Case study
Kure Medical Center

Fujitsu helped the National Hospital Organization Kure Medical Center replace its EMR system. The new healthcare information system brings significantly improved user convenience, enhanced data security, and better support for decision making in regard to patient care.

The customer

Industry: Healthcare
Location: 3-1 Aoyama-cho, Kure-shi, Hiroshima
Number of beds: 700 beds
Departments: Internal Medicine, Psychiatry, Neurology, Pulmonary Medicine, Gastroenterology, Cardiology, Pediatrics, General Surgery, Breast Surgery, Orthopedics, Plastic Surgery, Neurosurgery and others (27 departments in total)
Website: http://www.kure-nh.go.jp/

The challenge

- Revamp the hospital's siloed ICT to allow simultaneous access to patients' EMRs while maintaining high levels of data security.
- Need for unified and centralized data management to strengthen fail-safe protection of sensitive patient information.
- Promotion of the Kure Medical Center's commitment to contributing to environmentally-friendly management.

The benefit

- Created two virtualized server environments one for an EMR system and one for the information system. Through single sign on capability, these two virtual servers can be easily accessed simultaneously by the doctors and nurses. Furthermore, the thin client installations, combined with the use of contact-type smart IC cards, make it possible for medical practitioners to log on to their desktop anytime without having to worry about security issues.
- The new EMR system allows seamless integration of information with the hospital's other departmental systems. Once patient information (Medical history, disease severity levels etc.) is entered, that data is automatically reflected in all other relevant systems. This significantly helps nursing staff avoid duplication, reduce errors and increase efficiency.
- Through virtual server consolidation of its departmental servers and slim client installations, the hospital can reduce the amount of ICT-related CO_2 emissions by approximately 150 tons per year.

Overview

The National Hospital Organization Kure Medical Center, in Kure City, Hiroshima Prefecture, needed to refurbish its electronic medical record (EMR) system. The hospital called upon Fujitsu for help to create a better ICT environment, and decided to implement a thin client solution to achieve enhanced security and user convenience. The thin client rollout was successful in enabling physicians to access patients' EMRs, web pages and their personal folders anytime, from any location in the hospital. Furthermore, the new environment has centralized management of all patient data, providing improved fail-safe measures for protecting sensitive healthcare information.

As one of the core medical centers in the region, the Kure Medical Center always looks for better ways to facilitate the use of health information technology for high quality patient care. As part of this effort, the hospital transformed its existing EMR system into a highly-secure, user-friendly thin-client environment using Citrix XenApp virtualization technology and Fujitsu server and storage platforms. The newly-constructed environment enables the hospital to improve workflow efficiency, gain tighter data security and better support for doctors. The sophisticated "Dokodemo" (Anywhere) environment now provides unified patient information management at the backend, reducing potential for any unwanted leaks of any patient data. The eco-friendly slim client installations have made the hospital greener, helping reduce ICT-related CO_2 emissions by approximately 70%, compared to the previous system.

Customer background

The Kure Medical Center saw an urgent need to have an effective way to integrate ICT with physician practices and facilitate higher quality healthcare delivery.

Located in Kure City, Japan, the Kure Medical Center (formally known as the Kure Naval Hospital) has a long standing history of quality care and services. The Center strives to always provide the latest advances in medical technologies and the best possible care for the community by meeting patients' healthcare needs of today. With 700 beds and over 600 nursing staff across 27 departments, the hospital plays multiple roles including; a center for cancer research, a tertiary level emergency care center, and a medical technology training center.

"At the Kure Medical center, our three major functions are;

- To provide acute healthcare treatment,
- Provide chronic healthcare treatment, and
- Act as a collaborative healthcare network for this region and

Hardware

- Fujitsu PRIMERGY RX300 S6 industry-standard servers
- Fujitsu PRIMERGY BX900 S2 blade servers
- Fujitsu ETERNUS storage systems

Software

- Fujitsu HOPE/EGMAIN-GX electronic medical record (EMR) solution
- Citrix XenDesktop thin client solution (XenApp is mainly used)

surrounding areas.

