Case Study

Empowered by Innovation NEC

Kanazawa University Hospital

Customer

- Kanazawa University Hospital

Challenges

- The network is getting complex and hard to manage as it expands to respond to fast-evolving medical technologies by each department.
- The network was operated by hospital staff and vulnerable to failures caused by human error.
- Connecting new equipment to the network required making complicated settings and rewiring, increasing the management workload and pushing up costs.

Solution

- ProgrammableFlow, NEC's groundbreaking network solution based on OpenFlow technology, was proposed to provide network visibility and create a network infrastructure that was easy to manage.
- The ProgrammableFlow proposal allowed departments to create their own virtual networks, while at the same time providing seamless and safe interdepartmental connectivity.

Results

- ProgrammableFlow provides visibility for the entire network.
- Departments can easily create independent virtual tenant networks on the ProgrammableFlow network, realizing a network that is both flexible and secure.
- The new network has a stable foundation that can keep pace with the rapid developments occurring in clinical medicine and medical technologies today.

Introduction

Kanazawa University Hospital had a network where hospital staffs were struggling to keep pace with the rapid evolution in clinical medicine and medical technologies occurring today. The network had been expanded according to the individual needs of each department or laboratory and was difficult to manage. The decision was made to revolutionize the hospital's network infrastructure by deploying NEC's UNIVERGE ProgrammableFlow series, a groundbreaking network solution based on OpenFlow technology. ProgrammableFlow delivered a flattened, open networking topology that simplified network management and improved performance. The hospital now hopes to use NEC's ProgrammableFlow series to realize universal connectivity to facilitate the movement and use of medical equipment.

Challenges

"Individual optimizations had led to a complex network structure whose physical wiring and overall configuration were difficult to grasp," explained Shinsuke Yamaoka, Research Associate Professor in the Corporate Planning Division, Kanazawa University Hospital. "Also, because the network was operated by hospital staff, human errors could occur easily. Sometimes just plugging a cable into an available port would create a loop."

Technologies evolve rapidly in the medical field, and doctors were often trying out new equipment. Connecting these equipment to the network involved changing settings and verifying connections, and sometimes even rewiring, putting a considerable strain on the hospital's budget. Kanazawa University Hospital's Vice Director and Corporate Planning Division Director/Professor Keisuke Nagase elaborated. "A network that requires setting changes and rewiring every time a new piece of equipment is connected cannot be called stable. We needed a flexible, safe, and secure network infrastructure that would allow us to respond immediately to the rapid changes that occur in our field, provide independent security for each department, and be easy to manage."

Kanazawa University Hospital

Solution

To solve its network problems and create a stable network infrastructure, Kanazawa University Hospital chose to deploy NEC's UNIVERGE ProgrammableFlow series.

The ProgrammableFlow series is a ground-breaking network solution developed by NEC based on OpenFlow network control technology. With ProgrammableFlow, the entire network can be managed like a single virtual switch, facilitating the creation of an independent virtual network. This kind of software-defined network (SDN)—a network that is constructed logically via software—enables flexible architectural modifications and additions as well as efficient operations management.

Nagase explained why the hospital selected NEC's ProgrammableFlow series. "We wanted a network that was transparent and that could be managed in an integrated fashion, while responding flexibly to the demands of each department. We also needed to reduce the work involved in changing settings and so on whenever we moved or added a piece of equipment. We felt that ProgrammableFlow would resolve all these issues and provide us with a network that could be run and managed very efficiently."

"What we really wanted was a network that we could control," added Yamaoka. "With ProgrammableFlow, we could control the flow of communication data, making network management much easier for those of us who are not IT or network professionals."

NEC installed two ProgrammableFlow controllers and 16 switches in the hospital's clinical research building, built to provide enhanced facilities for research and training.

"ProgrammableFlow allowed us to install devices one floor at a time and expand gradually and safely," said Yamaoka. "And we could manage each department's LAN without impacting our existing network."

