

HTTP/2

HTTP/2 protocol - OTHER

Global

77.83% + 5.6% = 83.42%

Networking protocol for low-latency transport of content over the web. Originally started out from the SPDY protocol, now standardized as HTTP version 2.

Current aligned Usage relative Date relative Show all

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
			² 49						
		² 52	^{2 4} 60			² 10.2			
	² 15	² 55	^{2 4} 61	^{2 3} 10.1		² 10.3		4.4	
^{1 2} 11	² 16	² 56	^{2 4} 62	^{2 3} 11	^{2 4} 48	² 11	all	² 56	^{2 4} 61
		² 57	^{2 4} 63	^{2 3} TP	^{2 4} 49				
		² 58	^{2 4} 64		^{2 4} 50				
		² 59	^{2 4} 65						

Notes Known issues (0) Resources (6) Feedback

See also support for the [SPDY protocol](#), precursor of HTTP2.

¹ Partial support in IE11 refers to being limited to Windows 10.

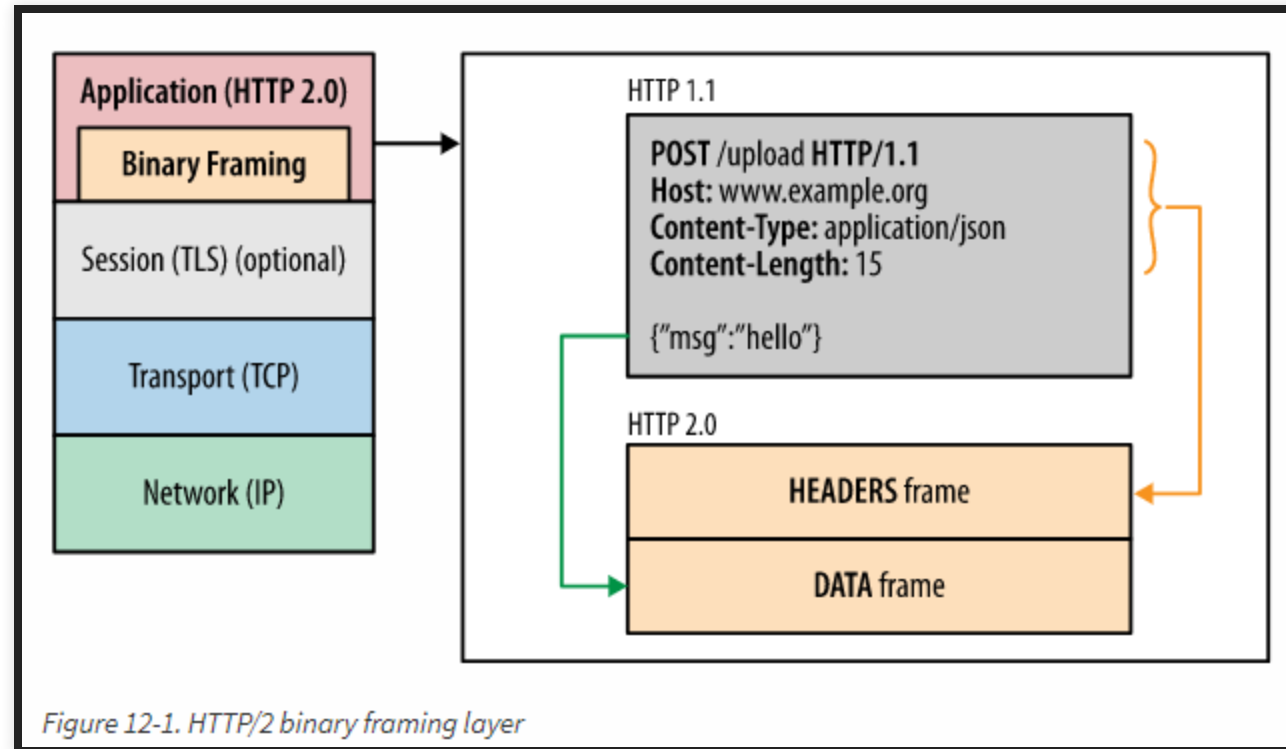
² Only supports HTTP2 over TLS (https)

