing the university's business needs and challenges carefully. The solution, planned and implemented by Hitachi Data Systems Global Services Solutions, included two parts:

The intelligent Virtual Storage Platform provides a virtualized cloud storage platform with high performance, scalability, on-demand resource allocation, dynamic optimization and self-management for Ocean University of China.

Virtualized Active-Active Data Centers

HDS built virtualized active-active data centers based on Hitachi Virtual Storage Platform (VSP), with one VSP deployed in both the Laoshan and the Yushan campus. Based on its unique high-performance and bottleneck-free Hitachi Universal Star Network crossbar-switch architecture, VSP addresses the performance and scalability requirements of the university's IT implementation.

VSP consolidates all the fiber storage in the existing environment into a unified storage pool with storage virtualization, and extends its advanced storage capabilities to the entire resource pool: Thin provisioning virtualizes the physical disk space into a capacity pool, allowing the storage capacity to be provisioned automatically, according to application needs. With dynamic auto-tiering, the data moves freely between tiers with different performance levels, depending on the frequency of data access, thus maximizing the storage efficiency and improving the business performance. The intelligent VSP storage system provides a virtualized cloud storage platform with high performance, scalability, on-demand resource allocation, dynamic optimization and self-management for Ocean University of China.

Meanwhile, the two VSP storage systems in the Laoshan and Yushan campuses create an active-active data center through advanced storage-system-based Hitachi High Availability Manager (HAM) storage clustering. The synchronous replication and disaster recovery module, Hitachi TrueCopy, and HAM are configured on both storage systems. The data is copied synchronously and bi-directionally between both storage systems, which act as redundant backups of each other and form a storage cluster with HAM (similar to dual-server cluster solutions). Both VSP storage systems support business data access in their

respective campuses. If one storage system fails, the application systems on it will fail over to the identical data copy on the other storage system. The entire process requires no human intervention and downtime, ensuring continuous business operation.

For the increasing amount of file data in the university, a high-performance Hitachi NAS Platform file service platform was deployed in each campus to provide file storage and sharing service.

Private Cloud File Management Solution Based on Hitachi Content Platform

By combining the Hitachi Content Platform (HCP) object storage and Hitachi Content Platform Anywhere (HCP Anywhere) mobility, HDS provided a unique private cloud solution. Addressing the university's challenges, the HDS solution includes file sharing, file management, data security and mobility for teaching and scientific research, the most frequent activities in the university.

Hitachi Object Storage Solutions
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In this solution, HCP is deployed in the data center for file management and sharing in teaching and scientific research. Files are stored in the form of objects (metadata and file data). HCP features multitenancy, data self-protection, deduplication, automated versioning, full-text search and standard Web-based access. Plus, the HCP Anywhere mobile file management solution, based on HCP content storage, is deployed as the dedicated enterprise cloud drive system for the university. The storage space for HCP and HCP Anywhere comes from the VSP cloud storage platform.

The Benefits

HDS helped the Ocean University of China build a new generation of storage infrastructure: a private cloud data center with the virtualized active-active data center

solution, as well as the file management solution. The solutions provide complete business continuity and address the university's challenges, thus improving IT efficiency and productivity. Specific benefits include:

Cloud-based Homework Collection and Distribution

Previously, the homework was collected and distributed via emails or FTP, which was complex and prone to error. Now, with tiered management based on a multitenant "group" of HCP, each department in the university is set as a group, and each teacher in each department is set as a "team." HCP allocates dedicated group space for each department, and then allocates dedicated team space for each teacher from the group space. Teachers have complete permissions for their own team space and can define which students have access to it. However, students have only the read and write permissions to the "team" space of their teachers. When teachers place the homework to their "team" space, students access and download the homework over the Web, and upload it to the personal space of the teacher after completion. Located at the cloud data center of the university, the group space can be accessed from anywhere over Internet. Parameters of the groups can be set to prevent or allow sharing between groups.

Dedicated Workspace for Scientific Teams

The university has a number of temporary scientific research teams, which require private and dedicated online workspace. An independent tenant space can be created for the scientific research teams, which can only be accessed by the team members. Within this space, the team members can share files with each other, and each of them can have their own personal space.

More Flexible Cloud-based File Sharing

HCP provides FTP-like campus file sharing through anonymous HTTP access to replace the existing FTP service. It is more flexible and faster to access, and simpler to manage. With HCP Anywhere, the university created its own enterprise personal file synchronization and sharing cloud drive system. Compared with the other public clouds, the cloud-drive-based HCP Anywhere provides complete privacy and better data security.

Faculty members can store their important personal files on the cloud drive without worries. Additionally, teachers can access their files anytime, anywhere, from PCs, mobile phones or tablets, and share files with others through flexible policies.

Top Security and Reliability

The university's private cloud system back end, built on Hitachi VSP and HCP content storage, guarantees performance and reliability. Moreover, the unique automated mirrored protection and versioning of HCP ensures the security and reliability of the data in the private cloud. Virtualization with VSP enables resource sharing and on-demand provisioning. With the auto-tiering and thin provisioning, the storage system can provision the storage resources automatically, according to the performance and capacity demands of the business. In this way, it maximizes storage efficiency and optimizes business applications.

The advanced VSP-based HAM storage clustering of HDS creates an active-active data center for both Laoshan and Yushan campuses. Both centers act as redundant backup of each other to guarantee "zero" data loss. If the storage in one data center fails, the applications will fail over to the backup storage in the other data center.

This approach ensures continuous business operation and brings peace of mind to IT administrators.

Elimination of File Management Problems in Teaching and Scientific Research

HCP provides a rich set management features for unstructured file data to address the traditional file sharing, file management and data security problems in teaching and scientific research. Instead of following the traditional application model, the HCP-based file management solution adopts a flexible, easy-to-manage and simple-to-use private cloud architecture, improving exchanges and communications.

Enterprise Cloud-drive System

The university builds its own enterprise cloud drive system with HCP Anywhere to provide private and secure personal file storage space for its faculty members. The cloud-drive system enables mobility, thus reducing cost and improving productivity.

In this project, based on its deep understanding of the needs of Ocean University of China, HDS addressed the problems and challenges innovatively. Together, they created a solution that has become a new benchmark for IT implementation in China's universities.

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