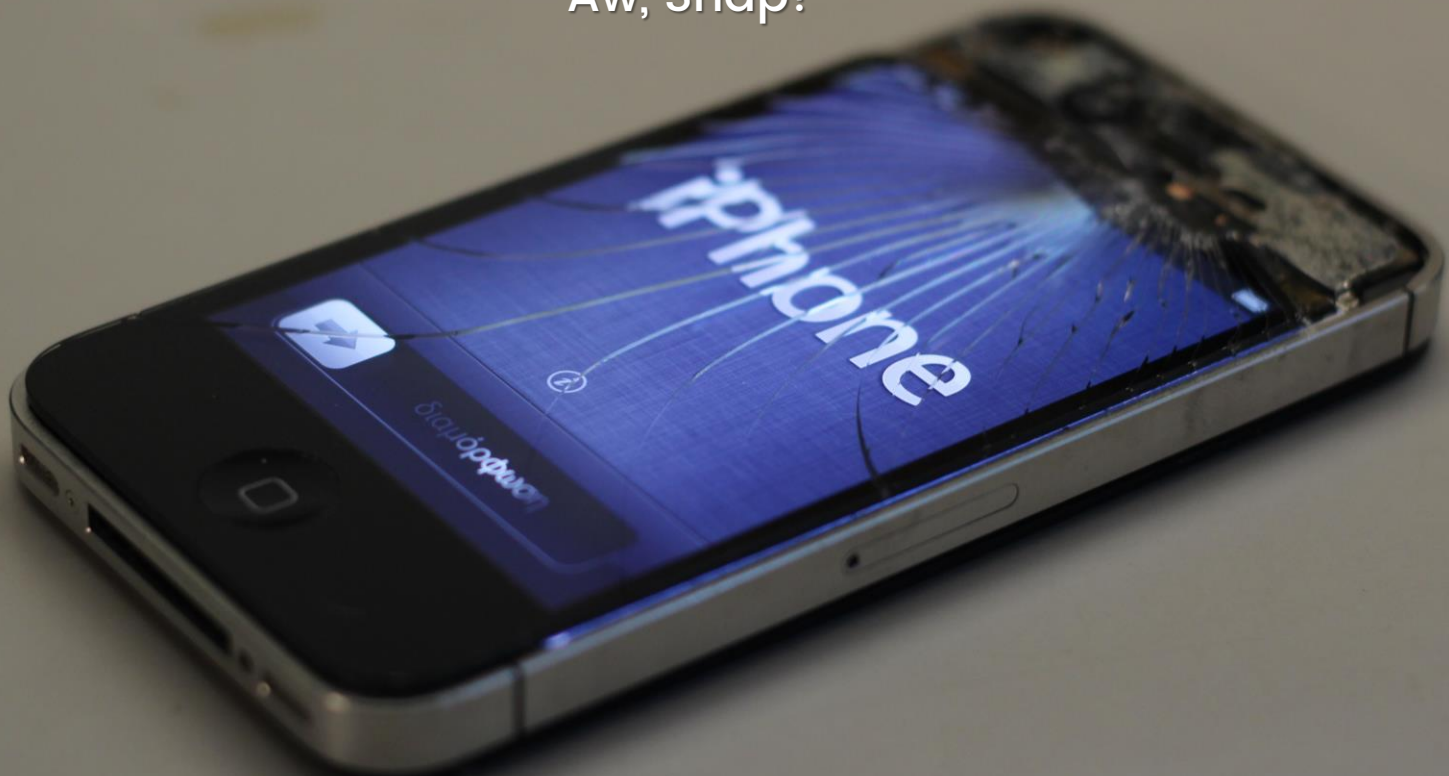


WE'RE BREAKING THE MOBILE WEB

Aw, Snap!