³ Partial support in Safari refers to being limited to OSX 10.11+

⁴ Only supports HTTP2 if servers support protocol negotiation via ALPN

<https://caniuse.com/#feat=http2>

HTTP/1.1 → SPDY → HTTP/2



<https://hpbn.co/http2/>

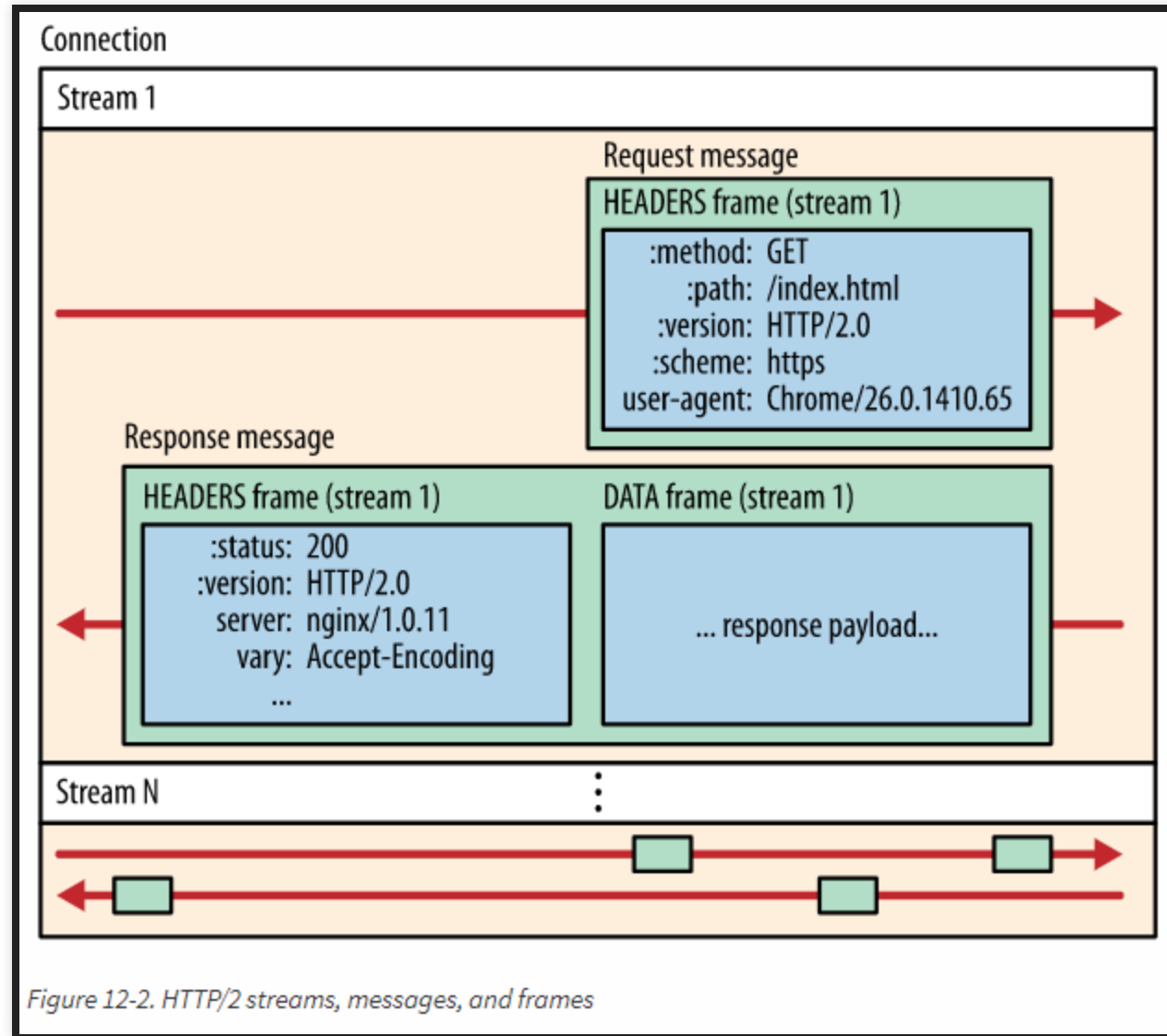
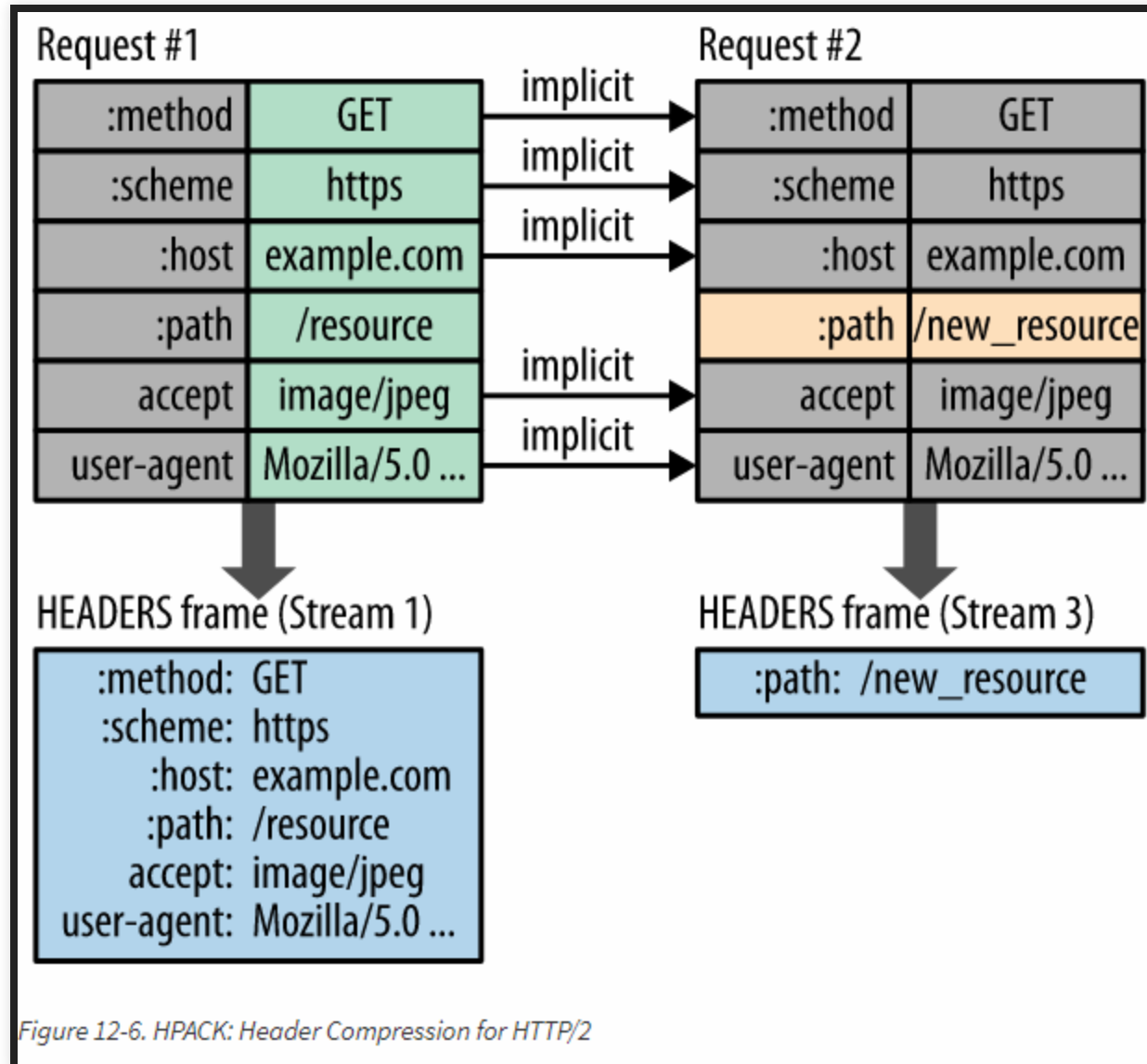


