SPEEDUP YOUR WORDPRESS WITH NGINX AND HTTP/2

OR: How to get a performant WordPress installation without real caching plugins.

16.12.2015 – Martin Wolfert – https://wp-loft.de

ABOUT …

- kid of the german „Babyboomer-Generation"
- lateral entrant in IT at 1-th of January 2000
- means: 15 years of Linux- & WebHosting (LAMP) knowledge
- since 1998, own profession in WebDesign & PHP-Programming
- WordPress user since version 2.6
- Panograf (360° photography)
- main profession: Operations-Architekt, working for 1&1 Internet SE in Karlsruhe

- Big fan of north-west france & and their coasts
- Redwine & Scottish Single-Malt Whisky (from Islay) gourmet

HTTP/2 EVOLUTION
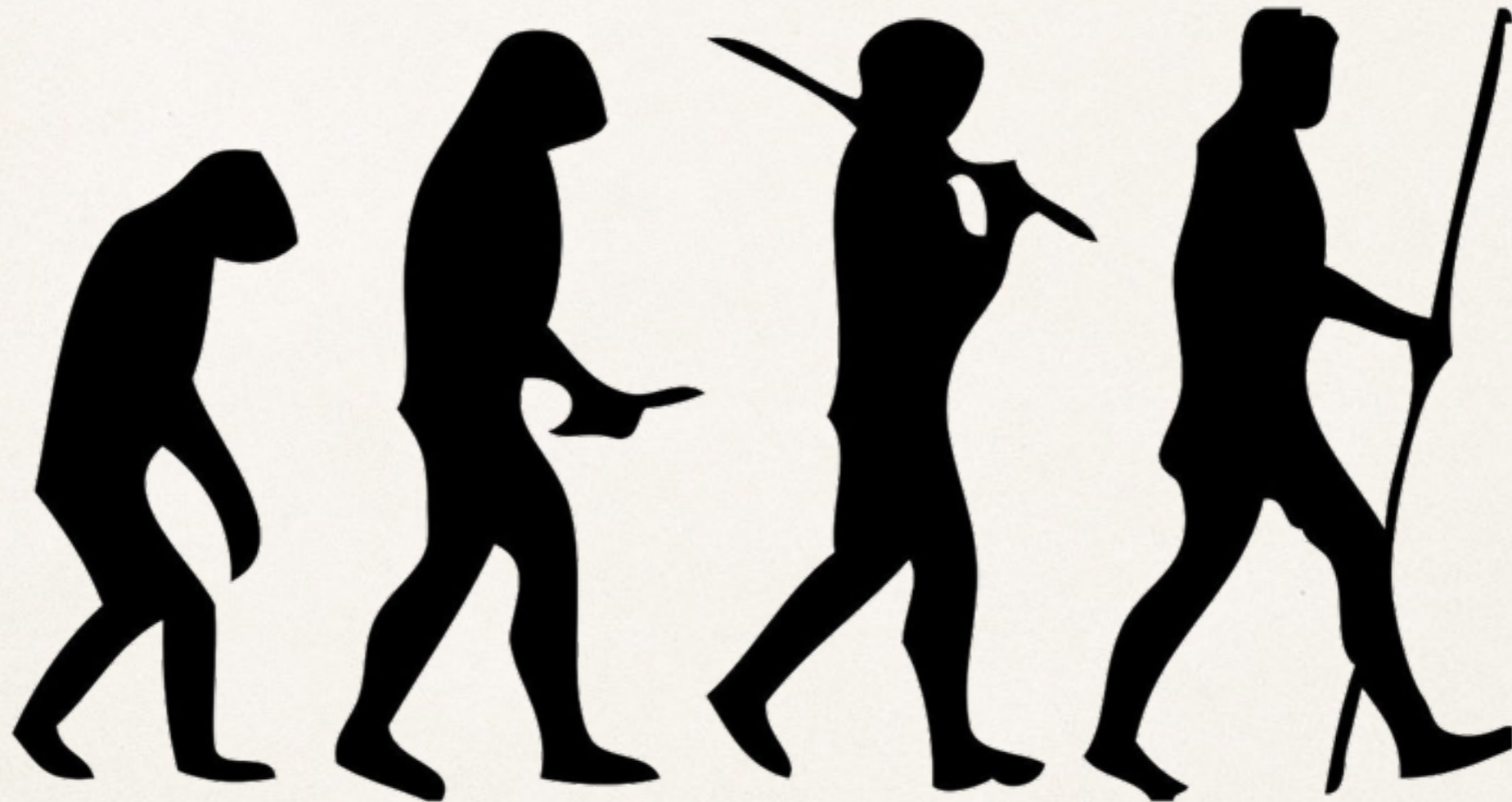
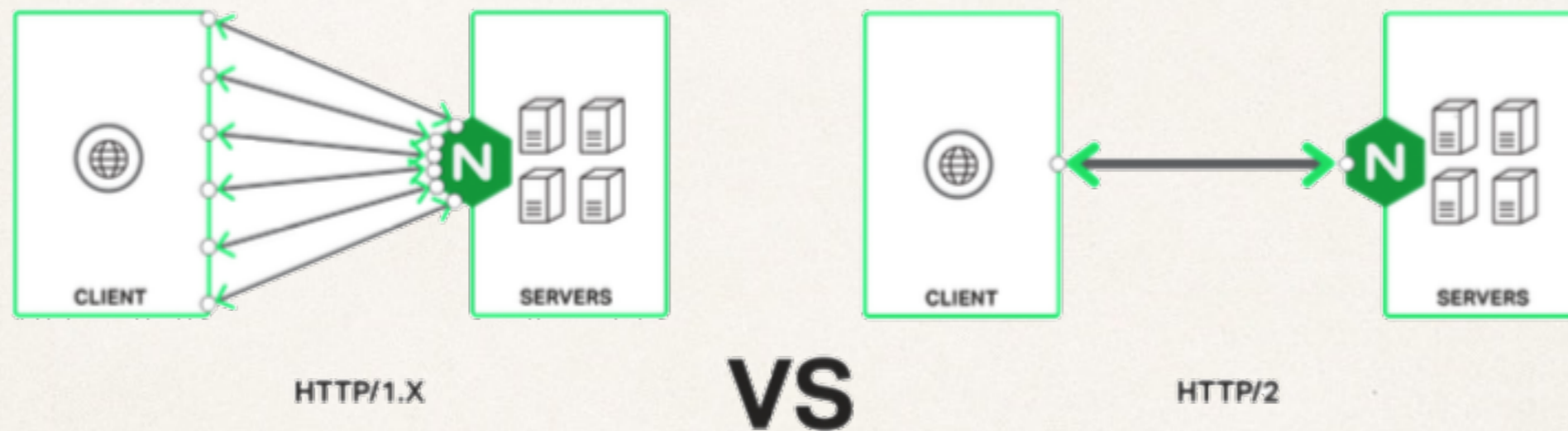HTTP/1.0   HTTP/1.1   SPDY   HTTP/2

