

Introduction of SDN to Improve Service Response Speed, Reliability and Competitiveness for Future Business Expansion

Minaminihon Information Processing Center (MIC) provides system integration and data center services mainly in the Kyushu region, Japan. MIC aims to expand its business and is embarking on a reform of its data center, which serves as a key foundation for its various businesses. MIC's plan is to implement SDN (Software-Defined Networking) by introducing NEC's UNIVERGE PF series network solution. This makes it possible to offer various benefits and high-value-added services: quick network infrastructure construction for virtual hosting services, improved price competitiveness through reduced management loads and costs for network changes, enhanced reliability through fast network recovery when a failure occurs, interruption-free maintenance, etc.

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Data Center Network Innovation for Future Business Expansion

Minaminihon Information Processing Center (MIC) provides high-quality IT services mainly in the Kyushu region, Japan under the keyword *Tsunagaru*, which means “connect.” The company offers not only the internet connection service “MINC Internet” to businesses and individuals, but also system integration and various services including housing or colocation, virtual hosting and SaaS, which are made possible through the optimal use of our existing data center. In addition, its range of originally developed packaged products has been used by businesses, municipalities and medical institutions around Japan.

“The keyword *Tsunagaru* expresses our commitment to building close relationships with clients,” says Hiroshi Churei, President of MIC. “But it also embodies our desire to offer network connection at any location, taking into account the fact that the Kyushu region includes many remote islands. Aside from assisting businesses with their transactions and communications, ensuring business continuity in the event of a disaster is an important mission.” One of the pillars of MIC's growth strategy today is to further expand its operations nationwide while maintaining them in the Kyushu region as its core business. Realizing the need to make its services more sophisticated in order to achieve this objective, the company embarked on a reform of its data center, which serves as a key foundation for its various businesses. This included the virtualization of its data center networks to enable the facility to provide high-value-added services to clients and also to solve various issues that the data center possesses.

“Under our old way of providing a housing or colocation service together with system integration, our system engineers select devices and build a network to be suitable for the individual client,” says Akito Eitoku, Manager of MIC's IT Promotion Division. “As these individual networks are optimized for the individual client over time, network structures at

our data center become very complicated. As a consequence, network system managers are forced to use various different applications to cope with these operations, resulting in growth of network management load.”

Challenges were also becoming obvious in the field of virtual hosting services, which are increasingly being adopted in the market. “We haven’t had a significant problem in conducting the provisioning of virtual servers; however, we have been facing issues in configuring network infrastructure, which requires setting up VLANs for individual clients,” notes Kazuhiro Fuchigami, Manager of the DC Service Group in MIC’s IT Promotion Division. “VLAN setup involves mission-critical system management. It generally has to be done by hand, consuming a lot of work and time. Our urgent priorities were to reduce the time and effort spent on developing VLANs, lower the risk of human error and raise network reliability.”

Employing A New Technology Differentiates MIC From Our Rivals

To build a virtual network for overcoming these challenges, the company turned to NEC’s UNIVERGE PF series. The series employs ProgrammableFlow, a network architecture compliant with the OpenFlow protocol. This Software-Defined Networking (SDN) solution, implemented with ProgrammableFlow architecture, achieves software-based central control of network devices, which in turn makes it possible to build virtual networks that are not dependent on the underlying physical network. ProgrammableFlow SDN enables users to change network structures flexibly and manage networks efficiently.

For example, unlike the previous method of setting up VLANs, the UNIVERGE PF series allows users to set up a secure, independent VTN (virtual tenant network) instantly for clients signing up for virtual hosting services. This dramatically reduces the time it takes for MIC to begin providing virtual hosting services to a new client.

“We value the ‘visualization’ feature of the UNIVERGE PF series,” Mr. Fuchigami says. “Under the previous conventional network environment, which was linked intrinsically to physical configuration, it was very difficult to grasp which services were using which resources. But thanks to the UNIVERGE PF series, we can now easily check device configuration and network data flow using a GUI. This also enhances our networks’ availability and stability, as it enables us to pinpoint where problems originate and respond promptly when a network bottleneck occurs.”

The fact that it employs a new disruptive technology that is expected to spread widely in the future also encouraged MIC to embrace the UNIVERGE PF series.

“The source of our competitiveness comes down to the technology we use,” says Hiroshi Matsukubo, Senior Executive Director of MIC. “We believe we will be able to better differentiate ourselves from rivals and offer our clients higher

value by implementing new technologies ahead of others and becoming expert in them.”

