



The Vary header and the future of cache variation

Andrew Betts

Principal developer advocate | Fastly

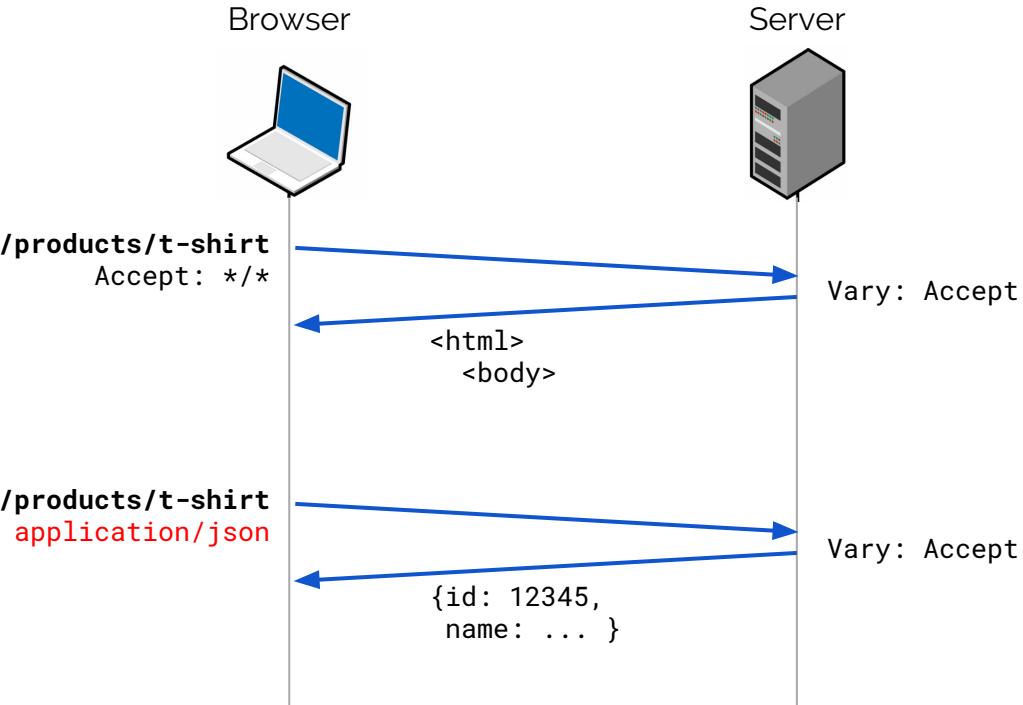
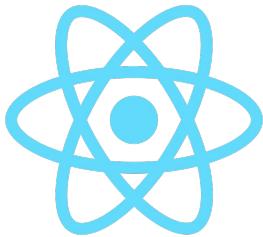


Why should I care?



A close-up shot of a yellow Minion with two large eyes and a single eyelash, wearing a black headband and a blue harness. The Minion is sitting at a laptop keyboard, looking directly at the camera with a neutral expression. A second Minion is visible in the background, also near a laptop. The setting appears to be a control room or laboratory with various equipment and screens.

Banana.



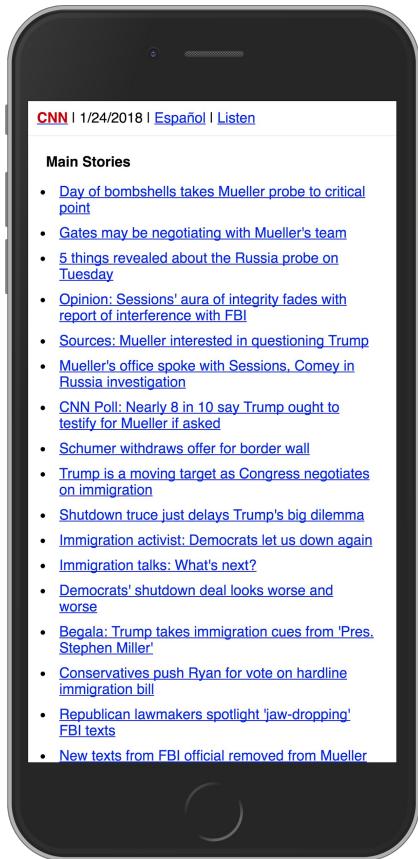


Brotli



Save-Data: 1

"Lite"



"Normal"





A letter about Google AMP

We are a community of individuals who have a significant interest in the development of the World Wide Web ("the Web"), and we are deeply concerned about [Accelerated Mobile Pages](#) ("AMP"), a Google project that purportedly seeks to improve the user experience.

In fact, AMP has a significant benefit of Google's market dominance.

We acknowledge that the technology used by AMP (and similar media) has made significant compromises.



Открытое письмо о Google AMP

Мы – сообщество людей, в высшей степени заинтересованных в развитии и благосостоянии Всемирной паутины ("Web"), и мы глубоко обеспокоены проектом [Accelerated Mobile Pages](#) ("AMP") от компании Google, якобы нацеленным на улучшение пользовательского опыта в Интернете.

Фактически AMP удерживает пользователей в домене Google, тем самым уводя трафик с других сайтов в пользу последнего. В масштабе миллионов пользователей это усиливает и без того растущее доминирование Google в Сети.

Мы признаем проблему медленной загрузки веб-страниц относительно альтернативных проприетарных технологий, таких как [Facebook Instant Articles](#) и [Apple News](#). Создатели сайтов (особенно СМИ) уже давно сталкиваются со скучным выбором и недостаточным стимулом, что приводит к плохим технологическим решениям и компромиссам, и, в результате, к ужасному UX.



Una carta sobre Google AMP

Estamos con un gran interés en la salud y el desarrollo de la Web. Nosotros estamos profundamente preocupados con [Accelerated Mobile Pages](#) (AMP), que supuestamente busca mejorar la experiencia de usuario.

Los sitios web dentro del dominio de Google y desvía tráfico de Google. Con una escala de mil millones de usuarios más el dominio que Google tiene en la Web.

Las páginas Web sean lentas para cargarse, en comparación con [Facebook Instant Articles](#) y [Apple News](#). Los editores (sobre todo los medios) enfrentándose a cuestiones difíciles e incentivos malos, que conceden, resultando en una mala experiencia de usuario.



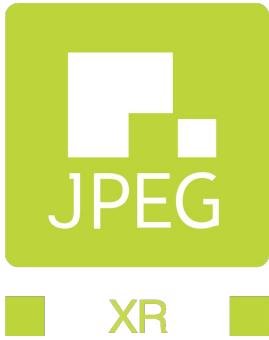
Google AMPに関する公開書簡

私たちはワールド・ワイド・ウェブにおける健全さと発展に関して大いに关心を持っている個人達であり、私たちは、ウェブにおけるユーザ体験を向上させる、と喧伝しているGoogleのプロジェクト、AMP(Accelerated Mobile Pages)に対して深い憂慮を抱いています。

実際にAMPはGoogleのドメイン内にユーザを留め、Googleの利益のためにトラフィックを他のウェブサイトから迂回させています。数十億のユーザを有するGoogleにおいて、そうすることは、より完全なウェブの独占を推し進めることと同義と言えるでしょう。

Facebookのインスタント・アーティクルやAppleニュースなどの独自の技術と比べ、ウェブページの読み込みが遅いという問題は確かに存在しています。パブリッシャーは特に報道メディアにおいては難しい選択と不十分なインセンティブに長い間直面しており、売上げを最大化するために間違った意志決定や妥協をし、最終的には酷いユーザ体験を提供することになってしまっています。

ampletter.org



XR

2000

mozjpeg



Content negotiation

14.37	Referer	131
14.38	Retry-After	131
14.39	Server	132
14.40	Transfer-Encoding	132
14.41	Upgrade	132

Fielding, et. al.

