

Network separation infrastructure without speed loss for greater efficiency in the security operation

CISCO UCS-based network separation minimizes business inconvenience and enhances the level of personal information protection

Since its establishment in 2000, the National Cancer Center (President Lee Kang-hyun; www.ncc.re.kr), an affiliate of the Korean Ministry of Health and Welfare, has grown into an institution specializing in cancer study and treatment. The mission of the National Cancer Center is to reduce the cancer incidence and mortality rates in Korea and improve the quality of life of cancer patients. Its forward-looking research helps to accomplish its vision of becoming the world's best cancer center with the best facilities for cancer treatment. The National Cancer Center is dedicated to fostering cancer experts and supporting the national cancer control projects in the most efficient way possible. To maximize efficiency, the National Cancer Center (NCC) is currently carrying out network separation that separates the business network from the Internet network using Cisco UCS. This, as a result, helps the center safely protect its sensitive information and mission-critical systems.



In recent years, large-scale information leaks in both financial and medical institutions bring data security to the fore of the public agenda. Medical institutions, which hold, store and use particularly sensitive data, are facing the rising threat of cyber attacks and consequent loss of public trust. To address such concerns, the NCC has been conducting phased network separation since 2013. This project, which involves separating the business network from the Internet network, is designed to safely protect important medical information and systems.

Delivering excellent VDI infrastructure without any deterioration in speed

In 2013, the first phase of the network separation project was conducted for 100 users of the information and computing team, which includes many outsourced developers. NCC separated its business network with virtual desktop infrastructure (VDI) in order that business could be conducted solely with virtual PCs. Given that developers do not save information on PC, separating the business network with virtual PCs minimizes the possibility of an information leak. No matter what developers may be replaced in the course of work, the time to transfer such data can be greatly expedited, as it had already been

saved to a central server, rather than a local PC, and a standardized development system has helped streamline development.

The second phase of the project was carried out in 2014 for 200 users in the national cancer control headquarters and executive office, which handles a considerable amount of personal information. The Internet network was separated so that the personal information used by the business network could be safely protected.

The second phase of the network separation project focused primarily on securing a fast response speed. If VDI was used for network separation, all business would be conducted across the network, meaning several users would share server resources. The implication was a deterioration in response speed relative to that of a PC environment. That's why, when it comes to a VDI environment, a high-performance server, capable of handling a large number of virtual PCs without deterioration of speed, is not optional, but a definite requirement.

By phase 1 of the project, developers had already pointed out the problem with the server response speed, which triggered a review by the National Cancer Center of its methods of reinforcing security without impacting speed. In a VDI environment, a high-performance server can help mitigate against performance issues and ensure a speed similar to that of a PC environment. However, a high-performance server, which can guarantee sufficient speed, was more expensive than the budget allocated for the task.

CISCO UCS optimized for the virtual environment

NCC used Cisco's x86 server 'UCS (Unified Computing System)' to solve the speed problem of VDI. As UCS provides more than twice as much memory as existing servers, it can run many more virtual machines (VM) than comparable competitor servers can. That makes it particularly well suited to jobs that require high-performance computing power with a small number of servers. As Cisco's network technology is integrated into UCS, it is possible to manage increasingly complex networks. With one-off cabling work, it is possible to configure the Ethernet and FC, and reduce network options like adaptor switch cables by more than half as compared to existing servers. The 'UCS-B200 M3,' which was supplied to NCC, is a blade server designed with the Intel Xeon 5600 series. As it is about half the size of competitive solutions, it is possible to load up to 8 B200 M3 blade servers, which effectively maximizes the spatial efficiency of the data center. Cisco's integrated IO and Unified Fabric architecture enables a more innovative IO structure than with previous blade servers.

CISCO UCS greatly reduces the data center operating expenses.

Yoon Tae-sik, assistant manager of the information and computing team of NCC, said, "Cisco UCS features improved performance and functionality over the previous server. Especially as speed was greatly improved, performance is maintained to a PC environment level, regardless of how many virtual PCs are operated."

