VARNISH
SOFTWARE

Telia used Varnish Enterprise to create its next-generation CDN

Case Study:

Telia

Telia used **Varnish Enterprise** to create its next-generation CDN

Background

Telia, referring to itself as a "New Generation Telco" and as the hub of a complete digital ecosystem, is a Swedish-based multinational telecommunications company, providing high-speed internet, TV and mobile network services.

Telia is the largest Nordic and Baltic fixed-voice, broadband, and mobile operator by revenue and customer base. It also owns a TV and media operation, including TV4 in Sweden and MTV in Finland as well as C More. It operates the world's largest and fastest-growing wholesale IP backbone.

The challenge

When their existing CDN solution was close to reaching end-of-life, Telia began to think about what should replace it. Their decision also considered whether that replacement could be expanded, enhanced and customized as a long-term, future-proof solution, based on standard hardware.

Telia focused on accommodating the growth of video streaming and finding a solution with the ability to scale for the unpredictable nature of user demand, that is, predictable peak traffic during scheduled, specific events (such as sports, news, cultural programming) and unexpected traffic spikes.

> Telia needed to optimize the underlying operating systems and have a CDN solution to manage the large, and growing, level of traffic we routinely serve.
>
> *-Ragnar Kåhre,*
> *Solutions Architect, Telia*

Telia at a glance

Organization

- Telia is a Swedish-based multinational telecommunications company, ISP and mobile network operator with operations throughout the Nordics and Baltics.

Challenge

- Build Telia next-generation CDN for Nordic and Baltic markets
- Manage traffic in growing streaming landscape with maximum stability, scalability and performance
- Achieve high-performance content delivery based on standard hardware (COTS) to maximize output, i.e. 150Gbit/s per server with in-core TLS

Varnish Enterprise

- Varnish CDN solution
- Professional support from Varnish core developers for custom development of in-core TLS solution

Defining requirements

When the exploration of new solutions began, Telia conducted analysis of their existing solution with small geographically scattered nodes, confronting the assumptions that indicated that the network itself caused bottlenecks, and this required scattered smaller nodes. Based on calculations, tests and simulations they discovered that, in most cases, the network was not the bottleneck, and a more centralized CDN architecture could create improvements.

With this in mind, the solution evaluation examined several providers during a four-month-long process. The RFP put emphasis on large nodes and the use of plain COTS solutions. Telia specified that getting maximum performance from a single server including TLS was the main criterion; they conducted a number of lab tests prior to the RFP to explore capacity possibilities, and with the results from the lab environment, they were better able to evaluate software solutions and guide the terms of the engagement they wanted.

Looking at the bigger picture, one solution could be small nodes scattered across the geographical area we cover. At the other extreme, we could deploy a limited number of large nodes. We went with a predominantly large-node solution to generate a lot of traffic at a small number of sites. But we also retain the ability to deploy smaller nodes wherever there were capacity issues in the network. This became more important as Telia acquired Norwegian cable operator GET (now Telia Norway) during the CDN replacement process. The backbone of the network in Norway isn't as robust as that in Sweden, so the need for smaller nodes in parallel with big nodes ensures reliable performance in Telia's Norwegian network.