As the need for network virtualization increases, the world of SDN continues to expand year after year and the market’s expectations for the technology keep growing. “NEC is a world leader in OpenFlow, being the first in the world to commercialize products that support this technology,” notes Shinobu Kamikaseda, Executive Managing Director of MIC. “NEC’s engineers possess high levels of skill. And the company responded swiftly to our inquiries and our request to see products in action. This convinced us that we would be able to receive attentive customer support and efficiently utilize virtual networks based on UNIVERGE PF series products.”

UNIVERGE PF Series: The World’s First Commercial Product Using OpenFlow Technology

The UNIVERGE PF series consists of network products that support OpenFlow, the next-generation network control protocol. NEC is a pioneer in OpenFlow technology, having conducted extensive research, development and testing. Leveraging this work, it developed ProgrammableFlow network control technology, the first commercial implementation of OpenFlow technology in the world.

In order to build a network, the technology makes use of the ProgrammableFlow Controller, which centrally manages and controls the network, as well as the ProgrammableFlow Switch, which transfers data at high speed. The controller monitors the overall network, determines the ideal route for a particular flow of communications data and sends instructions to the switch.

This makes it possible to manage an overall network as if it were a single virtual switch, allowing users to easily build an independent VTN, as well as automatically set an alternative route when a network failure occurs. The resulting high-performance network is scalable, flexible and reliable. In addition, the UNIVERGE PF series makes it possible to grasp data communications routes visually via a GUI. This not only makes network management and control easier, but also enables service providers to deliver high-quality network services to their clients without interruption by quickly detecting the trouble source when network load surges or an abnormality or failure appears along a communications route.

Thanks to these benefits, the market expects the UNIVERGE PF series to be ideal for supporting corporate LAN systems and data center networks.

Lead time for setting up a network infrastructure is decreased from 3 days to same-day and cost is also reduced

MIC first introduced the UNIVERGE PF series in the area of virtual hosting services. Through experience, the company

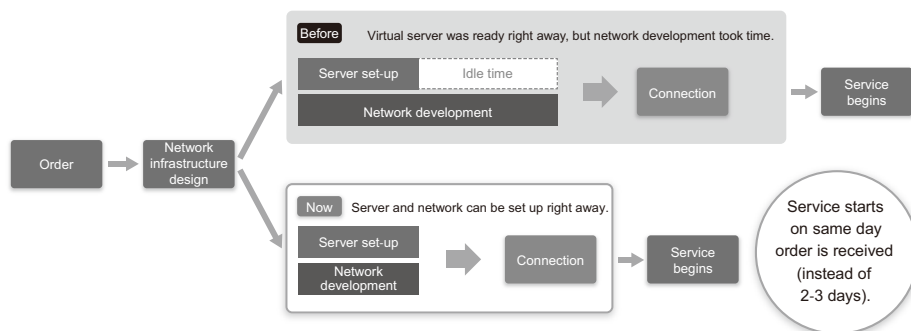


Fig. 1 Virtual hosting reduces the lead time needed to set up network infrastructure.

found a variety of benefits.

Faster response in providing virtual hosting services

The greatest advantage was the significant reduction in lead time required to set up network infrastructure (Fig. 1). Previously, conventional hosting services made it possible to quickly provide a virtual server, but it required extensive time to provide a network infrastructure. A network infrastructure usually required VLAN configuration, which consumed a lot of time and labor, as well as communications tests, fault tests, etc. There was therefore a long delay before services could be delivered.

“Previously, it took MIC at least two to three days to provide infrastructure, including a virtual server and network,” Mr. Fuchigami says. “Since implementing the UNIVERGE PF series, it has become possible for the company to offer a secure, independent VTN on the day a client requests one. This has reduced MIC’s expenditures on network management and control and has also changed client strategies for utilizing IT.”

Availability of new high-value-added optional services

The UNIVERGE PF series allows users to pool network devices and allocate them flexibly to a VTN. This means that devices such as firewalls can be shared over the network. According to Mr. Eitoku, “MIC previously installed devices separately for each client when a firewall was requested. Now we can offer a lower-price firewall as an option in our ‘shared services’ menu for clients.”

Improved service reliability and availability

A “non-stop network” can now be implemented, since the controller automatically selects and sets an alternative communications route when a device failure is detected. By minimizing downtime caused by failures, it becomes possible to securely manage mission-critical systems.

By optimally using such advantages, the UNIVERGE PF series has also made it possible to add new devices, change configurations and carry out maintenance and software upgrades without stopping network operations. According to Mr. Fuchigami, “Several weeks used to be needed to provide a comprehensive maintenance plan, which includes pre-evaluation, preparation of standby machines, scheduling of meetings with clients via sales staff, etc. Since introducing the UNIVERGE PF series, we do not have to worry about such things anymore.”

Efficient utilization of network engineers

Another benefit is the ability to free up network engineers from daily network administration chores and assign them to more strategic operations.