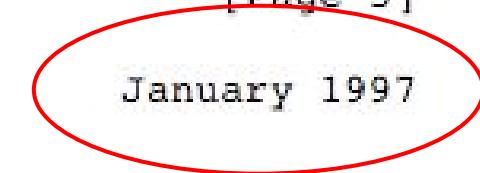
Standards Track

[Page 5]

RFC 2068

HTTP/1.1

January 1997



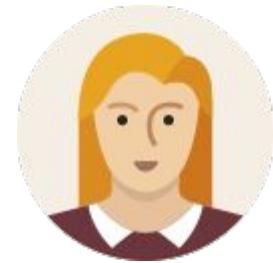
14.42	User-Agent	134
14.43	Vary	134
14.44	Via	135
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15.2	Offering a Choice of Authentication Schemes	140
15.3	Abuse of Server Log Information	141
15.4	Transfer of Sensitive Information	141



Hi bank.com! **GET /statement** please

Here's a **text/html** representation of **/statement**

Thanks, but, like, **Accept: text/csv?**

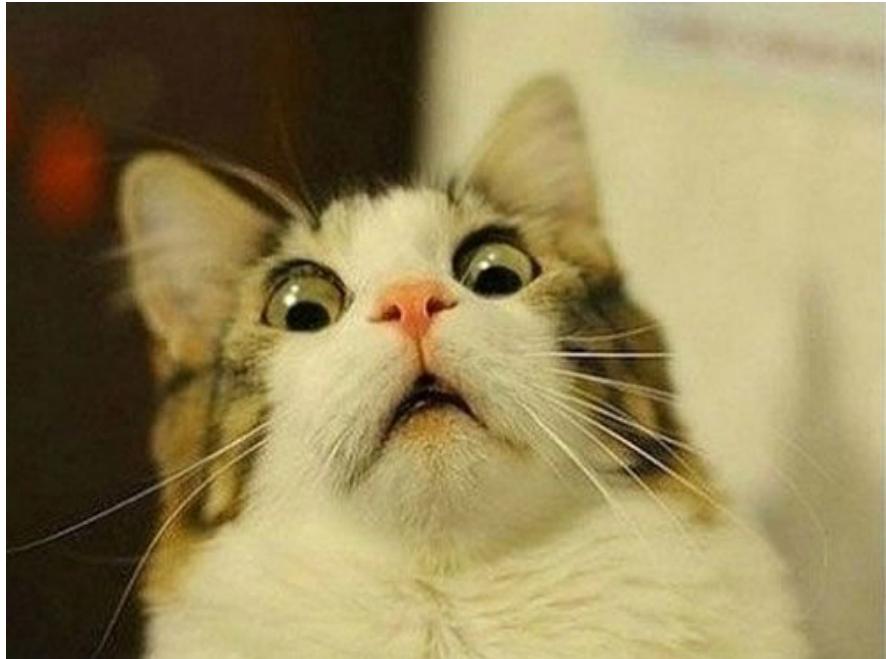


Very well, human.

Here's a **text/csv** representation of **/statement**

What if I told you...

You don't **have**
to view the
web as HTML





"Accept" ?????





Content negotiation is dead?



The **original idea** of
content negotiation is dead.

▼ International

ログイン メニュー ▾

日本経済新聞

2017年7月30日(日)

電子版/新聞 お申し込み

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金正恩氏の「過信」と核実験への懸念

北朝鮮が7月28日、大陸間弾道ミサイル（ICBM）とみられる発射実験を、ふたたび強行した。最近の傾向とは異なり、深夜に想定外の場所から発射して、「任章の根拠、時間に合致せず」できる能力」（朝鮮中

- ・日米韓、対抗措置を
- ・ICBM発射試験「
- ・漁師ら「落下場所が
- ・ミサイル閃光？複数

[PR] サービス品質を

米大統領「中国

【ワシントン=井上和也】2回目の大陸間弾道ミサイル発射で、中国には非常に落胆した。

- ・日本、試された「安否確認」
- ・北朝鮮、ICBM発射実験

東芝・WD、舞鶴工場

米カリフォルニア州が求めた東芝の半導体部門を開いた。差し止めに

- ・東芝、WH債務保証
- ・日本取引所CEO、



日経平均(円)
7/28 大引 19,959.84 -119.80 -0.60%

NYダウ(ドル)
7/28 終値 21,830.31 +33.76 +0.15%

日経アジア300
7/28 終値 1,287.61 -6.55 -0.50%

ドル円
-0.51円高 -0.45%

-0.24円高 -0.18%

+0.010

+0.75 +1.52%

Quick



資本評価研究所
が語る
「アズ先物を
始めた3つの戦略

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□ 日経電子版をもっと知りたい方はこちら >

今なら10日間無料お試しも実施中！

Request headers

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

Accept-Encoding: gzip, deflate

Accept-Language: en-GB, en-US;q=0.8, en;q=0.6

Cache-Control: max-age=0

Connection: keep-alive

Host: www.nikkei.com

Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_12_6)
AppleWebKit/537.36 (KHTML, like Gecko) Chrome/59.0.3071.115
Safari/537.36

Same URL, different response

Users

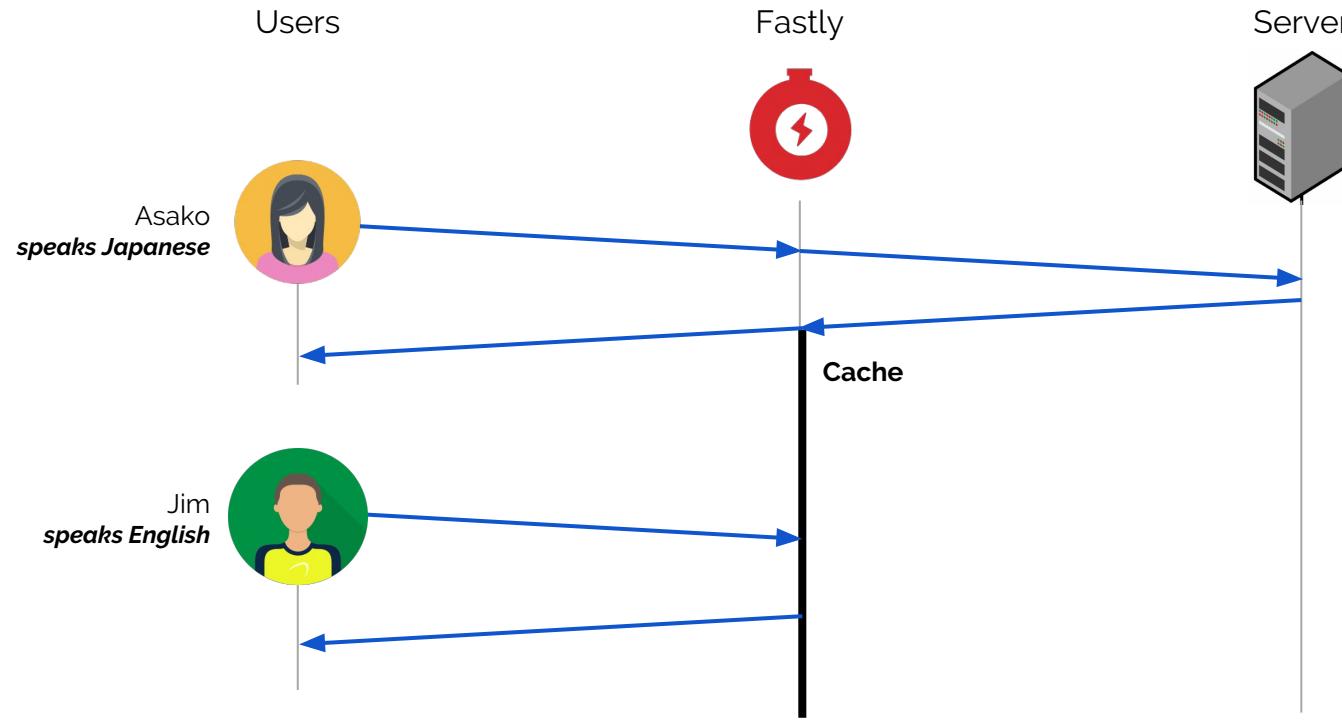


Fastly



Server







Response headers (no vary)

