



Case Study/Yongdong Severance Hospital

# Replacement of the overall key system with Fujitsu machines

Introducing two 'PRIMEQUEST' 440, IA server from Fujitsu based on Intel® Itanium® processor, for use on core work processes such as OCS, EMR, etc.

# Achieving an 'uninterrupted environment' by introducing a cluster system of two DB servers

Since operation of 'U-Severance' commenced in July 2006, system failure time is 'zero' while enjoying benefits such as swift service



As DB servers for the hospital's key system, Yongdong Severance Hospital is using two Fujitsu PRIMEQUEST servers with Intel® Itanium® processors. By applying a clustered configuration, the hospital has maximized the usability of the system.

July 1, 2006, Yongdong Severance Hospital of Yonsei University completed their 'U-Severance' project aimed at integrated Hospital Information System(HIS), Enterprise Resource Planning(ERP), Data Warehouse(DW), Groupware (GW), etc. Since then, 'U-Severance' has been operated at full scale. During the development of this new system, the hospital upgraded its overall core infrastructure, including servers and storage. Windows servers previously used as the key server were replaced with 'PRIMEQUEST' an IA (Intel® Architecture) server from Fujitsu. The hospital also newly introduced 'ETERNUS' storage from Fujitsu. By developing the new

infrastructure, Yongdong Severance Hospital has enjoyed not only system stability, but also swift service response.

Information technology systems in the medical field are mainly divided into treatment and strategic management areas. In the treatment area, OCS, PACS, EMR etc., are the core factors, while with strategic management, ERP is the core. In September 2003, Yonsei University Medical Center started the 'U-Severance' project, aimed at organically integrating various medical information systems such as OCS, PACS, EMR, ERP, DW and GW. This would manage the information operations of the four hospitals in Shinchon, Yongdong, Yongin and Gwangju and standardize their work processes and codes.

While Severance Hospital in Shinchon started 'U-Severance' on November 1st, 2005, Yongdong Severance Hospital prepared for it starting in January 2006, and completed 'U-Severance' on July 1st, 2006 for full-scale operation.

Upon the development of 'U-Severance' the integrated management and real-time exchange of patient information became available. Before, difficulties in management and exchange were greatest obstacles in the 'informatization' of Yonsei University Medical Center. Plus, by integrating program sources between Shinchon and Yongdong, medical services to the same quality became available anytime, anywhere. In short, a 'U-Hospital' environment was achieved where management information is standardized and provided in real-time. Currently, a dual 50MB exclusive line connects Shinchon and Yongdong

Severance Hospitals to share and manage patient information, etc.

## Enabling a U-Hospital environment

Opened in 1983, Yongdong Severance Hospital has about 750 beds with around 23,000~24,000 inpatients and 56,000~57,000 outpatients, monthly averaged. The main and annex buildings of the hospital are currently undergoing maintenance work. Once this work is completed in 2008, the number of beds will increase to 950.

Yongdong Severance Hospital started computerization by introducing an IBM mainframe in 1990. In 1994, the hospital changed its system to a Windows environment, and by the end of the 1990s, it had completely removed the mainframe to operate a 100% Windows-based system.

The computers previously used as the key system for the core work of Yongdong Severance Hospital were two ProLiant 7000, a large Windows server made by HP. On commencing 'U-Severance' however, the hospital changed these computers to two PRIMEQUEST 440 with Intel® Itanium® processors.

PRIMEQUEST 440 is a large Windows server made by Fujitsu.

The decision to change the computers wasn't easy to make.

Shinchon Severance Hospital, which already commenced 'U-Severance' in 2005 using an HP Superdome, pointed out that the performance and stability of the HP system was proven, and that there was no need to select another type of computer besides HP. Compatibility between the Fujitsu system and the previous operating systems also rose as an issue. Others objected to the change saying that the engineers would have to relearn about the system since they had never used one made by Fujitsu before.

However as the performance of the hardware in the market was fairly equivalent, most opinions favored competitive bidding participated in by all providers able to satisfy the conditions of the new system proposed by Yongdong Severance Hospital.

Heeding these opinions, the medical information team, the heads of each business headquarters and the medical information board of Yongdong Severance Hospital mutually started the selection procedure. As a first step, they sent a request for a proposal to four companies that provided large servers for Windows environments. The most important condition that Yongdong Severance Hospital demanded was to satisfy the compatibility and performance required by the architecture of 'U-Severance'. After reviewing the pre presentations made by the four companies, PRIMEQUEST proposed by Fujitsu was finally selected.

Changing the infrastructure such as the server and storage into a Fujitsu system On final selection,

Yongdong Severance Hospital introduced two Fujitsu PRIMEQUEST 440, as DB servers for the hospital's key system. These two DB servers were organized as a cluster with a design of an Active-Active structure. If there is an error in one server, Fail-over occurs to run the other server immediately.

Director Sung-il Kim of Yongdong Severance Hospital's medical information team commented, "The structure of our DB servers guarantees an uninterrupted service environment. In fact, there hasn't been a single case of system error since the operation of the system in July 1st, 2006." Currently, one of the Fujitsu PRIMEQUEST servers is used for the core works of the hospital such as OCS, EMR etc, while the other is used in general work such as insurance claims.