JUST TO MENTION IT

LATENCY IS THE PROBLEM NOT BANDWIDTH!

Except video-streaming

HTTP/1.X VERSUS HTTP/2

HTTP/1.1 uses many connections between client and server. As a modern browser could handle only 4 - 8 parallel connections on a chosen target domain. So, loading of e.g. a WordPress Page could be really painfull.
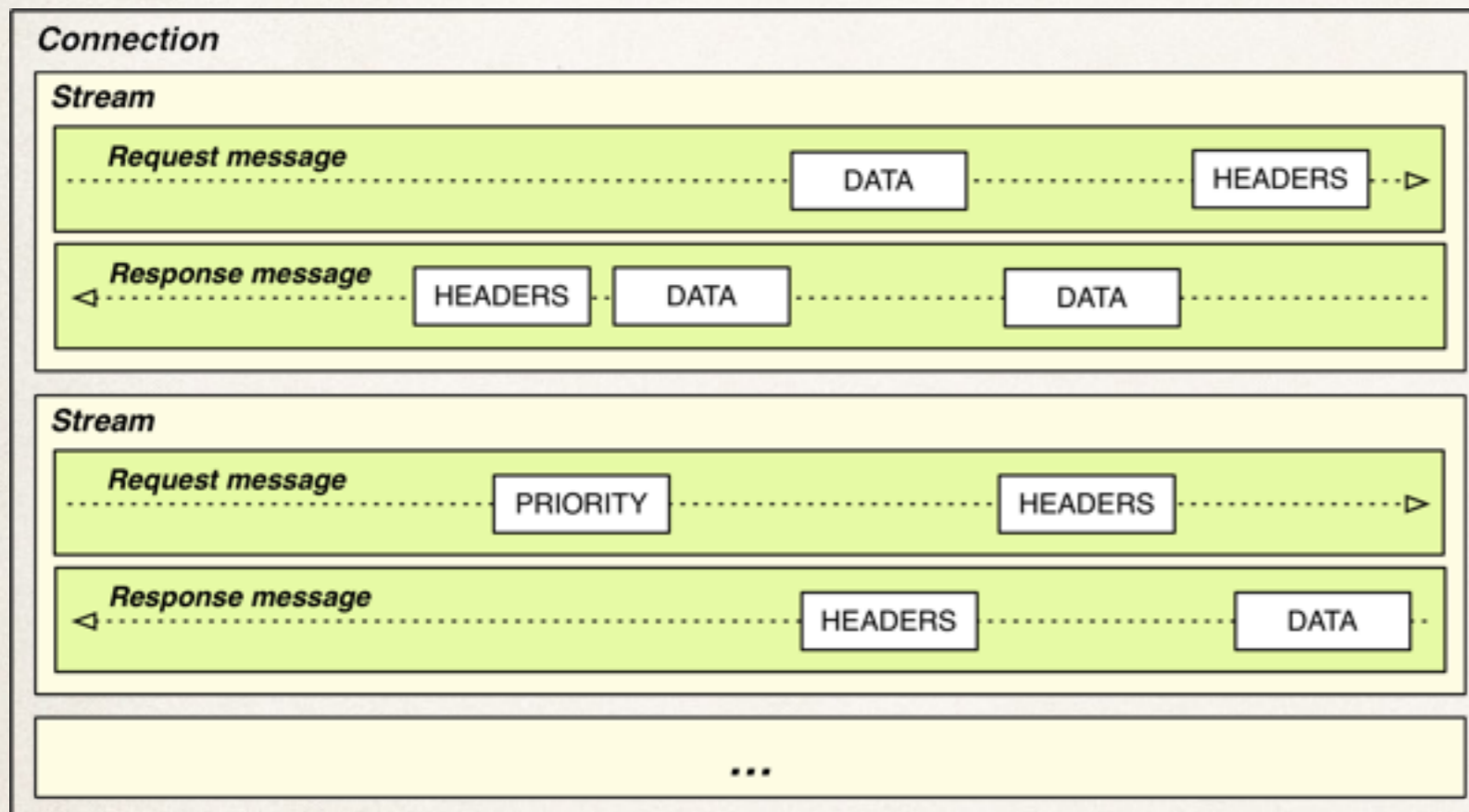
Source: 2)

HTTP/2, THE BETTER PROTOCOL

(BASED ON THE ACTUAL HTTP/2 IMPLEMENTATION FROM OPENSOURCE-NGINX 1.9.7 *)

- <u>Single, Persistent Connection</u> : Only one connection is used for each web page. The same connection is used as long as the web page is open.

- <u>Multiplexing</u> : Requests and replies are multiplexed onto separate streams within the single connection. When the connection is stable, "head of line blocking" is eliminated.

- <u>Header Compression and Binary Encoding</u> : Headers are compressed using a new, separate, secure standard -HPACK compression. It reduces the amount of data crossing the network. Header information is sent in compact, binary format, not as plain text.

