Keith and Mario's Guide to FAST WEBSITES

@keithpitt @mariovisic
We Love Gifs
Introducing...
Introducing... GIFTOPPR
Page Load: 9157ms
...what?
So let's make it FASTER!
Goal

$\leq 2$ Seconds

Speed. Not Concurrency.
“80-90% of the end user response time is spent on the frontend. Start there.”

Steve Souders
Backend

http://www.giftoppr.co/
1. www.giftoppr.co - /
2. www.giftoppr.co...c0ca04966aebaf.css
3. fonts.googleapis.com - css
4. www.giftoppr.co...da0385b3a0aecc7.js
5. giftoppr.desktop...mpressed_iiai4.jpg
6. giftoppr.desktop...sed_cm4-medium.jpg
7. www.giftoppr.co...bf8ecce6b26cf8.png
8. www.giftoppr.co...1ef9b7950c96aa.png
9. giftoppr.desktop...ressed_344xtt1.jpg
10. giftoppr.desktop...r-white-blonde.jpg
11. giftoppr.desktop...607035837_auto.jpg
12. giftoppr.desktop...mpressed_fjntx.jpg
13. giftoppr.desktop...mpressed_a6kki.jpg
14. themes.googleapis.../www_rBj0Tow.woff
15. giftoppr.desktop...ssed_1163479_0.jpg
16. giftoppr.desktop...mpressed_at5yb.jpg
17. giftoppr.desktop...mpressed_dimyj.jpg
18. giftoppr.desktop...mpressed_biskf.jpg
19. giftoppr.desktop...mpressed_f6due.jpg
20. giftoppr.desktop...ressed_dm6xorq.jpg
21. giftoppr.desktop...mpressed_a1zoa.jpg
22. giftoppr.desktop...mpressed_bss6t.jpg
23. giftoppr.desktop...c-1eb34c236fe1.jpg
24. giftoppr.desktop...mpressed_image.jpg
25. giftoppr.desktop...mpressed_hlgyq.jpg
26. giftoppr.desktop...mpressed_8216d.jpg
27. giftoppr.desktop...mpressed_c1srx.jpg
28. giftoppr.desktop...sed_barfingdog.jpg
29. giftoppr.desktop...mpressed_gklsm.jpg
30. giftoppr.desktop...mpressed_ggd4.jpg
31. giftoppr.desktop...ated.gif_99995.jpg
32. giftoppr.desktop...d_harry-finger.jpg
33. giftoppr.desktop...mpressed_1mxrr.jpg
34. giftoppr.desktop...mpressed_0mg9p.jpg
35. giftoppr.desktop...ssed_4pgbc.jpg.jpg
36. giftoppr.desktop...mpressed_5asam.jpg

Frontend

http://www.giftoppr.co/
Top 10

- 24% - backend
- 76% - frontend

Google
Facebook
YouTube
Yahoo!
Baidu
Wikipedia
Twitter
Amazon
Tencent
LinkedIn

http://www.stevesouders.com/blog/2012/02/10/the-performance-golden-rule/
How To Measure?
OPEN SOURCE!
```bash
mba-2:~ mario$ wbench https://www.desktoppr.co/

Testing https://www.desktoppr.co/
At Sun Feb 10 22:02:35 2013
10 loops

<table>
<thead>
<tr>
<th></th>
<th>Fastest</th>
<th>Median</th>
<th>Slowest</th>
<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server performance:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total application time</td>
<td>15ms</td>
<td>27ms</td>
<td>41ms</td>
<td>4ms</td>
</tr>
</tbody>
</table>

| **Host latency:**      |         |        |         |         |
| a.desktopprassets.com  | 15ms    | 17ms   | 352ms   | 7ms     |
| beacon-1.newrelic.com  | 236ms   | 507ms  | 794ms   | 18ms    |
| d1ros97qkrwjf5.cloudfront.net | 14ms | 14ms | 371ms | 8ms |
| ssl.google-analytics.com | 14ms | 354ms | 354ms | 7ms |
| www.desktoppr.co       | 192ms   | 192ms  | 1307ms  | 20ms    |

| **Browser performance:** |       |       |        |         |
| Domain Lookup Start:     | 0ms    | 0ms   | 0ms     | 0ms     |
| Domain Lookup End:       | 0ms    | 0ms   | 0ms     | 0ms     |
| Fetch Start:             | 0ms    | 0ms   | 0ms     | 0ms     |
| Navigation Start:        | 11ms   | 11ms  | 13ms    | 3ms     |
| Connect Start:           | 194ms  | 194ms | 210ms   | 14ms    |
| Secure Connection Start: | 605ms  | 605ms | 649ms   | 25ms    |
| Connect End:             | 605ms  | 605ms | 649ms   | 25ms    |
| Request Start:           | 820ms  | 820ms | 967ms   | 29ms    |
| Response Start:          | 820ms  | 820ms | 967ms   | 29ms    |
| Response End:            | 1016ms | 1016ms| 1169ms  | 32ms    |
| DOM Loading:             | 1018ms | 1018ms| 1172ms  | 32ms    |
| DOM Content Loaded Event Start: | 1140ms | 1140ms | 1302ms | 34ms |
| DOM Interactive:         | 1140ms | 1140ms| 1302ms  | 34ms    |
| DOM Content Loaded Event End: | 1141ms | 1141ms | 1302ms | 34ms |
| DOM Complete:            | 1504ms | 1824ms| 1996ms  | 42ms    |
| Load Event Start:        | 1504ms | 1824ms| 1996ms  | 42ms    |
| Load Event End:          | 1518ms | 1840ms| 2010ms  | 42ms    |
```
performance.timing object