Accept-Ranges: bytes

Cache-Control: no-cache,no-store,must-revalidate,proxy-revalidate

Connection: keep-alive

Content-Encoding: gzip

Content-Language: ja

Content-Length: 29019

Content-Type: text/html; charset=utf-8

With vary

Accept-Ranges: bytes

Cache-Control: max-age=3600, public

Vary: Accept-Language

Connection: keep-alive

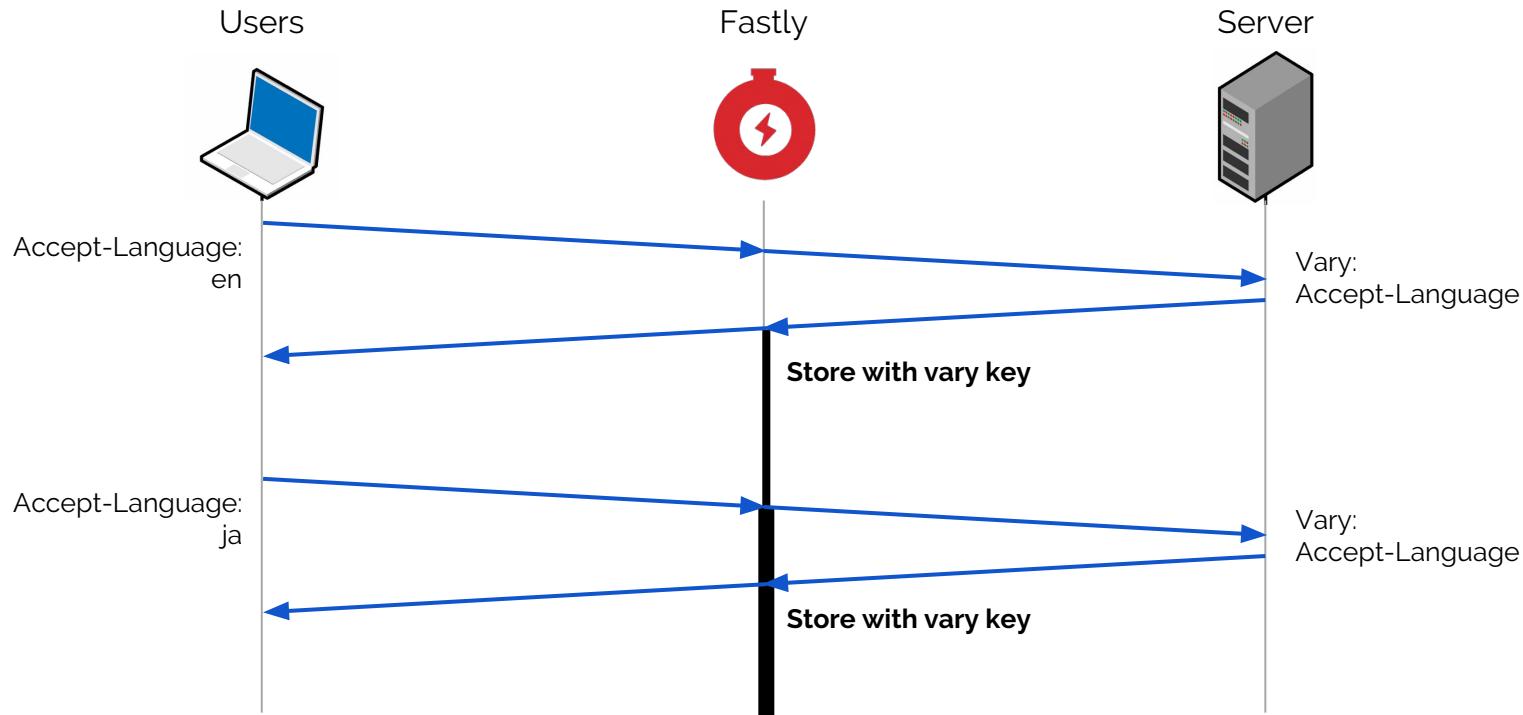
Content-Encoding: gzip

Content-Language: ja

Content-Length: 29019

Content-Type: text/html; charset=utf-8

How vary works



Compute a **cache key**

REQUEST

URL path: /home/
Method: GET
Host: example.com
Accept-Language: en



Cache key: **GET**

Ignore this
for now

Hostname

example.com

/home/

Method

Path

Compute Vary key

REQUEST

URL path: /home/
Method: GET
Host: example.com
Accept-Language: en

RESPONSE

Vary: Accept-Language
Cache-Control: max-age=3600

Vary key:
"en"

