Healthcare

Hyperconvergence to support mission-critical medical systems

Kitasaito Hospital

Giving medical systems a new lease on life with a hyperconverged infrastructure from Lenovo, powered by Intel® Xeon® Scalable processors, lifting availability while keeping costs and administrative effort low.

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Powered by up to 4th Gen
Intel® Xeon® Scalable processors

Lenovo

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Who is Kitasaito Hospital?

Kitasaito Hospital has provided local medical services in Asahikawa, Hokkaido, Japan, for more than 50 years. The hospital focuses on everything from acute and chronic care to nursing and home care. In addition to operating the largest dialysis center in Hokkaido, Kitasaito Hospital maintains specialized departments for urology and nephrology, along with 10 other medical and nursing facilities.

医療法人 仁友会 北彩都病院
ISHIDA

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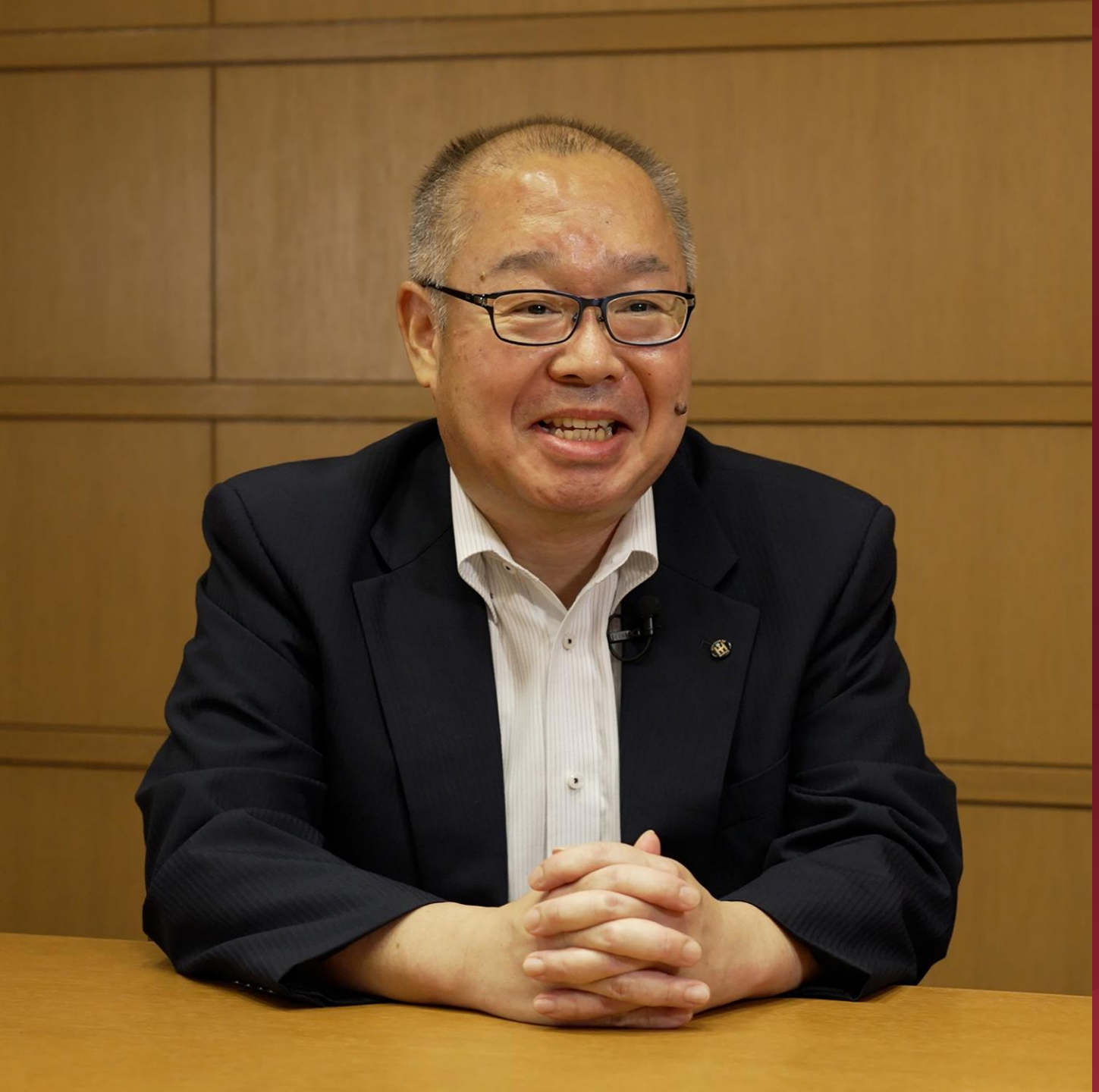
The Challenge

