H2 Server Push Performance
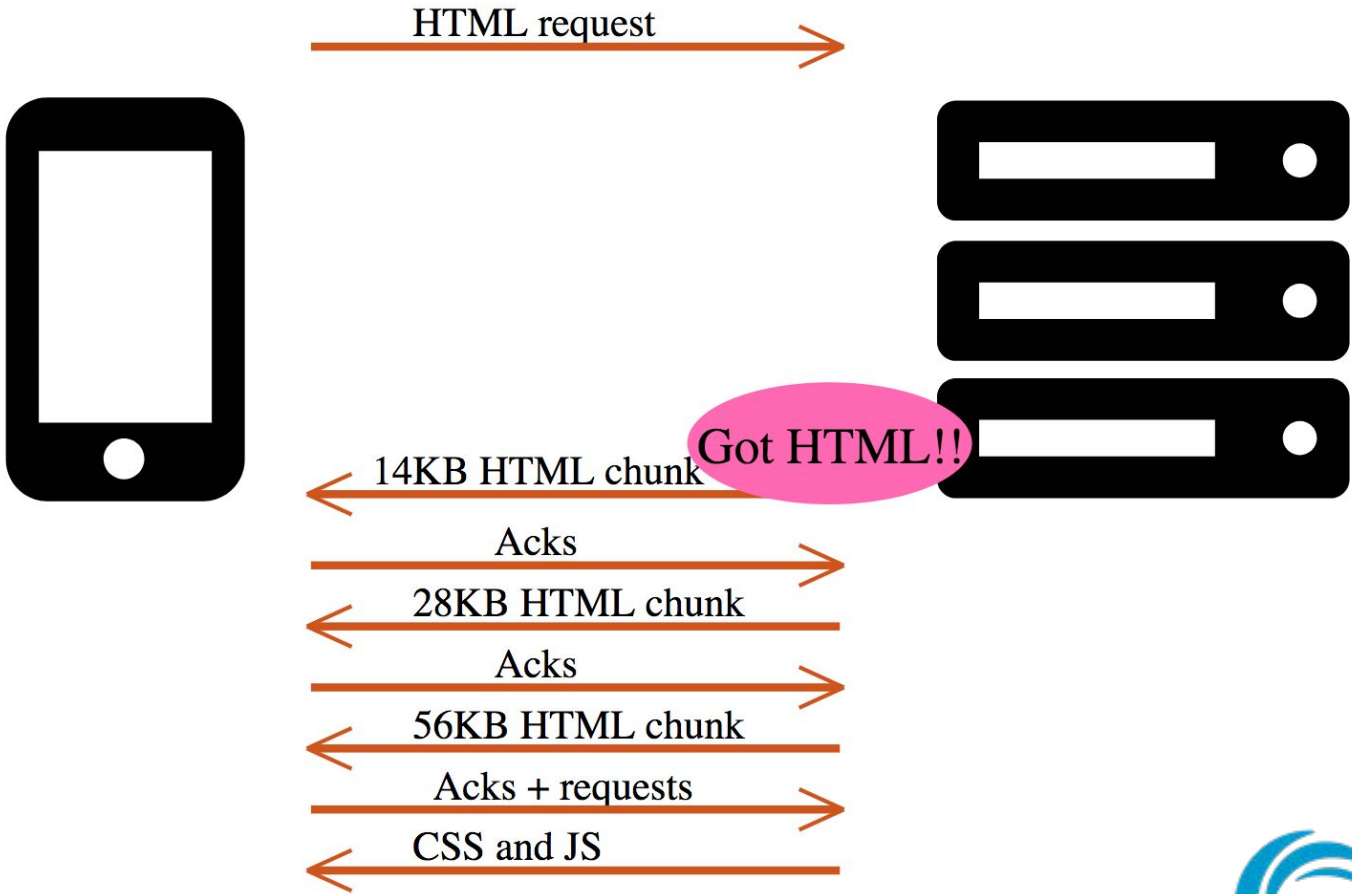
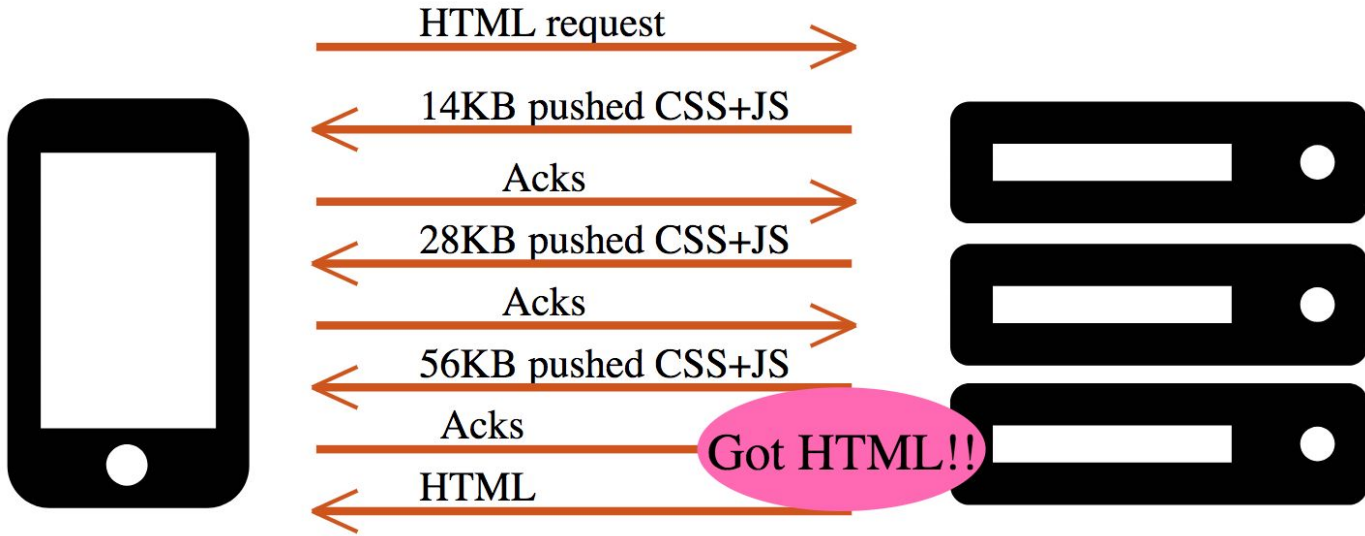# Measured over 11 days