CACHE OBJECT

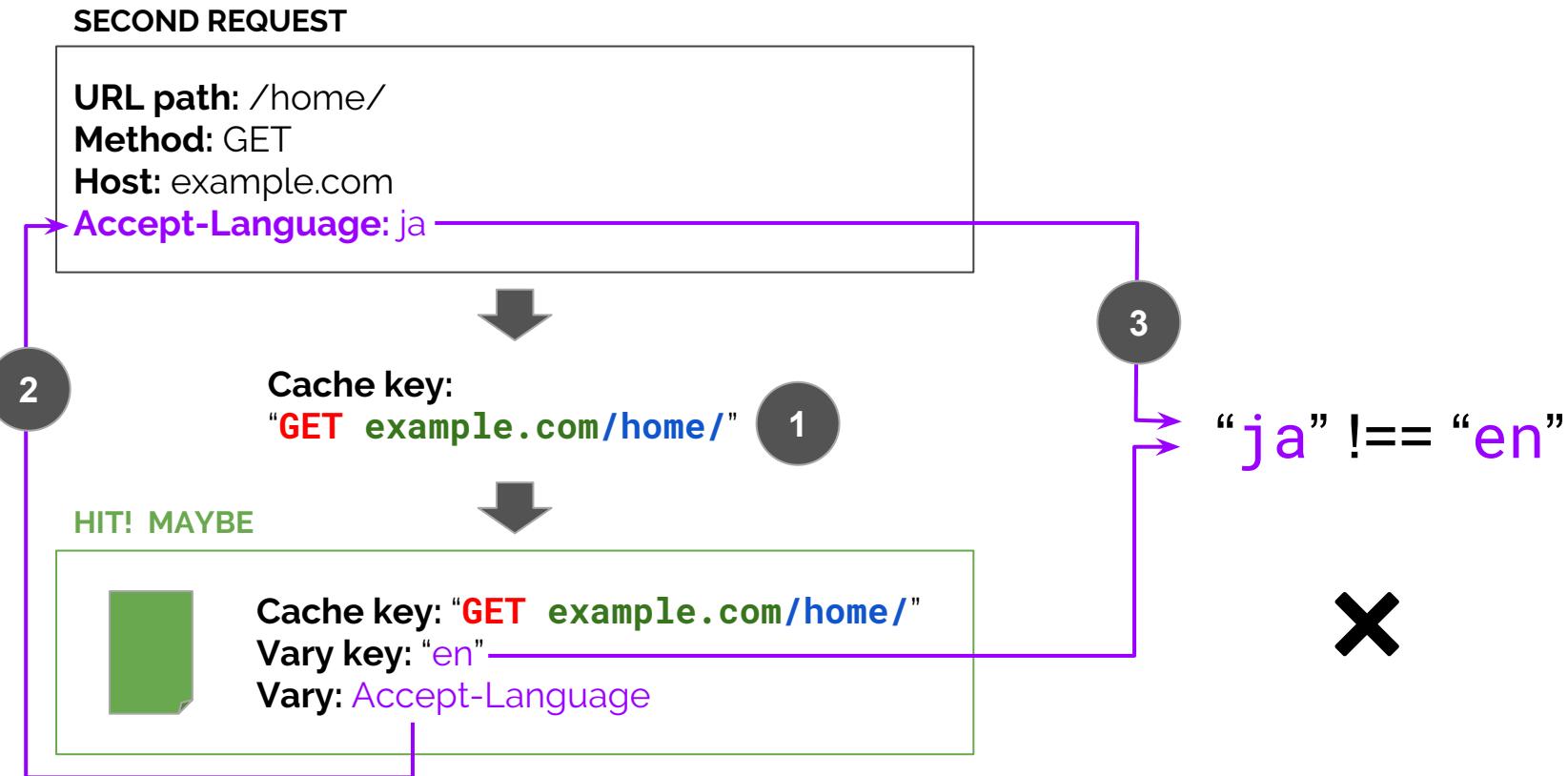


Cache key:
"GET example.com/home/"

Vary key:
"en"

Vary:
"Accept-Language"

Second request: hit in cache?



Many variations, same URL

THIRD REQUEST

URL path: /home/

Method: GET

Host: example.com

Accept-Language: es-es

MATCHING CACHE ENTRIES

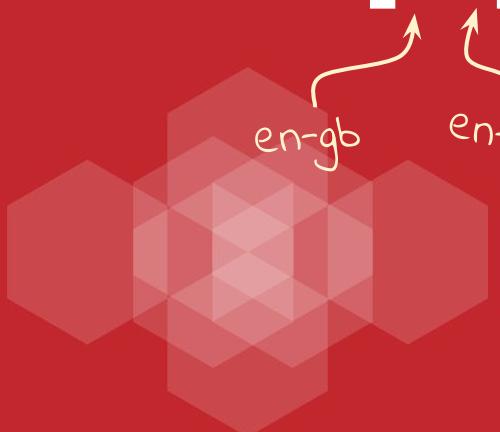
	Object 1	Object 2	Object 3
Vary header on cache object	“Accept-Language”	“Accept-Language”	“Accept-Language”
Computed vary-key for active request	“es-es”	“es-es”	“es-es”
Value of the cache object’s vary-key	“en”	“ja”	“es-es”
Vary match?	No	No	Yes

Accept-Language around the world

	Washington DC	Frankfurt	Tokyo
1	en-us	en-US,en;q=0.8	ja-jp
2	en-US,en;q=0.8	it-IT,it;q=0.8,en-US;q=0.6,en;q=0.4	ja-JP,en-US;q=0.8
3	en-US	en-us	ja-JP
4	en-US,en;q=0.5	it-it	ja-JP,ja;q=0.8,en-US;q=0.6,en;q=0.4
5	en	tr-tr	ja,en-US;q=0.8,en;q=0.6
6	pt-BR,pt;q=0.8,en-US;q=0.6,en;q=0.4	ru	ja
7	en_US	tr-TR,tr;q=0.8,en-US;q=0.6,en;q=0.4	ko-KR,ko;q=0.8,en-US;q=0.6,en;q=0.4
8	es-ES,es;q=0.8	pl-PL,pl;q=0.8,en-US;q=0.6,en;q=0.4	ko-KR
9	en,*	ru-RU,ru;q=0.8,en-US;q=0.6,en;q=0.4	en-us
10	en-US;q=1	de-de	ko-KR,en-US;q=0.8

+ over 5000 total variations

Normali[sz]e!



en-gb

en-us

Normalise for vary (5000 -> 6)

 **fastly** only

```
accept.language_lookup("en:de:fr:pt:es:jp", "en", req.http.Accept-Language);
```

	Washington DC	Frankfurt	Tokyo
1	en (84%)	en (60%)	jp (74%)
2	es (7%)	es (18%)	en (23%)
3	pt (6%)	de (12%)	es (3%)
4	jp (2%)	fr (7%)	
5	fr (1%)	pt (2%)	
6		jp (1%)	

Traditional Vary targets

Accept

Format. Doesn't really work as intended.

Accept-Language

Language. Not used enough!

Accept-Encoding

Compression. Used everywhere!



Brotli

Variation for Accept-Encoding

	Accept-Encoding	Cached response
1	gzip, br, deflate	Gzipped
2	br, gzip	Gzipped
3	gzip, br	Gzipped
4	br	Uncompressed
5	gzip	Gzipped
6	gzip, deflate	Gzipped

Network Working Group
Internet-Draft
Updates: [7234](#) (if approved)
Intended status: Standards Track
Expires: April 1, 2018

M. Nottingham
Fastly
September 28, 2017

HTTP Variants

[draft-nottingham-variants-00](#)

Abstract

This specification introduces the HTTP `variants` response header field to communicate what representations are available for a given resource.

Note to Readers

RFC EDITOR: please remove this section before publication

The issues list for this draft can be found at <https://github.com/mnot/I-D/labels/variant>.

The most recent (often, unpublished) draft is at <https://mnot.github.io/I-D/variant/>.

Recent changes are listed at <https://github.com/mnot/I-D/commits/gh-pages/variant>.

See also the draft's current status in the IETF datatracker, at <https://datatracker.ietf.org/doc/draft-nottingham-variant/>.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress".

This Internet-Draft will expire on April 1, 2018.

Copyright Notice

[mnot.github.io
/I-D/variants/](https://mnot.github.io/I-D/variants/)

