Frompage Boosts High School Students' Course Choice

Frompage's Yumenavi video streaming service for university lectures uses Akamai EdgeWorkers and Akamai EdgeKV for faster API requests and zero timeouts

60%
APIs on the edge

10x
Faster API response

75%
Reduced origin server

A better student experience with edge computing

Frompage is dedicated to students who want to learn. But managing API requests for the organization's video streaming service for high school students at times of peak demand was challenging. By using innovative solutions from Akamai EdgeWorkers and Akamai EdgeKV, Frompage has offloaded 60% of processing from its origin servers, API responses are 10 times faster, and timeouts have been eliminated.

Helping students make university and course choices that support their potential

The founding principle of Frompage Co., Ltd., is that "a university where you can study what you want to learn is the best path forward." To support this mission, Frompage has developed a range of services that support entry into higher education by linking high school students with universities. These services include Yumenavi, a service that enables prospective students to discover the subjects they might want to study based on their interests and searches for universities.

Yumenavi provides an online lecture video service that includes approximately 4,000 30-minute video lectures given by teaching staff from 350 universities. Students at high schools that register for the service can browse and watch lectures on popular subjects such as

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Osaka, Japan
frompage.jp

Industry

Public Sector

Solutions

• EdgeWorkers
• EdgeKV

physics, law, architecture, and sustainable development. To enable informed decisions, these videos focus on features and research topics unique to the individual departments and institutions.

Wataru Anyouji, Section Head of the Information Systems Department at Frompage, says, "Yumenavi is used by approximately 1,800 high schools for further education guidance and lessons, and has more than 550,000 registered users. Demand for the service is particularly concentrated when students log in to watch videos in class or write reports on videos that interest students at the end of long vacations. As the volume of content has increased, so has the number of schools and students using the service. Handling peak traffic was a big challenge at times of high demand and simultaneous viewing within a class."

Offloading API authentication and authorization

High school students who have created an account use tokens for API authentication and authorization when browsing members-only video content. Each time a user logs in and presses a button in their browser to display a list of contents, transition between pages, or display lecture summary information, an API request is sent to the origin server where the token is verified. But during times of high demand, there were large numbers of concurrent requests, which exceeded the permissible load value on the origin server. This high demand increased server response times and diminished the user experience.

Frompage was using the autoscaling feature of an infrastructure as a service (IaaS) and the company increased origin server resources to prepare for periods of high usage. But this approach failed to keep up during periods of unpredictable demand. For example, when hundreds of high school students were watching videos in class at the same time.

Although overcoming this challenge was a priority, Anyouji and his team also wanted to avoid overspending on origin servers while making as few alterations as possible to the servers already in operation. This led them to select Akamai EdgeWorkers, which provides application developers with a serverless computing environment where they can implement their own custom logic on Akamai's edge network. Frompage also deployed Akamai EdgeKV as the key value store database that works with EdgeWorkers.

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> All you need to know, including what libraries to use, is stated in the documentation and extensive sample code that supports development on EdgeWorkers and EdgeKV. Even JavaScript beginners like me can easily find coding cues.
>
> – Wataru Anyouji,
>   Section Head, Information
>   Systems Department, Frompage

Just one month from coding to implementation

The Yumenavi lecture video service API uses a time-limited token for authorization. Now, these tokens are stored on EdgeKV and when they receive the same type of request from the web browser, they are matched on EdgeWorkers. This reduces the number of API requests to the origin servers and reduces the display bottleneck caused by the processing of API authorizations.

Akamai's CDN service provides multiple authentication and authorization mechanisms. However, the ability to implement their own logic in JavaScript, a language familiar to the developers, without having to change the mechanisms of the origin servers, was a decisive factor for Frompage. Speed to deployment also played a role, and it only took one month to move from coding to production implementation.

"We implemented two sets of logic at the edge to store and verify tokens. All you need to know, including what libraries to use, is stated in the documentation and extensive sample code," Anyouji says. "Even JavaScript beginners like me can easily find coding cues. Akamai engineers helped to validate our ideas for security and other implementation details which meant we enjoyed the development process even though we were on a tight schedule."

At the same time that development was taking place, Akamai was hosting an EdgeWorkers Coding Contest in the Asia-Pacific region. The technical capabilities of the Frompage team were highly praised — and the team won an award for the offloading of origin API authentication and authorization encapsulated in custom ideas and simple code.

Eliminating timeouts, boosting the student experience

By driving token processing logic at the edge, responses to API requests are now 10 times faster. This has eliminated the timeouts that affected some users during peak demand. Frompage was also able to offload more than 60% of its API processing load to the edge, reducing the number of origin servers required for this task.

Nobukatsu Yoshii, Assistant Manager of the Information Systems Department at Frompage, says, "When we ran a load test, we only needed a quarter of the original origin web servers at peak times. We also managed to reduce the costs to between one-quarter and one-third of the previous total. After leveling the load, we no longer need to fine-tune IaaS's autoscale feature, which was an issue in the past."

Shogo Naito, who is Chief for developing web applications for the lecture video service in the Information Systems Department, also noticed a dramatic improvement. "We had been plagued by this issue for a long time, so I remember how happy Anyouji and I were when we saw a graph of the load test results. Since implementing Akamai, there have been no performance complaints made to the Sales Department from our participating high schools," he says.

Managing demand, facing the future

Access to Yumenavi increases exponentially in April, the beginning of the new school year in Japan, but edge computing with EdgeWorkers and EdgeKV enabled Frompage to manage demand easily.

Tetsuyo Sano, Manager of the Information Systems Department, says, "Akamai understood the nature of the challenges we were facing and presented us with the best possible solution. We are happy and proud to have found a partner who can work with us to build a better service. Edge computing is an advanced challenge but being able to deal with it by being curious and inquisitive made it a valuable experience. I would like to embed these technologies throughout the entire company in the future."

All this gives Frompage a solid foundation from which to provide a more stable and high-quality service to universities, high schools, and students across the country. Anyouji says, "As well as deploying an innovative solution with EdgeWorkers, Akamai has helped us to understand how we can incorporate new technologies to overcome challenges. It means we can face the future with complete confidence."

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– Nobukatsu Yoshii,
   Assistant Manager, Information
   Systems Department, Frompage

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Frompage develops a wide range of services, under the philosophy of "Japan will change if we can ignite the hearts of high school students with passion." Its services connect universities, high schools, and high school students. They include Telemail, which allows high school students to easily request materials and applications over the internet and by telephone; Yumenavi, which enables students to study university subjects based on their interests; and OCANs, which supports the operation of open campuses.

Akamai