Figure 12-2. HTTP/2 streams, messages, and frames

<https://hpbn.co/http2/>

- HPACK
- multiplexing
- server push

HPACK Compression – Huffman Encoding



- Static Dictionary: A predefined dictionary of 61 commonly used header fields, some with predefined values.
- Dynamic Dictionary: A list of actual headers that were encountered during the connection. This dictionary has limited size, and when new entries are added, old entries might be evicted.
- Huffman Encoding: A static Huffman code can be used to encode any string: name or value. This code was computed specifically for HTTP Response/Request headers - ASCII digits and lowercase letters are given shorter encodings. The shortest encoding possible is 5 bits long, therefore the highest compression ratio achievable is 8:5 (or 37.5% smaller).

<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>

Request #1:

:authority:blog.cloudflare.com

:method:GET

:path: /

:scheme:https

accept:text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,/;q=0.8

accept-encoding:gzip, deflate, sdch, br

accept-language:en-US,en;q=0.8

cookie: 297 byte cookie

upgrade-insecure-requests:1

user-agent:Mozilla/5.0 (Macintosh; Intel Mac OS X 10_11_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/55.0.2853.0 Safari/537.36

<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>

Request #2:

:authority:blog.cloudflare.com

:method:GET

:path:/assets/images/cloudflare-sprite-small.png

:scheme:https

accept:image/webp,image/*;q=0.8

accept-encoding:gzip, deflate, sdch, br

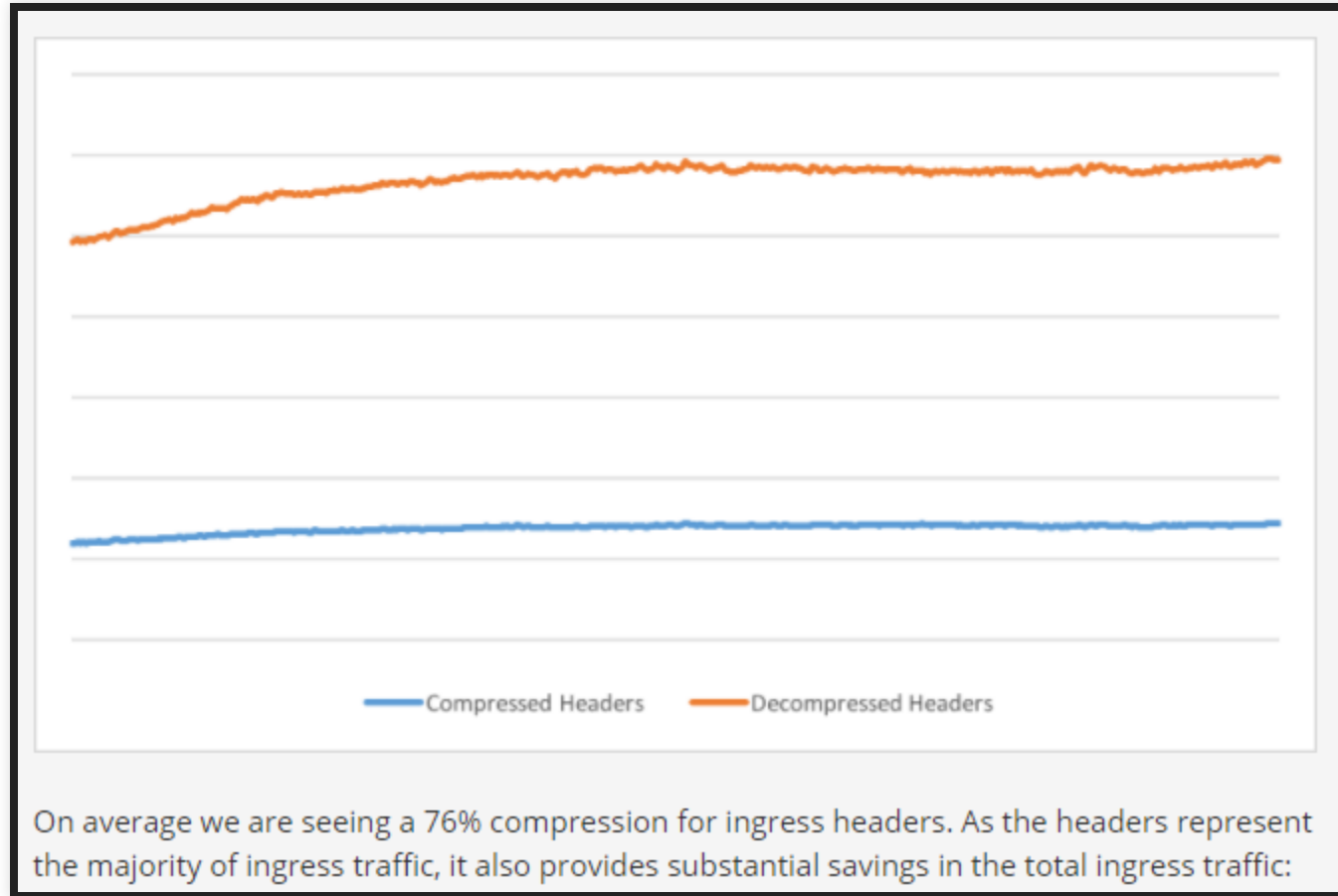
accept-language:en-US,en;q=0.8

cookie:same 297 byte cookie

referer:https://blog.cloudflare.com/assets/css/screen.css?v=2237be22c2

user-agent:Mozilla/5.0 (Macintosh; Intel Mac OS X 10_11_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/55.0.2853.0 Safari/537.36

<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>



<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>

Response #1:

cache-control:public, max-age=30

cf-cache-status:HIT

cf-h2-pushed:</assets/css/screen.css?v=2237be22c2>,</assets/js/jquery.fitvids.js?v=2237be22c2>

cf-ray:2ded53145e0c1ffa-DFW

content-encoding:gzip

content-type:text/html; charset=utf-8

date:Wed, 07 Sep 2016 21:41:23 GMT

expires:Wed, 07 Sep 2016 21:41:53 GMT

link: <///cdn.bizible.com/scripts/bizible.js>; rel=preload; as=script,
<https://code.jquery.com/jquery-1.11.3.min.js>; rel=preload; as=script