Like many other regions in Japan, Kure City has a very high elderly population. For this reason it is imperative that we work closely with neighboring healthcare facilities to deliver adequate care for this demographic. For example, if we see a patient needing emergency treatment, after they are stabilized, the patient can then be transferred to a smaller local hospital for rehabilitation. For this to occur efficiently, close collaboration with the other facilities is very important. I believe Kure City is pioneering region-level patient follow-up practices in this country," says Dr. Toshiharu Kawamoto, MD, PhD, Clinical Professor, the National Hospital Organization Kure Medical Center.

Kure City, located along the Setonaikai Sea coast

Today, medical care in Japan is facing the challenges of an aging society and a chronic shortage of doctors. To mitigate the situation and better meet people's healthcare needs, the Kure Medical Center strongly believes the effective use of ICT is critical. Upholding this strong commitment, the Center started rethinking its healthcare information systems when the existing EMR system was beginning to deteriorate. The hospital created a framework for the next-generation healthcare ICT, concentrating on four main themes;

1. Portable and accessible medical intelligence
2. Fail-safe data protection
3. A hospital-wide data warehouse (DWH) that can gather valuable feedback for clinicians
4. Regional networks for collaborative healthcare delivery (The networks that enable nearby hospitals to access patient information and appointment-scheduling of the Kure Medical Center).

Among the four themes, (1) and (2) were the hospital's priorities and formed the basis to the EMR system replacement project.

The hospital issued an RFP to revamp its aging systems

Deployment of a new, highly secure Dokodemo environment through client virtualization has enabled medical practitioners to confidentially view patient records and web pages simultaneously.

Previously, the Kure Medical Center's EMR and web-based health information systems (including web browser, email and clinical databases), were separately managed and for security reasons could only be accessed using separate terminals. This was very inconvenient for doctors, as they would be required to use two terminals to research medical literature and to input a patient's data into the EMR system. Of course, it was also not possible for the doctors to view their PC-stored documents when physically away from the doctor's office.

"As a physician in the Department of Cardiology, I have to make quick decisions regarding my patients. It is critically important that doctors can access medical information to solve questions immediately whenever doubts or uncertainties arise. At the Kure Medical Center, we wanted to support the doctors' decision making and establish the Dokodemo concept ('Dokodemo' translates as 'Anywhere'). This concept would allow the use of portable medical intelligence inside the hospital to access the Internet, up-to-date patient information and doctor's personal folders while on the move without compromising security," says Kawamoto.

Dr. Toshiharu Kawamoto, MD, PhD, Clinical Professor The National Hospital Organization Kure Medical Center (NHOKMC)

Kawamoto continues, "Fail-safe data protection and data synchronization were another challenge the hospital needed to address. In the previous environment, due to the lack of connection between the EMR and the information systems, nurses had to duplicate important patient data. This meant manual entry to each system for information such as illness, family, medical and surgical history, thereby increasing the opportunity for human error. To solve the situation, we developed a detailed RFP with an operational workflow model, detailing how we want to transform the EMR system through a virtualization approach. In the RFP, we strongly requested solutions that would provide stringent data protection and enable automatic data integration across all systems at the hospital."

After considering a variety of offerings, the Medical Center chose to adopt Fujitsu's solution. In particular, the center recognized Fujitsu thin clients' ability to support HD video for streaming medical images/videos obtained from PACS (Picture Archiving and Communications System), which is essential for the hospital's day-to-day medical practices.

The steps towards a successful system refurbishment

The new systems have enabled the hospital to significantly improve user convenience and the level of security at the same time.

During transition, one of the most challenging aspects was to meet the security needs of the hospital while still improving the users' experience. The hospital's primary goal was to develop a flexible and efficient work environment for the doctors. Fujitsu worked with the hospital, and created two securely-isolated virtualized server environments, one for the EMR and one for the information system. Along with single sign on capability, this provided the Kure doctors with simultaneous access to both systems from a single terminal. In this environment, security is now maintained through two methods; no data is stored at the user endpoints and, contact-type IC cards are used to lock down PC's. These methods protect the highly secure medical data from vulnerability.

