VARNISH
SOFTWARE

The University of Wuppertal (Bergische Universität Wuppertal, or BUW, in German) uses Varnish Enterprise to boost performance, redundancy and strengthen its video-on-demand streaming capabilities

Case Study:

University of Wuppertal

BUW uses **Varnish Enterprise** to boost performance and strengthen its streaming capabilities

Background

The University of Wuppertal is a university in western Germany, serving approximately 23,000 students and 2,650 employees.

The university's central IT department delivers everything from network, infrastructure and hardware support to software licensing, access control and e-learning.

The challenge: Performance

University of Wuppertal's IT department supports 400 departmental subdomains on a centralized TYPO3 CMS cluster. TYPO3, a PHP-based CMS, suffered problems typical of PHP-driven software: slow load times.

Searching for solutions within the TYPO3 community, Varnish Cache had been mentioned several times as a way to speed things up and invalidate content in the cache. The university first turned to the open source version of Varnish Cache, using a standard Debian installation package. Initially, and for the next five years, a single Varnish caching server in front of TYPO3 served their performance needs, and the university IT staff were able to educate themselves and get questions answered in online forums.

Redundancy and resilience needs

The open source Varnish setup worked well, but the IT department recognized that a single Varnish cluster could also become a single point of failure, and serving content reliably meant eliminating these kinds of bottlenecks, and embracing redundancy.

University of Wuppertal at a glance

Organization

- The University of Wuppertal is a dynamic university in western Germany with an interdisciplinary teaching and research profile.

Challenge

- Speed up TYPO3 CMS content delivery with caching
- Gain redundancy and resilience alongside performance
- Strengthen video-on-demand streaming platform

Varnish Web and API Acceleration and Streaming Server

- Caching solution and flexible cache invalidation
- Professional support with implementing robust VoD streaming solution

The solution: From open source to enterprise: High availability, redundancy and cache invalidation

To safeguard the always-available redundancy the university sought, they again turned to Varnish, seeking to pair Varnish solutions with Kemp load balancers to distribute requests for maximum performance and resilience.

With Varnish Enterprise, they were able to create a cluster of two Varnish servers to which the load balancer would distribute requests. Having had extensive experience with open source Varnish, the jump to the supported enterprise version was quick and seamless, with a "Varnish-approved" VCL review and access to the Varnish Controller (Varnish Administration Console, or VAC, at the time) to gain a single point of control for administering Varnish instances.

When we looked for open source support in online forums, we were surprised to see the names of many of Varnish's core developers actively providing advice and solutions, and we thought that was cool and built a lot of confidence in working with Varnish.

- Christian Nölle, Head of Department , Center for Information and Media Processing, University of Wuppertal

New challenges: Streaming video on-demand

Most organizations across the public and private sectors faced entirely new challenges in 2020 as the COVID-19 crisis changed the way everyone did business, including learning. The university faced coronavirus lockdown conditions, and moved all curriculum online via e-learning and video streaming. While e-learning and blended learning had been available for some time, it had been treated as a "nice-to-have" option for most departments, meaning that the video streaming infrastructure existed and functioned, but it had never been put to the test in any meaningful way.

Once the entire university moved operations online, concerns arose about how the video-on-demand platforms would cope with sudden and heavy loads. How would the existing solutions behave when hundreds of people uploaded videos into the encoding queue and the system delivered the videos to potentially thousands of people? How could the IT department ensure uptime and availability?

Our past experience with Varnish made transitioning from open source to enterprise smooth. We didn't have any downtime or struggles in the implementation, and gained the greater reliability we were seeking. With Varnish Enterprise, we got both redundancy and, equally as important, professional Varnish support on-demand.

- Christian Nölle, Head of Department, Center for Information and Media Processing, University of Wuppertal

Again, having had experience with Varnish, the university's IT team knew there was a solution. Within one week, the Varnish team had delivered a solution for the VoD platform based on the university's specifications, and within another week of testing and internal management, the streaming solution was ready for action.

Photo by Sebastian Jarych, used courtesy of University of Wuppertal

Results:

The University of Wuppertal's IT team has realized tangible benefits from their Varnish implementation:

- Faster page load speeds: With completely uncached, first-call-to-page content, page loads could take as long as 1.6 seconds; with TYPO3 caching, this was reduced to about 900ms. With Varnish caching, this was reduced significantly to 300ms.

- Better performance, same server capacity: With Varnish, the university did not need to add more servers to achieve better performance on an increased workload. They maintained the same CPU cores, same virtualized hardware for years thanks to the offloading capabilities and efficiencies Varnish provides.

- Peace of mind: While the university has not quantified in human resource hours or downtime how much Varnish has delivered, they don't face Varnish-related downtime. Varnish redundancy allows for cached content to be served even in outage situations (when the network or virtualization is down), which relieves some of the outage-related burden.

> While adding Varnish into the mix adds complexity and some training time for staff, it has a big payoff. Performance is crucial, and the redundancy lends an intangible 'I can sleep at night' factor.
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> *- Christian Nölle, Head of Department, Center for Information and Media Processing, University of Wuppertal*

University of Wuppertal on Varnish: Beyond caching

Since adopting the open source version of Varnish, Varnish has been top of mind for University of Wuppertal when they run into problems that Varnish might be able to solve, particularly because Varnish can be applied to all kinds of problems that aren't straight caching issues. For example, a research database had a persistent speed problem, making users wait for results for up to five seconds. The IT department thought it sounded like a problem for Varnish, and used Varnish to speed up the search and deliver results faster.

> Varnish is flexible enough to use for all kinds of different things, which is one of the main reasons we are so happy with the software. And when we run into problems, Varnish is always there with near-instant support replies. We are not used to that from other software companies.
>
> *- Christian Nölle, Head of Department, Center for Information and Media Processing, University of Wuppertal*

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www.varnish-software.com