Nippon Express Co., Ltd.

Customer
- Nippon Express Co., Ltd.

Industry
- Global logistics supplier

Challenges
- Silo infrastructure supporting diverse tasks
- Reduce costs and utilize IT resources in a flexible and efficient way
- Create a virtual environment and shift entire infrastructure to a private cloud by 2014
- Limited flexibility for modifying networks in virtual environments
- Add value to customer experience

Solution
- NEC’s UNIVERGE ProgrammableFlow (PF) Series
  - Backup site: Two NEC ProgrammableFlow controllers, NEC ProgrammableFlow Management Console, and four 5240 ProgrammableFlow switches, serving 144 servers
  - Main site: Two NEC ProgrammableFlow controllers, NEC ProgrammableFlow Management Console, and eight 5240 ProgrammableFlow switches

Results
- Infrastructure deployment completed in 10 days, reduced from 2 months
- New level of flexibility and network control
- Full control eliminates need for vendor involvement, saving over $75K annually
- Improved reliability and availability; equipment errors take less than one second with no interruption
- Equipment footprint halved, power consumption cut significantly

Introduction

Nippon Express Co., Ltd. is a global logistics supplier, including domestic and international relocation, home delivery and transportation of specialized goods and fine art by rail, sea and air. Close attention to detail in domestic and international freight transportation, integrated warehouse and distribution management, logistics and information technology (IT) have made the company a leading provider of global logistics solutions. The company has cargo centers and logistics service operations in 37 countries throughout six continents with a global network composed of 383 subsidiaries and 62 associated companies. Nippon Express Group utilizes their logistical strengths to connect people, businesses and regions throughout the world.

Challenges

To improve efficiency and reduce operating costs, Nippon Express needed to eliminate its silo infrastructure supporting dispersed tasks. A cloud system was the best approach to achieve their objectives and leverage IT resources in a flexible and cost-effective manner. Additionally, a private cloud environment would add value to its distribution services portfolio, and represented a potential new revenue stream for Nippon Express.

As the IT arm of Nippon Express, Nittsu Information Systems Co., was responsible for exploring the options and executing the plan. “Nippon Express has been migrating toward a total virtual environment, and we expect to complete the transition by 2014,” said Yasunobu Nagase, Director at Nittsu Information Systems.

“Network storage can be easily setup using virtualization,” commented Shinti Fujibayashi, Network Planning Group Leader at Nittsu. “The problem occurs when a virtual machine is added or modified, then the physical layout of network equipment and LAN cables have to be moved, and the configuration settings of network equipment must be adjusted manually.”

Under the current structure, making adjustments to the network required onsite support from the network supplier. The network in the new virtualized infrastructure did not offer flexibility for adding or modifying systems, which severely limited benefits that Nippon Express could reap from its virtual servers and storage solution. Ultimately, Nippon Express wanted to regain control of network operations by using locally controlled servers and storage systems. In order to realize these advantages, a number of barriers had to be overcome.
After carefully considering the options, Nippon Express selected NEC’s UNIVERGE ProgrammableFlow (PF) Series to maximize the performance and management of the network in their virtual environment. Developed by NEC, the PF Series, a ground-breaking network solution based on OpenFlow network control technology, delivers a radically simplified and open infrastructure for datacenter and cloud networks.

ProgrammableFlow completely separates the transmission control function and the packet forwarding function of a traditional network switch. ProgrammableFlow controllers offer integrated control of the network, while ProgrammableFlow switches handle packet forwarding. This approach enables flexible architectural modifications and additions, greater levels of automation, as well as efficient operations management.

Mr. Nagase explains, “A virtual environment network was the optimal choice for Nippon Express because it enabled us to easily create virtual multi-tenant environments without physical restrictions. Clearly, this is a ‘first-of-its-kind’ technology, but extensive testing and evaluation from our cross-functional team determined that the technology was sound, and NEC provided excellent support and back-up.”

