Case Study

\Orchestrating a brighter world NEC

Nagoya City University Hospital

Customer

- Nagoya City University Hospital

Challenges

- Nagoya City University Hospital urgently needed to integrate their networks to support the speedy implementation of new technologies.
- The hospital's many dedicated networks were configured in a complex way making integration difficult.
- The network topologies were not visible, increasing the risk of errors and compromising medical safety.
- Additions and setting changes required stopping the network, which made it hard to add new medical services quickly.

Solution

- The hospital adopted NEC's "UNIVERGE PF series" to build an integrated network infrastructure based on software-defined networking (SDN), provide network visibility and improve medical safety.

Results

- The UNIVERGE PF series integrated all the hospital's networks to realize total optimization and effective use of network resources.
- Network integration combined with server virtualization enabled considerable space and energy savings.
- The entire network infrastructure can now be visualized, enhancing network management and monitoring and improving medical safety.
- Equipment can be added to the network and virtual networks can be constructed on the GUI, enabling rapid roll-out of advanced medical services that use the latest technology.

Introduction

Nagoya City University Hospital is one of Japan's most technologically advanced hospitals, utilizing state-of-the-art IT to provide high-tech medical treatment. The hospital introduced NEC's "UNIVERGE PF series," and built an integrated network infrastructure based on software-defined networking (SDN).

The user-friendly GUI enabled centralized network management through integration and visualization of all of the hospital's networks, allowing networks to be added or changed quickly and flexibly by software. Wireless LANs and smartphones could also be deployed to share data throughout the hospital, allowing the hospital to immediately respond to needs on the medical front while ensuring the medical safety.

Challenges

Nagoya City University Hospital deploys state-of-the-art IT for both administration and medical treatment and requires an environment in which new technologies can be quickly incorporated and translated into medical services. The barrier to achieving this was the state of the hospital's networks, which the hospital recognized were in urgent need of integration.

However, network integration proved problematic for several reasons. Each clinical department had a network that was constructed and run by departmental staff, and that was dedicated to that department's equipment. As a result, the hospital was running on layers of individually optimized networks, making the overall network configuration very complex. As new equipment was added to each network, it became very difficult to accurately grasp and verify the state of the network.

The time and effort required to add equipment or change settings had also become prohibitive. "We were increasingly faced with the problem of trying to provide a single service using equipment installed in physically different locations," says Masayoshi Iida, medical information systems engineer at Nagoya City University Hospital. "We recently set up a new intensive care unit for seriously ill patients, but we had to spread the unit over three floors due to space limitations. We also had to install additional equipment and make extensive network setting changes."

Each addition or setting change also required stopping the network, which increased costs and staff workloads, and made it hard to add new medical services quickly.

Solution

The hospital sought a way to build an optimal network infrastructure to support medical IT and turned their focus to SDN, subsequently adopting NEC's "UNIVERGE PF series" as their solution.

"The key point was the GUI, which enabled both the physical and logical network topologies to be visualized at the same time," says Iida. "When a network is virtualized, it is often difficult to visualize the topology, but NEC's solution didn't only virtualize the network; it also allowed us to see both the physical and virtual topologies. This helped lower our operational workload and reduced the risk of network setting mistakes caused by input errors. The GUI itself served as the design sheet. We could run the network with confidence because we could confirm on the screen that all the network nodes were operating according to the design sheet. There were other proposals that included products for centrally managing network settings, but none of them had features that would allow us to see into the logical configuration."

NEC's strong record in the SDN field was also a decisive point.

Results

NEC succeeded in integrating all the hospital's networks by using the UNIVERGE PF series. The integrated network accommodates four virtual networks (virtual tenant networks or VTNs): one for electronic medical records, one for medical equipment, one for smartphone and other mobile networks, and one for external networks such as the Internet and university LANs, and the network scale is large, with over 4,000 IP addresses. Network integration combined with the effects of server virtualization has enabled a reduction in the number of racks in the server room from 17 to 6, resulting in considerable space and energy savings.

