

KONKUK UNIVERSITY MEDICAL CENTER MODERNIZES SERVICE SYSTEM WITH RED HAT



KONKUK UNIVERSITY
MEDICAL CENTER

SOFTWARE AND SERVICES

Red Hat® Enterprise Linux®
Red Hat JBoss® Enterprise Application Platform
Red Hat Consulting
Red Hat Learning Subscription

PARTNER

Open Naru

Konkuk University Medical Center (KUMC) is committed to providing the highest quality care to patients through its medical service system. However, its outdated UNIX equipment and proprietary web application server led to high maintenance costs and difficulty collaborating with external groups. KUMC decided to migrate to Red Hat Enterprise Linux and Red Hat JBoss Enterprise Application Platform to build an open source medical information system. As a result, the medical center gained a flexible, cost-effective microservices architecture with faster response time and less downtime. It can now respond faster to government project requests and support more effective services.



HEALTHCARE

2,400 EMPLOYEES,
INCLUDING 400 DOCTORS
AND 600 NURSES

“Red Hat helped us address issues immediately. They played an important role in overcoming prejudices, like ‘open source is hard to manage’ or ‘open source takes a long time to adopt.’ We definitely recommend the system to other hospitals.”

JE-KWAN LEE
SENIOR RESEARCH ENGINEER, INFORMATION TEAM,
KONKUK UNIVERSITY MEDICAL CENTER

BENEFITS

- Improved scalability to meet peak demands with less downtime
- Increased flexibility for better collaboration
- Reduced maintenance costs to just 20% of prior solution's cost
- Gained access to expert services, including on-demand, all-access training



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VENDOR DEPENDENCY RESTRICTS PARTNERSHIPS AND OPPORTUNITIES

Konkuk University Medical Center (KUMC) was founded in 1931 to provide high-quality medical services to the people of Korea. To respond to rapid changes in the medical industry and continue providing high-quality medical services, KUMC has pioneered adoption of innovative technologies. In 2004, it became the first hospital in Korea to implement a UNIX- and Java™-based medical information system with the creation of the Konkuk University Medical Center Information System (KIS). This solution includes a picture archiving and communication system (PACS), lab information system, data warehouse, and business intelligence services to help medical staff access the information needed for their work. After the success of this open source initiative, other hospitals in Korea began adopting Java platforms.

However, KUMC built this innovative system with a proprietary framework from a local IT service vendor, as well as a proprietary web application server and Oracle Java Developer Kit (JDK) 1.4. Modifying or upgrading the system was not possible without the technical support from the vendors. Business decisions were dependent on vendor service availability, hindering KUMC’s ability to respond quickly to government research opportunities.

“The old system worked only on certain Oracle Enterprise JavaBeans (EJB) APIs [application programming interfaces] and the vendor’s framework,” said Je-kwan Lee, a senior research engineer on the information team at Konkuk University Medical Center. “Since it was dependent on a single vendor, our developers were not satisfied with the system.”

Using a restrictive back-end system also made exchanging data with other medical organizations and government agencies—a critical capability—very difficult. The system was technically incapable of integrating with these groups’ IT interfaces.

The system’s performance was also hindered by heavy concurrent traffic, resulting in slow response and reboot times that increased downtime. Many people at the hospital—from doctors, nurses, and medical technicians to administrators and cashiers—work together or in parallel, requiring high available, customized systems. With the medical center’s single system, while an administrator worked on a statistical analysis, the electronic medical record (EMR) used by the medical staff would not open, or the hospital management system slowed down while delivering data to external systems. During peak times, it was also difficult for staff to access and use PACS or the order communication system. As a result, user-facing patient services experienced slower response times.

MIGRATION TO OPEN SOURCE PROVIDES BETTER BUSINESS SUPPORT

To ensure high performance and reliability, as well as integration with third party medical groups, KUMC decided to standardize its system on vendor-agnostic, open source software. The center worked closely with Red Hat Consulting and local open source consulting company Open Naru to evaluate the feasibility of its open source initiative, including a UNIX to Linux pilot project and system and application architecture design.

KUMC then deployed Red Hat Enterprise Linux, a robust open source operating system, and Red Hat JBoss Enterprise Application Platform, a fully certified Java Enterprise Edition (Java EE) solution that includes clustering, caching, messaging, transactions, and other features for building, running, deploying, and managing Java applications.

In addition to engaging Red Hat Consulting, KUMC invested in Red Hat Learning Subscription to help its staff easily transition from the old system. This training offering delivers access to Red Hat online training resources—including videos, courses, and hands-on labs—in a single, annual subscription.

With help from Red Hat and Open Naru, implementation was completed in just four months. “Red Hat helped us address issues immediately. They played an important role in overcoming prejudices, like ‘open source is hard to manage’ or ‘open source takes a long time to adopt,’” said Je-kwan.