server:cloudflare-nginx

status:200

vary:Accept-Encoding

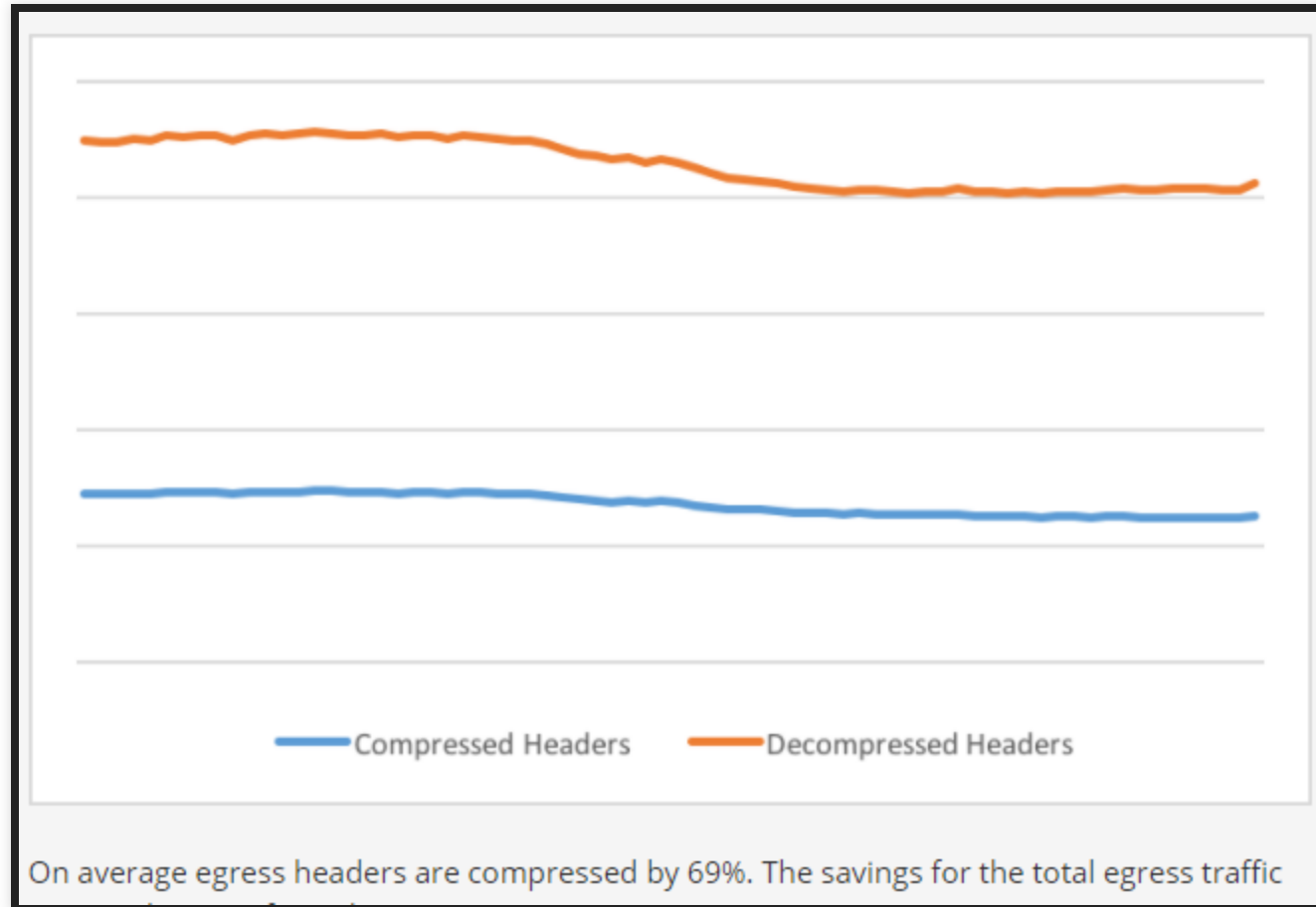
x-ghost-cache-status:From Cache

x-powered-by:Express

<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>

Response #2:
cache-control:public, max-age=31536000
cf-bgj:imgq:100
cf-cache-status:HIT
cf-ray:2ded53163e241ffa-DFW
content-type:image/png
date:Wed, 07 Sep 2016 21:41:23 GMT
expires:Thu, 07 Sep 2017 21:41:23 GMT
server:cloudflare-nginx
status:200
vary:Accept-Encoding
x-ghost-cache-status:From Cache
x-powered-by:Express

<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>



<https://blog.cloudflare.com/hpack-the-silent-killer-feature-of-http-2/>



..THAT WAS EASY

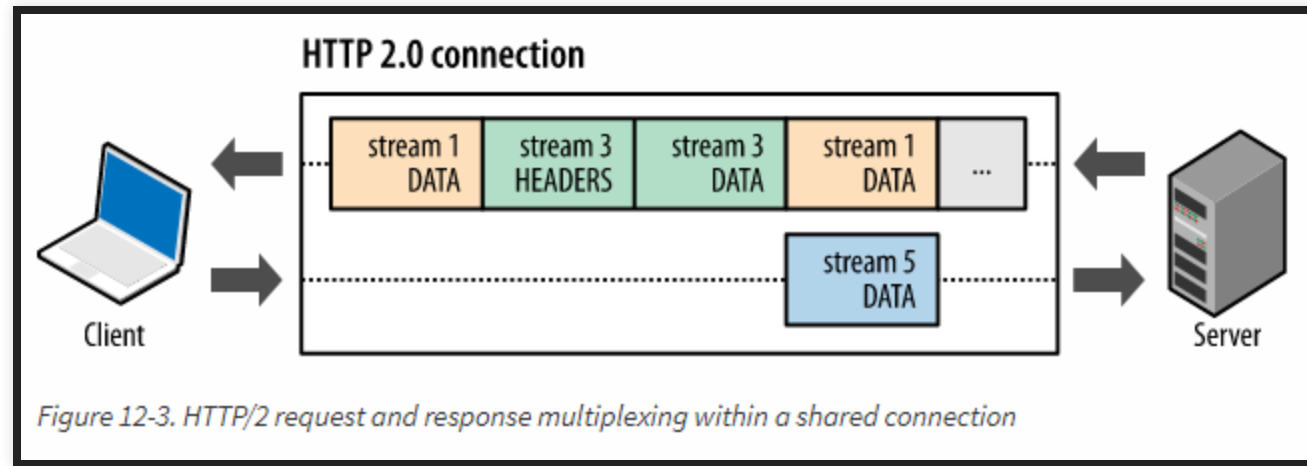
<https://http2.github.io/http2-spec/compression.html>