Nagoya City University Hospital has been able to integrate the networks of each department and realize total optimization and effective use of network resources. Also, network management and monitoring have been enhanced by enabling visualization of the entire network infrastructure, which has greatly improved medical safety. Equipment can be added to the network and virtual networks can be constructed on the GUI, enabling rapid roll-out of advanced medical services that use the latest technology.

Nagoya City University Hospital is now launching a new medical service that utilizes smartphone camera functionality. "Until now, if we wanted to register photographs of a patient's injury or photographs for surgery notes, we had to connect the digital camera to the electronic medical record system and register the photos manually," explains Mikinori Sato, medical information engineer at the hospital. "However, this method can easily lead to medical accidents such as incorrectly identifying patients. Now we've built a system that requires the correct patient to be identified by smartphone before taking clinical photos. These photos can also be transferred via wireless LAN from anywhere in the hospital, such as a ward or operating room, and immediately recorded in a patient's medical records, providing us with a method that is both safe and efficient."

The hospital has also just verified a new biomonitoring system that can measure patients' vital data. "One of the major benefits of SDN is that it allows us to introduce this kind of new service very quickly," says Iida.

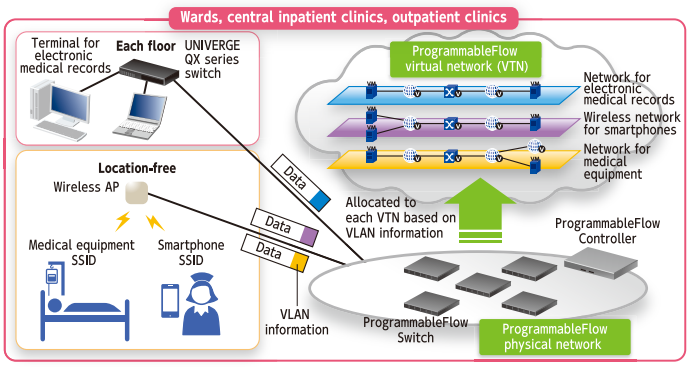
The hospital will continue looking at ways to use its integrated network more effectively to realize innovative medical services.

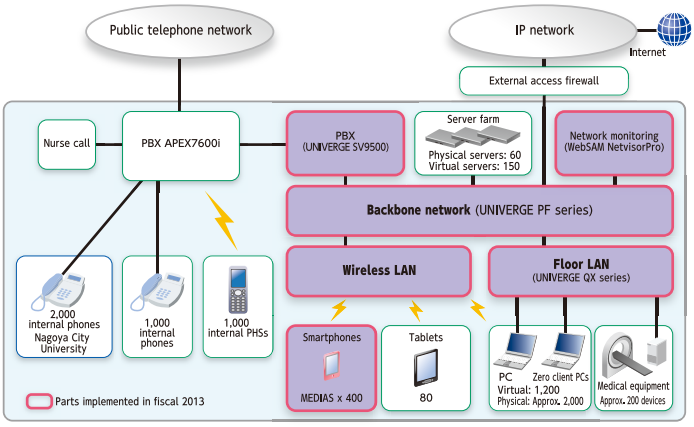
"The most important point in medical IT is that a technology or system can be adapted to fit the purpose," emphasizes Iida. "Even if it is a new technology, I think that, as long as we have clarified its purpose of use and found that it is the best option, we shouldn't be afraid to give it a try."

About

Nagoya City University Hospital is a core medical institution serving Nagoya City and surrounding areas. The hospital prioritizes medical safety and actively utilizes IT to provide advanced medical treatment that is both safe and effective. Ten years ago, the hospital implemented a ground-breaking hospital-wide electronic medical record system in which medical records for both inpatients and outpatients were simultaneously digitized. Nagoya City University Hospital was also one of the first hospitals in Japan to introduce a hospital-wide wireless LAN and utilize smartphones for three-point check processes*, nurse calls and as IP phones.

* Used to prevent medical accidents such as misidentification of patients and incorrect administration of medicine.





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