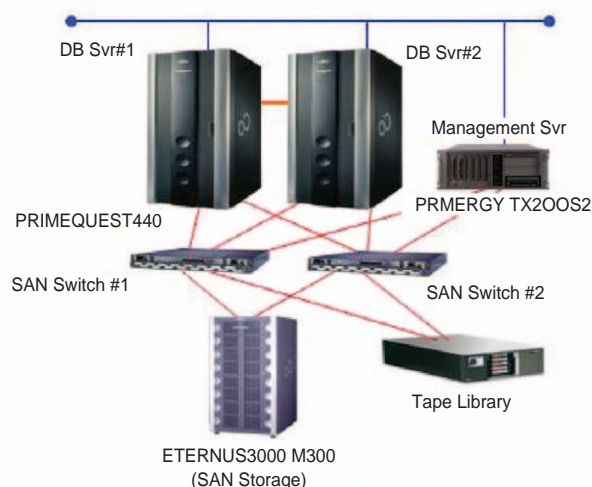
In developing new DB servers, Yongdong Severance Hospital also introduced new storage system, a Fujitsu 'ETERNUS', with sized at 2.7TB. The two DB servers are designed to share this storage system. For use as an application server, the hospital also introduced a smaller sized Fujitsu's IA(Intel® Architecture) server.

The software environment at Yongdong Severance Hospital is organized as follows; Windows 2003 Enterprise 64-bit version for OS; MS SQL 2005 Enterprise 64-bit for DMBS, SAP R/3 Enterprise 640 for ERP; Legato NetWorker for backup; and Kaoni ezFlow for groupware.

By upgrading the infrastructure with Fujitsu's server and storage system, Yongdong Severance Hospital is enjoying benefits including maximized system usability and swift service.

Director Sung-il Kim gives high credit to the system's stability by saying, "We've operated the system for more than a year, but hasn't been a single problem." Director Kim also added that customer satisfaction level is maximized by providing a faster service in the site.

Structure of Yongdong Severance Hospital's system





## Interview

**“Although I didn’t know Fujitsu servers well, now I am very satisfied.”**



**Director Sung-il Kim**  
Medical Information Team,  
Yongdong Severance  
Hospital, Yonsei University

Since the hospital was using HP servers, it must have been difficult to make a decision to change to Fujitsu servers.

The relationship with Fujitsu was first built in 2006 as the hospital was promoting our ‘U-Severance’ project. Of course, there was a burden in adapting to a new system instead of the HP servers which we had used for more than 10 years. Even after we decided to use Fujitsu, we wondered, “Won’t there be any problems?” Yet, those concerns were just baseless anxieties. During operation over 13 months, Fujitsu servers haven’t cause a single problem. The board of directors, the members of the information team and all other working staff are satisfied by the stability of the

system, as well as the swift service it provides.

### How did the data migration go with the previous system?

As we changed our system environment to Windows in 1994, we had developed our programs in Visual Basic. On the other hand, we used Visual Studio, c#, .NET etc., as the development tools on the ‘U-Severance’ project. Accordingly, we completed a 100% migration of important data such as test results and histories of patients. For other data, we have completed migration of the last two years of history. The rest is kept and operated using the previous HP system. We will continue migration of the remaining data.

### Developing DR in the future

By developing EMR, Yongdong Severance Hospital has achieved ‘a working environment without film or paper.’ The future IT plans of the hospital focus on a Disaster Recovery(DR) system to secure patient information and provide an uninterrupted system 365 days a year, 24 hours a day. Yongdong Severance Hospital is planning to develop a DR system starting from the second half of 2007, or the first half of 2008. With regarded to the method of development, Director Sung-il Kim commented, “A remote-area type DR system seems to be difficult to apply due to the high cost of the exclusive lines. Thus, the system will be developed inside the hospital.” In total, Yongdong Severance Hospital has three buildings. As the main system is located in the main building, Director Kim forecasts that the DR system will be in the annex building to be connected to the main system through the network.

### Solution applied – Fujitsu PRIMEQUEST 400 series

**Having both the economical efficiency of an open system and the reliability of a mainframe.**

Supporting Intel® Itanium® processors, maximum of 32 cores, 1TB memory, 8 partitions

Designed to satisfy data centers with high demands for reliability and usability, PRIMEQUEST 400 series are servers optimized for open environments such as LINUX and Windows. PRIMEQUEST 400 series also provide powerful virtualization functions and system expandability.

Using a chipset independently developed by Fujitsu, the reliability and expandability of the 64-bit Intel® Itanium® processors can be enjoyed to its full extent.

The servers also apply DSSA (dual synchronous system architecture), an original technology only available from Fujitsu. This provides both the economical efficiency of an open system and the reliability of a mainframe.

PRIMEQUEST 400 series are optimized for missioncritical work where optimal resource management is demanded. The true merit of these servers is displayed through work related with large databases, online processing environments, reconstruction of key systems, ERP platforms, integration between databases and servers, etc.

Supporting up to 32 cores, 1TB memory and 8 partitions, PRIMEQUEST is the ultimate high-end system and guarantees the operation of a company’s core business. The state-of-the-art Intel® processors and the advanced architecture of Fujitsu have come together to give birth to PRIMEQUEST 400 series, and by selecting these competitive servers from Fujitsu, companies aiming to maintain business continuity, gain economic efficiency and acquire the flexibility of industrial standard solutions, will benefit greatly.



For more information, please contact: kr.fujitsu.com  
Main office: 83-1, Susong-dong, Jongno-gu, Seoul, Korea  
Phone: (02)3787-6000 / Fax: (02)3787-6073  
CS center: Main Office (02)3787-6044~6047 Phone(Toll free)080-750-6000 Fax (Toll free): 080-760-6000  
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