This object stores the info about timing of the various events' that happen during the webpage loading. Its properties' description can be found below.

NOTE: This is simplified version based on W3C Navigation Timing spec.

domComplete
Returns the time when there's nothing more that can delay load event of the document i.e. all images are loaded.

redirectEnd
If redirect is present it stores the time when last byte of the response of last redirect was received. Zero otherwise.

fetchStart
The time just before browser starts doing anything with the request. It's

http://kaaes.github.com/timing/info.html
Testing https://www.desktoppr.co/
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Server performance:
Total application time 15ms 27ms 41ms 4ms

Host latency:
a.desktopprassets.com 15ms 17ms 352ms 7ms
beacon-1.newrelic.com 236ms 507ms 794ms 18ms
d1ros97qkrwjf5.cloudfront.net 14ms 14ms 371ms 8ms
ssl.google-analytics.com 14ms 354ms 357ms 7ms
www.desktoppr.co 192ms 192ms 1307ms 20ms

Browser performance:
Domain Lookup Start: 0ms 0ms 0ms 0ms
Domain Lookup End: 0ms 0ms 0ms 0ms
Fetch Start: 0ms 0ms 0ms 0ms
Navigation Start: 0ms 0ms 0ms 0ms
Connect Start: 11ms 11ms 13ms 3ms
Secure Connection Start: 194ms 194ms 210ms 14ms
Connect End: 605ms 605ms 649ms 25ms
Request Start: 605ms 605ms 649ms 25ms
Response Start: 820ms 820ms 967ms 29ms
Response End: 1016ms 1016ms 1169ms 32ms
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mba-2:~ mario$
Testing https://www.desktoppr.co/
At Sun Feb 10 22:02:35 2013
10 loops

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<th>Std Dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total application time</td>
<td>1141ms</td>
<td>1141ms</td>
<td>1302ms</td>
<td>34ms</td>
</tr>
<tr>
<td>Response Start:</td>
<td>1140ms</td>
<td>1140ms</td>
<td>1302ms</td>
<td>34ms</td>
</tr>
<tr>
<td>Response End:</td>
<td>1504ms</td>
<td>1824ms</td>
<td>1996ms</td>
<td>42ms</td>
</tr>
<tr>
<td>Load Event Start:</td>
<td>1504ms</td>
<td>1824ms</td>
<td>1996ms</td>
<td>42ms</td>
</tr>
<tr>
<td>Load Event End:</td>
<td>1518ms</td>
<td>1840ms</td>
<td>2010ms</td>
<td>42ms</td>
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</tbody>
</table>

DOM Content Loaded Event Start:
DOM Interactive:
DOM Content Loaded Event End:
DOM Complete:
Load Event Start:
Load Event End:
Network Link Conditioner

Profile: Average Australian Connection

DNS Delay: None

Downlink
Bandwidth: 5 mbps
Packets Dropped: 0%
Delay: 0 ms

Uplink
Bandwidth: 2 mbps
Packets Dropped: 0%
Delay: 0 ms

Click the lock to prevent further changes.