NEC required only one month to get the new network up and running.

"In spite of the new technology and short lead-time, we've had no major problems. Thanks to NEC's excellent technology, the network is running very stably," said Nagase.

Results

Kanazawa University Hospital believes that NEC's ProgrammableFlow series will deliver the following results:

1. Network transparency and integrated management

ProgrammableFlow gives visibility to both the network's physical and logical configurations, providing a clear picture of all network statuses. This enables integrated management and reduces the operational load.

2. Virtual networks can be flexibly created for each department and controlled centrally

ProgrammableFlow realizes a network that is both flexible and secure by allowing departments to create their own virtual networks, while at the same time providing seamless and safe interdepartmental connectivity. "Each department is responsible for information such as research data that should not be able to be accessed by people from outside that department," explained Yamaoka. "But this problem is now solved because departments can create independent virtual tenant networks (VTNs) on the ProgrammableFlow network." ProgrammableFlow also allows devices such as firewalls to be allocated from a common pool, reducing the number of network devices required, thereby lowering network-related costs.

3. Connected devices are recognized and automatically deployed to the appropriate VTN

ProgrammableFlow will enable the realization of universal connectivity in which the appropriate policy is applied to a medical device when it is connected, regardless of which LAN port it is connected to.

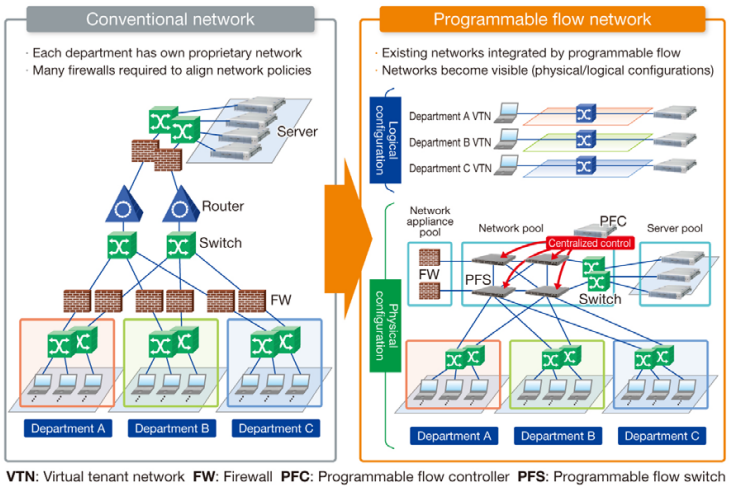
Yamaoka talked about the hospital's hopes for the future. "We are seeing an increase in portable equipment that can move around with patients, so equipment is frequently being unplugged from and plugged into the network. In a conventional environment, the network settings would have to be changed each time the equipment was connected, but ProgrammableFlow technology renders this unnecessary. We believe that NEC's next-generation network technology will provide universal connectivity and even enable devices connected to the network to be controlled remotely."

4. Advanced routing control based on communication type

By using ProgrammableFlow, the routing required for certain types of communication can be specified in advance. "For example," says Nagase "We can preallocate wideband routing for image data, which has become incredibly heavy as definition has increased, helping us maintain network stability."

ProgrammableFlow will clearly resolve all the client's networking issues, while at the same time increase the knowhow of staff on the ground and help optimize the hospital's entire medical information system. "NEC has an incredible amount of technical expertise—we can rely on them completely," praised Nagase. "We hope to continue our excellent relationship."

Kanazawa University Hospital intends to continue using advanced information technologies to improve the quality of care, rationalize operations, and respond to the needs of the local community.



VTN: Virtual tenant network **FW**: Firewall **PFC**: Programmable flow controller **PFS**: Programmable flow switch

About

As one of core medical institutions, Kanazawa University Hospital is dedicated to providing the best medical care to patients with the most advanced technology and a superior team. The hospital is committed to promoting clinical research and developing excellent human resources, acting as a role model for local doctors and other healthcare professionals.

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