my face →



Simon Hearne
@SimonHearne

Senior Performance Consultant
NCC Group

1

a brief history of
web performance

Sept 21st 2007

web performance was 'invented'

my phone
in 2007

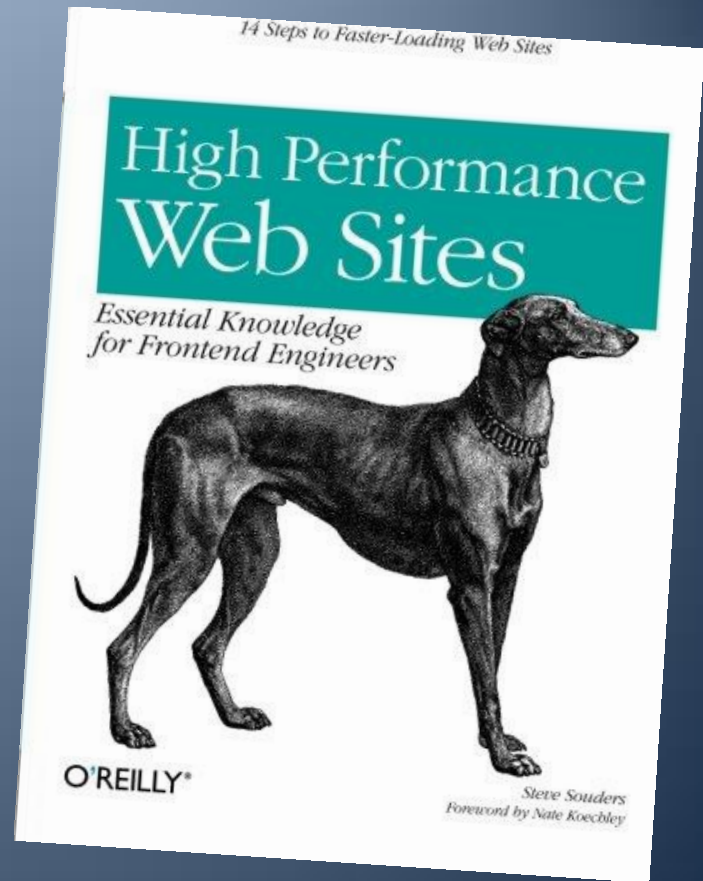


Sept 21st 2007

web performance was invented

14 Steps to Faster-Loading Web Sites

Because in 2007, developers didn't get it





"optimisation" was done on the server



because the application was on the server



even web2.0 was pretty static

May 13th 2013

I started work in web performance

My induction...



CS193H: High Performance Web Sites

[Class Schedule](#) | [Web 100 Performance Profile](#) | [Class Project](#) | [Assignments](#) | [Grading](#)

This class was taught at Stanford in **Autumn 2008**. You can register to watch [all 25 CS193H lecture videos](#) through the [Stanford Center for Professional Development](#).

Instructor: Steve Souders

CA: Aravind Narayanan

Schedule: 9/22/08-12/5/08, Mon, Wed, Fri - 3:15-4:05

Office Hours: Mon 4:15-6pm, Gates 195

Location: [Gates](#), B01

Textbook: [High Performance Web Sites](#) and [Even Faster Web Sites](#) by Steve Souders

Lecture Videos: [SCPD course videos](#)

My induction...



CS193H: High Performance Web Sites

[Class Schedule](#) | [Web 100 Performance Profile](#) | [Class Project](#) | [Assignments](#) | [Grading](#)

From: scpd-customerservice@stanford.edu
To: Simon Hearne
Cc:
Subject: Congratulations! You passed: High Performance Web Sites (XCS193H) Final Exam

Dear Simon Hearne,

Congratulations on passing your **Audit Plus - High Performance Web Sites (XCS193H) Final Exam** with a score of 100%!

Office Hours: Mon 4:15-6pm, Gates 195

Location: [Gates](#), B01

Textbook: [High Performance Web Sites](#) and [Even Faster Web Sites](#) by Steve Souders

Lecture Videos: [SCPD course videos](#)

LIFE WAS EASY

“Reduce blocking JavaScript”

“Use gzip compression”

“Compress images”

“Reduce TTFB”

...