Manage Profiles...
**Note:**

We’re benchmarking with an empty cache.
Test a website's performance

Enter a Website URL

Test Location
Dulles, VA USA (IE 6–10, Chrome, dynaTrace) → Select from Map

Browser
IE 8

Advanced Settings

Test Settings
Connection
DSL (1.5 Mbps/384 Kbps 50ms RTT)

Number of Tests to Run
Up to 10
3

Repeat View
First View and Repeat View, First View Only

Keep Test Private

Label

Run a free website speed test from multiple locations around the globe using real browsers (IE and Chrome) and at real consumer connection speeds. You can run simple tests or perform advanced testing including multi-step transactions, video capture, content blocking and much more. Your results will provide rich diagnostic information including resource loading waterfall charts, Page
<table>
<thead>
<tr>
<th>URL</th>
<th>Time (ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.gifoppr.co/">http://www.gifoppr.co/</a></td>
<td></td>
</tr>
<tr>
<td><a href="http://www.gifoppr.co">www.gifoppr.co</a> /</td>
<td>1483</td>
</tr>
<tr>
<td><a href="http://www.gifoppr.co...c0ca04966aeabf.css">www.gifoppr.co...c0ca04966aeabf.css</a></td>
<td>1419</td>
</tr>
<tr>
<td>fonts.googleapis.com - css</td>
<td>471</td>
</tr>
<tr>
<td><a href="http://www.gifoppr.co...da0385b3a0aecc7.js">www.gifoppr.co...da0385b3a0aecc7.js</a></td>
<td>701</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_ila14.jpg</td>
<td>3315</td>
</tr>
<tr>
<td>gifoppr.deskto...sed_cmt-medium.jpg</td>
<td>424</td>
</tr>
<tr>
<td><a href="http://www.gifoppr.co...bf8ecc6b26cf8.png">www.gifoppr.co...bf8ecc6b26cf8.png</a></td>
<td>393</td>
</tr>
<tr>
<td><a href="http://www.gifoppr.co...1ef9b7950c96aa.png">www.gifoppr.co...1ef9b7950c96aa.png</a></td>
<td>418</td>
</tr>
<tr>
<td>gifoppr.deskto...ressed_344xtt1.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...r-white-blonde.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...607035837_auto.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_fjntx.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_a6kk1.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>themes.googleus...Cwuv_rBj0tT0w.woff</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...ssed_1163479_o.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_at5yb.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_dimyj.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_biskf.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_f6due.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...ressed_dn6xorq.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_alzoa.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_bss6t.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...c-1eb34c236fe1.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_image.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_hlguyq.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_8216d.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_cisrx.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_barfingdog.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_gklsm.jpg</td>
<td>1013</td>
</tr>
<tr>
<td>gifoppr.deskto...pressed_gkdo4.jpg</td>
<td>1013</td>
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Minify CSS & JavaScript

# config/environments/production.rb
config.assets.compress = true
# true by default in rails
9157ms
8061ms
gzip
(html, css, javascript)

# config.ru
require ::File.expand_path('...', __FILE__)
use Rack::Deflater # add this line
run Giftoppr::Application
# Gemfile

gem "carrierwave-processing"

# app/uploaders/preview_uploader.rb

class PreviewUploader < CarrierWave::Uploader::Base
  # ...
  process :convert => "jpg"
  process :strip
  process :quality => 80
end
Tip:
Use sprites or font libraries for small images.
JavaScript
at the Bottom

...<script src="/assets/application.js"></script>
</body>
</html>
Asynchronously Loading JavaScript

# application.html.erb
<script><!-- inline head.js script loader --></script>
<script>head.js("/assets/application.js");</script>
Why did it get SLOWER‽

Why did it get SLOWER?
Note:
Only 1 JavaScript file, and increased page size.
Tip:
Be smart about how you split up your assets.
Note:
Watch your Load and DOMContentLoaded events!
# Gemfile

gem "asset_sync"

# Heroku Environment Variables
export ASSET_SYNC_GZIP_COMPRESSION="true"
# CDN (Multiple Hosts)

```ruby
# config/environments/production.rb
config.action_controller.asset_host = "http://%d.assets.com"

# config/initializers/carerwave.rb
CarrierWave.configure do |config|
  config.asset_host = lambda do
    lambda do |file|
      "http://%d.assets.com".gsub(/%d/, (file.path.sum % 4).to_s
    end
  end
end
end
```
Tip: DNS Prefetching

<link rel="dns-prefetch" href="//a0.assetdomain.com"/>
Tip: Cookie-less Domains
Goal Achieved
< 2 SECONDS!
Bonus Round!
SPDY for Static Assets

SPDY  / PRO / BUSINESS / ENTERPRISE / BETA

Next generation transfer protocol that makes webpages load faster in supported browsers.
We saved... 7301ms
# Gemfile

```ruby
# Default in Rails 4

gem "turbolinks"  # Default in Rails 4
```

Tip:

**HTML5 History API**
Danger!
3rd Party JavaScript

It’s a trap!
“Look at all these social buttons! We need those!!”
4716ms
Oh! Btw...
just now
desktoppr open sourced desktoppr/giftoppr

Sync your favourite gifs with Dropbox
PS. We have Desktoppr Stickers.

@keithpitt

@mariovisic