The newly created environment has made it possible for practitioners to view patients' records and web pages from a single device. Furthermore, with the built-in roaming feature, doctors can manage documents in their personal folders, accessible from any thin client terminal located throughout the hospital.

A thin client device deployed in a hospital ward. ERMs and web pages can be viewed simultaneously from one device.

"Taking into account the different needs of doctors and nurses, we configured detailed settings on each client. We set up role-based access control and set limitations on USB storage connection. Although due to these required settings the backend operational configuration became quite complicated. By implementing the single sign-on mechanism, that complexity is invisible to end-users, ensuring a smooth and seamless user experience. We really appreciate Fujitsu's efforts in providing detailed technical support to meet our demanding needs," says Kawamoto.

The technology at the center of the hospital's new environment is the Citrix XenApp thin-client and Fujitsu's PRIMERGY BX900 S2 blade servers. Kure also chose to select Fujitsu's leading-edge HOPE/EGMAIN-GX EMR solution which is specifically designed software for the health care industry (refer to the figure 1. System configuration at the Kure Medical Center).

"The new EMR must interoperate with the hospital's existing 35 specialty departmental systems, and that was the area we were most concerned about. However, with Fujitsu's full support we addressed all of these critical concerns. Fujitsu called for all vendors to come to the Fujitsu Numazu factory, and collaboratively carry out a series of evaluations and validations. The purpose was to get all the vendors working together and ensure the planned EMR system would work seamlessly with the departmental systems in virtualized environments. We were amazed by this effort, and thankfully, we now have a secure, stable and reliable operation," recalls Kawamoto.

Business benefits and future scenarios

The new platform solution delivers; Better support for collaborative decision making, fail-safe unified data management and reductions in ICT-related power consumption.

The new EMR system went live in September 2011. Since then, the hospital has seen a vast improvement in its ICT benefits including a new level of efficiency and an increase of convenience for physicians. Doctors now have the ability to log in to the Dokodemo environment to access patient information and referential materials using any client device deployed throughout the hospital. Furthermore, the system means doctors can collaborate with each other much easier and manage the document from different terminals as they move around the facilities. These efficiencies have significantly improved the overall quality of patient care.

Only two months after the new system was online, Internet use in the hospital increased by four times. Although through forward planning, the hospital's new Citrix XenApp SBC (Server Based Computing) technology, makes it is easy to address user volume increases while keeping costs low. Furthermore, centralized application management via the thin client environment has allowed the hospital to gain significant operational and administrative efficiencies. These two initiatives bring benefits not only to doctors and nurses, but to all who interact with the Kure hospital.

"Nurses really like the new environment because they don't have to worry about making data entry errors anymore. Besides, it is no longer necessary to enter the same data again and again into different systems," according to Kawamoto.

Meanwhile, the refurbished ICT is helping the hospital accelerate its environmental sustainability efforts. With the consolidated and virtualized environment, the hospital now has fewer servers and slimmer client devices. Compared to the previous health information systems, the hospital has reduced the amount of ICT-related CO_2 emissions by 150 tons annually.

Kawamoto has vision for further improvements. "We need to work towards completion of the new systems. We have ambitious plans that include initiatives like allowing nurses to register diagnostic forms from a tablet and creating an Open Office implementation involving a shift to cloud. As we look to realize our ambitions, we greatly look forward to continuing to work with Fujitsu. We believe that Fujitsu can not only provide technical support but also come up with many dynamic proposals that will help us grow as the region's leading medical provider".

The Kure Medical Center strives to take on new challenges in order to deliver higher quality patient care. As a trusted partner of the forward thinking hospital, Fujitsu will continue to be committed to providing end-to-end support to them and their health care delivery efforts.