but the way we consume the web has changed



رایتل
RightTel



2007

2016

and the way we develop for the web has changed



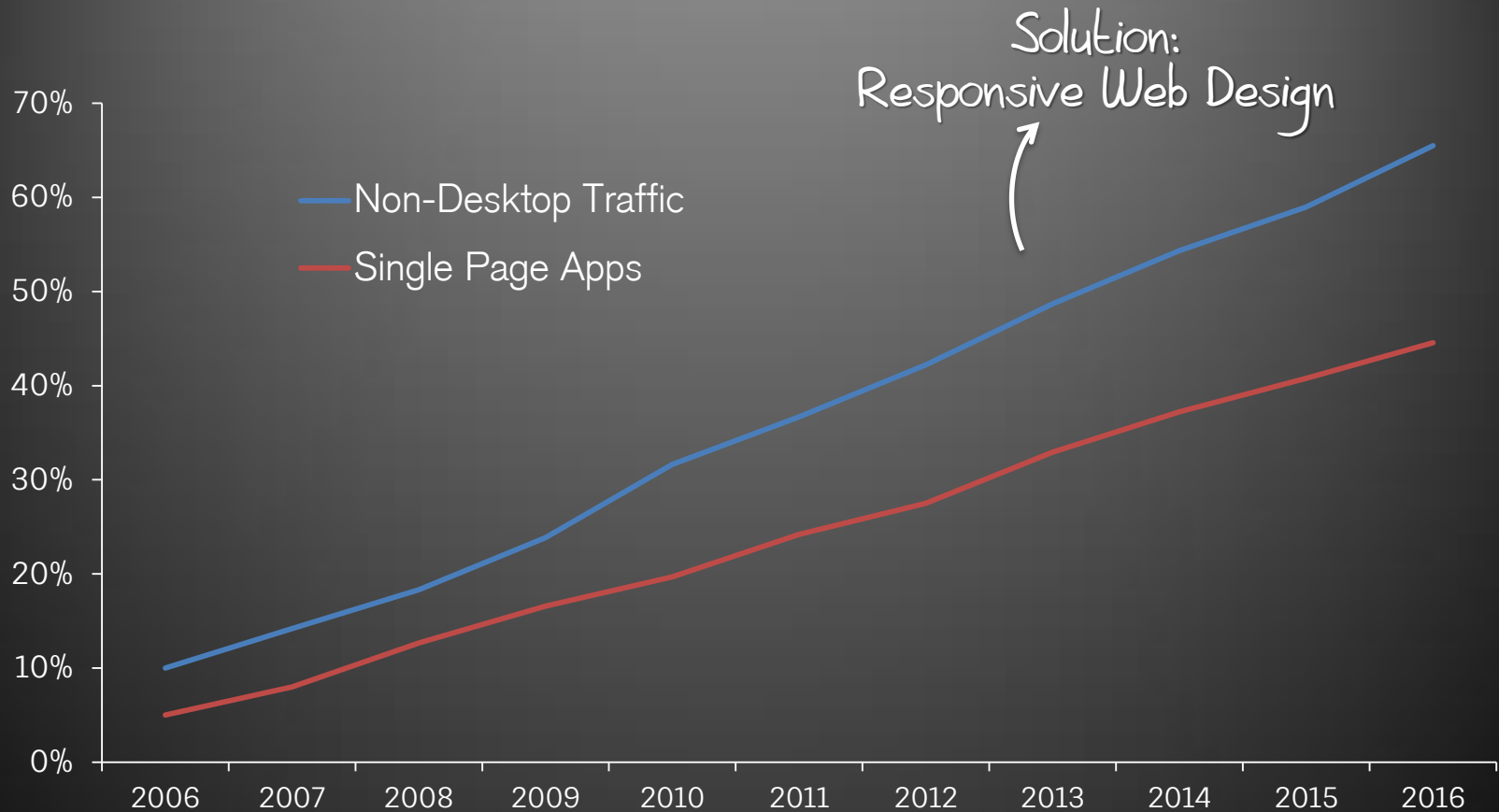
ANGULARJS

METEOR



2007

2016



* this is totally made up

“ Responsive web design is a
fluid grid, flexible images and media queries ”

Ethan Marcotte

i.e.

*cram a desktop site
into a mobile viewport*

Which is fine.

Unless your site is an *application*

we increasingly rely on JavaScript,
while our users increasingly use mobile devices

“

Among our 5,400 panelists, approximately 15% do not have Javascript-enabled devices.