June 14th - June 25th, 2018

Adaptive Acceleration

- Using RUM data to find critical resources

- Push those critical resources during the HTML generation "think time"

- Utilize idle network time

- Start "slow-start" earlier

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HTML request →

← 14KB HTML chunk

Got HTML!!

Acks →

← 28KB HTML chunk

Acks →

← 56KB HTML chunk

Acks + requests →

← CSS and JS

3

Akamai

HTML request →

14KB pushed CSS+JS ←

Acks →

28KB pushed CSS+JS ←

Acks →

56KB pushed CSS+JS ←

Acks →

Got HTML!!

HTML ←

Akamai

HTTP/2 push is tougher than I thought

Posted 30 May 2017

"HTTP/2 push will solve that" is something I've heard a lot when it comes to page load performance problems, but I didn't know much about it, so I decided to dig in.

HTTP/2 push is more complicated and low-level than I initially thought, but what really caught me off-guard is how inconsistent it is between browsers – I'd assumed it was a done deal & totally ready for production.

This isn't an "HTTP/2 push is a douchebag" hatchet job – I think HTTP/2 push is really powerful and will improve over time, but I no longer think it's a silver bullet from a golden gun.

Hello, I'm Jake and that is my face. I'm a developer advocate for Google Chrome.

Elsewhere

Twitter   Lanyrd
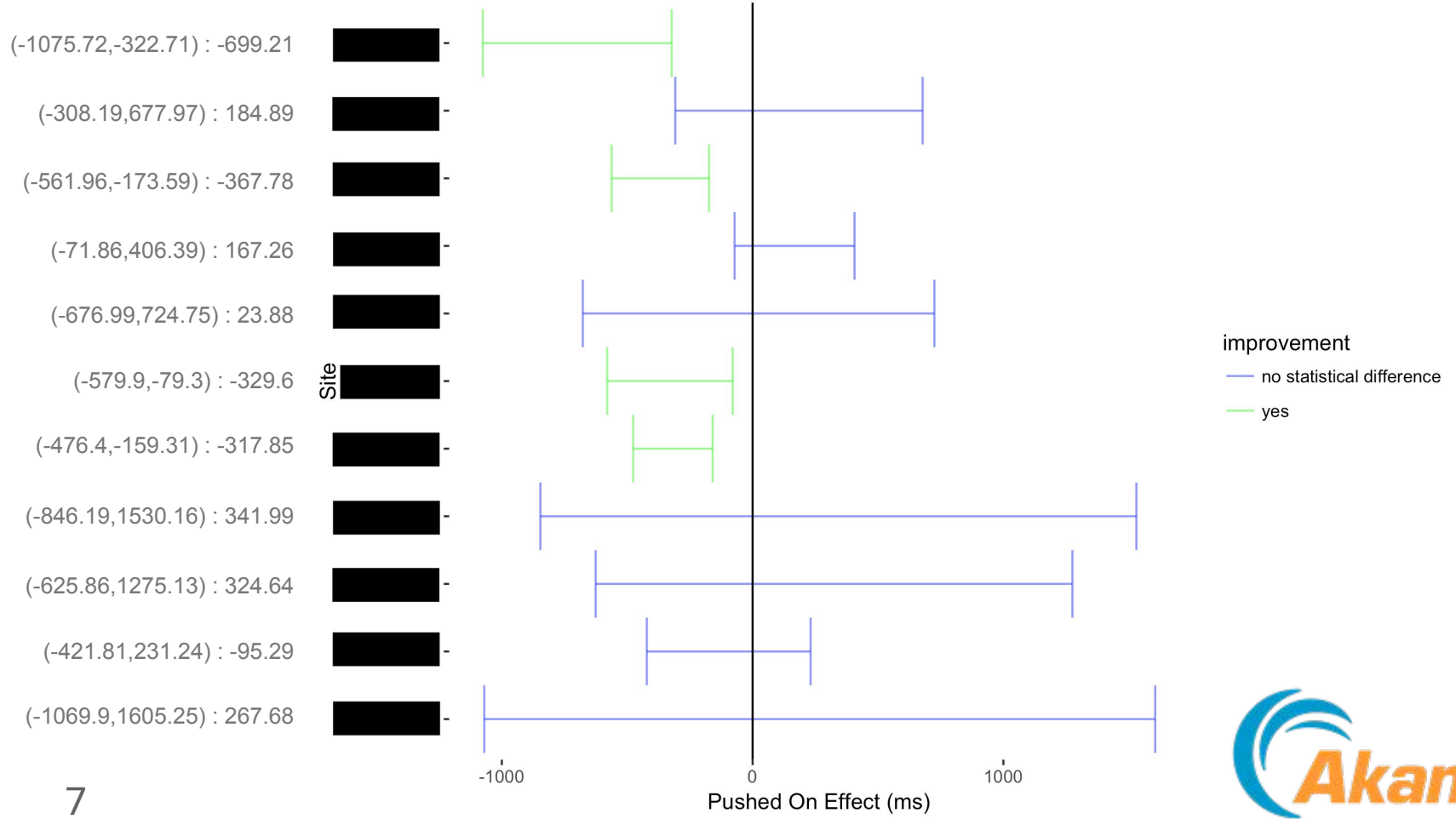
Github   Google+

Flickr

Contact

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How to interpret results