- <u>SSL Encryption</u> - HTTP/2 allows you to add SSL support with, in some cases, no performance penalty, making your site more secure.
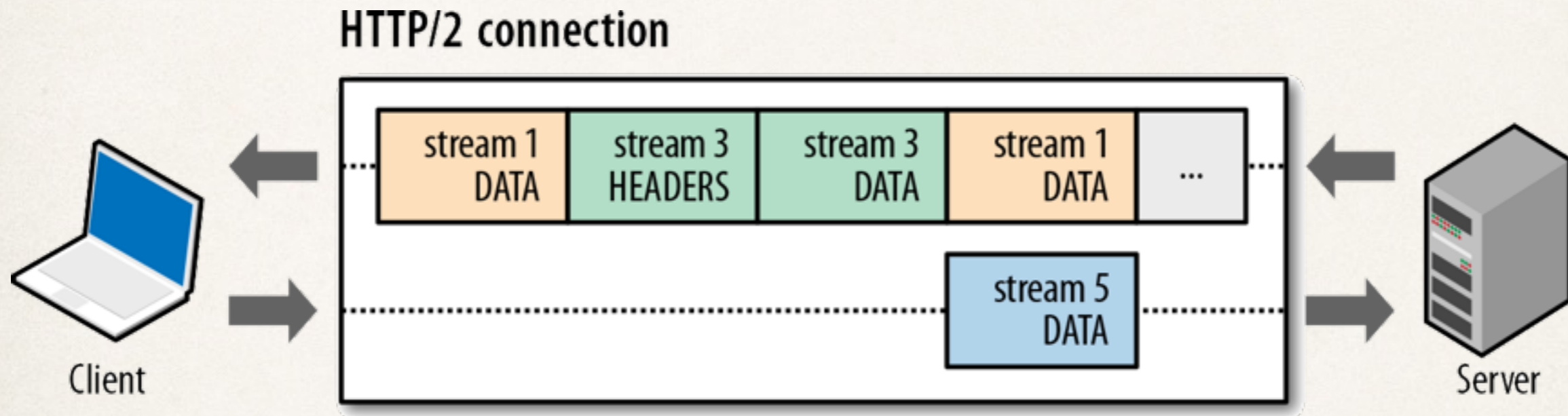
  * lacks of Server-Push and Prioritization

HTTP/2, STREAMING


Three components (ascending):

- Frames
- Messages
- Streams

HTTP/2 Multiplexing

HTTP/2 connection

stream 1 DATA	stream 3 HEADERS	stream 3 DATA	stream 1 DATA	...

stream 5 DATA

Client

Server

- Interleave multiple requests in parallel without blocking on any one
- Interleave multiple responses in parallel without blocking on any one
- Use a single connection to deliver multiple requests and responses in parallel
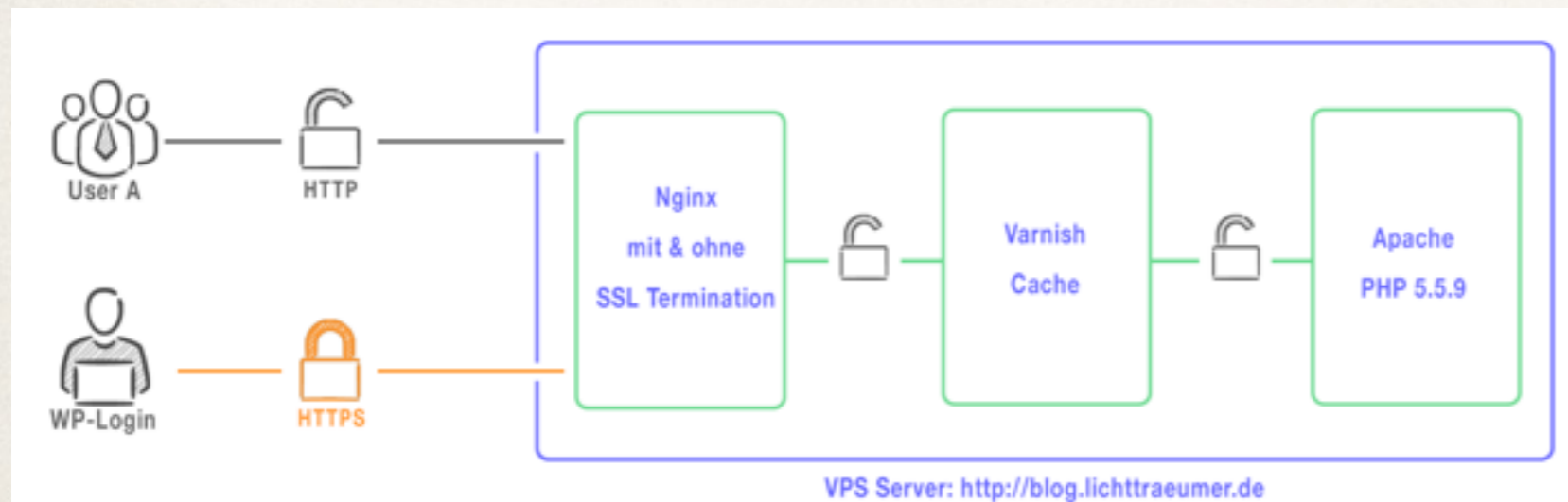- No old HTTP/1.1 stuff like e.g. image sprites or domain sharding