To support its operations, Kitasaito Hospital had long relied on an IT infrastructure comprising around 70 servers and 450 client terminals. They supported a range of healthcare and administrative systems, including an electronic medical record (EMR) system used by all departments and various applications used by individual departments.

Most of these servers operated in a virtualized environment, built using Microsoft Hyper-V server virtualization technology. In the past, Kitasaito Hospital ran approximately 60 virtual servers on six physical servers. It also relied on a dedicated physical server, configured in a high-availability cluster, as the database server for its EMR system. Alongside this, the hospital used local disks built into the physical servers to secure storage space for its virtual infrastructure.

With the three physical servers supporting the virtual server infrastructure reaching the end of their maintenance period, Kitasaito Hospital set out to find a replacement. The new virtual infrastructure had to be able to achieve a high level of redundancy and availability, while keeping administrative effort low. In addition, the hospital looked to migrate its EMR database, which had previously operated in a dedicated physical server environment, to a virtual environment in order to fully unify its operations.



“The EMR database was a mission-critical system, so we set up a dedicated cluster configuration to increase availability. However, with the virtual environment that housed other departmental systems, we had to manually perform failover to the standby system in the event of trouble or maintenance. It meant that we had to stop the business system every time, and the time and effort required to do so were becoming unsustainable.”

Mr. Takemasa Mishima
Healthcare Information Technologist, Manager, Information System, Healthcare Information Department, Kitasaito Hospital

Smooth migration to HCI

Kitasaito Hospital decided to adopt a hyperconverged infrastructure (HCI) based on Lenovo ThinkAgile MX3331-F All Flash Certified Nodes, powered by Intel® Xeon® Scalable processors. The latest Intel® Accelerator Engines and software optimizations help improve power efficiency.

Validated by Microsoft, Lenovo ThinkAgile MX Series is fully software-defined and runs on Windows Server 2019 Datacenter Edition, which includes Hyper-V virtualization and Storage Spaces Direct (S2D) technology.

The hospital worked with a local implementation partner to plan and deliver the migration. First, the two organizations carefully analyzed the current specifications and utilization status of the Kitasaito Hospital's existing virtualization infrastructure. They used this information to determine the number of required Lenovo ThinkAgile MX units and their specifications.

Hardware

Lenovo ThinkAgile MX3331-F
All Flash Certified Node
Intel® Xeon® Scalable processors

Software

Microsoft Hyper-V
Microsoft Storage Spaces Direct (S2D)
Microsoft Windows Server 2019 Datacenter Edition

Once the system configuration was decided, the implementation partner procured the ThinkAgile MX platform from Lenovo, configured it to the hospital's requirements, and installed it. At that point, Kitasaito Hospital stepped in to migrate the virtual servers from the old environment to the new HCI environment—a process that went exactly according to plan.

"We have always migrated virtual servers to other host servers for maintenance," notes Mr. Takemasa Mishima. "The migration to Lenovo ThinkAgile MX was also a migration of virtual servers between the same Hyper-V environment as before, so it was a simple matter of copying the VHDX files of the virtual servers and reconfiguring the virtual machines."

