FUJITSU

Case study
Tokyo Denki University

Tokyo Denki University Constructed a Private Cloud within Fujitsu's Datacenter.
The newly-built shared infrastructure enabled the leading Japanese university to deliver student services with a new level of efficiency including, enhanced student ID management and enhanced library services.

The customer

TDU 東京電機大学
TOKYO DENKI UNIVERSITY

Industry: Education
Established: September 11, 1907
Number of faculty & staff: 616 (430 professors, 186 staff members)
Schools: Tokyo Denki University (Engineering, including the Evening Division; Science and Technology for Future Life; Science and Engineering; Information Environment)
Tokyo Denki University Graduate School
Tokyo Denki University High School
Tokyo Denki University Junior High School
Number of students: Undergraduate students: 10,616
High school students: 762; Junior high school students: 521
(Data as of 01 May, 2012)
Website: http://atom.dendai.ac.jp/

The challenge

- Build a private cloud environment to refurbish the university's information silos.
- Achieve improved system stability while reducing the costs required to revamp the existing systems.
- Reduce the complexity of student ID management for all of the TDU-affiliated school and university students.

The benefit

- TDU built its own internal cloud running on Fujitsu blade servers and VMware virtualization software. TDU moved from the existing geographically dispersed ICT systems to a secure, centralized and integrated management solution. This has enabled the university to provide enhanced services for all students and graduates.
- The new cloud environment was constructed inside the Fujitsu datacenter which is equipped with the highest levels of security and disaster resiliency. The packaged Fujitsu solution provided a cost effective method for TDU to standardize their operations. These approaches have helped the university gain significant value for money and achieve a stable and emergency-ready ICT platform.
- With the implementation of Fujitsu UnifIDone integrated ID management system, TDU can assign a totally unique, lifetime ID to each individual student. This greatly improves management efficiency, enabling the university to provide better student services and enhanced career support, specific to each student's needs.

Overview

Tokyo Denki University (TDU) is one of Japan's leading science and technology, educational institutes. Since its foundation in 1907, TDU has been committed to providing excellence in education and training, preparing graduates with professional engineering skills. The university recently celebrated its 100th anniversary and as part of the commemoration activities, in April 2012, TDU relocated a facility to a brand new campus in the Senju area of Tokyo. In accordance with the opening of the new campus, TDU wanted to consolidate and revamp its ICT systems. The university called on Fujitsu to help merge the geographically dispersed platforms across the new Senju campus and TDU's other two campuses in Chiba New Town and Saitama Hatoyama, and create an optimized ICT environment. With end-to-end support from Fujitsu, TDU moved its systems to a secure private cloud environment within the Fujitsu datacenter. The solution is deployed on expandable Fujitsu PRIMERGY blade servers and VMware virtualization technology, providing TDU with an advanced ICT infrastructure. As a result, TDU has been able to reduce costs through the consolidation and deliver its students a reliable, stable and high quality service.

Customer background

TDU wanted to consolidate its geographically dispersed ICT systems to improve efficiency.
In today's world, science and technology in Japan are considered to be prominent, and without a doubt, those technological advancements couldn't have been achieved without the dedicated efforts of countless engineers.

"Fostering the development of leaders who contribute to society through technological expertise" - Upholding this strong educational mission, Tokyo Denki University (TDU) has been at the forefront of providing exceptional education and training to students seeking to become a professional engineer. Originally started as a vocational technical school in 1907, TDU has grown to be a comprehensive education institution. TDU is composed of a junior high school, a high school, an undergraduate school and a graduate school, all of which are dedicated to engineering. TDU's founding principles, "Respect for practical study", "In the technology breathes its creator", and "The major players at TDU are always our students" have been inherited over generations, and a total of more than 200,000 students. For years, TDU graduates have enjoyed a high success rate in finding jobs, predominantly due to the recognition of their strong engineering expertise.

Hardware
■ Fujitsu PRIMERGY BX900 blade servers

Software and Cloud Services
■ VMware virtualization software
■ Fujitsu UnifIDone ID management package for universities
■ Fujitsu RapidWeb+ web systems development solution
■ Fujitsu iLiswave-J software for university libraries
■ Fujitsu Ufinity academic portal software-as-a-service

Tokyo Denki University recently reached a special milestone in its history - 100 years of engineering education and research. In April 2012, to mark this milestone and move into the next 100 years, TDU opened a new campus in Tokyo (the Tokyo Senju campus). The new campus embraces the idea of "TDU Renaissance and Evolution", it is designed to provide a learning environment that emphasizes the students experience through a creative and innovative model. The new campus was constructed with a variety of state-of-the-art features including;

TDU students using a media room

- Adoption of heat pumps with a thermal storage system using night-time electric power;
- Use of intelligent information systems that enable TDU to control electricity, lighting, cooling and heating depending on classroom occupancy;
- Disaster-resistant construction practices, producing an earthquake-proof structure.

