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Calvin Chan
Deputy Director, Enterprise Infrastructure
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INDUSTRY: Education

SOLUTIONS:
- Enterprise Platform, Modular Platform, Business Continuity and Storage Management
- Hardware — Hitachi Adaptable Modular Storage 2500 (2), Hitachi Universal Storage Platform® VM
- Software — Hitachi Storage Navigator Modular 2, Hitachi TrueCopy® Synchronous, Hitachi IT Operations Analyzer
- Services — Consultancy, planning and implementation services provided by Hitachi Data Systems Global Solution Services
Singapore Management University Minimises Storage Migration Risks with Hitachi Modular and Enterprise Storage

The Singapore Management University (SMU) had been seeking to upgrade its storage systems as part of its technology refresh cycle. With many mission-critical applications riding on the storage infrastructure, it was imperative to minimise downtime during the data migration process. This was one of the key reasons SMU decided to partner Hitachi Data Systems for its storage upgrade. The university deployed Hitachi Adaptable Modular Storage 2500 with the Hitachi Universal Storage Platform® VM to handle back-end virtualisation to ensure minimal disruption during migration.

In 2010, as part of the university’s technology refresh cycle, SMU decided to upgrade its storage infrastructure to capitalise on new technologies that will facilitate storage management and lower the total cost of ownership (TCO).

The university evaluated proposals from several vendors before deciding to opt for Hitachi Data Systems. This was not just because of the features, functionalities and lower total cost of ownership (TCO) of the proposed Hitachi solution, but also because Hitachi back-end virtualisation capabilities would enable SMU to minimise the downtime involved in storage migration.

Key Considerations

Downtime was an important consideration given the mission-critical nature of the applications riding on the storage infrastructure. For example, an estimated 5,000 to 6,000 users could be online at any time accessing the email system. Equally important are the teaching and learning applications.

Sudharsanan Ranganathan, Manager with SMU’s Integrated Information Technology Services, said, “Imagine if you are about to teach a class and the application breaks down, what would you do for the next one and a half hours?”

The teaching and learning system is accessed not just by students in the university’s 100 or more classrooms, but also those in discussion groups or individuals preparing for classes. Sudharsanan estimates that about 2,000 students use the

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Sudharsanan Ranganathan
Manager
Integrated Information Technology Services
Singapore Management University
teaching and learning application during the university’s operating hours.

Scheduling downtime for any system, therefore, has never been easy. “We have students, faculty and staff working round the clock. We cannot afford to have the services go down, and if there is downtime, it has to be scheduled and kept very minimal,” said Sudharsanan.

Selection and Implementation

The Hitachi proposal got the nod because the risks were minimal and scheduled downtime would be minimised. The solution involved the use of Hitachi Universal Storage Platform (USP) VM to migrate data from the old storage systems to the new Hitachi Adaptable Modular Storage (AMS) 2500.

Based on USP VM, unique Hitachi virtualisation capacity masks complexity and presents all heterogeneous storage as a single pool that can be controlled and optimised simply and centrally using a powerful suite of management tools. In the SMU example, the USP VM was used to virtualise the university’s existing storage systems and the new AMS 2500 into one pool. This gave users uninterrupted access to the data even as it was being moved from the previous storage to the new AMS 2500. The nondisruptive data migration was carried out using Hitachi Tiered Storage Manager, which allows seamless, transparent data volume movement among any storage systems attached to the USP VM.

The deployment of the new storage solution and the planning and execution of the storage migration was carried out by the Hitachi Data Systems Global Solution Services team.

SMU had about 40 servers connected to the storage infrastructure, with 20 servers at each site. These were cut over to the new platform in batches whenever downtime was available. In all, the planned migration took about 3 months. “We would cut over the systems whenever we could find the slots to do so. So every weekend, we would move about 3 or 4 servers. We also took the opportunity of the term break and the recess week,” said Sudharsanan.

Before moving each batch of servers, the storage administration team would carry out pre-check activities to make sure that all processes were in place and that all required tasks related to migration were taken care of. These included back-end configuration and SAN switch zoning, as well as checking on the Fibre Channel connections. After each batch of servers was moved to the new storage infrastructure, SMU also scheduled downtime for application testing before bringing the system up again.

With the new storage infrastructure, the medium- and high-performance storage systems previously deployed at each of the data centers were consolidated onto a single AMS 2500, with about 40TB of storage at each site. The 2 sites are maintained as an active-active cluster, with data mirrored using Hitachi TrueCopy® Synchronous replication. Hitachi IT Operations Analyzer was also deployed for events monitoring.

Reduced Downtime with Virtualisation and Seamless Storage Migration

With USP VM, SMU was able to make use of unique Hitachi virtualisation capabilities to present existing storage systems and the new AMS 2500 as one data pool. This allowed seamless storage migration to take place in the background, without impacting users’ access to the data residing on heterogeneous storage systems.

“The Hitachi solution enabled SMU to minimise the risks involved in storage migration by using the back-end virtualisation capabilities of the USP VM, which allowed us to successfully migrate our old storage systems to the new platform with minimal disruption,” said Calvin Chan, Deputy Director of Enterprise Infrastructure and project lead of this SMU storage upgrade.

With the data migration taking place at the back end, the servers only had to reboot to the new storage when ready. In effect, this reduced the downtime involved in storage migration to less than an hour, excluding the downtime that SMU had scheduled for applications testing.

Alternative solutions proposed by other vendors, such as host-to-host migration, could involve a downtime of about 8 to 12 hours for migrating about 400GB of data, Sudharsanan estimated.

Lower TCO through Self-service Storage Management

The Hitachi solution enables SMU to do self-service storage provisioning and management through Hitachi Storage Navigator Modular 2 (HSNM 2), a software that enables essential functions for the management and optimisation of individual Hitachi storage systems. HSNM 2 provides both a web-accessible graphical management interface and a command line interface to allow ease of storage management.

“HSNM 2 is a user-friendly tool,” said Sudharsanan. “With the previous storage solution, we had to engage the vendor’s services in order to provision storage space. HSNM 2 enables us to do this by ourselves. This has effectively reduced on-site support and, therefore, lowered TCO, through lower cost of services.”

Consolidation of Disparate Storage Systems

Besides consolidating previous mid- and high-performance storage systems onto the same platform, the new Hitachi solution has also allowed SMU to bring other disparate network attached storage (NAS) systems onto AMS 2500. “Previously, storage was acquired on a project basis, so we had separate NAS for separate projects,” explained Sudharsanan.

Today, a new approach to storage acquisition and the emergence of new technologies provide SMU with an opportunity to consolidate these disparate systems onto a single box, lowering the maintenance cost. “The Hitachi solution has been able to support the consolidation of different platforms, such as [Microsoft] Windows, Linux and UNIX, thereby providing scalability and resiliency,” said Sudharsanan.