Semantically-aware variant processing

HTTP/1.1 200 OK

Content-Type: image/gif

Content-Language: en

Content-Encoding: br

Variants: Content-Language;en;jp;de

Variants: Content-Encoding;gzip

Vary: Accept-Language, Accept-Encoding

Transfer-Encoding: chunked

Cookie header contains many cookies

Cookie: bknx_fa=1493712326578; _cb_ls=1; __gads=ID=b97051db299bac0a:T=1493714224:S=ALNI_MbDirXmxxxxxxxxxxH9MEN0IAJA; o-tracking-proper-id=cj208xxxxxxxx0003i5xajkyks1d; opFTData=%26v%3D1; opPageCount=null%26sub%3D1; SIVISITOR=NC4z0TUu0xxxxxxxxxxxxxTE4MDQuMTQ5NjI2MDI50DYyMi4z0DgyMDA0*; opTrackSess=%26t%3D1%26vt%3D1; FTUserTrack=8.18.217.202.1496260299656254; AYSC_C=S; GZIP=1; FT_M=; __utmc=37329215; **userAuthState=subscriber;** fyre-fpuuid=54067c4a-cdf3-40f4-8755-a1c66113fabc; _ga=GA1.2.1627681311.1496190716; amp-access=amp-8rCnbBwKSCB_t3PxsLVBrZ5VYPNsrrJEMLGzdWK0viudRFpse1K3z4rgEVCHJuTuK; _kuid_=amp-TgUtXcxY-F8zD9qcv2Ddj_1zNPdnSrI-JRCn3sSMEiwd4vcTl3YXuuxiqzy3vYnm; h2_isEnabled=true; h2_rtt=13; sc .ASP.NET_SESSIONID=qjaxxxxxxf12doptyhq22s1; FT_P=exp=1512039366183&prod=71|72|73; FT_User=USERID=4012147701:EMAIL=andrew@example.com:FNAME=Andrew:LNAME=Betts:TIME=%5BThu%2C+30-Nov-2017+10%3A55%3A36+GMT%5D:USERNAME=andrew@xxxxxxxx:REMEMBER=_REMEMBER_:ERIGHTSID=1xxxxx01:PRODUCTS=_Tools_P0_P1:_RESOURCES=:GROUPS=:X=; AYSC=_04PVT_05IT_06TEC_07PR_13USA_14GBR_15US_17PVT_18PVT_22ToolsP0P1_24PVT_25PVT_26PVT_27PVT_96PVT_98PVT_; FT_U=_EID=1xxxxx1_PID=40xxxxx01_TIME=%5BThu%2C+30-Nov-2017+10%3A55%3A36+GMT%5D_SKEY=VqTtH%2F6To%2F2Vh6JfG0WeVA%3D%3D_; FTSession=z0Wn3PvaXUQu04WXrVahJv9JzwAAAWAMkUc2w8I.MEUCIQDYxn0Iup726g044CxqpCXW2xKpuGzSvsdQxxxxxxxxfgYvyfQX7uuEISTqIhRuEdutpKsMV3oPTQGuzgnNt3g; FTSession_s=z0Wn3PvaXUQu04WXxxxxv9JzwAAAWAMkUc2w8I.MEYCIQCjsYjnWe7LHFGWrGh XL0NC0qtfXgATicwiH7-dVgslaQIhAKzhBo32vj2i2c7Z38daf6NRLNmnpvLkDm0ocaUAje33; _cb=DPINxxxxxxxxHBkohYk; FTAllocation=45a7dcfb-da5d-442e-xxxxx-adxxxxxxff49; spoor_id=cj208hsbu0003xxxxxxxxks1d; __cfduid=d57xxxx3c5f00546aaaf8accce16b608cc1516016990; __utma=37329215.1627681311.1496190716.1496957522.1516016993.2; __utmz=37329215.1516016993.2.1.utmcsr=duckduckgo.com|utmccn=(referral)|utmcmd=referral|utmccct=/; ft-access-decision-policy=-; lux_uid=15166xxxxxx09308369; o-typography-fonts-loaded=1; _chartbeat2=.1493xxxxxxxx66.1516625619078.01xxxx01000001.ByQBYaC_X2j1saGnTBWe8TRBsbFL3; _cb_svref=null; kppid=12xxxx01

Interesting
one!

~(Y)~

Edge normalise: Extract, verify, split

Cookie:

Auth=e3J0eXAi0xJKV1QiLTJhbGciOiJIUzI1NiJ9.eyJhdWQiOiJybmlra2VpX3dlYiIsImlzcyI6ImFwaWd3Lm44cy5qcCI&ImRzX3Jhbmsi;



UserID: 12345

UserRole: free-user

UserGroups: 53, 723, 111

Edge normalise: response

BEFORE

```
Vary: Cookie  
Cache-Control: max-age=3600
```

Essentially uncacheable

AFTER

```
Vary: UserRole  
Cache-Control: max-age=3600
```

Only 2 variations

The Key HTTP Response Header Field

[draft-ietf-httpbis-key-latest](#)

Abstract

The 'Key' header field for HTTP responses allows an origin server to describe the secondary cache key (RFC 7234, Section 4.1) for a resource, by conveying what is effectively a short algorithm that can be used upon later requests to determine if a stored response is reusable for a given request.

Key has the advantage of avoiding an additional round trip for validation whenever a new request differs slightly, but not significantly, from prior requests.

Key also informs user agents of the request characteristics that might result in different content, which can be useful if the user agent is not sending request header fields in order to reduce the risk of fingerprinting.

Note to Readers

Discussion of this draft takes place on the HTTP working group mailing list (ietf-http-wg@w3.org), which is archived at <https://lists.w3.org/Archives/Public/ietf-http-wg/>.

Working Group information can be found at <http://httpwg.github.io/>; source code and issues list for this draft can be found at <https://github.com/httpwg/http-extensions/labels/key>.

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<http://datatracker.ietf.org/drafts/current/>

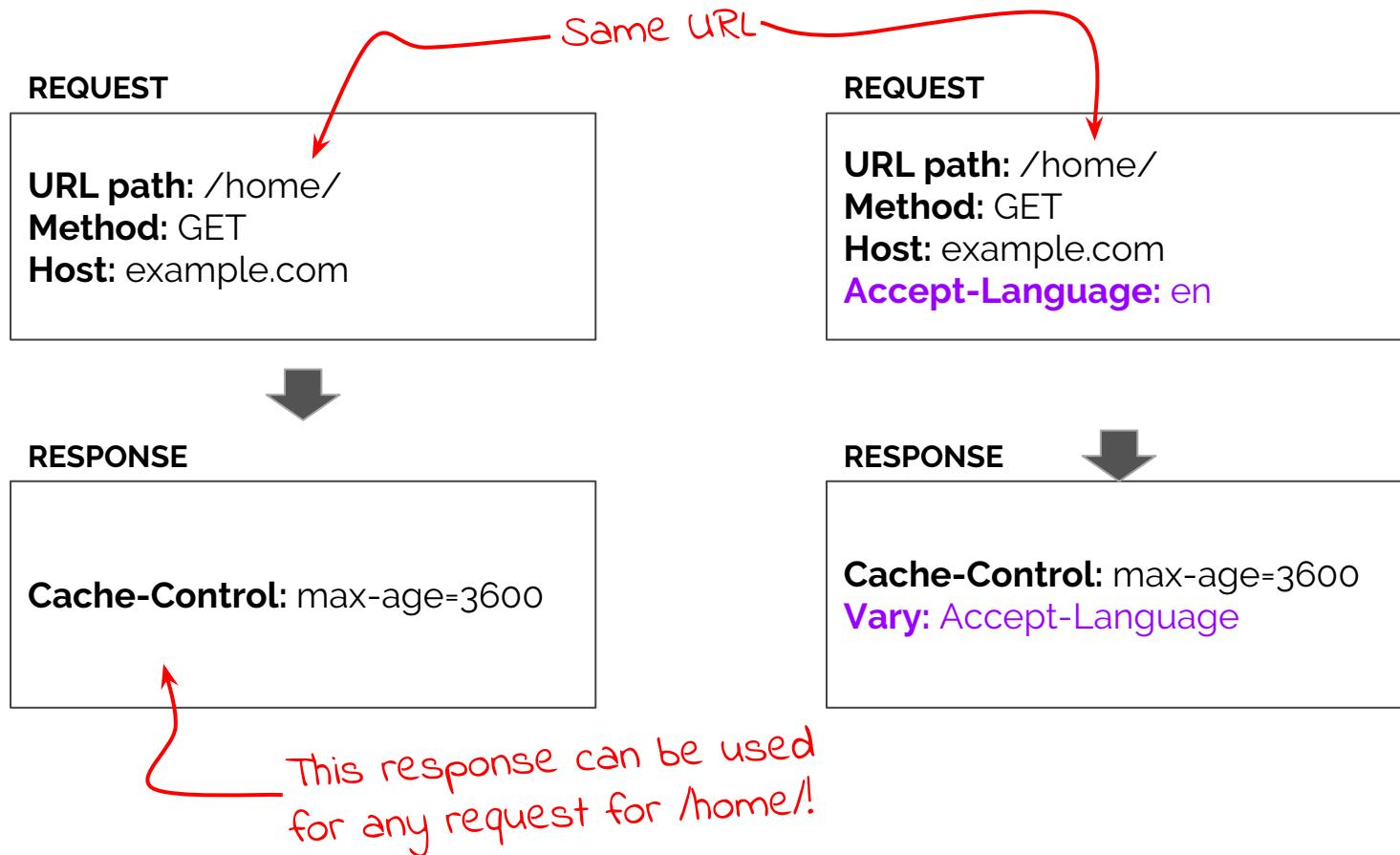
[http://httpwg.org/
http-extensions/key.html](http://httpwg.org/http-extensions/key.html)

Vary on a single cookie!?