INNOVATIVE I.T. IMPROVES MEDICAL SYSTEM EFFICIENCY

IMPROVED SYSTEM PERFORMANCE AND AVAILABILITY

By adopting a microservices-based architecture supported by Red Hat software, the medical center can now structure its applications as collections of microservices that can be independently distributed for various tasks and roles within its business, improving system availability and reliability.

The medical center can now meet peak demand without affecting services. Its highest workloads occur from 10 am-12 pm and 2-3 pm, when it transfers data to various agencies. Services slowed on the previous system when concurrent users’ total requests exceeded 200 transactions per second. With its microservices-based architecture, KUMC has eliminated the bottleneck affecting service reliability to achieve 3 times faster response times. Its Red Hat software helps the system easily handle 250 concurrent users on a single JBoss instance. With up to 24 instances dedicated to a single task—three times more than previously—KUMC can now scale to better support different roles within the hospital.

In addition, JBoss Enterprise Application Platform drastically improved system reboot speeds. The previous system took up to 40 minutes to reboot and run applications, during which all work was paused. As a result, developers could not effectively fix errors or launch improvements. After adopting Red Hat software, KUMC has reduced its system and services boot time to just 80 seconds—even with additional instances. Now, its developers can create and launch valuable updates without worrying about downtime.

Standardizing its new medical information system on Red Hat technology also helps developers quickly and easily provision and configure environments. Compared to 2-3 months for onboarding with the previous system, KUMC’s developers can now configure and start using Red Hat’s standard development environment in just 2 hours.

As a result of these improvements, both KUMC’s developers and end users can reliably access the resources needed to build and use innovative applications, enhancing patient care.

EFFECTIVE INTEGRATION

By switching to an open source environment, KUMC gained the flexibility to connect to external organizations’ systems—such as the Health Insurance Review & Assessment Service, the Korea Centers for Disease Control & Prevention, and the National Health Insurance Corporation. These organizations use the e-Government Standard Framework (eGovFrame) to standardize development. Switching to an open source environment helped KUMC better connect to organizations’ eGovFrame systems. As a result, the medical center can respond in time to government and research tasks.

“We need to provide consistent services to our patients and users at the same quality as the national level. With an open environment, we were able to meet business requirements and rapidly respond to changes,” said Je-kwan.



CUSTOMER CASE STUDY Konkuk University Medical Center modernizes service system with Red Hat

REDUCED COSTS

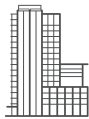
Standardizing on Red Hat’s open source software helped KUMC reduce its operating and maintenance costs to only 20% of the previous system’s total cost of ownership (TCO). “Before, maintenance costs took up much of our budget. After we reduced our operating costs and TCO with Red Hat, we can now allocate budget to more valuable areas, such as government projects,” said Je-kwan Lee.

ACCESS TO EXPERT SERVICES

Working with Red Hat Consulting helped KUMC’s Red Hat deployment succeed. For example, the latest version of JBoss Enterprise Application Platform required several adjustments to accommodate unique processing and language encoding for the Korean organization. Red Hat consultants used their expertise and help from Red Hat’s global technical support network to quickly address any issues and optimize features for KUMC’s environment.

During the transition, KUMC provided comprehensive education and training for its staff. Red Hat Learning Subscription offers 24x7 unlimited access to Red Hat’s online training resources.

In addition, working with open source technology provided development support from a global community of developers working on creating, updating, and securing open source software. “Our confidence in open source grew from the fact that there is an ecosystem where many open source developers collaborate to solve common problems,” said Je-kwan.



ABOUT RED HAT

Red Hat is the world’s leading provider of open source software solutions, using a community-powered approach to reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.



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SUCCESS PROMPTS FURTHER INVESTMENT IN INNOVATION

KUMC plans to continue its investment in innovation. The medical center is considering implementing Red Hat OpenShift® Container Platform, with help from Red Hat Consulting, to support an agile DevOps approach and expand its use of microservices.

“We plan to take the lead in improving public health and advancing the medical industry by managing our system more efficiently and actively participating in government-led projects,” said Je-kwan. “We definitely recommend our Red Hat system to other hospitals.”

ABOUT KONKUK UNIVERSITY MEDICAL CENTER

Established in 1931, Konkuk University Medical Center provides a high standard of medical service with its 2,400 excellent medical professionals and cutting-edge medical technologies. The medical center is dedicated to making people’s lives healthier through high-quality medical care, training, and research.

www.kuh.ac.kr

NORTH AMERICA
1 888 REDHAT1
www.redhat.com

EUROPE, MIDDLE EAST,
AND AFRICA
00800 7334 2835
europa@redhat.com

ASIA PACIFIC
+65 6490 4200
apac@redhat.com

LATIN AMERICA
+54 11 4329 7300
info-latam@redhat.com

www.redhat.com
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