



Changhua Christian Hospital builds new image system

HPE 3PAR StoreServ Storage reduces data transfer times by more than 80 percent

Objective

Implement a new generation storage system that will support all the hospital HIS/PACS data centers and complete the online transfer of large amounts of medical image data without any interruption to the operation of the healthcare system

Approach

Researched the market then conducted Proof of Concept testing

IT Matters

- Provides better capacity and efficiency
- Reduces transfer time for medical images by more than 80 percent and reduces risk to almost zero
- Improves medical image access so reliability reaches 99.9999 percent

Business Matters

- Achieved upgrade with no interruption to operation of healthcare systems
- Cuts data transfer times to significantly reduce software licensing and consultancy costs
- Delivers high reliability of the medical image system to guarantee the continuity of hospital treatment and diagnostic services



Growth in medical data volumes meant that Changhua Christian Hospital needed to upgrade its storage of medical images. Hewlett Packard Enterprise 3PAR StoreServ Storage was chosen to support all the Hospital Information Systems (HIS) and Picture Archiving and Communication Systems (PACS). It will complete the online transfer of large amounts of existing medical image data quickly and successfully without any interruption to the healthcare systems.

Challenge

Need for high availability

Since its establishment in 1896, Changhua Christian Hospital has become one of the largest healthcare organizations in central Taiwan. It includes a medical center, a regional hospital, five local hospitals and one psychiatric hospital. A brand new greenfield hospital started to serve people in the Yuanlin area in mid-2015.

Changhua Christian Hospital's services cover the Changhua, Yunlin, Taichung and Nantou cities and countries. It has an average of over 13,000 outpatients every day. The total number of beds where health insurance has been applied for has reached 3,451.

Due to the growth of Changhua Christian Hospital's systems and an explosion in the quantity of medical data generated by new medical examination equipment, the access efficiency and scalability of its PACS medical image storage system had suffered significant bottlenecks.

“The transfer of 30TB of image data takes less than 24 hours to fully complete. It takes less than three days to transfer everything. The amount of time saved is unbelievable and software licensing and consultancy costs have also been reduced significantly.”

— Dr. Tien-Cheng HSU, chief information officer, Changhua Christian Hospital

It was unable to effectively support the future growth of the hospital and the warranty periods for the storage devices had already expired, resulting in more hard disk failures and increased risks to healthcare services. As a result the hospital needed a new generation medical image storage system to process the increasing quantity of data.

It was decided to carry out the project as proactively and regularly as the replacement of servers and other storage devices - taking the initiative to replace and upgrade equipment at the end of its useful life.

“Due to the technology and efficiency of storage devices, they are upgraded every few years. If the cost of replacing something with a new technical solution is close to the cost of maintaining equipment, it is actually more efficient in the long run,” asserts Dr. Tien-Cheng Hsu, chief information officer, Changhua Christian Hospital.

Healthcare operations run 24 hours a day without stopping so the upgrade process had to happen without disruption to services and online database transfers could not be affected in any way. To cope with the increasing number of people receiving healthcare services and the hospitals' 24-hour operations, the devices need to maintain high availability. The HIS must not be rendered unable to operate due to data transfers, affecting frontline healthcare services.

Large amounts of data must be successfully transferred onto the new devices. A large amount of existing medical image data needs to be transferred online to a new storage system and the transfer of data must not cause the PACS system to become unusable. The quality of technology and functions had to be verified through a rigorous Proof of Concept (POC) process. In addition to high reliability, real-time online backup and a high degree of scalability, the new storage devices must also provide good mechanisms for data protection and remote backup capabilities to comply with government regulations on healthcare information systems.

Storage devices need to be approved by GE, the PACS system manufacturer, to ensure the system's integrated security, stability and reliability and the new system needed a capacity up to 300TB.

Solution

Online Import technology

During the POC, the HPE 3PAR storage device won Changhua Christian Hospital's favor by virtue of its exclusive key technology - the security, reliability and unprecedented transfer efficiency brought by Online Import, as well as other outstanding features that met all the above requirements.



First of all, through the combined efforts of the technical teams at the HPE Taiwan office and headquarters, HPE 3PAR was approved by GE's head office. This ensured that there would be no problems when integrating the system with Changhua Christian Hospital's existing PACS system and guaranteed the integrity of the medical image data.