Key: cookie; param=userAuthState

Variable vary values

Don't do this



Fixed

REQUEST

URL path: /home/
Method: GET
Host: example.com



RESPONSE

Cache-Control: max-age=3600
Vary: Accept-Language

Same Vary

REQUEST

URL path: /home/
Method: GET
Host: example.com
Accept-Language: en



RESPONSE

Cache-Control: max-age=3600
Vary: Accept-Language

General rule of thumb

Always include the Vary header in the response

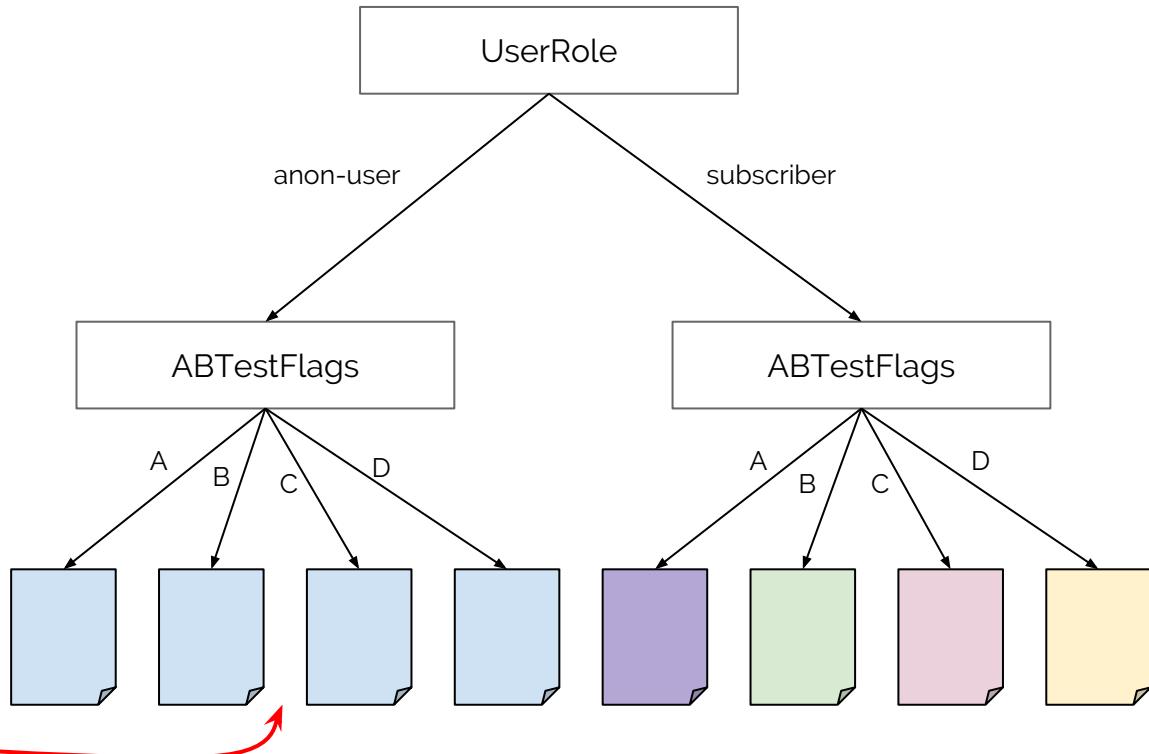
Even if the header you are varying on is not in the request

What if multiple headers interact?

RESPONSE

Cache-Control: max-age=3600
Vary: UserRole, ABTestFlags

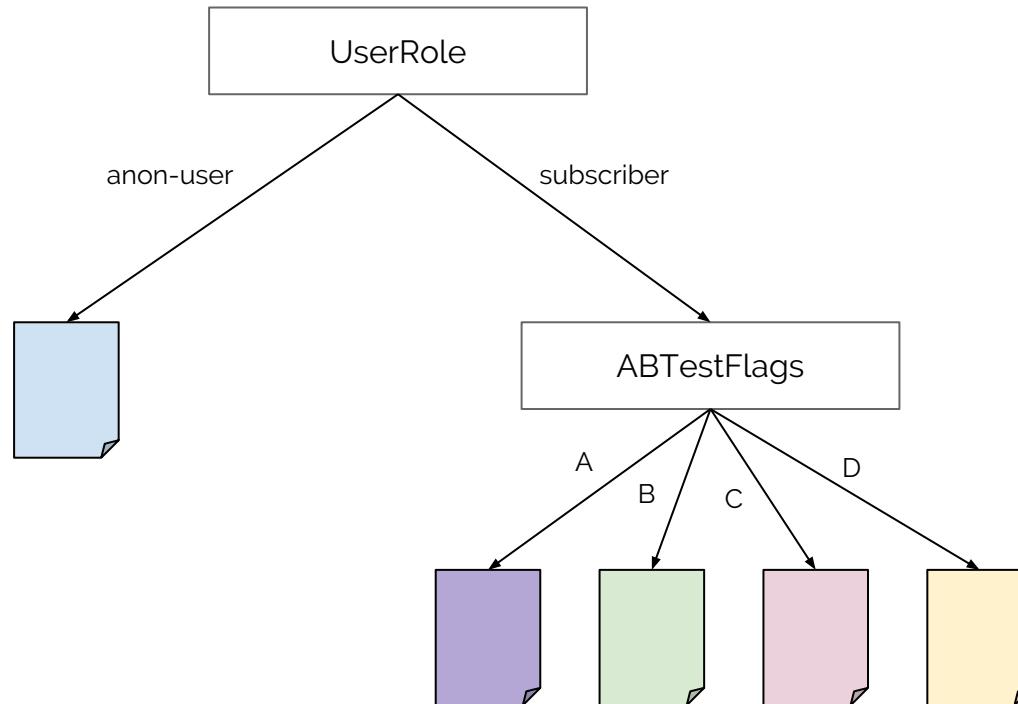
Hmm. For anonymous users, all the variations are the same.



What if multiple headers interact?

