

Cache , The Good, the Bad and the Ugly

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About Me - Omid Kosari

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Iran NOG goals

- Inviting and Covering all operators
 - Broader community of participants than before
- Talk about special conditions and share experiences
 - Strange problems in web!

Types of caches

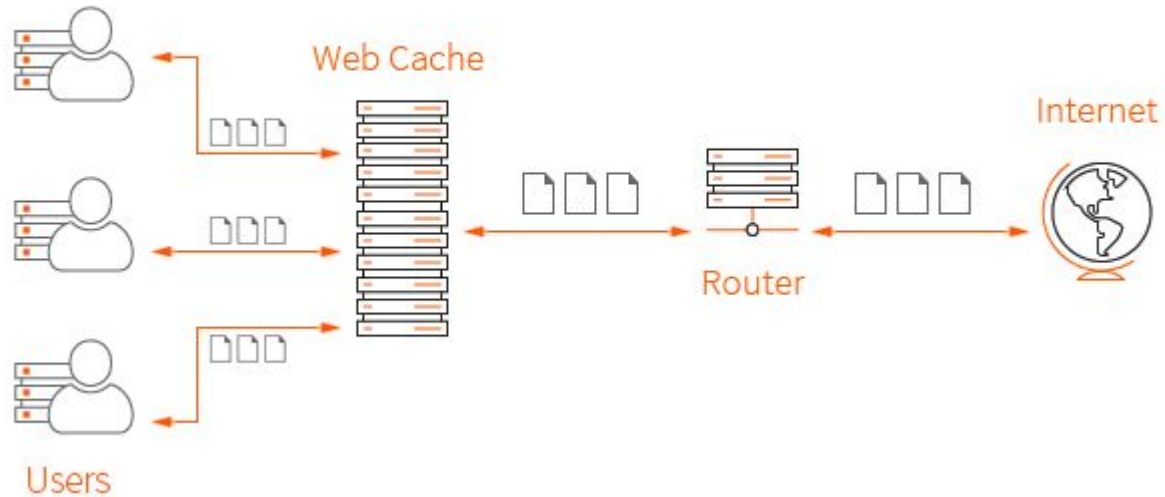
- CPU/GPU cache
- Disk cache
- Database query cache
- Code cache (opcache)
-
- DNS cache
- **Web cache**

