# FUĬTSU Case study **YONSEI UNIVERSITY Gangnam Severance Hospital**

# PRIMEQUEST 1800E2 enabled high performance OCS/EMR system

One-stop Solution for 'Data Overload' and 'Downtime' through replacing OCS/EMR DB Server



### The customer

Country : Republic of Korea Industry : Healthcare Founded : April 1983 Website : gs.iseverance.com/

# The challenge

Gangnam Severance Hospital decided to upgrade its existing OCS(Order Communication System) / EMR(Electronic Medical Records) server to new models to cope with increasing number of patients and resulting data overload. The hospital's existing Itanium-based server had limitation in the future system expansion and posed doubtful concerns regarding system upgrade and maintenance costs. It prompted the hospital to upgrade its server to an entirely new system package rather than upgrade piecemeal expansion of CPUs.

### The solution

Gangnam Severance Hospital selected PRIMEQUEST 1800E2, Fujitsu Mission-Critical x86 server series, as a new server that will replace the existing OCS/EMR DB system. Throughout the past 8 years of using the Fujitsu products, the customer has been greatly satisfied with the system stability and services provided by Fujitsu Korea's engineers. Not only that, PRIMEQUEST 1800E2 system is composed of 4 system boards, capable of much faster processing while also providing features to cope with system failure.

### The benefit

- Ensures continuous and reliable support for hospital operation with enhancement in data processing capability
- Enhances operation efficiency and performance via integration of OCS and EMR server
- Enhances system stability by Active-standby clustered operation
- Reduces maintenance costs and labor by ensuring operational stability and system reliability on an open technology

#### **Product and services**

- PRIMEQUEST 1800E2
- OCS/EMR DB Server migration service

## The customer

Gangnam Severance Hospital opened in 1983 in Gangnam region of Seoul, which was back then barren as far as the medical service goes. Its opening was part of a plan by the Yeonsei University, the birthplace of Korean modern medicine with 128 years of history, to expand its service coverage and establish a regional outpost to provide medical services. Praised by patients and general public alike for its proliferation of advanced knowledge in medicine and well-rounded medical services, Gangnam Severance Hospital has now developed into a comprehensive specialized medical institution complete with 36 departments and 804 beds, treating over 3,000 outpatients on a daily average. As it strives to develop the customer-centered services, the hospital presently concentrates its effort to providing more advanced medical services and establishing related infrastructures.

# The challenge

The fast-changing medical environment, coupled with the growing importance of efficient hospital operation, is adding pressure on many hospitals to enhance their service qualities and build an optimized operation system. Subsequently, it has risen as a key factor of the competitiveness of hospitals to build and operate the efficient medical information system. With the proliferation of large-scale information systems such as Order Communications System (OCS), Picture Archiving and Communication System (PACS) and Electronic Medical Records (EMR), it has grown bigger than ever before to invest the information system of hospital. Therefore it has surfaced as an urgent requirement to build and operate an efficient information system.

Understanding the importance of information system as key infrastructure of its operation, Yeonsei Medical Center has been fervent in realizing the system in the most effective manner. Since 2003, the hospital has pursued 'u-Severance' project with goals of: integrated organic operation of medical information systems including OCS, PACS and EMR; consolidated management of administrative data of its 4 affiliating hospitals; and standardization of work process and codes.

"Given the sensitive issue of maintaining net profit of the hospital, the cost of IT investment is a very critical issue," said Kim Sung-il, Dept. of Medical Informatics at Gangnam Severance Hospital. "I think it is required to consider very carefully the repair cycle of the product as well as its actual applicability once put to implementation before selecting the next system." His remark implies the need for introducing new systems based on Gangnam Severance Hospital's IT investment roadmap after taking into account the performance improvement of server models, thanks to the breakneck speed of advancement in information technology, as well as projected increase of volume in the hospital operation-related data. Gangnam Severance Hospital first introduced servers supplied by Fujitsu Korea in 2006 when it had conceived the 'u-Severance' system concept. Kim said he had carefully checked performance level of products supplied by Fujitsu Korea as well as its services, since he had made an investment decision based on cost-effectiveness. And, Fujitsu Korea had done its part as best as it can to meet his high expectation. For the past 8 years, Gangnam Severance Hospital has been operating PRIMEQUEST 440, 520 and 540 systems, all of which supplied by Fujitsu Korea, without discovering a single glitch from the hardware.

Gangnam Severance Hospital had introduced two PRIMEQUEST 540 systems back in 2009 and operated them as OCS and EMR DB server. CPU load at an early stage of the system operation remained stable, hovering around a level of 20~40%, but with the increase of patients and resulting growth of data volume, it has risen to that of 80~90% by 2012. In resolving the situation, Gangnam Severance Hospital initially considered expanding the number of CPUs in the present system, but soon realized limitation in the future system expansion due to problems unique to the Intel Itanium processors. The hospital eventually concluded that, given the costs involved in system upgrades and maintenance, an introduction of a new server system is the most effective measure.

# The solution

With the explosion of data volume that needs to be processed by the IT system, Gangnam Severance Hospital felt a need for adopting an expandable and flexible server system capable of satisfying the changing requirements of hospital operation. While the hospital



was running its OCS/EMR system as an active clustering structure by configuring them into two separate servers, it had a plan to consolidate them into one unified system and hence improve its operational efficiency and performance. It also intended to enhance its system stability and reliability by reconfiguring current Active-active clustering structure into an Active-standby structure.