The migration began in January 2022, with Kitasaito Hospital ultimately migrating a total of 33 virtual servers to the Lenovo ThinkAgile MX platform. The hospital also completed the migration of its EMR database environment in March 2023. As this environment requires especially high availability, the hospital set up the virtual servers in a cluster configuration with double redundancy to further increase availability.

“With HCI, we can achieve virtual shared storage by virtualizing the internal disks of multiple servers with software and bundling them into one without installing new shared storage devices. As a result, we could make a smooth transition to the new infrastructure while maintaining our existing physical server operations as much as possible.”

Mr. Takemasa Mishima
Healthcare Information Technologist,
Manager, Information System, Healthcare
Information Department, Kitasaito Hospital

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Results

Since the migration, the HCI environment has continued to operate without any major problems, and Kitasaito Hospital rates its new platform very highly.

According to Mr. Takemasa Mishima: “The Lenovo system has been operating very stably, and the hardware monitoring functions have made day-to-day management much easier. Additionally, the new Windows Admin Center for monitoring the virtual server environment is just as easy to use as the software we used in our old environment, so the operational burden has not increased at all.”

With the Lenovo ThinkAgile MX platform offering fast and straightforward failover functionality, Kitasaito Hospital can ensure that critical systems and data remain highly available, even in the event of unexpected downtime.

- **20% more cost-effective than other proposals**
- **<1 minute failover time**
- **Simplifies IT management**

*Data provided by Kitasaito Hospital

Mr. Takemasa Mishima explains: “Fortunately, we have not yet encountered a situation where failover is required due to a failure. All the same, the Lenovo ThinkAgile MX failover function is very useful when applying Windows Update to the Windows Server OS on the host server.

“In the past, every time we applied Windows Update to the host server, we had to stop all the virtual servers for 30 minutes to an hour, and it took a lot of time and effort to inform the user department. However, after migrating to Lenovo ThinkAgile MX, we can apply Windows Update after failover to the standby system without having to stop the virtual servers, which makes it much easier and less disruptive to our users.”

While some departmental systems continue to run on the old virtual infrastructure, the hospital plans to migrate more virtual servers to the Lenovo ThinkAgile MX HCI environment as their underlying hardware comes up for renewal.

“The dialysis department's system is due for renewal soon, and we are planning to build three of these virtual servers in a Lenovo ThinkAgile MX environment. In addition, in two years, the hardware of the virtual infrastructure on which many virtual servers are running will reach the end of its maintenance period, so we would like to consider Lenovo ThinkAgile MX for that migration as well.”