The good

Cache = Ca\$h



- **Cut down on bandwidth costs**
- **Improve user experience**

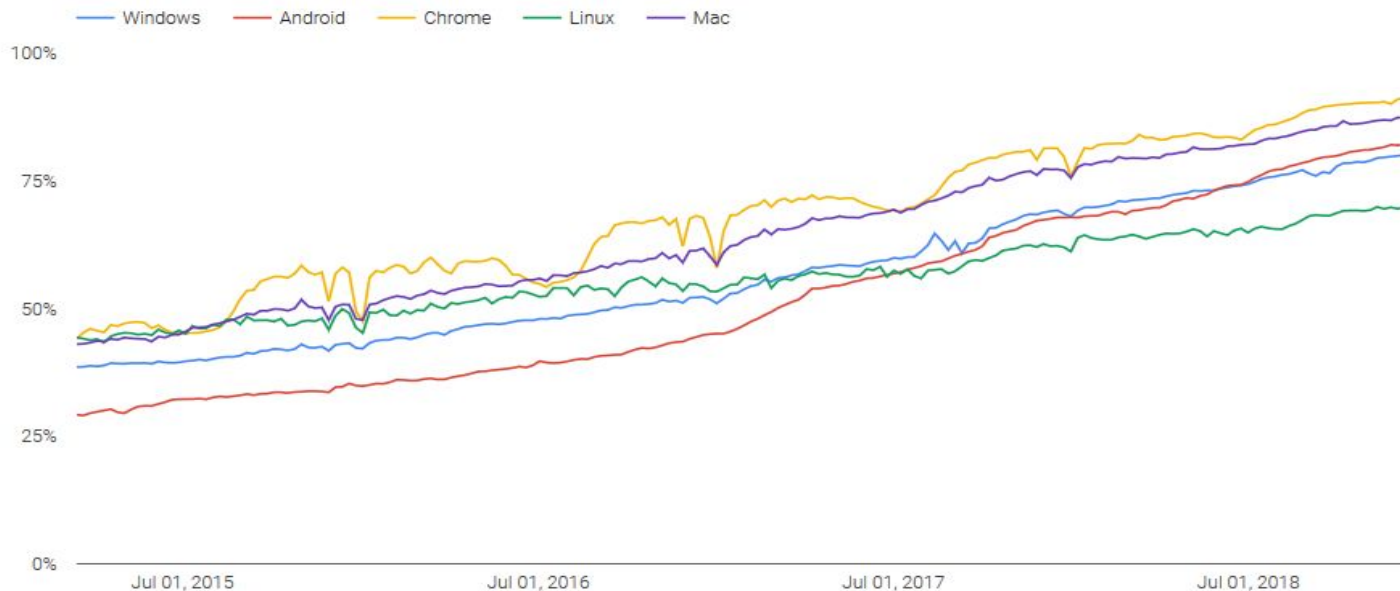


The Bad

HTTPS Encryption by Chrome platform

Since early 2015, we have been able to measure the prevalence of HTTPS connections thanks to Chrome users who choose to [share usage statistics](#). The graphs below show the growth in HTTPS usage across platforms and countries. Desktop users load more than half of the pages they view over HTTPS and spend two-thirds of their time on HTTPS pages. HTTPS is less prevalent on sites accessed on mobile devices, but there is still an upward trend in encryption usage there.

Percentage of pages loaded over HTTPS in Chrome by platform

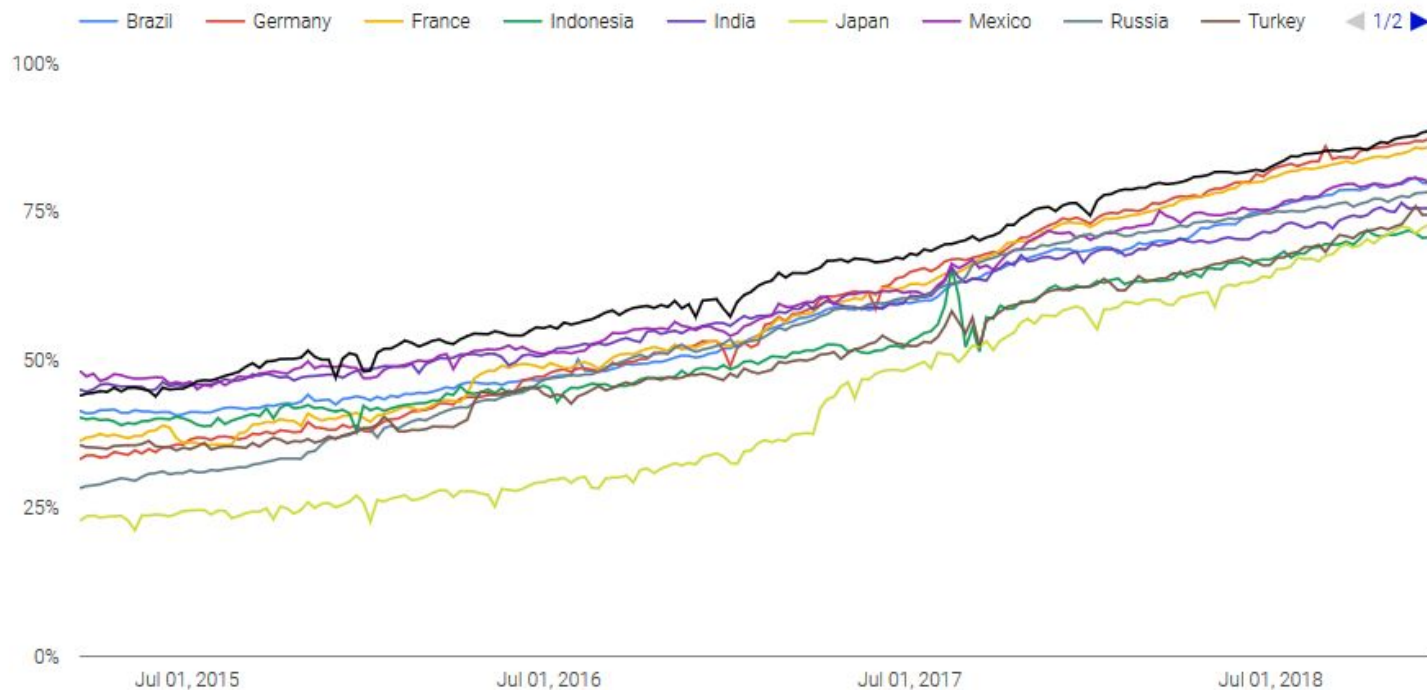


HTTPS usage in Chrome worldwide

HTTPS usage in Chrome is growing faster in some countries than others. For example, the prevalence of HTTPS has increased quickly in Russia compared to Japan, which has seen slower growth of HTTPS usage.