The selection of Gangnam Severance Hospital was PRIMEQUEST 1800 E2, the next generational Mission-Critical x86 server developed by Fujitsu. With its experience of constructing the EMR system for Gangnam Severance Hospital and detailed knowledge it acquired on the system's architecture, Fujitsu Korea had an unparalleled understanding of hospitals' information system. And, stability of other related models and quality of the company's service have been proven over the past 8 years of system operation history. The newly released PRIMEQUEST 1800E2 also demonstrated its excellent scalability for the future expansion of CPU and system capacity as it was equipped with Xeon E7 series, Intel's latest 10-core processor, and capable of accommodating up to 8 CPUs on 4 system boards.

PRIMEQUEST 1800E2 was an optimal choice for Gangnam Severance Hospital which not only tried to expand the system but also intended to enhance its system stability and reliability through investment. Equipped with 4 system boards per server, the system was capable of automatically switching to the Reserved System Board whenever it detected a failure from the system board without any additional redundant server configuration, and therefore recovery time was reduced to one tenth that of the previous system. As other x86 systems of other vendors were installed with a single system board, they do not support hardware partitioning and thus are not able to react nimbly to any failure in the system board unless the redundant system was configured in extra server.

With warranted excellence and stability of PRIMEQUEST 1800E2, the biggest task in this Gangnam Severance Hospital IT project was to make an uninterrupted transition from legacy servers to new models. Because, given the characteristics of hospital businesses, any



PRIMEQUEST 1800E2

interruption or delay of daily routine can jeopardize lives of patients. If data transactions involved in the server transition were not implemented as planned, it could lead to critical consequences such as 'rollback'. It was, therefore, required of Fujitsu Korea's engineers to produce substantial amount of job efforts such as conducting of various simulations from the beginning of preliminary stages and keeping ongoing communication with clients. Officials at Gangnam Severance Hospital said they could see enhanced technological supports of Fujitsu Korea through this server transition project; engineers from Fujitsu Korea were well prepared with various alternative plans, making it possible to implement the entire procedure flawlessly. The Gangnam Severance Hospital server transition project, which was performed during overnight, was completed successfully, and any problem discovered during the transition was immediately resolved by Fujitsu Korea engineers' prompt action.

# The benefit

The 'u-Severance' Project of Yeonsei Medical Center was conceived with such objectives as to enhance quality of medical services by providing an 'Anytime Anywhere service' and promote advancement of the patient-centered medical information system through establishment of ubiquitous IT environment. With the popularization of both the Internet and the patient-centered medical services, the importance of hospital information system is only growing so much as to require establishing a sort of state-of-the-art digital hospital.

The recent installation of OCS/EMR servers in Gangnam Severance Hospital was part of the project designed to establish an advanced medical service platform across hospitals. The most important goal of the server upgrade project in Gangnam Severance Hospital was to establish a '24/7 uninterrupted operation system', as well as to complete preparation work for the planned upgrade of the existing system to Windows Sever 2012 and MSSQL Sever 2012. Particularly, the hospital did not want to remain complacent with the present back-up servers in the DR system currently configured as a redundant system, but planned to build a new DR system through the future upgrade to MSSQL Server 2012 system. As such, the hospital intended to construct a database system configured as a triplex system by replacing the present DR server to a new server, hence realizing perfect IT system environment capable of recovering the system from any type of problematic situation within 5 minutes.

By realizing an advanced IT environment through such IT investments, Gangnam Severance Hospital aspires to become a patientcentered, most sophisticated digital medical institution in South Korea, thereby elevate its status as a leading university hospital in the country and enhance its role as a public medical service provider.

## The interview



Kim Sung-il, Dept. of Medical Informatics

#### Q2. What made you to choose Fujitsu products?

#### Q1. What was the background and purpose of the OCS/EMR server replacement?

The increase of visiting patients and resulting growth of data volume made it necessary to expand the number of server CPUs. Given the unique characteristics of hospital businesses, the number of visiting patients peaks at 10~12 a.m. and 2~4 p.m., pushing up CPU load of the existing servers from early level of 20~40% to that of 80~90%. As potential delays of server response time are feared to extend the patient waiting time, increasing complaints by medical staff and patients, it was urgently required to come up with a due solution. At first, we discussed about possibility of expanding the number of CPUs for the legacy servers. However, because of some worries posed over the potential limitation in the scalability of Intel Itanium processors installed in the legacy system, we ended up introducing an entirely new server system to ensure the future system expandability.

With our experience of using the system for 8 years, we have been highly satisfied with the stability of Fujitsu Korea's products and sincerity of its engineers. The fact that PRIMEQUEST 1800E2 consists of 4 system boards per server made our decision of implementing the product easier, for the system is excellent in terms of coping with system failure or system recovery.

#### Q3. What plan is in store for your future IT project?

System stability is paramount especially for the hospital IT infrastructure. Gangnam Severance Hospital devotes its effort in the system stability more than anything else in its pursuit of cost reduction and introduction of the latest IT technologies. We have a plan to upgrade the existing DR system configured as a redundant system into a system configured as a triplex system by introducing the latest severs. And, we will also ensure the improved performance and operational flexibility of the existing IT resources with virtualization of the current server configuration.

## Conclusion

At present, Gangnam Severance Hospital is striving to consistently improve its IT infrastructure through investments in an attempt to enhance the value of its medical services, realize the cutting-edge medical IT environment and ensure customer satisfaction and trust. Guided by its banner of 'Prestigious Global Hospital', the hospital is at its utmost effort to help ease the difficulties involved in treatment and research and provide high-quality medical services to patients. It also plans to boost efficiency in investing in new systems as well as utilizing legacy systems. To achieve these goals, the hospital plans to ensure the system performance and the operational flexibility by introducing a virtualization system to the existing servers. Instead settle for status quo, Gangnam Severance Hospital intends to reward customers for their trust with focused investment in IT system and become a prestigious global hospital by increasing the level of customer satisfaction through continued quality assurance of medical services, improving the existing management system more efficiently, and modernizing the medical information system.

# About Fujitsu

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