TDU hopes this new cutting-edge, eco-friendly campus will be a catalyst for growth of the Senju city. With this in mind, the Tokyo Senju campus has a fence-free design that opens its library and cafeteria spaces for public use. Furthermore, rigorous security systems have been implemented throughout the campus, enabling TDU to ensure a safe environment for students while also providing public access to the facilities.

In preparation of moving to the new campus, TDU also needed to upgrade and advance its ICT infrastructure. "Enhancement of student services and ICT-related cost reductions are always a large part of our focus," says Mr. Shigeo Wada, Director of TDU Multimedia Resource Center and Library and Faculty of Engineering, Tokyo Denki University. "We had ambitious plans to revamp the existing ICT systems to coincide with the big event of opening the new campus. With the previous ICT infrastructure, the biggest challenge was how to improve operational efficiency, because previously the three campuses had operated their systems individually. Those information silos caused undesired overheads, inefficient operations and inconsistency in the quality of service. We wanted to solve all these challenges, and strongly felt that our next-generation ICT infrastructure should be cost-efficient, responsive and flexible enough to provide enhanced IT services for many students at the new and existing campuses," Wada recalls. Taking these factors into consideration, TDU's journey to explore forward-looking solutions began in 2010.

Private cloud-based systems appeared to be the best option to meet the university's objectives
TDU chose to build a private cloud environment inside Fujitsu's datacenter with an eye towards operational efficiency and improved crisis management.

After thorough consideration and a broad discussion, TDU decided to

build its own internal cloud to shift from the existing geographically dispersed system toward a secure, centralized and integrated ICT management system. The TDU Multimedia Resource Center and Library, responsible for the entire ICT infrastructure, then embarked on a private cloud deployment project that began with consolidation and integration of the existing infrastructure. The Center had very clear objectives to meet throughout the project - "We wanted to develop a new environment that would enable us to achieve our primary goals; –

Mr. Shigeo Wada, Director of TDU Multimedia Resource Center and Library, Faculty of Engineering Tokyo Denki University

- To deliver high-quality, consistent services
- To ensure a stable system for our students
- To reduce ICT associated costs.

In order to improve disaster-response capabilities, security levels and business continuity readiness, we needed to place our new cloud platform in a secure and resilient space provided by commercial datacenters," Wada states. Moving forward to the higher efficiency environment, TDU also chose to adopt solution packages for operational standardization.

Once the decision was made, the university engaged Fujitsu to provide the core foundation and datacenter space for the TDU private cloud. The vendor selection process was not a challenging task, according to TDU. "In 2007, TDU and Fujitsu collaborated to virtualize and consolidate our network servers using Fujitsu hardware products with VMware virtualization technology, and we were very happy with the results. Our years of solid business relationships and established trust with Fujitsu, as well as their wealth of experience in virtualization, operational support and maintenance capabilities, gave us confidence to work with Fujitsu again," Wada says. In February 2011, TDU's new private cloud environment, comprised of Fujitsu's PRIMERGY BX900 blade servers and VMware virtualization software, was successfully constructed in the Fujitsu datacenter. Following migration, TDU's new and upgraded, cloud-based education system and library management system went live in October 2011. Then, in April 2012 the new student ID management system was integrated into this existing, TDU cloud environment.

Highlights of the new and upgraded services at TDU
The Fujitsu UnifIDone student ID management system has enabled TDU to assign a totally unique lifetime ID for individual students.

In the new environment, Fujitsu's iLiswave-J packaged solution provides significant improvements to TDU's library management system. The specifically designed solution attaches each book with an RFID tag, TDU can now manage all the books in its libraries easier and more efficiently than ever. TDU also integrated the Fujitsu Ufinity academic portal software-as-a-service with the iLiswave-J system,

enabling the university to provide students, graduates, faculty and even local community members with access to a database offering a wide variety of academic resources.

Aiming to employ the best solution possible, the university issued an RFP for the student ID management system. Fujitsu was chosen, and implemented the Fujitsu UnifIDone integrated ID management solution. The UnifIDone is a packaged offering that is specifically designed for unique university environments where identity management tends to be quite complicated. The sophisticated student ID system will be a core component of improving student services and is the first of many initiatives to come.

"Up until now, the TDU schools and University's created student ID numbers using different identification schemes. This created many complexities as it became possible for a single student to have multiple IDs at different stages in their student lifecycle. Even for graduates, after graduation, their contact information was managed by the TDU alumni association, again using a separate ID numbering system. It's always a tremendous task to track and maintain accurate contact information," says Ms. Yoko Takahashi, Manager, TDU Multimedia Resource Center and Library, Tokyo Denki University. "With UnifIDone, we can assign a totally unique ID to each individual, and once assigned, the given ID can be used throughout the students' lifetime, from admission through to university graduation and even after graduation. This system significantly benefits us by providing efficiencies and detailed management of student information. The solution will enable the provision of detailed career support that will be based on the individual education needs of the student throughout their development. Through enhanced services, TDU hopes to establish and maintain long-term relationships with its students," Takahashi continues. "The assignment of a lifetime ID will unlock valuable information that will be available for enhancement, evaluation and analytic analysis," Wada adds. "The consistent student management capabilities help us improve efficiency in gathering student records, analyzing students' educational experiences and evaluating the effectiveness of our education. This in turn leads to the delivery of fine-tuned and guided support, for each student."