[LEARN ABOUT HOW WE SELECT THESE COUNTRIES](#) ↗

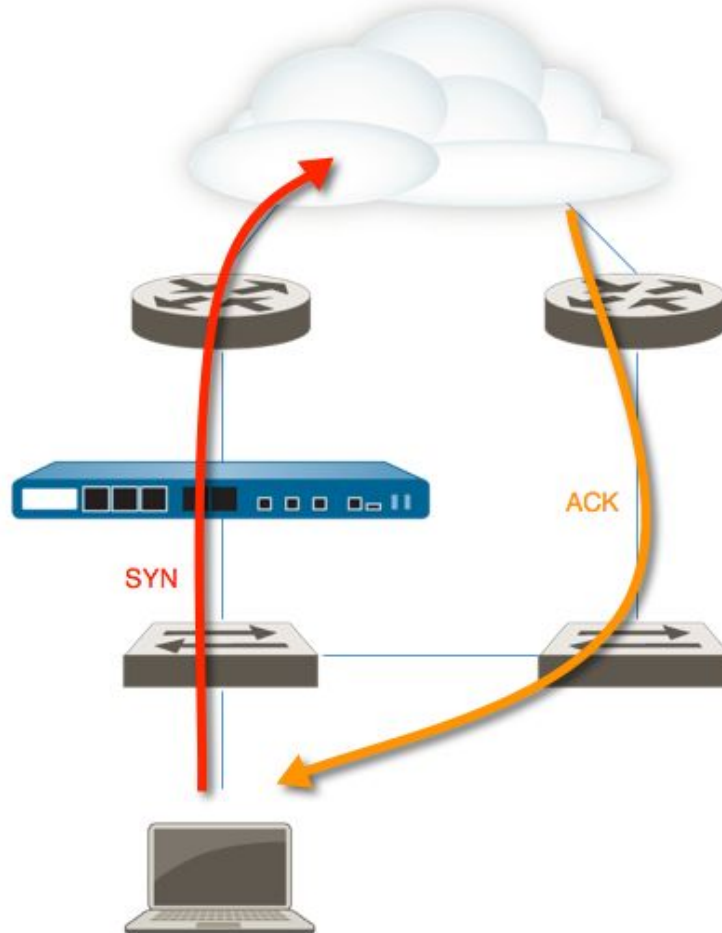
Percentage of pages loaded over HTTPS in Chrome by country



Complexity

Asymmetric

Routing



Misconfigs

- Showing old and outdated content
- Damn CTRL+F5

And The Ugly

See next pages ;)

سوال

بهترین فردی که می داند کدام آبجکت ها و صفحات در وب اپلیکیشن اجازه کش شدن دارند و کدام ها اجازه ندارند کیست ؟

انتخاب کنید

1. کاربر نهایی
2. توسعه دهنده یا برنامه نویس وب اپلیکیشن
3. پرتقال فروش
4. هیچ کدام

پاسخ صحیح

گزینه 5 درسته

ادمین شبکه

چرا؟

چون فکر میکنه بهتر تشخیص میدهد !

پاسخ واقعا صحیح

گزینه 2 توسعه دهنده یا برنامه نویس اپلیکیشن (البته امیدوارم که این طور باشد)

Meet the HEADERS



Cache Control

Introduced with HTTP/1.1, headers handle a variety of cache functions. [*Cache Control*](#) is supported by all modern browsers and supersedes any previous generation headers (such as [*Expires*](#)).

- [*Cache-Control: public*](#) – enables caching by public platforms such as CDNs.
- [*Cache-Control: private*](#) – reserved for private information that is designated non-cacheable.
- [*Cache-Control: no-cache*](#) – requires validation before caching.
- [*Cache-Control: no-store*](#) – completely prohibits caching.
- [*Cache-Control: public, max-age=\[seconds\]*](#) – sets a max limit (in seconds) for time that content can be cached before purging.



Expires

Similar to *Cache-Control: max-age*, sets the time of content expiration and removal.



Surrogate

Gives you increased control over cache policies, acting with the authority of the origin server.



Etag

Provides your cached web content with unique identifiers, enabling individual labeling and more sophisticated sorting.



Pragma

Largely supplanted by *Cache Control*, *Pragma* was previously used to handle caching instructions for browsers.



Vary (use with caution)

Some browsers still struggle with supporting the *Vary* header. When used properly, *Vary* can be a powerful tool for managing delivery of multiple file versions, especially for compressed files cached alongside their uncompressed counterparts.