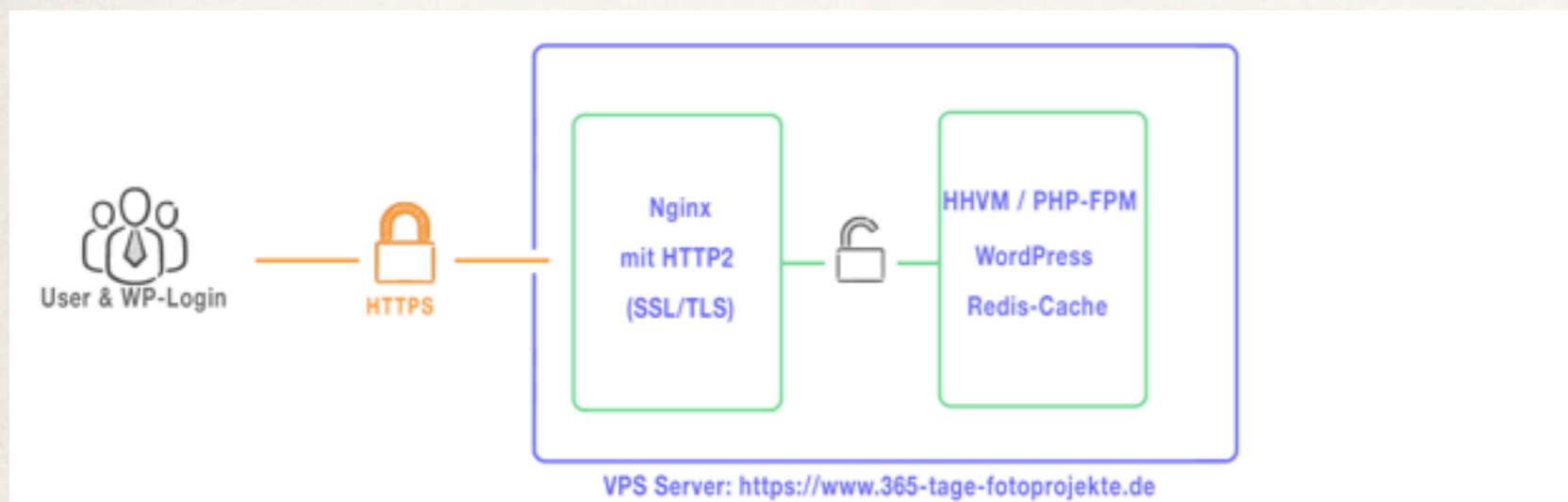Source: 4)