REQUEST	RESPONSE
UserRole: anon-user ABTestFlags: A	Vary: UserRole
REQUEST UserRole: subscriber ABTestFlags: C	RESPONSE Vary: UserRole, ABTestFlags

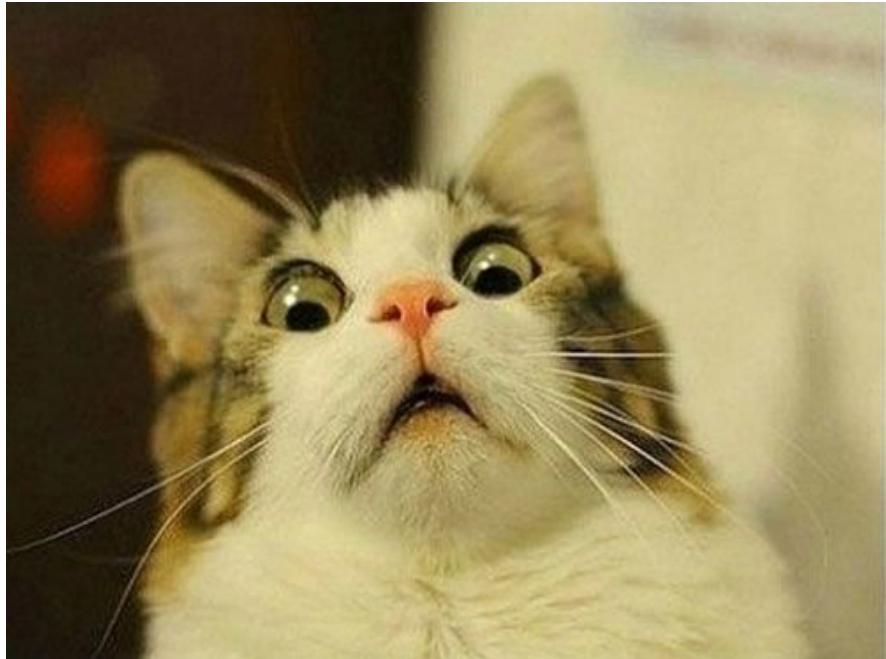
What if multiple headers interact?



Browser

What if I told you...

Browsers
only store
one variation



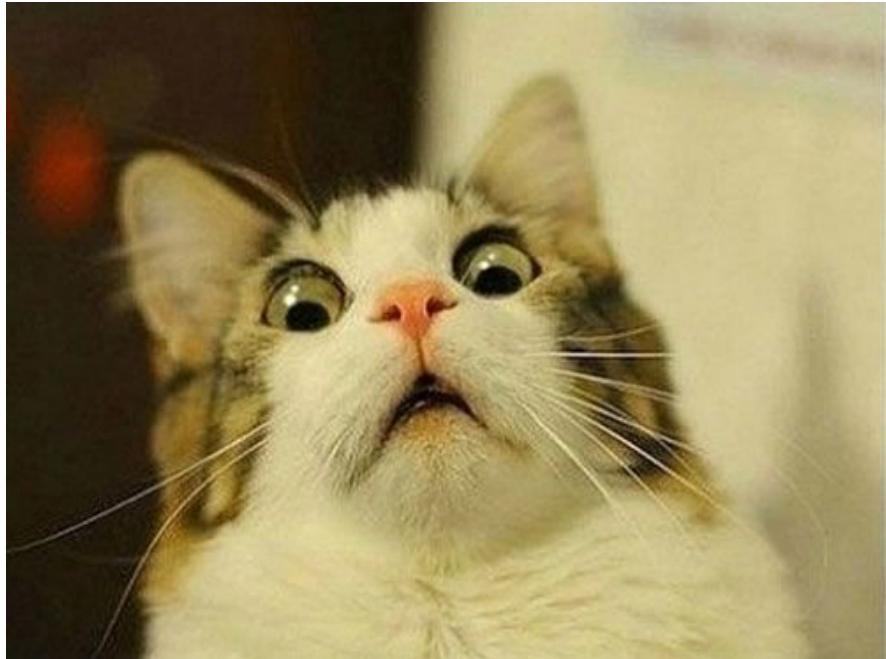
Browsers only store one variation... really:

Accept 🔗

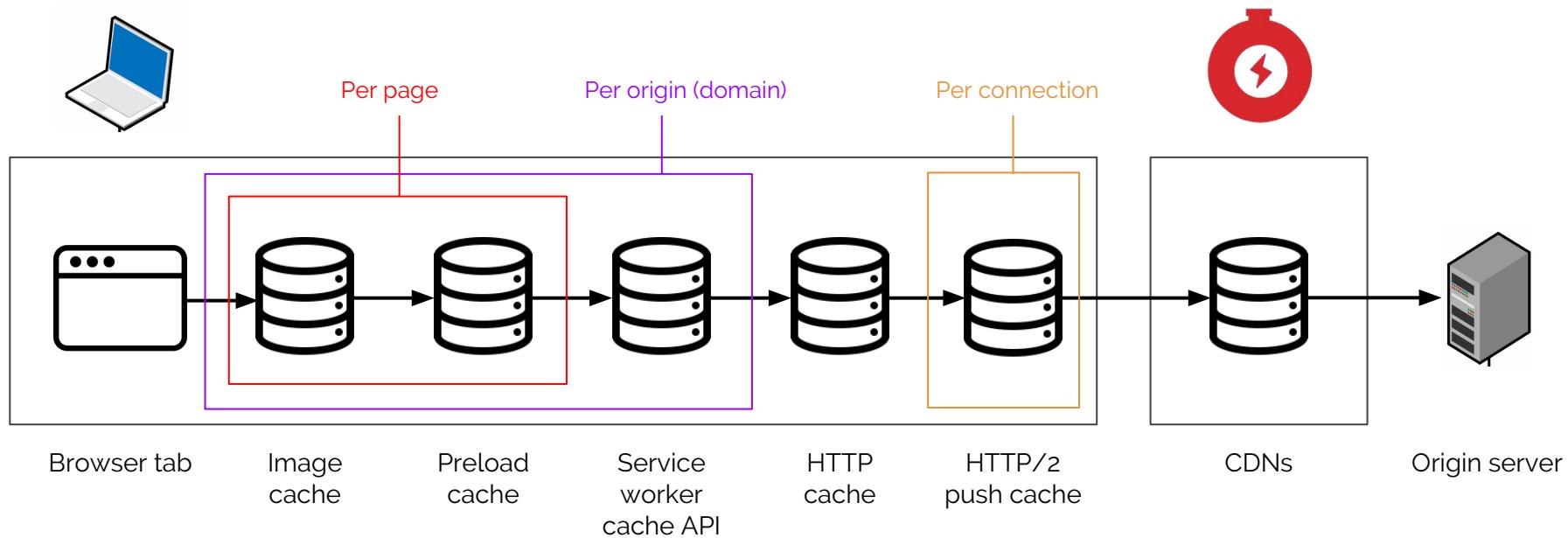
REQUEST URL	HEADERS	EXPECT	ACTUAL	NOTES
/format? v=Accept	Accept: application/json		Seed	
/format? v=Accept	Accept: application/json	HIT	HIT	Identical request for cachable object => HIT in HTTP cache
/format? v=Accept	Accept: text/csv	MISS	MISS	Different varied value => MISS HIT: Browser doesn't support vary?
/format? v=Accept	Accept: application/json	MISS	MISS	Back to original varied header value. HIT for intermediate caches. MISS for browsers because they use vary as a validator only

What if I told you...

There are
actually **six**
caches...



What if I told you...