”

<http://www.pewresearch.org/2015/04/08/results-2/#javascript>

“

website visitors tend to
care more about speed
than all the bells and whistles
we want to add to our websites

”

KISS Metrics

2

mobile web = web

“

Mobile applications are a bridging technology.
Like Flash.

”

Bruce Lawson

people would rather uninstall an app than delete photos

The image is a side-by-side comparison of two smartphone screens. The left screen, titled "regular apps", shows a standard Android home screen with various app icons (Facebook, Twitter, SoundCloud, Flipkart, Wikipedia, Flipboard, and a messaging app) and a red progress bar at the bottom indicating a size of 460 MB. The right screen, titled "web apps with Opera for Android", shows the same home screen layout but with a blue background and a green progress bar at the bottom indicating a size of 1 MB. The Opera logo is visible at the bottom left of the image.

regular apps

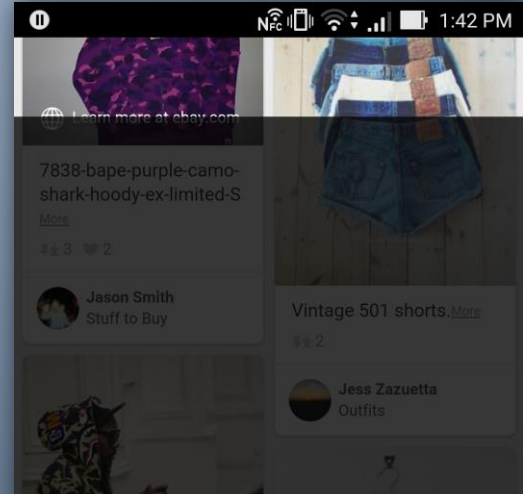
460 MB

web apps with Opera for Android

1 MB

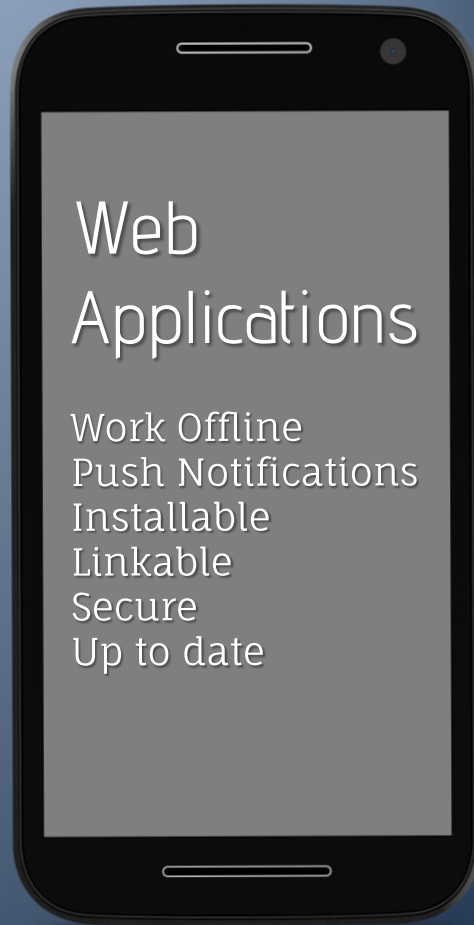
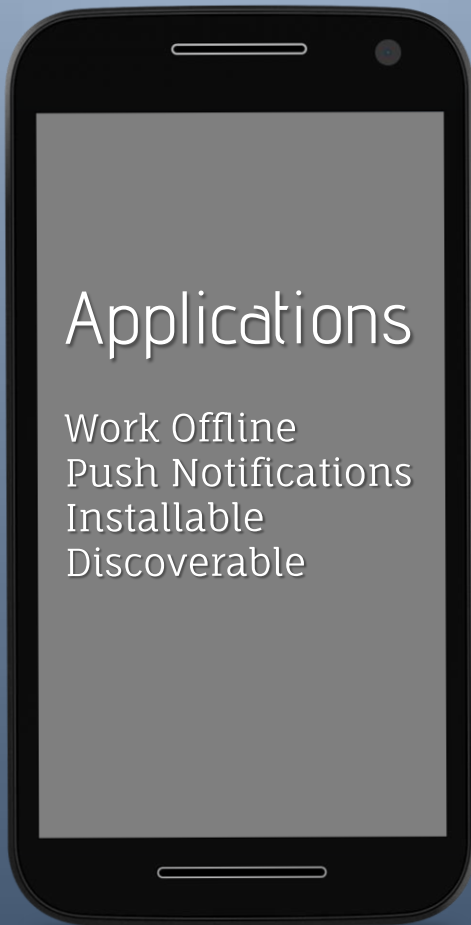
Opera

psst, this is not the future.