HPE also recommended using dual-core architecture for the synchronized copying of important data to two storage systems, in order to comply with government regulations on healthcare information systems. HPE 3PAR also has various types of high-level protection mechanisms and can prevent the data corruption caused by system component failures. These special security designs increase data access reliability to 99.9999 percent and effectively prevent the risk of doctors being unable to see patients, view data or prescribe medication, greatly enhancing patient satisfaction with their healthcare.

Transferring large amounts of medical image data and online critical task databases onto the new storage system in the shortest time possible was another challenge. When Changhua Christian Hospital last updated its storage devices, it took three months to complete the transfer of all of its systems. This time, the quantity of data that needed to be transferred had more than doubled. It was predicted that the transfer time would be even longer and would probably affect frontline healthcare services.

Therefore, HPE recommended its unique Online Import technology. Functionality was verified through transfer testing and taking into account recovery mechanisms when transfers fail, the extent of the effect of transfers on online services and transfer efficiency.

Verification revealed that the HPE 3PAR Online Import technology had almost no effect on access operations. The hospital's IT Department staff were very pleased with this as it relieved their fear and uncertainty about data transfers. Moreover, following the transfer of data to the new storage system, data access efficiency was also improved by the effectiveness of the new devices.

Benefits

Zero risk upgrade

Following the procurement of the solution, the transfer of data was completed within a month. With regard to the risk management of the project, Dr. Hsu emphasizes: "During the initial planning, in the middle of the project, and during installation and verification, Changhua Christian Hospital held discussions at several meetings. It was a continuous exercise with a view to reducing risk to zero. Even if force majeure factors had been encountered during the POC or installation processes, we had drawn up a restoration plan to ensure that the overall operation of the system would definitely not be affected during the project."

Case study

Changhua Christian Hospital

Industry

Healthcare

Customer at a glance

Hardware

- HPE 3PAR StoreServ Storage 7400
- HPE ProLiant DL380 Gen8 server
- HPE 8/40 SAN Switch 530

Software

- HPE Structure Data Manager (AIO)

HPE services

- Implementation services

The HPE Online Import technology has provided a transfer efficiency of up to 350MB per second and the quantity of medical image data transferred every hour is as high as 1.3TB. As a result, the transfer of 30TB of short-term PACS images can be completed within 24 hours.

“The amount of time saved is unbelievable, software licensing and consultancy costs have also been reduced significantly,” points out Dr. Hsu. “Moreover, this transfer of data to the new system has reduced the risks to frontline healthcare services to almost zero. The completion of this data transfer task has been painless.”

The HPE 3PAR StoreServ Storage device medical image storage system, in addition to its visibly increased space and efficiency (the raw capacity of the HPE 3PAR StoreServ 7400 4-node Storage Base is 1,200TB), possesses system architecture with reliability of up to 99.9999 percent. This is sufficient to ensure the stable operation of Changhua Christian Hospital's HIS/PACS systems, guaranteeing the continuity of hospital treatment and diagnostic services.

The HPE 3PAR storage device's simple, user-friendly interface enables Changhua Christian Hospital's system administrators to carry out operations in as little as 30 minutes. Its virtual system features increased system deployment flexibility and simplified the overall management of procedures. The old storage system only concentrated medical image data from two hospital districts and sent it back to the main hospital.

Today, without any increase in administrator manpower, medical image data from nine hospital districts can be stored and sent back using the HPE 3PAR smart, simple management mechanisms. This has simplified overall data management processes and improved data protection security levels. In addition, HPE 3PAR is equipped with the advanced online load balancing mechanisms of RAID systems.

For Changhua Christian Hospital, which is going through a period of rapid growth, the effectiveness of RAID system investment is guaranteed.

“Whether it is the HPE ProLiant DL380 Gen8 server, which is used extensively across all hospitals in the system, or the HPE 3PAR storage device in the data center at the main hospital, HPE products have always been known to be stable and efficient. HPE is a long-term partner of Changhua Christian Hospital,” adds Dr. Hsu.

In fact, HPE technology is constantly innovating, this not only fits in with Changhua Christian Hospital's overall best interests, it will also provide an important foundation for future development.

As Dr. Hsu says: “A hospital is not a research and development unit, it's a place that should provide better service quality for patients. Therefore, a hospital's most important requirement is the stability of its healthcare systems. HPE will continue to provide the innovative solutions required to grow the hospital business. Along the way, HPE will always prove to be a trustworthy partner.”

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