The price of the system must also be taken into consideration. When it comes to budget, VDI can come in at a similar cost to physical network separation, particularly due to its requirement of a high-performance server, with a large-capacity storage and significant network expansion.

Cisco UCS has twice as much memory and includes technology optimized for operating virtual networks. Therefore Cisco UCS can

operate more virtual PCs compared to competitor's same class server. Eventually, it is greatly lowering TCO through low introduction cost, high space efficiencies in data center and saving power. Mr. Yoon said, "As the Cisco UCS server performs better than other products in the same class, it is possible to run a great number of virtual PCs with a small number of servers. This has a direct impact on the overall cost of network separation. As the spatial efficiency of the data center was enhanced and network configuration became convenient, we found that administrative loads were reduced and the data center operating costs were reduced as well."

Network separation enhances the efficiency of the security business

Cisco UCS-based network separation has meant that the NCC can now be assured in the safety and security of its protection measures for the sensitive personal and medical information of patients. While reinforcing security can sometimes complicate business businesses, the NCC used network separation for personal information, while actively minimizing any impact on staff work.

The national cancer control headquarters and executive office, to which the second phase of the project was applied, are departments that handle a great deal of personal information. As the Internet network is separated, the leakage of personal information used by the business network is prevented. Indeed, prior to starting the network separation project, NCC first identified businesses that do not use the Internet, and made sure that these businesses would use only the business-internal, rather than the public, network.

The NCC provided functions using the Internet with an Internet viewer to prohibit the installation of files or programs. This enables the NCC to be better protected against advanced attacks, which tend to originate from malicious codes introduced through unauthorized programs or insecure Internet software.

CISCO UCS

The x86 server optimized for the virtual cloud

Cisco UCS is an x86 server that combines Cisco's state-of-the-art network and virtualization technology. Its design is based on an innovative architecture capable of providing the best configuration for the virtual cloud environment to enhance the agility and reliability of IT. Based on next-generation Unified Fabric and IO architecture, it can unify all network configurations, such as LAN, SAN and network management, into a single infrastructure. It uses the 10Gb FCoE to unify and transmit data from the NIC of the server to the fabric interconnect, which means that even an IO module duplicated on the blade chassis alone is capable of responding to any Ethernet or SAN connection structure.

What's more, this product has increased memory scalability to support the virtual environment and it has achieved epoch-making changes, e.g. unifying the IO controllers. As it offers 4 DIMM slots for each channel and adds 4 new channels to each of the memory channels provided by the Intel Xeon series, the Xeon 5600 series can support up to 32GB of DIMM modules. In addition, it reduces the response speed by 30% by unifying the IO controllers separated from the CPU.



“VDI infrastructure maximizes the advantages of the virtual environment and enhances the protection of personal information.”

■ What was the background of the network separation project and the plan for its implementation?

The personal and medical information of patients is highly sensitive and the primary target of advanced attacks. The National Cancer Center implemented this project in order to separate the Internet network and the business network to prevent intelligent network attacks and safely protect patient information.

We carried out phase 1 of the project in 2013, i.e. separating the business network for 100 users in the development department, which has many outsourced developers. Then, in 2014, we conducted phase 2 of the project, i.e. separating the Internet network for 200 users in the national cancer control headquarters and executive office, which handles a considerable amount of personal information. In 2015, we are planning to extend the project to include 700 users in administrative departments and, in 2016, we plan to complete rollout to 1000 users in all departments.

■ What did you review most intensively?

We applied VDI-based network separation, in which the virtual PCs on the central server are used to conduct business. What we found was that, as the response speed was slow, it was in fact greatly inferior to the general PC environment in terms of business efficiency. In phase 2 of the project, we sought to put in place the high-spec infrastructure required to

enhance the response speed to the level of a PC environment. We also considered ways to solve the problem of increasing management complexity in a virtual environment, and build and operate VDI with a limited budget.

■ Why did you choose CISCO UCS?

As the server used in phase 1 of the network separation project was limited in supporting the virtual environment, it suffers from serious bottlenecks and slow speed, making it inconvenient to conduct business.

