

SDN Solutions

## Ryukoku University

**Customer**

- Ryukoku University

**Challenges**

Needed to overhaul and integrate ICT systems spread over three campuses to achieve vision of improving educational ability and quality of education.  
 Network topology is very complex and includes old networks as well as networks that have been expanded and individually optimized for specific purposes, making it difficult to effectively manage and upgrade networks.  
 Total system migration is not realistic due to differing upgrade schedules.

**Solution**

NEC's UNIVERGE PF series adopted to implement SDN to integrate and simplify networks.  
 SDN deployed gradually in conjunction with the existing network equipment to provide upgrade flexibility.

**Results**

Individually optimized and dispersed education systems integrated and standardized by SDN.  
 ICT resources can be used more flexibly.  
 IT staff workload reduced through simplified network topology and use of GUI to configure and modify settings.  
 Introduction of ICT provides students with a diverse learning environment and the ability to study autonomously off-campus.  
 First step in plan to create an all-campus integrated ICT environment that will enhance the quality of education provided to students.

NEC SDN Solutions provide the first step in a plan to build an all-campus integrated ICT platform that will improve educational ability and quality of education.

**Introduction**

Ryukoku University is a comprehensive university spread over three campuses in the ancient city of Kyoto and its neighboring prefecture, Shiga. Established in 1639 as a Buddhist seminary, the university now boasts ten faculties, one junior college, and ten graduate schools. In 2010, Ryukoku University released its 5th master plan—Ryukoku Vision 2020—outlining the steps the university will take to achieve its goals of enhancing the comprehensiveness and diversity of the education and improving educational quality. At the core of this plan is the overhaul of the university's ICT environment to support autonomous and diverse learning and enhance the value of the university as a forward-thinking academic institution that can meet the educational needs of current and future generations.

**Challenges**

Ryukoku University's information systems serve three campuses housing ten faculties, one junior college and ten graduate schools. Systems are broadly divided according to purpose into education, administration, research, and academic information, and are administered separately on each campus. Some of the networks have been in use for many years and have been individually optimized or expanded for specific purposes, creating a particularly complex network topology. This setup causes major headaches for IT staff, especially if they need to make setting modifications or perform failure handling. The university had considered network virtualization, but the differing system upgrade schedules made total system migration an unrealistic option.

"As systems were added, the network became increasingly complex," said Professor Yoshihiro Okada, head of the Information Media Center and Professor of Information Media in the Faculty of Science and Engineering at Ryukoku University. "And even within the same system, the operations differed depending on the campus, leading to a lot of inefficiencies in terms of cost and labor."



The university required an innovative, easy to operate network that would enable the construction of an all-campus integrated platform, but that could be introduced gradually in line with system upgrade schedules.

## Solution

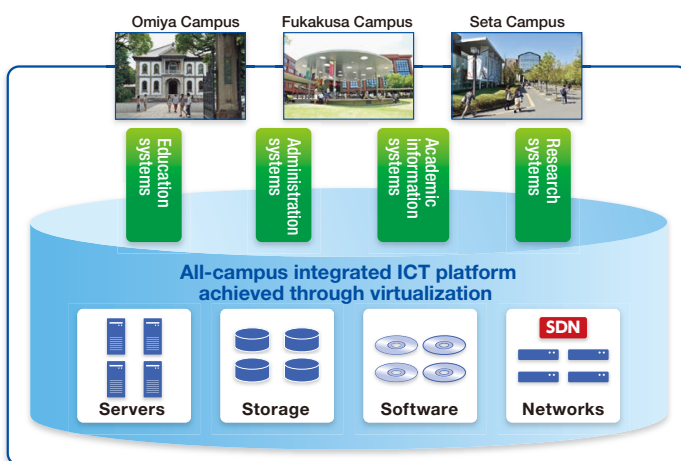
Turning their attention to SDN (software-defined networking) as a solution to their network issues and as a means of building an optimal network infrastructure, Ryukoku University adopted NEC's proposal centered on the UNIVERGE PF series. The university was also impressed with NEC's strong track record in the SDN field.

"Previously, if we needed to improve responsiveness, we had to search for the bottleneck and change the settings of each individual router or switch, which was a big hassle," said Professor Okada.

"Because the configuration was so complex, even replacing the wiring somewhere became a major task. But by introducing SDN through NEC's UNIVERGE PF series, our networks could be physically integrated and simplified, and because the topology is visible on the GUI, network settings can be configured and modified effortlessly."

NEC's proposal involved deploying the UNIVERGE PF series in conjunction with the existing network equipment little by little, allowing systems to be migrated flexibly and on a schedule that suited the university. This gradual introduction of SDN is the first step in a broader plan to build a common system platform for all campuses and faculties by integrating and virtualizing all ICT infrastructure resources such as servers, storage, and networks.

- all-campus integrated ICT platform envisioned by Ryukoku University



"We didn't just want to solve the problems of cost and operations management," said Professor Okada. "We also wanted an ICT environment that would provide the resources we required, when we required them, allowing us to enhance the education we provide to our students, which is our overriding goal."

## Results

Ryukoku University started by introducing SDN to the education-related information system infrastructure in each campus whose update schedules overlapped. Thanks to SDN, an environment has been created in which network settings can be modified without reference to the physical configuration. This is expected to greatly reduce the load of network management operations.

SDN has also resolved the issue of individually optimized networks to which each campus applied their own operating rules—a major cause of management inefficiencies—by integrating the networks, allowing them to be operated based on a set of standard rules and processes.

Moreover, by improving the efficiency and convenience of network operations, faculty staff can concentrate on education and research; students on studying; and university administration on formulating strategy and managing the day-to-day operations of the university.

"Our use of ICT has increased considerably, not only for administrative functions, but also in the classroom, where we can now provide our students with an interactive, multimedia learning environment," said Professor Okada. "We have also been able to extend this learning environment off-campus, enabling our students to study autonomously, and in any location. This solution from NEC is a big step in the direction of achieving the ICT environment that is the goal of our future vision."

Ryukoku University is also looking to implement dynamic security measures linked with SDN, which will not only raise the level of operational safety, but will also provide a secure environment for the university to take on new challenges in providing education to future generations.

Moving forward, the university is looking to continue implementing SDN in its networks while at the same time push ahead with integrating the non-educational systems, such as the administration, research and the academic information systems.