Just a second!

**Switching you to
our faster, funner
app.**





What we're missing:

- Battery Status
- Connection Status
- Permissions Model
- Discoverability

85%

of websites are 'responsive'

```
SELECT COUNT(*) FROM [httparchive:runs.latest_requests_mobile] WHERE firstHtml IS TRUE AND url like "%://m.%"
```

11%
of mobile pages use Modernizr

```
SELECT COUNT(DISTINCT pageid) FROM [httparchive:runs.latest_requests_mobile] WHERE url LIKE "%modernizr%"
```


> 10%
of mobile pages are SPAs

```
SELECT COUNT(DISTINCT pageid) FROM [httparchive:runs.latest_requests_mobile] WHERE  
url LIKE "%angular%" OR url LIKE "%react%" OR url LIKE "%ember%" OR url LIKE "%meteor%"
```

10%

of mobile pages have A/B testing

javascript

```
SELECT COUNT(DISTINCT pageid) FROM [httparchive:runs.latest_requests_mobile] WHERE  
url LIKE "%optimizely%" or url LIKE "%maxymiser%" or url LIKE "%zarget%" or url LIKE "%visualwebsiteoptimizer%"
```

422kB

average mobile JS payload

<http://mobile.httparchive.org/trends.php#bytesJS&reqJS>

4 B



<http://mobilesJS&reqJS>

3

mobile web = slow

In the beginning, there was the network

“ the U.K. ranks near the bottom
of the list of 4G countries in terms of coverage ”

Open Signal
State of Mobile Networks 2016

then there was the cheap device

“

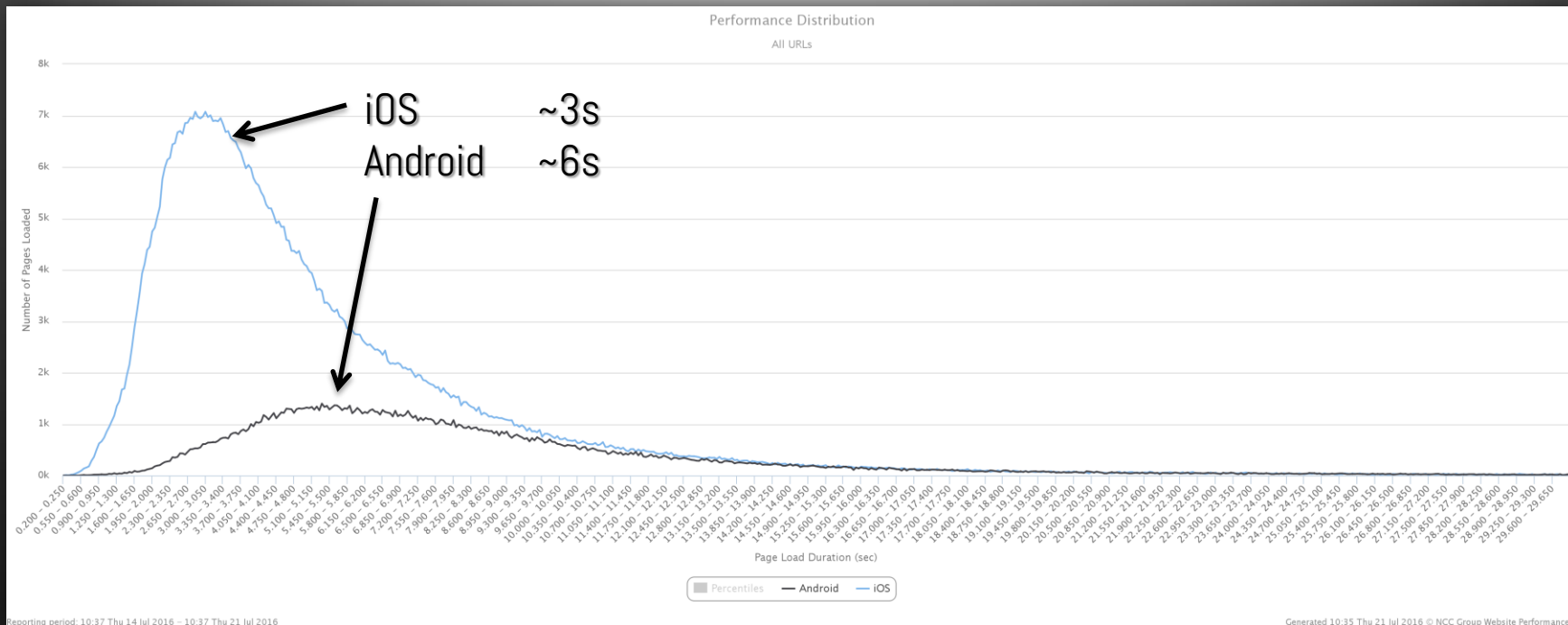
we bet heavily on near-desktop JavaScript performance on mobile devices.

