CASE STUDY

Intel® Xeon® Processors

Enterprise Storage

China's Anhui Province Uses Intel®-based Storage to Support Digital Hospitals

CHALLENGE

China seeks to implement a network of "digital hospitals," with information systems that apply advanced network and digital technologies to hospitals and other relevant medical fields at the national, provincial, prefecture, and county levels. Picture Archiving and Communication Systems (PACS) are a critical component of this model, but have high requirements for storage capacity, performance, scalability, and reliability.

SOLUTION

To support PACS as well as facilitate the digitization of medical information across China, Anhui Provincial Health Department adopted United Information Technology SV5000G2*, a unified storage product based on Intel® Xeon® processors. UIT SV5000G2 optimizes storage performance to reduce capacity requirements and energy consumption.

China's Vision for Unified Medical Care

To create patient-oriented "digital hospitals," China seeks to implement a unified national hospital information system (HIS) platform, applying advanced network and digital technologies to hospitals and relevant medical fields. These systems will accelerate the acquisition, storage, transmission, and processing of digital medical records, and will also facilitate business processes.

Centered on clinical medical information and operation management, HIS aims to:

- Support clinical activities and scientific hospital management by providing timely and accurate data.
- Increase efficiency by improving the management and use of hospital information and breaking down information silos.
- Integrate resources and the collaborative application of information and processes in all links of the medical services chain.
- Support the extensive and complex software applications used in the digital hospital.
- Optimize the infrastructure of information systems.

Unified state planning in China provides for provincial- and prefecture-level platforms, as well as county-level data centers, in Anhui Province. The design of a unified HIS platform requires advanced storage systems for electronic medical record (EMR) systems and hospital-level Picture Archiving and Communication Systems (PACS).

To build effective provincial and national medical information networks, the PACS of county hospitals must connect to all levels of the unified HIS platform.

Storage Requirements for PACS

PACS, used for acquisition, storage, reporting, output, management, and queries of medical imagery, faces many challenges:

- **Capacity.** PACS requires massive storage capacity, as high-resolution images range in size from a few to hundreds of megabytes.
- **Scalability.** Each medical process involves a large number of pictures. As a result, medical record storage is increasing more than 70 percent every year. This requires PACS storage to scale in a simple and reliable manner.
- **Cost.** With the rapid growth of PACS data, hospitals must control storage costs while providing efficient data sharing and rapid retrieval of queries.
- **Reliability.** PACS storage must be highly reliable to meet the requirements of 24/7 hospital operations and to provide business continuity in case of disaster or human error.
- **Security.** PACS storage must secure data to avoid loss.

These challenges pose high requirements for storage capacity, performance, scalability, and reliability.

Storage for Current Requirements and Future Growth

To address the requirements of Anhui Provincial Health Department's design proposal for PACS storage in centrally subsidized county hospitals in Anhui Province, United Information Technology (UIT) recommended its SV5000G2 series mid-range storage product. UIT SV5000G2 is designed to address the challenges businesses face in this type of complex environment.

- UIT SV5000GT is based on 64-bit multi-core Intel® Xeon® processors and has a dedicated disk array for fast access to online data.

- Integrates multiple advanced data storage and disaster tolerance technologies, including UniFlex, Unisnap, and UniMirror. UniMirror technology helps hospitals build remote disaster recovery systems.
- Supports unified connection of Fibre Channel SANs and IP-based SANs to optimize storage performance and offer centralized management of rapidly growing data, thereby reducing capacity requirements and energy consumption.
- UIT SV5000G2 Unified Storage Manager and VMware virtualization management platform help integrate heterogeneous storage devices.

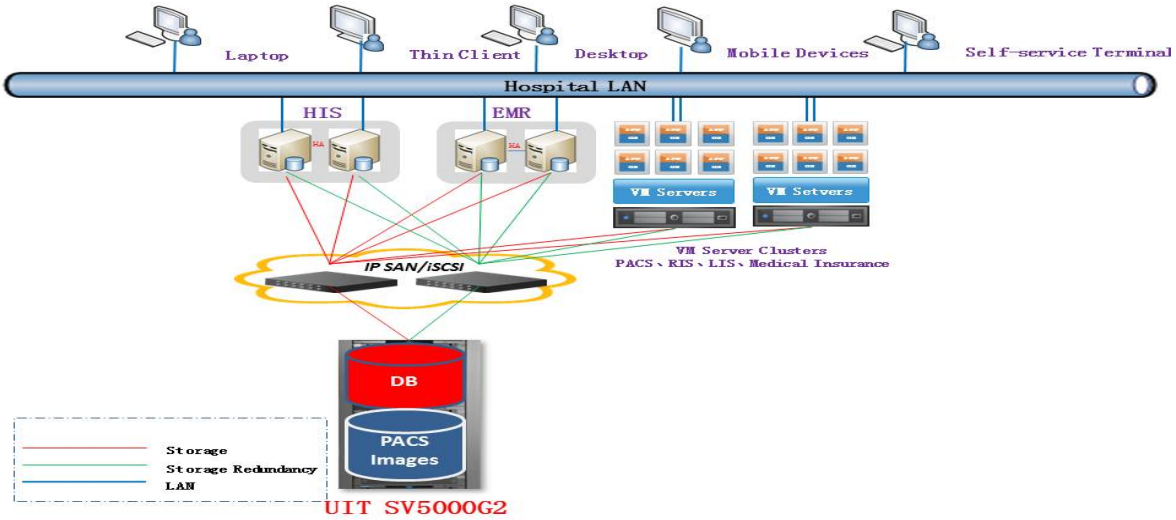

Figure 1. Network architecture supporting Picture Archiving and Communication Systems (PACS) for centrally subsidized county hospitals in Anhui Province, China.

In the PACS, storage devices are connected to IP-based SAN through eight 1-Gb iSCSI polymers to increase broadband for data transmission. UIT SV5000G2 uses a single controller in this project, greatly reducing costs for hospitals but allowing for expansion to dual controllers in the future.

Features and Benefits

- **Scalability.** Supports up to 240 disks to meet future capacity needs of business systems. Cache, interfaces, and disk types of UIT SV5000G2 can be increased to meet future needs of business systems.
- **Transmission speed.** Single controller has eight 1-Gb network interfaces with 8 Gb aggregate broadband and supports high-speed access to PACS storage by various business systems.
- **Stability and reliability.** Key modules of UIT SV5000G2 feature redundant design to provide uninterrupted access in case of failure.
- **Security.** UIT SV5000G2 leverages private LUN mirroring so that data is only accessible to business systems with permission.
- **Tiered storage.** With UniThin technology, UIT SV5000G2 migrates long-term data archives to lower-level storage tiers, reducing energy consumption.

User Value

While satisfying the current investment expectations of the Anhui Provincial Health Department, UIT SV5000G2 single-controller iSCSI storage system lays a foundation for future application expansion and integration needs in next three to five years.

For more information about Intel®-based enterprise storage solutions, visit www.intel.com/go/storage.

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