(From the right)
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Dr. Toshiharu Kawamoto, MD, PhD, Clinical Professor, the Kure Medical Center
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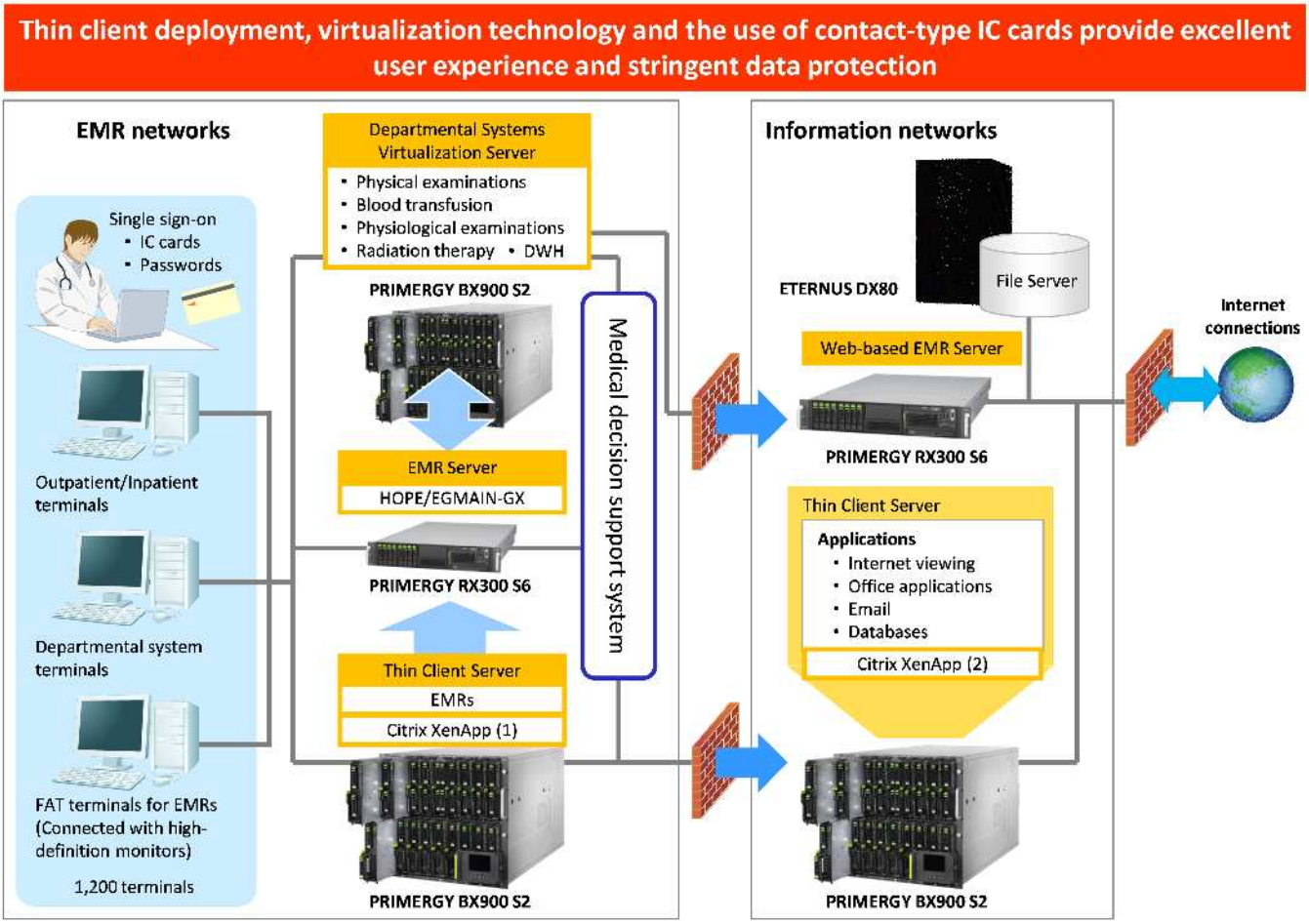

(Figure 1.) System Configuration at the Kure Medical Center

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