Cisco UCS is a server optimized for the virtual environment. As it has twice as much memory as its competitors and provides excellent support for the virtual network, we saw that it provided the best server infrastructure for a VDI environment that runs virtual PCs.

■ What is the effect of the CISCO UCS-based network separation?

Cisco UCS-based network separation has had a tremendously positive impact on our IT and information protection systems. It has greatly reduced the possibility of a personal information leak and reinforced our security. As we have now separated the Internet network from the business network, security is not threatened by the Internet, and we have



Yoon Tae-sik, assistant manager of the information and computing team of the National Cancer Center

effectively prevented the illegal leaks of highly sensitive information like personal and medical information. What we have found is that, as Cisco UCS is optimized for the virtual environment, it can process business at a speed similar to that of the PC environment. This is a benefit felt most keenly by our frontline networks, who are no longer dissatisfied by slow response speeds. And the best thing of all is that we have been able to provide performance without compromising either security or budget.

It is essential to identify businesses subject to network separation accurately.

Mr. Yoon said, “We were able to apply a powerful security policy with network separation and raise the level of security considerably. However, our research center has found it hard at times to conduct business due to the many challenges of referencing outside data and sharing information with internal and external organizations. In this special case, we are seeking ways to mitigate inconvenience, e.g. by providing a dedicated viewer.” When carrying out the network

separation project, it is necessary to understand to which businesses it will be applied, and what needs to be considered most important in conducting these businesses. As network separation inevitably involves a slowdown in speed as compared to the general PC environment, it is necessary to pay special attention when designing the network separation environment for any businesses particularly sensitive to speed. Any businesses that use a great deal of computing resources will have particular difficulty conducting business after network separation. This means it is crucial to pay attention to the initial design.

CISCO UCS Server (Unified Computing System Server)

Optimized for the cloud and virtual environment

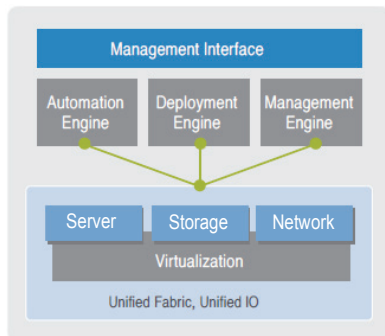
In general, when it comes to the X86 server environment, the average usage of most servers does not exceed 10%. The server itself tends to be connected as part of a complex web of separate cables and switches to networks and storage systems, having it difficult to provide the virtualization and cloud environment for the data center as a whole. Cisco UCS solves these inefficiencies, enabling it the optimal solution for next-generation data centers. With on Cisco's integrated IO technology, it simplifies the data center structure and incorporates within its design many virtualization solutions, making it particularly well suited to the virtualization and cloud environment.

Introduction to Cisco UCS

- Cisco UCS is an x86 server optimized to implement the cloud data center within a virtualization and cloud environment.
- The Cisco UCS server, which has the Intel X86-based state-of-the-art Xeon processor and Cisco's proven network virtualization and industry standard unified IO technology, is the best architecture for the expansion of the virtualization-based cloud computing.
- Cisco UCS supports blade and rack servers for the optimized performance of various applications and services.
- Cisco UCS reduces investment costs by optimizing the network architecture used to configure and operate the server farm at the data center. It achieves high-efficiency low-cost data in an easy and automated operating environment.



Features of Cisco UCS



Next-generation data center architecture

To configure the next-generation data center, the server, storage and network must be systematically combined. The Cisco UCS server is designed to fully reflect this requirement, with UCS Manager for unified management.

- Unified fabric and IO architecture
- Supports optimized virtualization environment
- Cisco's memory expansion technology
- Manages server, network and storage connections with system management software (Cisco UCS Manager)
- Simplifies system operation and management through service profile
- VCE (Vmware, Cisco and EMC) Partnership

Cisco UCS Server Line-up

Customized UCS B-Series Blade Servers



Customized UCS C-Series Blade Servers