HTTP/2, WATERFALL-DIAGRAMM
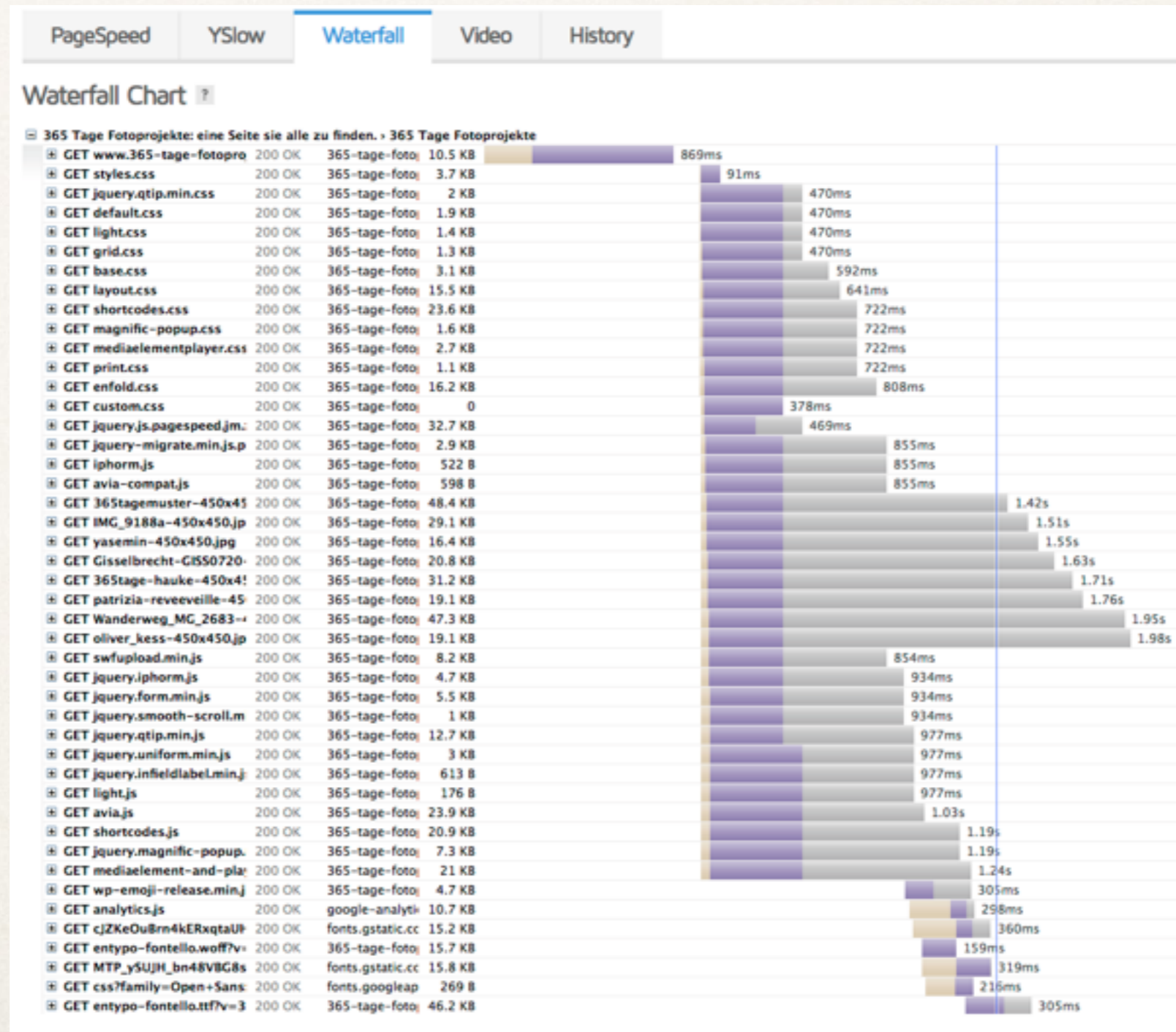
HTTP/2, BROWSER-SUPPORT

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Chrome for Android
			43					4.1	
8			44					4.3	
9			45					4.4	
10	12	41	46	8	33	8.4		4.4.4	
11	13	42	47	9	34	9.2	8	46	47
	14	43	48		35				
		44	49		36				
		45	50						

THIS LITTLE „OR" IN THE SUBLINE

The „old" stuff:
- Handling HTTP&HTTPS Port
- Nginx-Layer
- Varnish-Layer
- Apache-PHP-Layer

The „cool" state-of-the-art stuff:
- only HTTPS (HTTP/2) Port
- Nginx-Layer
- HHVM / PHP-FPM – Layer
- Redis-Server

REALLY WITHOUT CACHE PLUGIN?

To get a bit more speed „on top", i have a Redis-Server running on my VPS.

Redis is a key value store who can act as „persistent object cache" to store e.g. WordPress database queries.

