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Case Study:

SFR

Telecommunications

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## Background

SFR is a French telecommunications company that provides voice, video, data and internet telecommunications and professional services to consumers and businesses. As of 2012, SFR has 21 million customers and provides five million households with high-speed internet access.

SFR's main website is one of the top-ten most-visited sites in France. The costs of handling traffic were high enough that SFR decided to look into cost-reduction initiatives and ways to bring costs and efforts in-house.

## The Challenge: Develop own CDN/cost reduction

Why not launch one's own content delivery network (CDN)? As a major telecom operator with an online store that represents a very large proportion of their subscription channel, for both fixed and mobile lines and phones, SFR was handling millions of requests per day. Using Akamai as their CDN provider, they were able to deliver as expected, but when faced with rising costs in managing ever-increasing amounts of traffic, SFR asked itself the question posed above: why not launch our own CDN?

Already having excellent network coverage in France and serving the majority of French users, SFR found themselves in an ideal position to innovate and create their own solution.

The drive to limit OPEX and reduce costs for SFR's main services and websites formed the foundation of SFR's Varnish-based CDN solution. Once their DIY CDN was up and running, they asked themselves: why not extend it to sell directly to customers?

Ultimately the challenge was to build their own CDN, and the benefits would certainly outweigh the challenges and even provide a business-growth opportunity for SFR by offering their CDN solution to their own customers as a package solution.

## SFR at a glance

### Company

- SFR, Société française du radiotéléphone
- 12 POPs geographically distributed across France
- Current capacity: >20 million req/s; >350Gbps bandwidth; capacity can be upgraded by adding servers
- Main internal clients/services: sfr.fr online store, SFR TV apps, SFR webmail, SFR TV

### Challenge

- SFR handles millions of requests per day and used Akamai as CDN. Wanted to reduce costs, build DIY CDN with Varnish and offer CDN solution onward to customers

### Varnish DIY CDN for SFR

- SFR moved to Varnish DIY CDN in 2012 when the CDN became production critical.
- Professional expertise/support from Varnish core developers
- Varnish Massive Storage Engine
- Soon: TLS/SSL to backend

## The Solution: Varnish DIY CDN and Varnish professional expertise and services

In seeking a way to phase out expensive external CDN investment, SFR needed a solution that offered performance, ease of and flexibility with configuration and something open source. With these characteristics in mind, SFR discovered Varnish Cache, which meets all of these key criteria. They looked at other solutions that also matched these criteria but found that Varnish Cache's unique combination of easy and flexible configuration, better response time and performance put it over the top.

Implementation was interesting. Basic VCL was not too difficult to learn and use, but there is some complexity to the SFR setup. Because they had to make Varnish handle many domains, each with its own specific needs, significant configuration was necessary. Being a CDN, SFR had to create an API that allowed customers to register and generate the adequate VCL code for their specific need. (All configurations for their customers are merged into a single, large VCL.) Otherwise, one challenge was optimizing Varnish and system settings to achieve the best possible performance. Varnish Software helped to configure and tweak the setup to ensure that SFR could get the most out of their deployment.

### Access to Varnish core developer expertise

SFR has used Varnish DIY CDN for several years, in large part to gain access to Varnish core developer expertise and support. The move from open-source Varnish Cache was motivated in large part by SFR's use of specific, business-critical features, such as streaming.