[https://http2.github.io/http2-](https://http2.github.io/http2-spec/compression.html#static.table.definition)

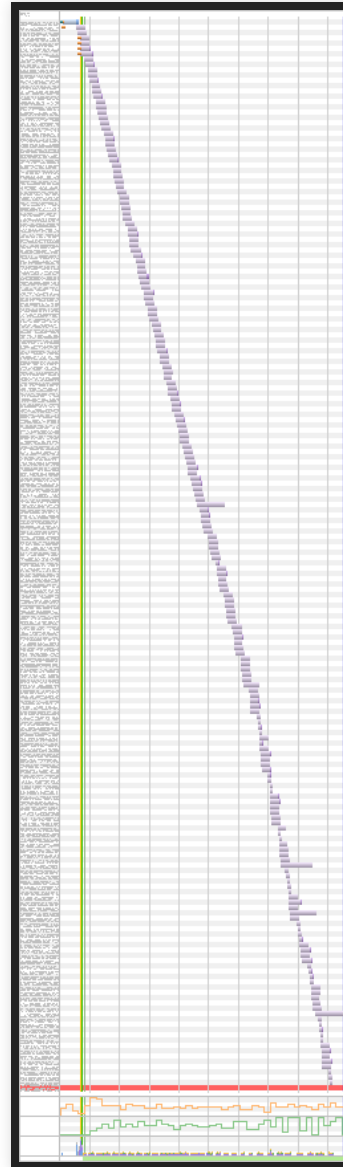
[spec/compression.html#static.table.definition](https://http2.github.io/http2-spec/compression.html#static.table.definition)

