

Fukuoka University Load Balances Its Servers for Its On-premises and Cloud Environments



FUKUOKA UNIVERSITY

Industry | Education

Fukuoka University is one of the largest private universities in western Japan with a 20,000-strong student body across two campuses. The Fukuoka University campus network is indispensable in providing students and faculty with the foundational tools they need to accomplish their educational activities. As a comprehensive education and research center conducting advanced research, a high-performance – and secure – network is not a luxury but a necessity. As part of its strategy to provide seamless performance and user experience, the university selected the A10 Networks Thunder® CFW solution for the load-balancing of the servers that support the university's campus network.



As the network has operated stably without any issues, there has not been any operational burden at all. We are able to provide a stable, high-quality network for all our users thanks in part to the A10 Thunder CFW solution.

– Sho Fujimura

Associate Professor of Office for Research and Development,
Information Technology Center, Fukuoka University



Network Solution

A10 Thunder CFW



Critical Issues

- Campus network needed to be renewed every five years
- Establish a convenient, secure and high-quality network environment
- Provide a mechanism that enables load balancing of various servers including DNS



Results

- Implemented load balancing and redundancy mechanisms for on-premises and cloud environments
- Established trouble-free, stable operation for the first two years of use
- Reduced maintenance burden thanks to stable operation, allowing a high-quality network environment to be created for users

Challenge: Create a New Platform for Campus Network

Fukuoka University was established as Fukuoka Commercial High School in 1934. The university embraces the goal of a holistic education with a guiding philosophy of “Steady, Sensible, Sincere, Strong, and Spirited.” As one of the leading private universities in western Japan – boasting a student body of some 20,000 students enrolled in 31 departments across 9 faculties, and 10 graduate schools – the university continues to produce a wealth of talented graduates as a center for comprehensive education and research in various fields.

Prior to celebrating its centennial in 2034, the university set out a vision to become a center of innovation able to nurture and develop human resources who can play a significant role in their respective communities and the world. As a holistic university in Kyushu and as a center for education, research, and medical care, the university has been promoting activities to contribute to society while valuing its ties to the local community. One factor that is indispensable for such activities was the establishment of a secure campus and internal network.

The university’s information and communications technology (ICT) platform was christened as “The Future” of education and research systems but was revamped as a campus network in 2020. Associate Professor, Sho Fujimura, of the Office for Research and Development in the Information Technology Center at the university explained, “The ICT platform had been upgraded as an educational and research system, being effectively replaced in roughly five-year cycles. In 2020, the name was also revised, partly because the whole infrastructure needed to be renewed.” Foundational to the planning was the establishment of a high-performance network that provided unimpeachable user experience both for the short and long term.

Selection Criteria: Past Results and Cost-Performance

All internal information systems, including administrative information systems, were consolidated into an integrated server platform installed across multiple public clouds. This was done while also upgrading the ICT platform in 2020 with the adoption of a configuration that directly connects the university to public clouds with a closed network via the academic science information network (SINET).

Professor Fujimura added, “The new ICT platform was designed to create a secure, high-quality network that is very convenient for users.”

For this new platform, load-balancing of the various servers was necessary and indispensable. A load-balancing mechanism has been used since the education and research system was adopted many generations ago. Professor Fujimura recalled, “A load balancer was adopted to realize load-balancing of the servers centered on DNS and a redundant configuration to ensure the network was never brought to a halt at a time when the number of users surged. This A10 Thunder series was adopted two generations ago.”

Also, for the recent renewal of the ICT platform, load-balancing was required not only for the DNS servers, but also other servers, such as multiple authentication servers, including RADIUS, and the NTP servers installed at the university’s main campus.

In addition to a fixed maximum number of sessions and connection performance, the load balancers needed to be able to maintain sessions even in the event of failures, balance loads over both IPv4 and IPv6, and provide TLS acceleration with ASIC, and more.

“A secure environment has been prepared via proxies to filter web content, with all computer classroom and administrative personnel’s computers, and all communication within the libraries and medical information-related communications for Fukuoka University Hospital being routed through proxies.

The new platform will continue to be used for the next five or six years, so we calculated the number of sessions and connection performance, etc., while also considering future environmental changes,” said Fujimura.