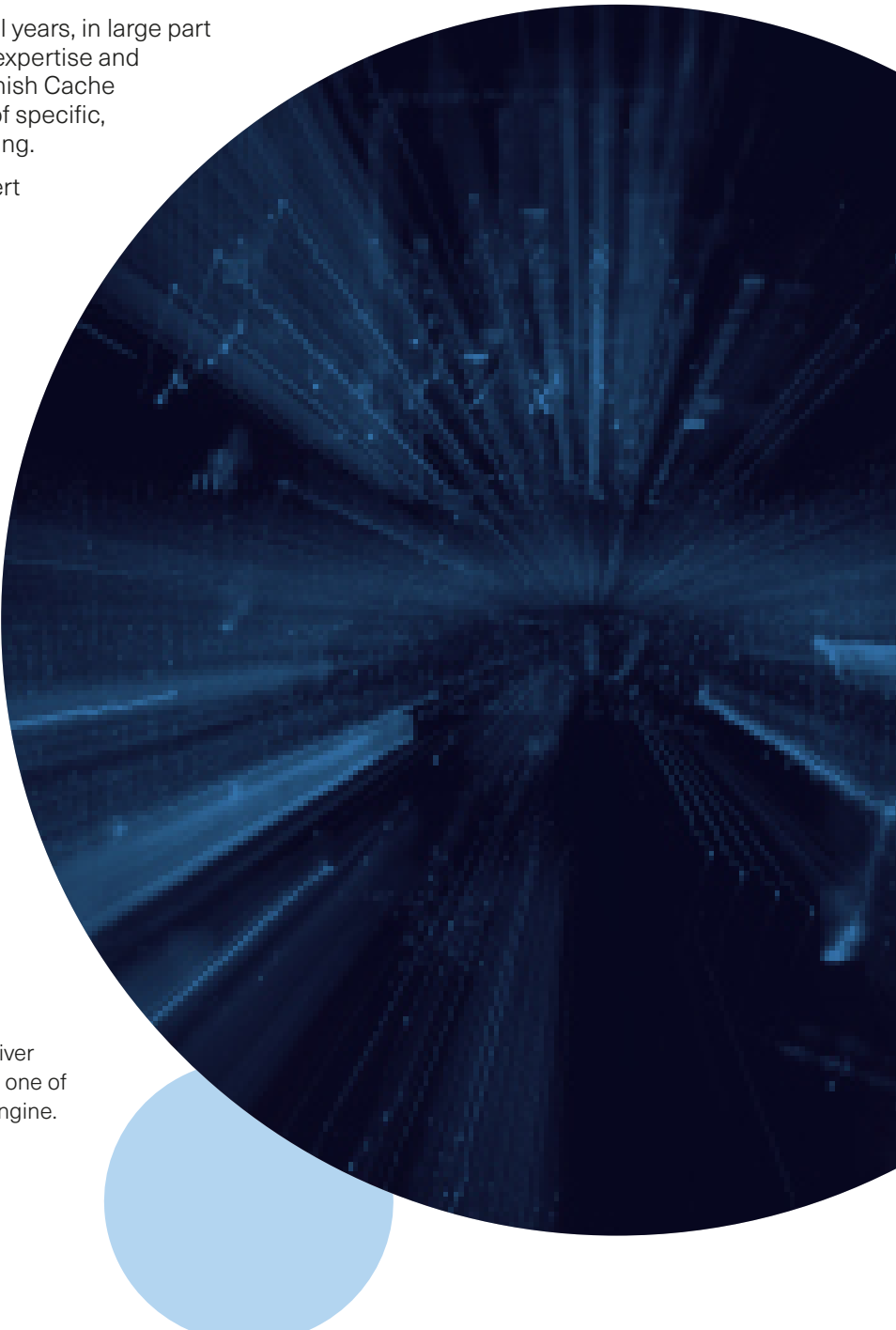
According to SFR's Thierry Magnien, expert CDN, "if any issues arise with our Varnish installations and configurations, the core developers have been immediately responsive and have resolved them quickly. We can count on their expertise to help us optimize."

### Performance

Performance is the core of SFR's business and success and in fact performance is what they sell. High-performance content delivery means reliability and speed. Because SFR has more and more multi-CDN clients, routing is based on performance. The better the performance, the more traffic SFR receives. The more traffic received, the more SFR is able to invoice. Performance, therefore, is directly related to the bottom line.

### Varnish Massive Storage Engine

SFR, one of its own biggest customers, delivers large data sets as content in the form of, for example, video and also offers CDN services to a host of external customers. With the Varnish Massive Storage Engine, SFR could cache virtually unlimited objects and deliver fast performance at scale. Video on demand is one of the reasons SFR needs the Massive Storage Engine.



## Results: Deploying Varnish DIY CDN helped SFR achieve several positive results:

### Security and support: Varnish expertise

SFR relies on Varnish Software professional support to get rapid and responsive expertise whenever they encounter configuration issues.

SFR's Thierry Magnien, expert CDN: "We are able to interact with Varnish engineers through IRC – in other words, sometimes very informally, to get answers. The advantage is that I can access the same people who answer formal support requests, easily and quickly, and to know that the same person I talked to on IRC was the same person handling our specific requests. It builds a lot of trust."

### High-performance driving bottom line

Not only is SFR able to deliver more content the better and faster it performs, leading to increased invoicing, it also contributes to the bottom line for their own CDN customers. Because SFR can store all the traffic they deliver, customers have considerably reduced their own infrastructure costs – for some of them, this represents a huge volume of traffic.

While it is difficult to calculate before- and after-Varnish performance statistics because SFR has a diverse customer base, SFR has been benchmarked by entities, such as Cedexis, on CDN performance. Cedexis rated SFR's CDNs number one in France.

### Customization

One of SFR's criteria was flexibility along with ease of configurability. With VCL, SFR was able to undertake customization, writing several VMODs in order to add functionalities they needed, for example creating a bandwidth limitation feature to be able to deliver HTTP videos at a fixed rate, creating some cryptographic functions and developing some session-tracking facilities.

SFR was instrumental in helping Varnish Software in the development of the Varnish Custom Statistics module, for example, as SFR had used VCL to create their own statistics engine. Together SFR and Varnish improved on each other's work using the flexibility of VCL.

### Return on investment

With Varnish DIY CDN, SFR was able to improve the online store response time while also eliminating the costs associated with their Akamai CDNs. As a result, SFR ended up providing a full-featured, best-performing CDN to external clients, such as leading e-commerce sites, video providers and TV channels. SFR's DIY CDN solution has not only delivered ROI for themselves but also, by extension, to many of their customers.

In addition, with Varnish professional services, SFR has been able to access Varnish experts and go right to the source to optimize and fix issues, saving time and resources on troubleshooting.

## The future

SFR will soon implement the TLS/SSL solution on its back-end, adding TLS/SSL integration to origin servers directly in Varnish in order to replace their Nginx intermediary stack and start benchmarking MSE persistence for their own VoD/catchup needs.



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