- Difference in [DOMComplete](#) time - negative/smaller is better

- Chrome-only, first-view results

- Difference is represented as a bar with a **min** and **max** values

- 95% confidence difference falls within the **min** and **max** values

- Green == Faster

- Red == Slower

- Blue == difference is not statistically meaningful

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Mobile A2 Pushed Performance Overview

Confidence Interval : Mean

(-1075.72,-322.71) : -699.21

(-308.19,677.97) : 184.89

(-561.96,-173.59) : -367.78

(-71.86,406.39) : 167.26

(-676.99,724.75) : 23.88

(-579.9,-79.3) : -329.6

(-476.4,-159.31) : -317.85

(-846.19,1530.16) : 341.99

(-625.86,1275.13) : 324.64

(-421.81,231.24) : -95.29

(-1069.9,1605.25) : 267.68

Site

Pushed On Effect (ms)

improvement

no statistical difference

yes

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Desktop A2 Pushed Performance Overview

Confidence Interval : Mean

(-87.25,280.39) : 96.57

(-284.14,217.57) : -33.28

(-2800.31,-110.41) : -1455.36

(-795.92,-300.42) : -548.17

(-271.58,-141.74) : -206.66

(-1092.97,-659.11) : -876.04

(-160.8,168.75) : 3.97

(-181.47,168.79) : -6.34

(-851.39,226.46) : -312.46

(-534.9,30.18) : -252.36

(-423.6,-185.64) : -304.62

(-663.12,291.28) : -185.92

(-288.51,-77.94) : -183.23

Site

improvement

— no statistical difference

— yes

Pushed On Effect (ms)