“It takes time to train engineers, especially network engineers, so we consider them important assets of the company,” Mr. Kamikaseda says. “Because the UNIVERGE PF series lowers the network management load, we can now relieve our important assets from simple network administration tasks and change the quality of their work.”

Possibility of reviewing service prices according to cost reduction

Because tasks such as making network changes have become easier, MIC has been able to lower its network management load and personnel costs (Fig. 2). “According to our estimate, network management load reduction and device usage efficiency will allow us to recover 60% of our initial investment within three years,” Mr. Matsukubo notes. “Reflecting these lower costs in our service prices will make our services more competitive.”

Expecting a New Backup Service Linked with NEC Data Center

To initiate SDN, MIC switched the network infrastructure for its virtual hosting and SaaS services to the UNIVERGE PF

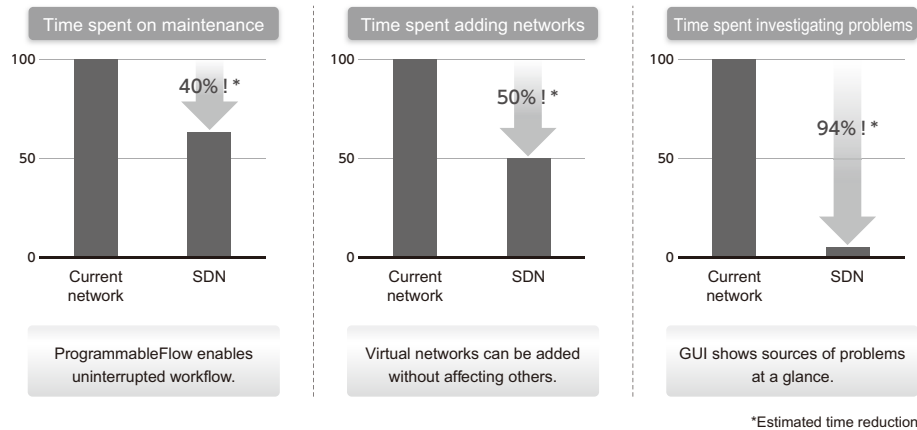


Fig. 2 Significant reductions in time spent on daily network management.

series. The company now plans to employ the UNIVERGE PF series to virtualize all networks in its data center by the end of the next fiscal year. Once this is done, the company's services will expand and become more flexible. For example, it will become possible to map systems controlled by housing or colocation services and systems with virtual hosting services to the same VTN, keeping those systems closely linked at all times.

A migration to SDN is also planned for the area of SaaS, which includes "Eye Vision" web conferencing and "Power Cabinet for SaaS" large-file management and transfer services. When this is completed, MIC will be able to grasp data flow through a GUI and check it client by client, paving the way for introducing charges based on data volume and other new service systems.

Furthermore, the company has set its sights on offering sophisticated data backup and disaster recovery services by working together with NEC's data centers. The goal here is to enable clients to quickly resume operations after a disaster or other incident. Because NEC's Kyushu Data Center has already implemented UNIVERGE PF series products, MIC will be able to set up a backup network easily without setting aside dedicated network resources. All we need is to set software-based network rules in advance between MIC and NEC's data centers.

"We are looking to open our second data center in the future," Mr. Kamikaseda says. "By organically connecting multiple data centers, we will be able to provide our clients added value in the form of less risk and higher reliability and flexibility at competitive prices."

MIC also aims to accumulate know-how on managing the UNIVERGE PF series and to start selling products to third parties in the future by making the most of its expertise. "Many clients are facing network-related challenges similar to ours," Mr. Churei says. "We want to offer the UNIVERGE PF series as a solution to solve these challenges that simplifies and visu-

alizes network infrastructures. We also have great expectations for NEC's technical expertise and promotional ability to assist us in our future business development." With its business potential boosted following implementation of the UNIVERGE PF series, MIC's business domain is expanding from the Kyushu region to the whole of Japan.

* This paper is based on interviews conducted in September 2013.

* Company and product names described in this paper are trademarks and/or registered trademarks of each company.

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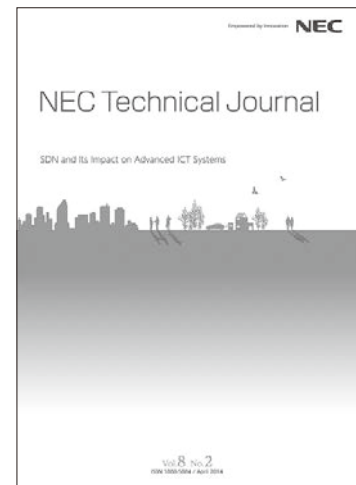
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