So … we can start discussing, if Redis works as a cache or not :). And we could also discuss, if the Redis Object Cache Plugin, to bind WordPress to the Redis-Server, is a typical cache plugin or not.
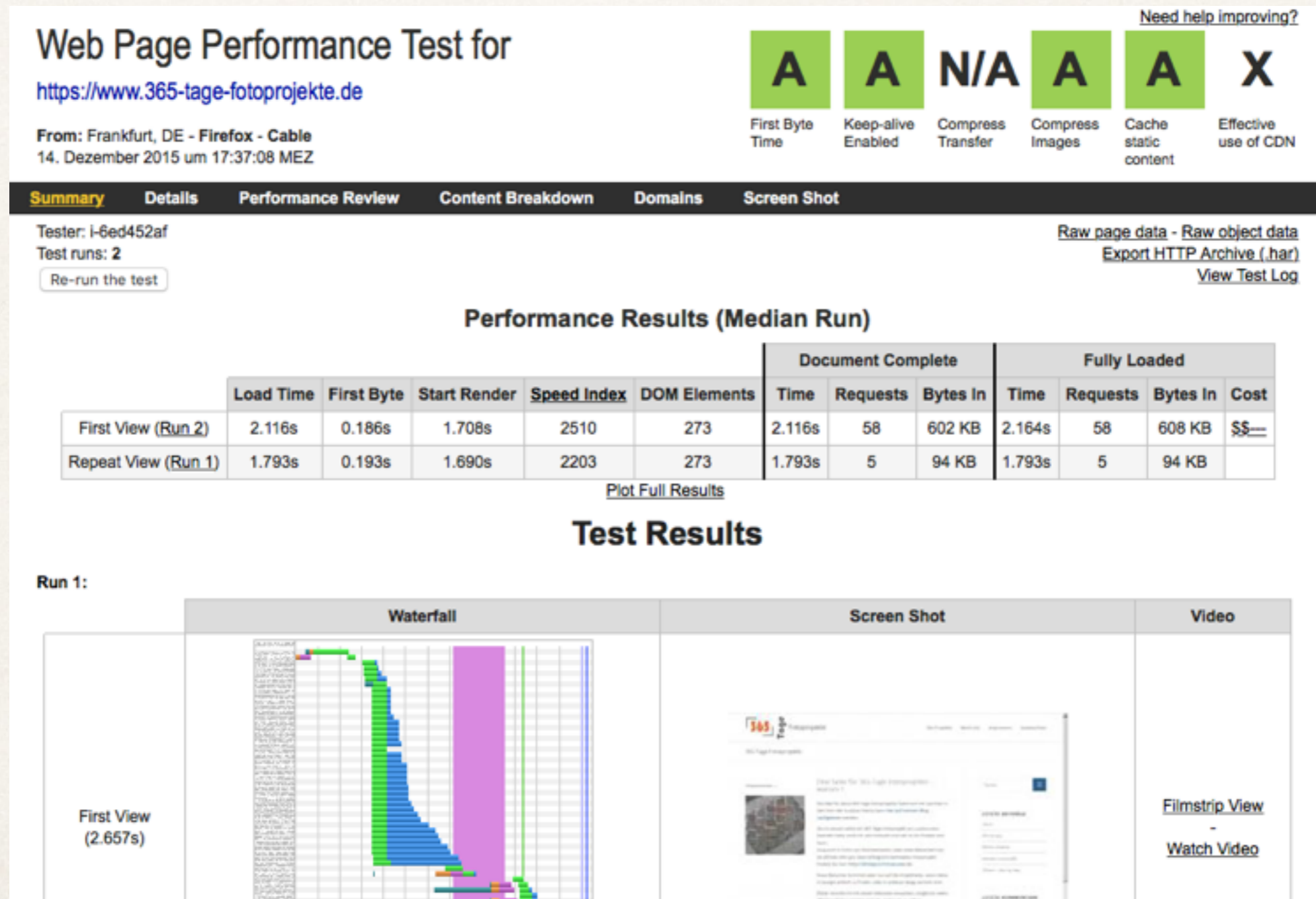
My optimizations in addition to HTTP/2

- HHVM instead of PHP-FPM (with Opcache)
- Fast CGI Caching, based on Nginx
- Google's mod_pagespeed, based on Nginx
  - CSS & JS - minify
  - DNS Prefetch
  - Async Google-Analytics
  - Image deduplication
  - etc.
- GEOIP-blocking
- Fail2ban based IP-blocking

A RESULTING SPEED TEST

(TESTED WITH WEBPAGETEST.ORG)

ADDITIONAL INFORMATIONS

- https://kinsta.com/blog/the-definitive-php-7-final-version-hhvm-benchmark/
- https://letsencrypt.org/

A bit self-promotion :-)

So, if you need a 360° Panorama-picture, visit my website on
http://panoramaatelier.de
For WordPress-Support and my WordPress-Blog look at
https://wp-loft.de

My personal Blog, you can find on
https://blog.lichttraeumer.de

THANK YOU !

PICTURE-SOURCES

- 1): „Human evolution scheme (2)" von Human_evolution_scheme.svg: M. Gardederivative work: Gerbil (talk) - Human_evolution_scheme.svg. Lizenziert unter CC BY-SA 3.0 über Wikimedia Commons - https://commons.wikimedia.org/wiki/File:Human_evolution_scheme_(2).jpg#/media/File:Human_evolution_scheme_(2).jpg

- 2 & 3): https://www.nginx.com/wp-content/uploads/2015/09/NGINX_HTTP2_White_Paper_v4.pdf

- 4): http://chimera.labs.oreilly.com/books/1230000000545/ch12.html

- 5) http://caniuse.com/#feat=http2

- 6) http://www.asterix-comics.de/pics/gallisches-dorf.jpg