Serviceworker cache API is different

Serviceworker cache [🔗](#)

REQUEST URL	HEADERS	EXPECT	ACTUAL	NOTES	
/util/sw-clear-cache		Clear the service worker cache in preparation for the test			
/sw-cache?v=Foo-Header&c=0	Foo-Header: 1	MISS	MISS	First variation of a request for something not in SW cache, expect a MISS	
/sw-cache?v=Foo-Header&c=0	Foo-Header: 1	HIT	HIT	Repeat the first variation. Expect a HIT despite not being cachable in browser cache, because it will be cached in SW cache.	
/sw-cache?v=Foo-Header&c=0	Foo-Header: 2	MISS	MISS	Second variation: Vary on the same header but with a different value, expect a MISS	
/sw-cache?v=Foo-Header&c=0	Foo-Header: 2	HIT	HIT	Repeat second variation, expect a HIT	
/sw-cache?v=Foo-Header&c=0	Foo-Header: 1	HIT	MISS	Back to the first variation. As specified , serviceworker should implement vary like an intermediate cache, not a validator Chrome (60): Serviceworker cache stores only one variation	
/sw-cache?v=Foo-Header&c=0	Foo-Header: 2	HIT	MISS	Repeat the second variation again, expect a HIT, if cache is storing multiple variations Chrome (60): Serviceworker cache stores only one variation	

HTTP/2 Push cache

HTTP/2 Push ⚙

REQUEST URL	HEADERS	EXPECT	ACTUAL	NOTES
/push?ct=image%2Fgif		HIT	HIT	Simple push => HIT Safari (10): Sometimes does not use H2 push cache at all
/push?ct=image%2Fgif&c=0		HIT	HIT	... even if it cannot be cached in the HTTP cache (because it should be in the separate preload cache)
/push?ct=image%2Fgif&v=Accept-Encoding&c=0		HIT	HIT	If the server pushes an object that has a Vary header on the response, it should still be a hit
/push?ct=image%2Fgif&v=Foo-Header&c=0	Foo-Header: 42	MISS	HIT	Should MISS since the pushed resource varies on Foo-Header, but doesn't know what Foo-Header value we'll be sending. However, some browsers incorrectly ignore Vary on pushed resources. FF (54): Ignores vary, scores a hit (Bug) Chrome (59): Ignores vary, scores a hit (Bug) Safari (10): Ignores vary, scores a hit



If you think a bug might affect users in the 57 release, please set the correct tracking and status flags for Release Management.

Bug 1397621

All HTTP2 server pushes are being ignored due to faulty origin check

Get help with this bug

UNCONFIRMED Assigned to [nwgh](#)

▼ **Status** (UNCONFIRMED bug which should be worked on in the current release/iteration)

Product: [Core](#)

Reported: 12 days ago

Component: [Networking: HTTP](#)

Modified: 9 hours ago

Importance: P1 normal

Status: UNCONFIRMED

► **People** (Reporter: Austin Donisan, Assigned: nwgh)

▼ **Tracking**

Version: 56 Branch

Target: ---

Points: ---

► **Firefox Tracking Flags** (firefox55 unaffected, firefox56 ?, firefox57 ?)

304 “Not Modified” can **update** the cache

304 Not Modified (with non-matching validator) 

REQUEST URL	HEADERS	EXPECT	ACTUAL	NOTES
/304-special?non-matching	Foo-Header: 1			Seed with a response that Vary: Accept (not Foo-Header), cacheable but requires revalidation
/304-special?non-matching	Foo-Header: 2	304	304	Expect initial conditional HIT and revalidation request. Server returns a 304 but with Vary: Accept, Foo-Header (different Vary!). Use cache, update with new Vary header => HIT
/304-special?non-matching	Foo-Header: 1	MISS	MISS	Spec unclear, but browsers seem to update both the reference request and the cache object, meaning that the cached version is now the variation for foohandler=2. Requesting foohandler=1 should therefore MISS.

Why is Vary important now?

HTTP Client Hints

[draft-ietf-httpbis-client-hints-latest](#)

Abstract

An increasing diversity of Web-connected devices and software capabilities has created a need to deliver optimized content for each device.

This specification defines a set of HTTP request header fields, colloquially known as Client Hints, to address this. They are intended to be used as input to proactive content negotiation; just as the Accept header field allows user agents to indicate what formats they prefer, Client Hints allow user agents to indicate device and agent specific preferences.

Note to Readers

Discussion of this draft takes place on the HTTP working group mailing list (ietf-http-wg@w3.org), which is archived at <https://lists.w3.org/Archives/Public/ietf-http-wg/>.

Working Group information can be found at <http://httpwg.github.io/>; source code and issues list for this draft can be found at <https://github.com/httpwg/http-extensions/labels/client-hints>.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as

[http://httpwg.org/
http-extensions/client-hints.html](http://httpwg.org/http-extensions/client-hints.html)

New headers we can vary on

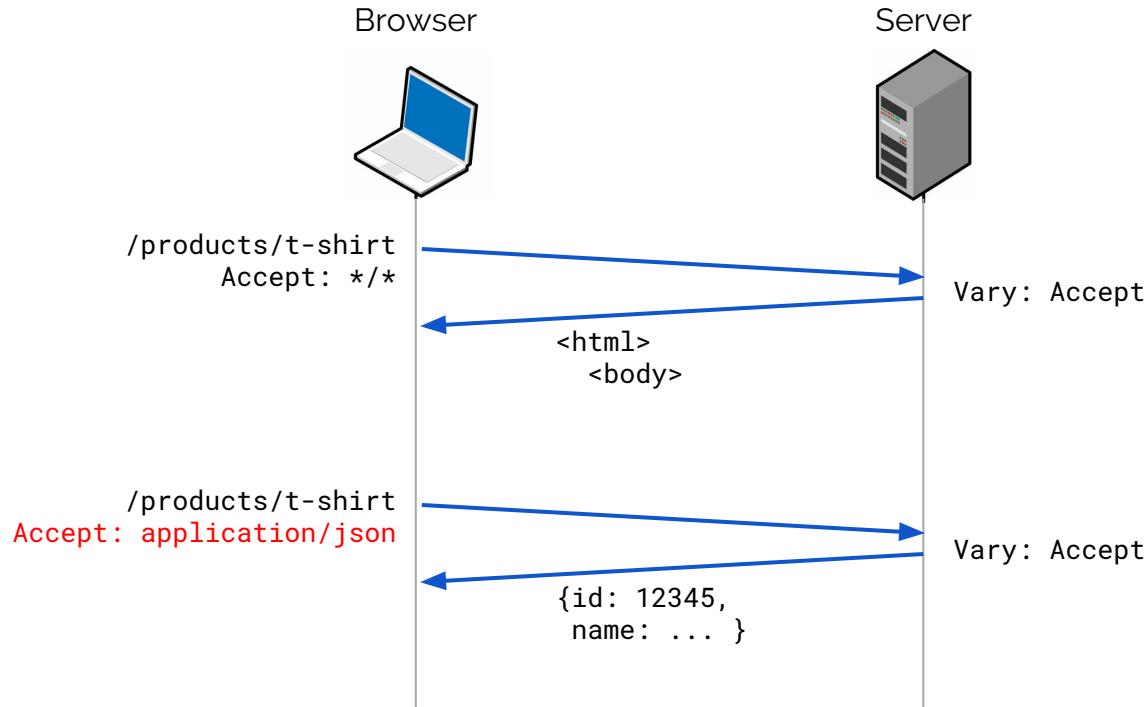
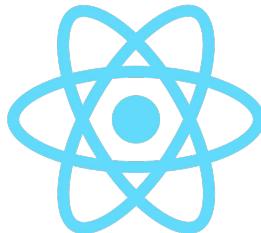
DPR: 2.0

Width: 320

Viewport-Width: 320

Save-Data: 1

Single page apps use same URLs for REST APIs





Brotli

Closing questions

- Are you serving unnecessary requests?
- Are you doing enough normalisation?
- Could you be using Client Hints?
- Do you have feedback on Variants, Key or Client Hints proposals?
- Does your hosting platform allow you to modify HTTP headers? If not, why not!?



Be variable.





Thanks for listening

I am
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@triblondon
abetts@fastly.com

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fastly.us/varytalk

Take our survey:
fastly.us/2skOnXM