Headers

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شبکه ، مرورگر



http://www.irnog.com/

add a request header

```
HTTP/1.1 302 Found
Date: Sun, 16 Dec 2018 17:11:49 GMT
Server: Apache
Location: https://www.irnog.com/
Cache-Control: max-age=2592000
Expires: Tue, 15 Jan 2019 17:11:49 GMT
Vary: Accept-Encoding
Content-Length: 269
Keep-Alive: timeout=15, max=1000
Connection: Keep-Alive
Content-Type: text/html; charset=iso-8859-1
```

response headers: 324 bytes body: 269 bytes

[view body](#) [view har](#) [validate body](#) [check embedded](#)

[about](#) | [help](#) | | [REDbot](#) bookmarklet

General

- The Keep-Alive header is deprecated.
- The server's clock is correct.
- The Content-Length header is correct.

Content Negotiation [\(Content Negotiation response\)](#)

- Content negotiation for gzip compression is supported, saving 18%.

Caching

- This response allows all caches to store it.
- This response is fresh until 30 days from now.
- This response may still be served by a cache once it becomes stale.

list

FTP Package Archive

override-expire enforces min age even if the server sent an explicit expiry time (e.g., with the Expires: header or Cache-Control: max-age). Doing this **VIOLATES** the HTTP standard. Enabling this feature could make you liable for problems which it causes.

Note: override-expire does not enforce staleness - it only extends freshness / min. If the server returns a Expires time which is longer than your max time, Squid will still consider the object fresh for that period of time.

override-lastmod enforces min age even on objects that were modified recently.

reload-into-ims changes a client no-cache or ``reload'' request for a cached entry into a conditional request using If-Modified-Since and/or If-None-Match headers, provided the cached entry has a Last-Modified and/or a strong ETag header. Doing this **VIOLATES** the HTTP standard. Enabling this feature could make you liable for problems which it causes.

ignore-reload ignores a client no-cache or ``reload'' header. Doing this **VIOLATES** the HTTP standard. Enabling this feature could make you liable for problems which it causes.

ignore-no-store ignores any ``Cache-control: no-store'' headers received from a server. Doing this **VIOLATES** the HTTP standard. Enabling this feature could make you liable for problems which it causes.

ignore-private ignores any ``Cache-control: private'' headers received from a server. Doing this **VIOLATES** the HTTP standard. Enabling this feature could make you liable for problems which it causes.

refresh-ims causes squid to contact the origin server when a client issues an If-Modified-Since request. This ensures that the client will receive an updated version if one is available.



Squid configuration directive reply_header_replace

Introduction

[About Squid](#)

[Why Squid?](#)

[Squid Developers](#)

[How to Donate](#)

[How to Help Out](#)

[Getting Squid](#)

[Squid Source Packages](#)

[Squid Deployment Case-](#)

[Studies](#)

[Squid Software Foundation](#)

Documentation

[Configuration:](#)

[Reference](#)

[Examples](#)

[FAQ and Wiki](#)

Available in: [4](#) [3.5](#) [3.4](#) [3.3](#) [3.2](#) [3.1](#)

For older versions than 3.3 see the linked pages above

Configuration Details:

Option Name: `reply_header_replace`

Replaces:

Requires: `--enable-http-violations`

Default Value: `none`

Suggested Config:

Usage: `reply_header_replace header_name message`

Example: `reply_header_replace Server Foo/1.0`

This option allows you to change the contents of headers denied with `reply_header_access` above, by replacing them with some fixed string.

This only applies to reply headers, not request headers.

By default, headers are removed if denied.

Configuration Details:

Option Name: `err_html_text`

Replaces:

Requires:

Default Value: none

Suggested Config:

HTML text to include in error messages. Make this a "mailto" URL to your admin address, or maybe just a link to your organizations Web page.

To include this in your error messages, you must rewrite the error template files (found in the "errors" directory). Wherever you want the 'err_html_text' line to appear, insert a %L tag in the error template file.

IRNOG Group Chats



Some real life experiences

- User logins confused on mobile operator (cookie,nat)
- Fake http headers
 - 40x,50x code on some pages
- Content injections
- YOUR EXPERIENCES ?

Conclusion

- Content Providers / Developers / Website Owners
 - Use right headers
 - Use HTTPS & TLS
- Network Providers
 - Respect to the standards and Best Practices

Questions ?

Thank You

سپاس

References

- <https://www.incapsula.com/cdn-guide/cdn-caching.html>
- <https://www.digitalocean.com/community/tutorials/web-caching-basics-terminology-http-headers-and-caching-strategies>
- <https://transparencyreport.google.com/https/overview?hl=en>
- <http://www.squid-cache.org/Doc/config/>
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