<https://http2.github.io/faq/#why-do-we-need-header-compression>

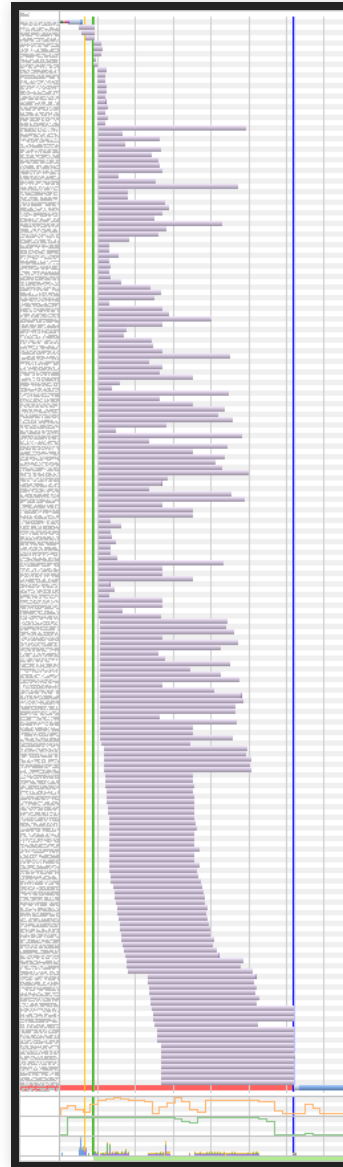
multiplexing



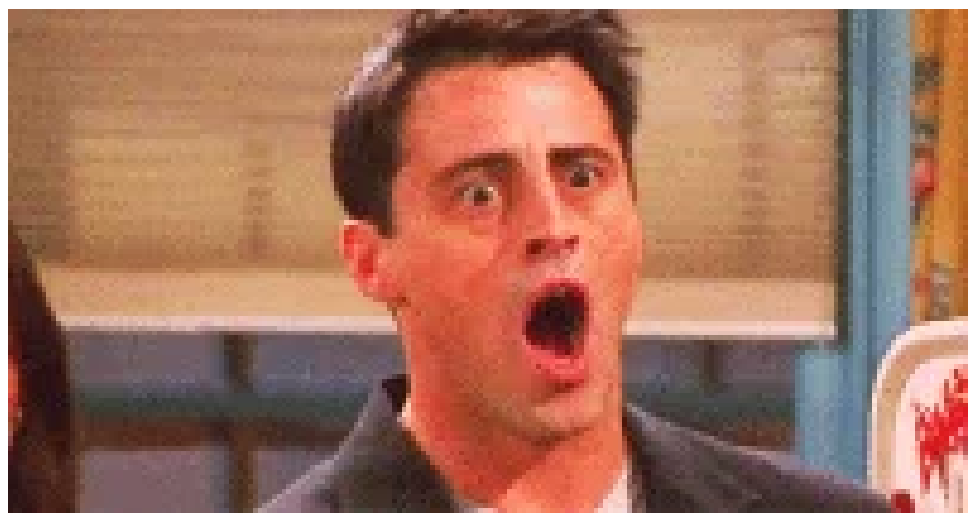
<https://hpbn.co/http2/>



http://www.webpagetest.org/result/171107_JH_cf777098020e891be6f8b6dacce76c81/



http://www.webpagetest.org/result/171107_V7_06052b5e21052c4e209afe926d2bcea0/



<https://http2.github.io/faq/#why-is-http2-multiplexed>
<https://http2.github.io/faq/#why-just-one-tcp-connection>

HTTP/2 TECHNOLOGY DEMO