That is clearly happening on iOS but it is quite disastrously the opposite on Android.

”

<https://meta.discourse.org/t/the-state-of-javascript-on-android-in-2015-is-poor/33889>

Android is consistently ~two times slower than iOS



1. Motorola Moto G 2015 (3rd gen)

- **Rating:** ★★★★★
- **Reviewed on:** 18 May 16
- **RRP:** From £149 inc VAT
- **Buy** [from Amazon for £145.00](#)

With various upgrades including a waterproof design, great cameras and stock Android, the new Moto G 2015 is a great affordable phone. The device is still a bit chunky and it's a shame to see the stereo

speakers gone. It's worth opting for the model with 16GB of storage and 2GB of RAM. Now with a price cut to £149, the Moto G 3rd-gen is the best budget phone you can buy.



JetStream JavaScript Benchmark

(bigger = better)

Galaxy S6
£550

48

Moto G (3rd Ed.)
£150

14
-71%

YOU WON'T BELIEVE HOW SLOW THIS THING IS!
JUST SHARE WITH 100 FRIENDS TO FIND OUT



then there were the cores

JetStream JavaScript Benchmark

(bigger = better)

Galaxy S6

48

Galaxy S6
(power saving)

37
-23%

Moto G (3rd Ed.)

14
-71%

JetStream JavaScript Benchmark

(bigger = better)

iPhone 6

£540

63

iPhone 5S

£549

52

-17%

iPhone 5C

£469

21

-67%

We are developing for people like us,
with devices like ours

“

”

Most low- and moderate-income families ...
are under-connected, with mobile-only access