Ease of operation was a critical requirement for the Nippon Express private cloud initiative. With ProgrammableFlow, a network can be created easily – even without expert knowledge – for each tenant. Network adjustments needed for adding or deleting virtual servers, or for migrating between physical servers are performed automatically.

“Based on prior experiences, we wanted to operate our own technology and avoid being dependent on the network supplier. ProgrammableFlow allows us to seize control of the network from the vendor. We consider the technology so valuable, that we would have adopted it even if OpenFlow was NEC’s proprietary technology,” added Mr. Nagase.

Nippon Express now operates two ProgrammableFlow controllers, the management console and four 5240 switches supporting 144 servers at a backup site. The backup site implementation allowed further testing of the ProgrammableFlow before deploying to the main site.

“It’s been six months since ProgrammableFlow was installed, and we’re very satisfied with the functionality and quality of the product.” Mr. Fujibayashi stressed, “Previously, the system centered on two chassis core switches to future-proof the system, but the new system doesn’t require a big capital investment right away. Switches can be added easily when they are required, allowing us to cut housing costs through lower initial space requirements and reduced power consumption.”

**Network migration from existing virtual environment to ProgrammableFlow**

- a) Deploy Server Virtualization to achieve private cloud (Challenge is network operation)
- b) Virtualizes network to achieve more flexible operational environment
- c) Migrate VM to virtual network environment sequentially
- d) Back up high priority business systems
The adoption of ProgrammableFlow has delivered impressive results for Nippon Express. The infrastructure which in the past would have taken two months to deploy, was completed in only 10 days with the automation functions of ProgrammableFlow. Modifications to the network, such as adding virtual servers, are now automated to enable such tasks to be handled in-house, which greatly reduces operating costs. Mr. Nagase explained, “Network changes cost Nippon Express 6 million yen, or more than US$75,000, in the last year alone. Now, that cost has basically been reduced to zero.”

Housing costs were reduced, too; the 24U of core switches is expected to be reduced by half. Through standardization and consolidation, the server pool will be reduced from more than 500 servers to approximately 100 servers, so significant savings in power consumption is also expected.

Uninterrupted access to online services is essential to Nippon Express’ customers, so reliability is very high in importance. Mr. Fujibayashi elaborated, “The previous network might have taken 50 seconds for an equipment error to switch to a new route, which negatively impacted our business by causing certain applications to cut communication. However, if an error occurs with ProgrammableFlow, the controller captures it and an alternate route is automatically set, which means that the switching time is typically less than 1 second without interruption.”

Reliability improvements play a role in improving the quality of service provided by Nippon Express to its customers. Currently, Nippon Express plans to move its inventory control system, which runs servers from customer offices, to a cloud system adding it to the ProgrammableFlow network. Mr. Nagase said, “The system is used by multiple customers at the same time, so the ability to seamlessly set up a multi-tenant environment is a big advantage. When the system is fully cloud-based, the risk of data loss will also be reduced.”

Systems which are not being migrated to the virtual environment will continue to operate on the existing network. However, as more systems are accommodated on the ProgrammableFlow network, Nippon Express will enjoy greater gains in space, power consumption and cost reductions.

With the success of the backup site, Nippon Express is now implementing a network using ProgrammableFlow for their main site. The network consists of two NEC PF controllers, the management console and eight 5240 PF switches, and various systems, including the logistics database, are planned for migration to the virtual environment. In the future, even if expansion is needed due to additional systems, ProgrammableFlow enables switches to be added easily without interrupting the network.

Nippon Express is set to intensify its use of private cloud technology and lead the logistics industry on advanced IT. NEC is ready to support system service improvements at Nippon Express and continues to contribute making migration to the cloud a successful experience.

Mr. Nagase explained, “As ProgrammableFlow is adopted, not just by Nippon Express, but more broadly as a new network format, the use of cloud technology will accelerate in the market. I have high expectations of NEC and ProgrammableFlow.”