VARNISH
SOFTWARE

"Varnish helps TfL prevent web traffic jams and better serve London's commuters"

Case Study:

TfL

Transport for London

Varnish has allowed us to provide cost savings and avoid paying a premium for world-wide distribution of content when we mostly serve traffic in and around London.

Background

With all the infrastructure projects, traffic incidents, special events and transport maintenance, accurate journey planning is vital to stress-free travel. A whopping 81 percent of the capital's busy commuters rely on Transport for London's (TfL) website every day to plan journeys on Tube lines, buses, river buses, trams, local railway lines, roads and cycle routes. The site even provides information on the new Emirates Air Line cable car that takes passengers across the River Thames between Greenwich Peninsula and the Royal Docks.

TfL's web traffic is busy on a 'normal' day in the British capital, serving 10 million unique users every month, 1.2 billion pages per year. Eighty percent of the data associated with TfL's various transport options is dynamic and accessed in real-time. Bring adverse weather or a Tube strike into the mix and normal traffic can spike up by a staggering 50 times. At the end of 2012, the drive to improve web performance and modernise in the face of digital transformation led TfL to embark on a programme to transform its old website architecture, which was based on a Content Delivery Network (CDN).

Elaborating on the digital transformation trends, Phil Young, TfL's Head of Online, "since 2007 the percentage of users accessing our site by smartphone has really taken off - the number of visits on smartphones has now overtaken those on desktops. At the same time, customers started expecting the site to be more mobile friendly and provide personalized services, like localised journey planning and map-based queries. Redesigning the site, we took lots of inspiration from successful retailers and commercial service providers."

Consumers, however, tend to judge TfL's website performance most critically during those exceptional circumstances when commutes are most stressful. Improving the experience during these massive traffic spikes became a key priority for the web transformation project. To solve this, Phil Young and his digital services team turned to Varnish API & Web Acceleration

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The Implementation

TfL's transformed site, which went live in March 2014, replaced its old CDN and fixed hosting with a new cloud- based architecture that includes Varnish as a high-availability front end cache to improve the user experience and boost performance. Varnish API & Web Acceleration enables TfL to serve up personalised information to its users through its website and third-party apps instantaneously, regardless of how many others are visiting the site.

Phil Young explains Varnish's impact on traffic spikes, "last April after we launched the new website, there was a Tube strike that resulted in one of our busiest ever days for web traffic, with over 2 million visits. The new site handled it easily."

Varnish API & Web Acceleration sits at the core of the website's new architecture delivered through Amazon Web Services. Through intelligent caching, Varnish helps TfL to save money on its cloud capacities. Phil Young explains "cloud services are billed on a pay-as-you-use basis. Varnish's intelligent caching allows us to tune our infrastructure so we can shrink the architecture as needed to save money on cloud capacity and expand it when we need to respond to high traffic volumes. Hosting costs are around 30% lower than the previous arrangements, despite the new service being far better in terms of resilience, performance and features."

Readers interested in the technical details of the whole architecture can find more information on TfL's Digital Blog: http://blog.tfl.gov.uk/2015/01/06/how-we-make-our-new-responsive-website-fly-part-1/

30%
OPEX

Up to
100x
Faster

The edge of a new platform

TfL's new site is now re-architected and the platform is ready to suite the future needs of commuters and the 6000+ app developers that are building businesses around London Transport's rich data (see sidebar).

Despite web traffic having grown from 77 to 81 percent since the new site was launched, customer satisfaction has reached a high of 86 percent and journey planning has grown by 10 percent. This is due to a combination of improved performance, personalisation, new geo-mapping capabilities and enhanced smartphone usability.

Phil Young added, "Varnish has allowed us to provide cost savings and avoid paying a premium for world-wide distribution of content when we mostly serve traffic in and around London. Also, our new design has introduced very different usage profiles and user journeys and this will change further as we roll out greater site personalisation. Varnish provides flexible configuration options that make it much easier to embark on design changes."

What parting lessons would Phil Young share with other web teams? He concludes, "working with Varnish API & Web Acceleration can involve a learning curve," claims Phil Young. "It definitely helped that we opted for Varnish and had people on our team who have used Varnish before. Looking back, we could have implemented even faster if we had trained more people on Varnish internally from the start. We encouraged people to get their hands on the tool to show a different way of thinking than we had with the CDN. Once you're up and running, it's relatively easy. Varnish looks after itself - it's pretty low maintenance."

About TfL's open data support

Company

Alongside with the reinvention of its web architecture, TfL has fully embraced the open data movement. TfL opens up its data to application developers on the basis that when more people work with its data, more innovation will result. To make this possible,

TfL has normalized approximately 40 different data sets into one single API also used to build the website. If the developers access the API through Varnish, they can develop 'multimodal' apps, which enable commuters to plan journeys based on multiple transport options.

Application Program Interfaces (API) responses are cached by Varnish, so apps often get fast cache hits returned directly from Varnish. TfL services approximately seven million API requests per day and more than 90 percent of these are cache hits.

Today TfL has more than 6000 registered application developers. Smartphone app development has nearly doubled over 2014, resulting in available 360 apps. According to an evaluation by Deloitte, the value in customer time saved through those apps is up to £58 million per year.

About TfL:

Transport for London (TfL) is a local government body responsible for most aspects of the transport system in Greater London in England. Its role is to implement the transport strategy and to manage transport services across London.

About Varnish Software:

Varnish Software's mission is to significantly enhance web performance for online businesses. Varnish powers major sites across all industry types - for businesses such as Tesco, Nikon, Boozt, Eurosport and Tesla as well as more than 2.8 million websites worldwide. Varnish Software's web performance and content delivery solutions offer scalability, customization, monitoring and expert support services.

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