Opportunity for all?
Victoria Rideout & Vikki S. Katz
Winter 2016

4

knowing your
performance

WebPageTest

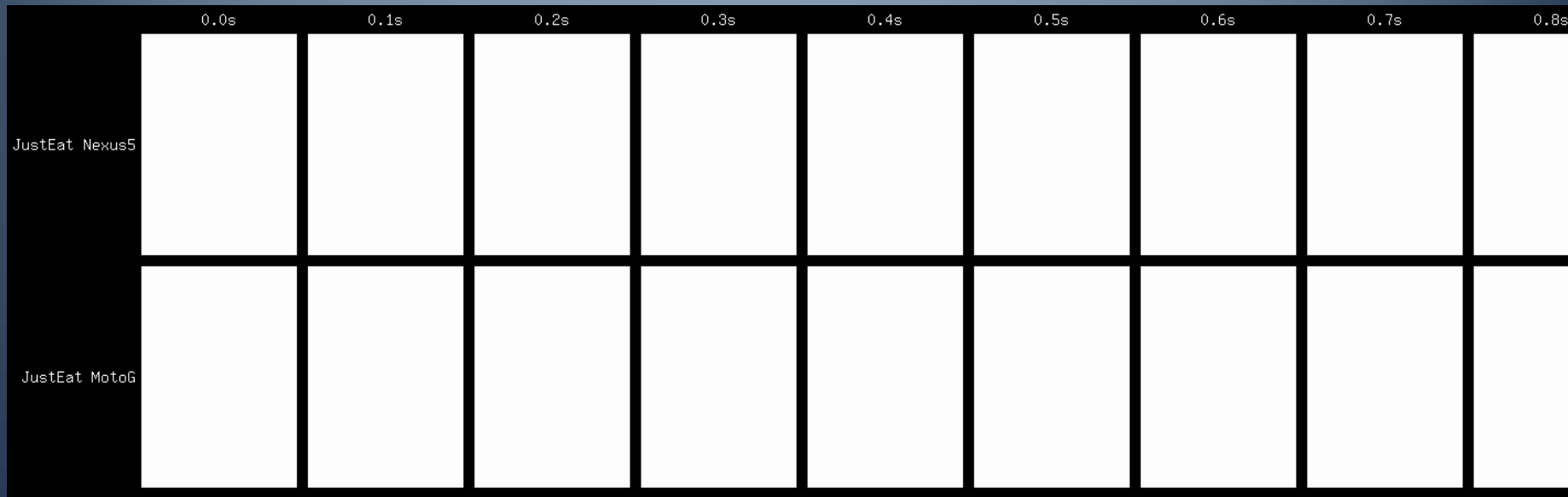
- 94. Doc Complete CPU Time (ms)
- 95. Fully Loaded CPU Time (ms)
- 96. Doc Complete CPU Utilization (%)
- 97. Fully Loaded CPU Utilization (%)

<https://sites.google.com/a/webpagetest.org/docs/advanced-features/raw-test-results>

Fast Phone / Slow Phone

The screenshot displays the 'Test a website's performance' interface. At the top, there are three tabs: 'Analytical Review', 'Visual Comparison', and 'Traceroute'. Below the tabs is a text input field labeled 'Enter a Website URL'. Underneath, there is a 'Test Location' dropdown menu set to 'Dulles, VA USA (Android, iOS 9)' with a 'Select from Map' button. The 'Browser' section features a dropdown menu with a scrollable list of device and browser combinations. The 'Advanced Settings' section is expanded, showing options for 'Test Settings', 'Connection', 'Number of Tests to Run', 'Repeat View', 'Capture Video', 'Keep Test Private', and 'Label'. The browser dropdown list includes: Nexus 5 - Chrome (highlighted), Motorola G - Chrome, Motorola G - Chrome Beta, Motorola G - Chrome Dev, Motorola G - UC Mini, Motorola G - Opera Mini, Nexus 5 - Chrome Beta, Nexus 5 - Chrome Dev, Nexus 5 - UC Mini, Nexus 5 - Opera Mini, Motorola E - Chrome, Motorola E - Chrome Beta, Motorola E - Chrome Dev, Motorola E - UC Mini, Motorola E - Opera Mini, Nexus 7 - Chrome, Nexus 7 - Chrome Beta, Nexus 7 - Chrome Dev, Nexus 7 - UC Mini, and Nexus 7 - Opera Mini.

FastPhone / SlowPhone



<http://bit.ly/29QG097>

TEST ALL THE THINGS

Building a Device Lab

The (now free!) book *Building a Device Lab* builds on our [Building A Device Lab workshop](#), given at various Velocity Conferences in 2014 by Destiny Montague and Lara Hogan.

In addition to the book, please check out the [slides and resources](#) from our 90-minute tutorial on how to build a device lab. You can also watch a two-part video of this 90-minute tutorial: [Video Part 1](#), [Video Part 2](#).



Copyright 2014 Destiny Montague & Lara Hogan

<http://larahogan.me/devicelab/>

TEST ALL THE THINGS



Simon Hearne
@simonhearne

Ready to start building the performance lab!



5

back to m.
?

“

Maybe we could tone
down the JavaScript

”

<https://eev.ee/blog/2016/03/06/maybe-we-could-tone-down-the-javascript/>

Progressive Enhancement FTW

(that means it works without JavaScript)

Thank you

Stay in touch!
@SimonHearne
webperf.ninja