Bidding for the load balancer itself was implemented as part of the project to revamp the entire ICT platform across the corporation. Based on its past results and overwhelming cost-performance, the A10 Thunder CFW was adopted as the load balancer for the servers on the new campus network.

The Solution: A10 Thunder CFW to Create a Secure Environment and Exceptional Load Balancing

Fukuoka University chose the A10 Thunder CFW due to its integrated ADC and firewall functionality that combines network security functions to safeguard availability and security of the university’s network.

The A10 product also contributes to the creation of a secure environment by not only optimizing application delivery via its advanced load-balancing functionality, but also due to its ability to aggregate multiple network security functions, such as firewalls, IPsec VPN, secure web gateways, DNS over HTTPS, CGNAT and DDoS protection.

Courtesy of the A10 Thunder CFW, and its proprietary Advanced Core Operating System (ACOS®), high performance and scalability are ensured, and it meets the diverse requirements of organizations like Fukuoka University for large-scale processing.



Results: A Trouble-Free and Stable Network

Redundant configurations of four A10 Thunder CFWs were installed for the university’s new campus network, which was launched in 2020. Due to the CFWs’ installation, the university’s network can now flexibly handle load-balancing between the cloud-based integrated server platform and on-premises servers installed at two locations. Essentially, the on-premises servers are treated as active, with the cloud environment held on standby in the event of failure.

Current load-balancing targets are the DNS servers, cache servers, authentication servers used to access wireless LAN, NTP servers installed in the university, proxy servers that filter web content, and servers that operate in a virtual VMware environment, such as log servers.

Access from users is connected to servers via web content filters so communications from over 20,000 devices are processed by A10 Thunder CFWs.

Two years have passed since operations began, and a well-functioning network has been maintained thanks to stable load-balancing. “The A10 Thunder CFW has operated steadily and without any problems. The end result of its deployment is that a high-quality network has been provided to the users without burdening the administrators,” said Fujimura.

Moreover, an intuitive GUI is easy to operate, including localization into the Japanese language, and it has earned a good reputation among IT staff as concepts such as service groups and other elements are clearly defined.

Also, A10 engineers visit the site and have provided excellent support from the design through construction stages. Professor Fujimura evaluated such post-sales support from a manufacturer as unique to A10.

The A10 Thunder series has been used without any major operational issues for over a decade within the university and is highly valued from a quality perspective.

Success and Next Steps

Professor Fujimura explained that the university currently uses the load-balancing function of the A10 Thunder CFWs but will conduct an overall review including cybersecurity elements when upgrading to the next-generation campus network.

“The number of opportunities utilizing the wealth of solutions offered by A10’s functionality must be increased. For example, we are interested in enhancing security using A10 Thunder CFW’s SSL inspection function, although further discussions are needed with each laboratory. We would like to extend its use if there are functions that match the university’s requirements,” said Fujimura.

He also stated that the current 10G interface may need to be reinforced depending on the future platform, and finally commented that they would like to explore how to expand the use of A10 Thunder CFW to create a platform that can flexibly respond to unexpected changes in the environment.

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– Sho Fujimura
Associate Professor of Office for Research and Development, Information Technology Center
Fukuoka University



About Fukuoka University

Founded in 1934, Fukuoka University is a private research university located in the far western region of the island nation of Japan. The university boasts a student body of approximately 20,000 students across 31 departments, nine facilities, 10 graduate schools, and over 2,100 faculty. The university is also rated as one of the top 2,000 universities in the world. The university also has two campuses in Nanakuma and Kitakyushu and manages one of the top hospitals in Japan. University alumni span accounting, sports, law, education, engineering, medical and healthcare sciences, and research fields.



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A10 Networks (NYSE: ATEN) provides secure application services for on-premises, multi-cloud and edge-cloud environments at hyperscale. Our mission is to enable service providers and enterprises to deliver business-critical applications that are secure, available and efficient for multi-cloud transformation and 5G readiness. We deliver better business outcomes that support investment protection, new business models and help future-proof infrastructures, empowering our customers to provide the most secure and available digital experience. Founded in 2004, A10 Networks is based in San Jose, Calif. and serves customers globally.

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