This test consists of 200 small images from CDN77.com so you can see the difference clearly.



HTTP/1.1
5.29s

REFRESH

HTTP/2
1.29s



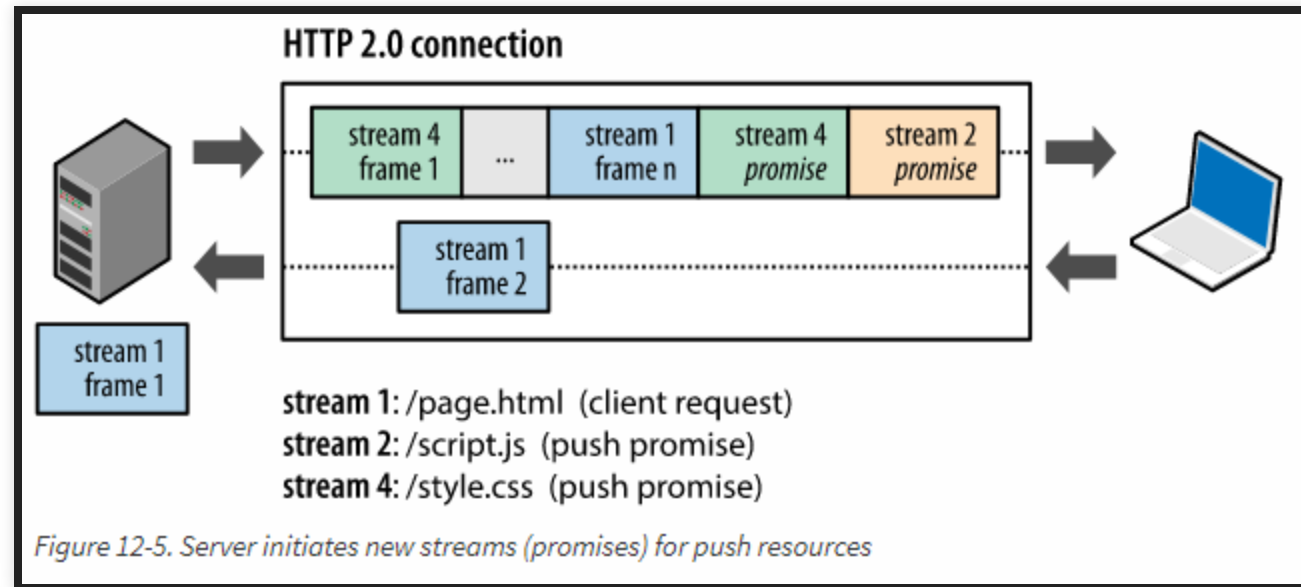
<http://www.http2demo.io/>

- WiFi / Cable: 4x
- LTE: 6x
- 3G: 15x
- 2G: 2x

<https://medium.com/apps-and-networking/http-2-makes-media-loading-3-15-times-faster-on-mobile-a455c3e68135>



server push



<https://http2.github.io/faq/#whats-the-benefit-of-server-push>

don'ts



- ~~concatenation~~
- ~~domain sharding~~
- ~~CDNs~~
- ~~spritesheets~~

<https://hpbn.co/http2/>
<https://http2.github.io>