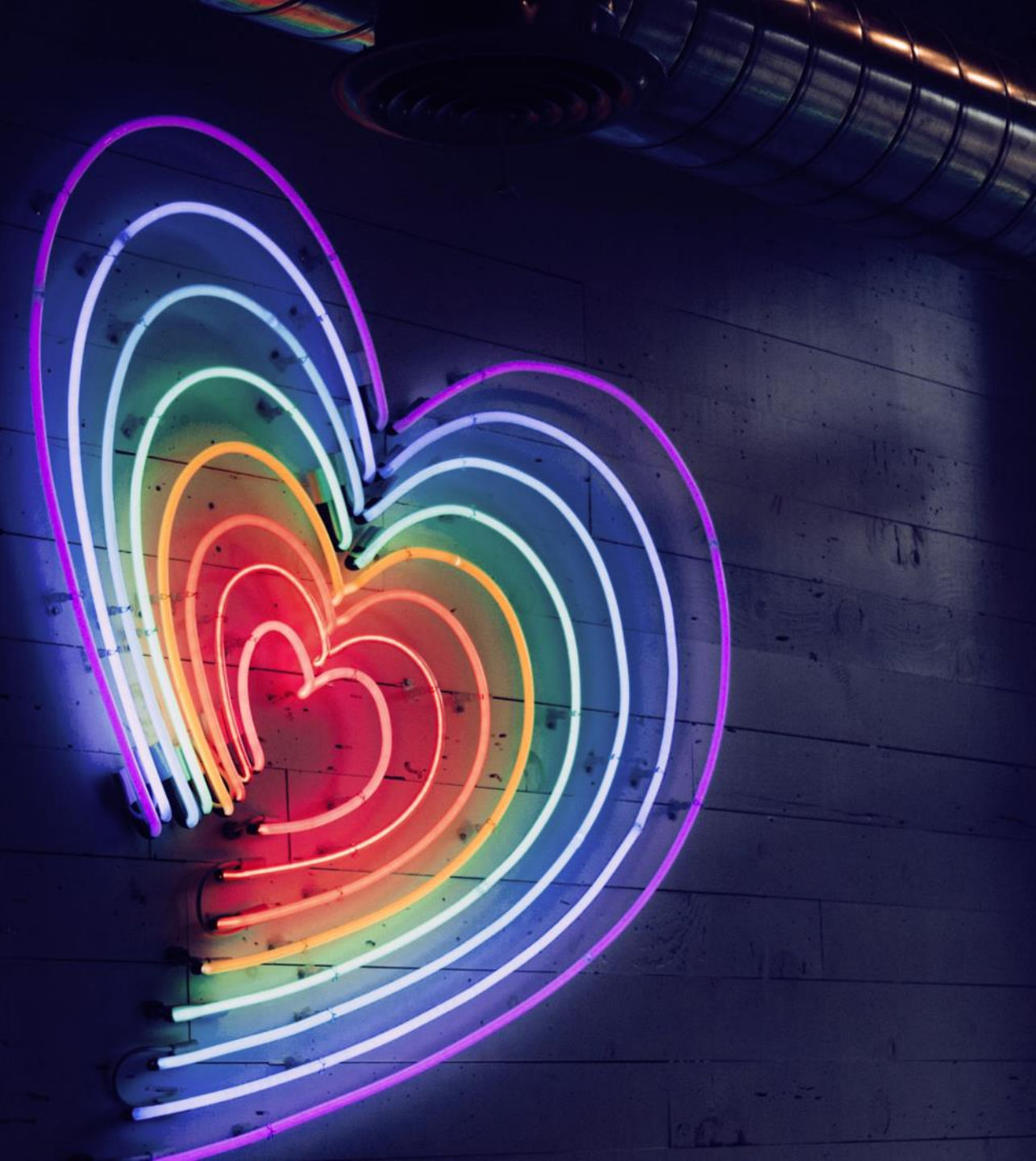
Mr. Takemasa Mishima
Healthcare Information Technologist,
Manager, Information System, Healthcare
Information Department, Kitasaito Hospital

Why Lenovo?

Lenovo ThinkAgile MX Series combines Lenovo's proven server platform with Microsoft's Windows Server 2019 Datacenter Edition, a server with HCI capabilities. The combination of the two products has been thoroughly tested and confirmed to deliver strong reliability and cost efficiency.

Mr. Mishima recalls: “Compared to other proposals, with Lenovo ThinkAgile MX Series we found that we could reduce our overall infrastructure costs by about 20%, including installation cost. We also found that the platform’s redundancy and availability functions were sufficient to meet our requirements, so we decided to formally adopt the Lenovo platform.”

Kitasaito Hospital encountered no problems during the migration process because it had anticipated future growth trends when designing the new HCI infrastructure, which ensured sufficient system specifications and capacity. The hospital also placed a high priority on redundancy and availability; when testing the failover function of Lenovo ThinkAgile MX Series, the team found that each virtual machine could be switched to the standby system in less than one minute—ensuring that critical systems and data remain readily available, even in the event of downtime in the main production environment.



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