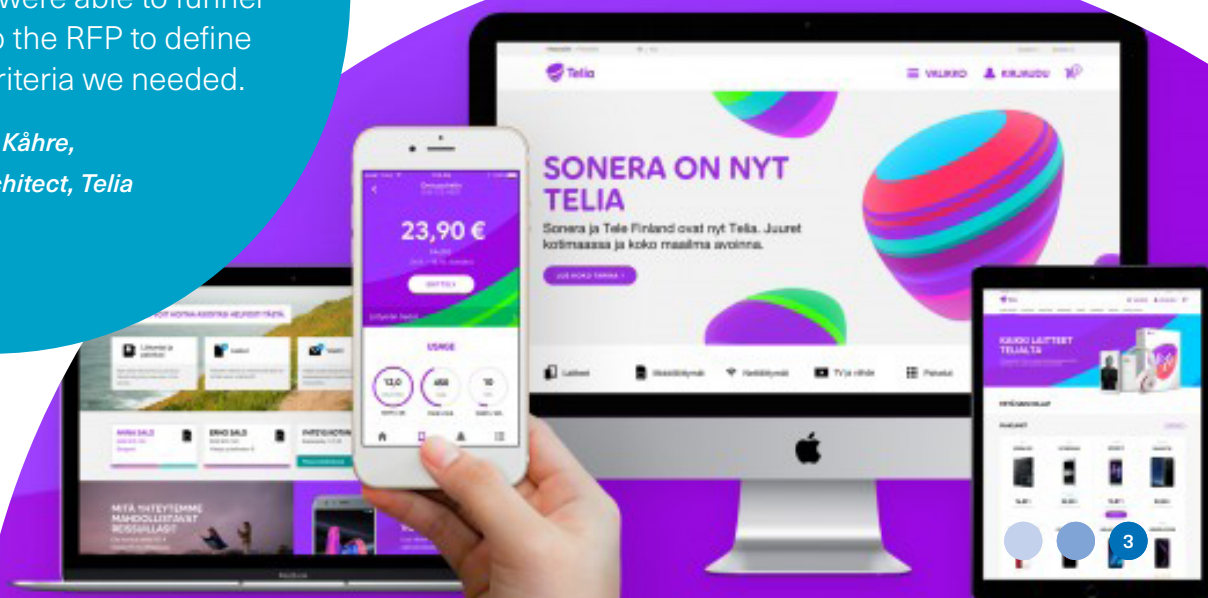*-Ragnar Kåhre,*
Solutions Architect, Telia

The solution

Armed with the knowledge that Varnish would deliver high-performance content delivery with in-core TLS and maximize capacity and throughput, Telia was ready to move forward with Varnish Enterprise to build their next-generation CDN and video streaming solution for the Nordics and Baltics with PoPs across these regions.

High-capacity performance: 150Gbit/s with in-core TLS

Serving increasing traffic volumes (particularly of video content) at high speed and boosting performance and resource efficiency came down to pushing the boundaries of each server's capacity. Telia's internal testing in a lab environment proved that Varnish would be able to handle their desired 150 Gbit/s capacity per server. Working with Telia's requirements, Varnish was able to develop in-core TLS functionality that would weave native TLS support into the core software, eliminating an extra network step, while reliably doubling the previous capacity limits achieved on a single server.

In a lab setting, we achieved 150 Gbit/s on a single server using Varnish with simple test-setup, in-core TLS. We wanted to know in a test setting that this could work. We were able to funnel those learnings into the RFP to define the performance criteria we needed.

-Ragnar Kåhre,
Solutions Architect, Telia

> Our needs and Varnish's development work was the unique part of our implementation. Together we were able to get Varnish to more than double the capacity of a single server.
>
> *-Ragnar Kåhre,*
> *Solutions Architect, Telia*

Problem-free and stable implementation and performance

Working together with Varnish, Telia has experienced performance enhancements with very few, if any, issues. Varnish stability has been highly valued, particularly as it is a constantly evolving product.

Partnership: More than a supplier

Telia and Varnish have worked together as partners, collaborating throughout the implementation processes

Results: Efficiency, scalability, cost savings: Varnish for more than caching

Telia experienced immediate savings from their Varnish implementation.

- With the Varnish caching solution, Telia reduced the number of on-prem servers as well as reduced the use of cloud CDN.

- Telia is in the process of replacing multiple CDN solutions with a single ubiquitous solution. When this process has come to an end there will be operational cost savings.

- The Varnish-based solution offers scalability in a way that the previous CDN solutions did not, thus making Telia able to adapt to the ever-increasing capacity and quality requirements of OTT video streaming.

Telia relies on future-proof Varnish versatility

In addition to using Varnish Enterprise to build their new CDN solution, Telia uses Varnish in multiple applications and solutions across Telia's different business units.

> Both generally as a product and within our implementation, Varnish changes and evolves all the time. The remarkable thing is that Varnish is astonishingly stable and almost never causes us problems. When we have contacted Varnish in any shape or form, we have received very quick responses. We've never been forced to wait. Varnish delivers and is open to dialogue with us. We have been very pleased.
>
> *-Ragnar Kåhre,*
> *Solutions Architect, Telia*

> In selecting Varnish, we wanted the assurance that this performance could be reached but also wanted more than just a supplier. We wanted a partner we could work together with to implement our ideas using their knowledge and experience. Varnish had the technical competence and the willingness to collaborate and develop things to meet our needs.
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> *-Ragnar Kåhre,*
> *Solutions Architect, Telia*

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