TDU liked the distinctive ability of UnifIDone to distribute ID numbers to large-scale targets. This function can be fully utilized in support of the university's efforts to make the university facilities open for public use. At TDU, UnifIDone is expected to be extended to achieve a unified user ID management system across non-student groups such as visitors and library users. To further improve operational efficiency, TDU also adopted Fujitsu's RapidWeb+ (RapidWeb Plus). This inexpensive SaaS-based solution for Web development has made it possible for the university to streamline the day-to-day management of student attendance, visitor records, room/facility booking and campus entry/exit data.

Business benefits and future scenarios
TDU achieves rapid disaster recovery, stable system operations and significant energy savings.

Ms. Yoko Takahashi
Manager, TDU
Multimedia Resource
Center and Library,
Tokyo Denki University
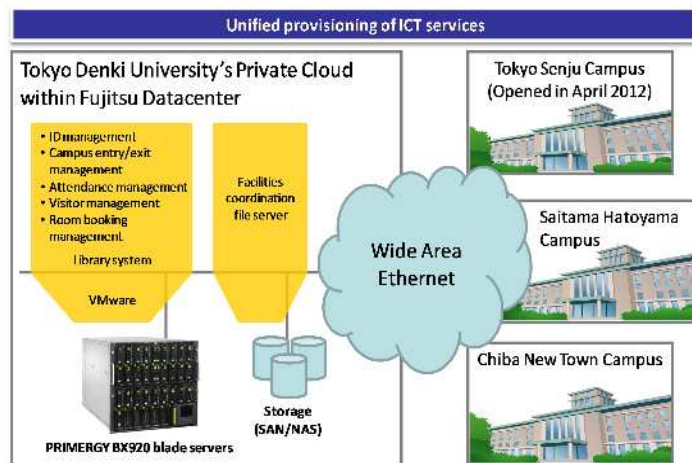
(Figure.) Tokyo Denki University's New ICT Platform

The private cloud deployment at TDU has already delivered many advantages to the university.

"Our choice of the cost-efficient packaged solutions was right - Without having to invest a large amount of money, we can now use powerful, industry-leading features and functionality that enable us to be more responsive to the changing needs of society. We also appreciate Fujitsu's efforts to bring stability to the TDU systems. Even when a huge earthquake devastated Japan in March 2011, we didn't experience any disruption to our system operations, as our cloud infrastructures within Fujitsu's datacenter remained functional during the disaster. We felt secure, and we established unshakable confidence in Fujitsu. As our systems are now hosted in the Fujitsu secure datacenter, in the event of system failures, it has become possible to shorten our recovery time, compared to the previous in-house operations," says a satisfied Wada.

Another advantage that TDU is excited about is the greatly improved resource optimization and efficiency gained through the use of shared infrastructure. "Usually at TDU, system workloads fluctuate throughout the year and now the new cloud environment will help us stabilize services during the periods of fluctuation. For example, during peak times of undergraduate course registration, a temporal surge in the workload is experienced. Now, we have the ability to add additional resources in order to process all registrations properly. The cloud infrastructure makes it easy, quick and inexpensive to expand resources and deploy new systems," explains Wada.

Shifting to the private cloud approach has enabled TDU not only to achieve improved system efficiency and stability, but to also make the university a more eco-friendly place. Thanks to the successful virtual server consolidation, TDU reduced the number of physical servers by 60%, and the state-of-the-art, environmentally-friendly Fujitsu datacenter is further promoting the university's energy-conservation efforts. With the new cloud environment, it is expected the university will be reducing the amount of its CO_2 emissions by 18 tons annually.

As part of the continuing improvement activities, TDU is collaborating with Fujitsu to capture the business processes of their daily operations. These activities involve Fujitsu providing TDU with supportive advice through practical and pragmatic proposals, (also known as Fujitsu's Field Innovation activities).

Tokyo Denki University has intentions to expand the use of cloud-based applications. "At TDU, we would like to develop and implement a variety of educational initiatives that leverage the advantages of the new private cloud environment. We are also considering more advanced approaches to the adoption of public clouds in the future. To realize our vision and achieve our objectives, we look forward to continuing the great work with Fujitsu," Wada concludes.

Moving forward, Tokyo Denki University strives to take on new challenges that promote the success of its students in society. As a trusted ICT partner of TDU, Fujitsu will, with its industry-leading portfolio of technologies and comprehensive capabilities, continue to be committed to providing end-to-end support to the research and educational efforts of TDU.

TDU Multimedia Resource Center and Library staff members and Fujitsu's sales representatives for this project