-2000   -1000   0

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Akamai
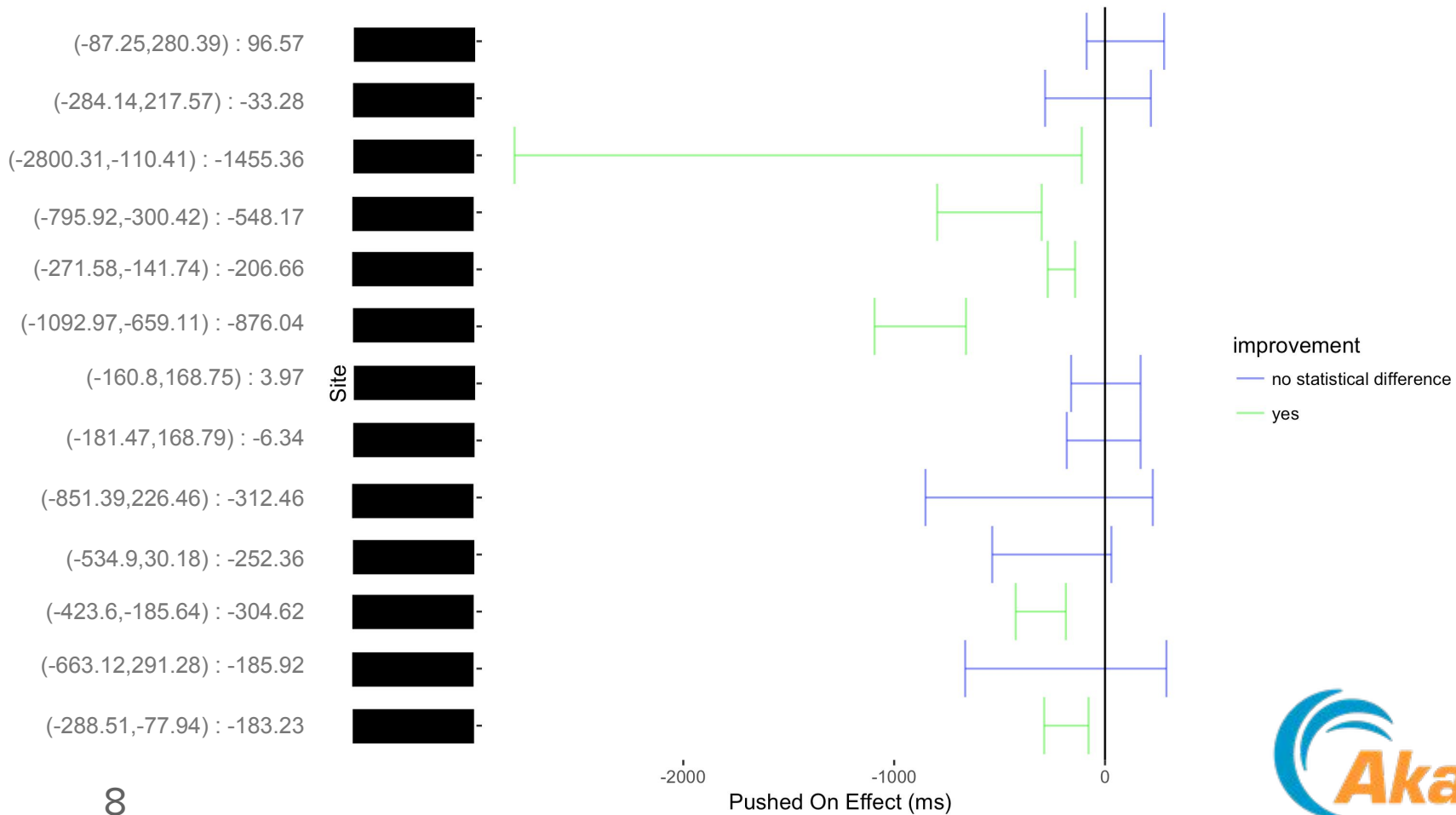
Observations

- Of the results where there is a <u>statistical difference</u>, we are seeing positive improvement with H2 Server Pushes applied

- Mobile performance data has more variation and noise, resulting in higher uncertainty (longer bars)

Statistical Methodology

- Linear regression methodology used for statistical calculations, based on the following dimensions:
    - Geographic location
    - Client OS
    - Browser user-agent
    - Hour of day
    - Day of week
    - ISP
    - URL

- This allows us to statistically account for natural performance variations due to the impact of the above dimensions

Statistical Methodology

- The set of customers used are those that:
  - Have enabled automated Server Push on Akamai
  - Are also using the new mPulse RUM product
  - Generate enough traffic for the statistical computation

- The traffic that was considered for this computation was restricted to:

  - Chrome only (split into Desktop and Mobile)
  - Restricted to "first-view" requests
  - Top 10 URLs for the customer web site in terms of traffic volume
  - Minimum of 1000 hits for a URL to be eligible
  - At least 10% of the URL hits must have had H2 Server Pushes applied

What's next?

- Will continue to gather data as the set of customers expands

- Will report back