Google™
11

Feedback: http://goo.gl/VF47I
Twitter: #TechTalk
#wpo
#io2011

Make The Web Faster

Joshua Marantz
Richard Rabbat
Håkon Wium Lie

May 10, 2011

Agenda

Feedback: http://goo.gl/VF47I
Twitter: #TechTalk
#wpo
#io2011

mod_pagespeed	**Joshua Marantz**
WebP	Richard Rabbat
Opera and WebP	Håkon Wium Lie

Google I/O 11

Why make your Web-site Fast?

- Benefits
  - User Satisfaction
  - Better Engagement & More Revenue
- Challenges
  - Its hard!
  - Maintainability Trade-off: sprites & minified versions
  - Agility Trade-off: Caching vs rapid site change propagation
  - Old browsers lack support for new techniques
  - New techniques are created all the time, e.g., mobile-focused best practice

  - Solution: Use Automated Tools

Google I/O 11

Why use mod_pagespeed?

Optimize Your Web-Site without changing it

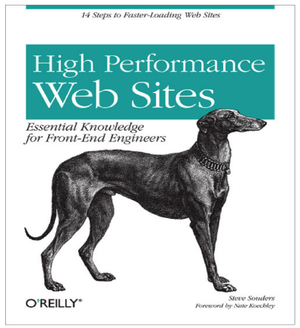
Do not change your content generation flow
Don’t change your HTML, CSS, or JavaScript
Don’t manually run compression on all your photos

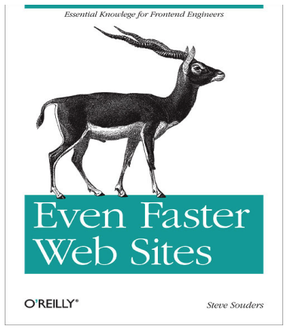
Get a machine to do that for you.

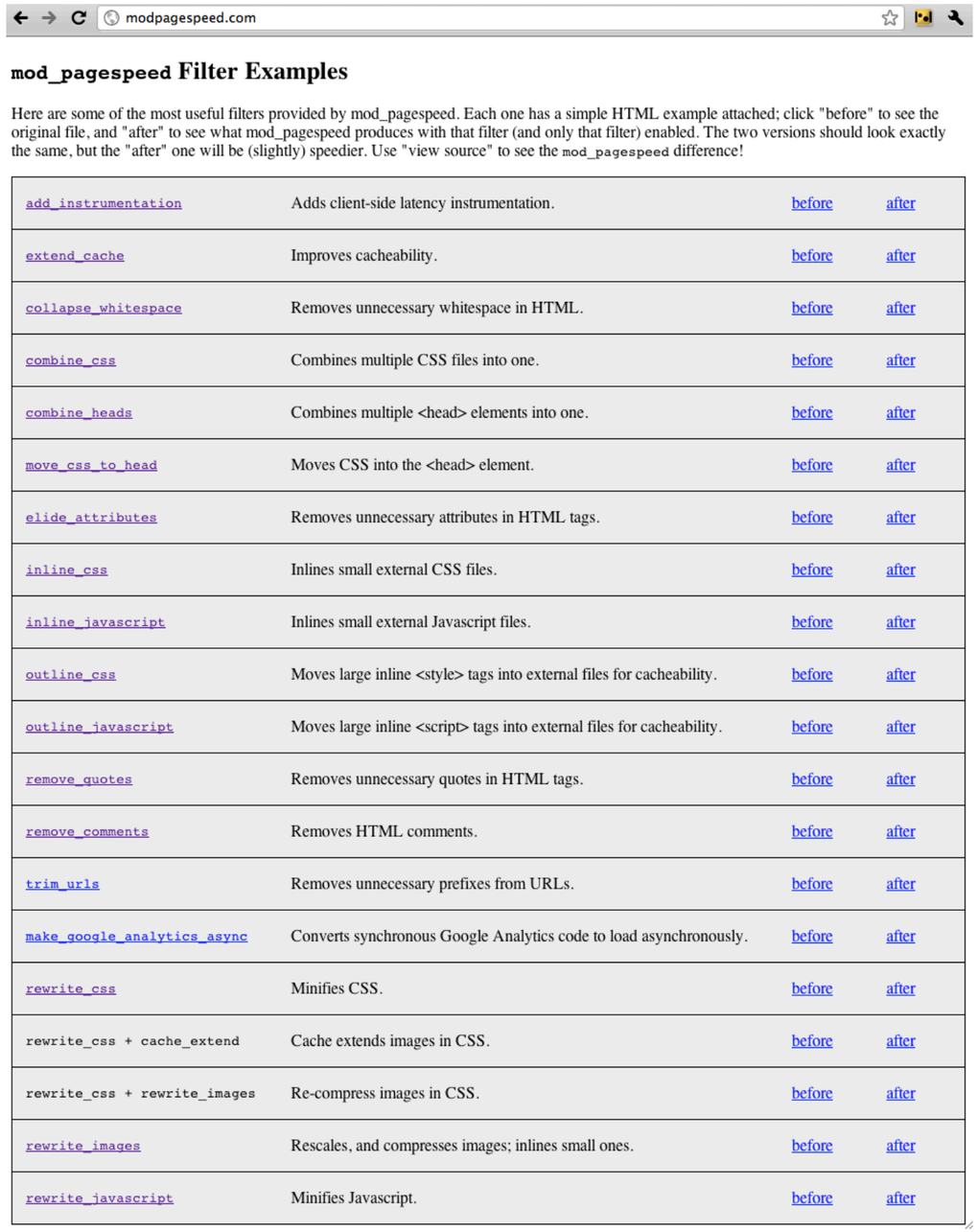
Google I/O 11

What does mod_pagespeed do?

- Automatic Image Compression & Resizing
- Minify CSS, JavaScript and HTML
- Inline small images, CSS, and JavaScript
- Cache Extension
- CSS Combining
- Domain Mapping
- Domain Sharding







Google I/O 11

Example: Combining multiple CSS files

```
<head>
  <link rel="stylesheet" type="text/css" href="styles/yellow.css”>
  <link rel="stylesheet" type="text/css" href="styles/blue.css">
  <link rel="stylesheet" type="text/css" href="styles/big.css">
  <link rel="stylesheet" type="text/css" href="styles/bold.css">
</head>
<body>
  <div class="blue yellow big bold">Hello, mod_pagespeed!</div>
</body>
```

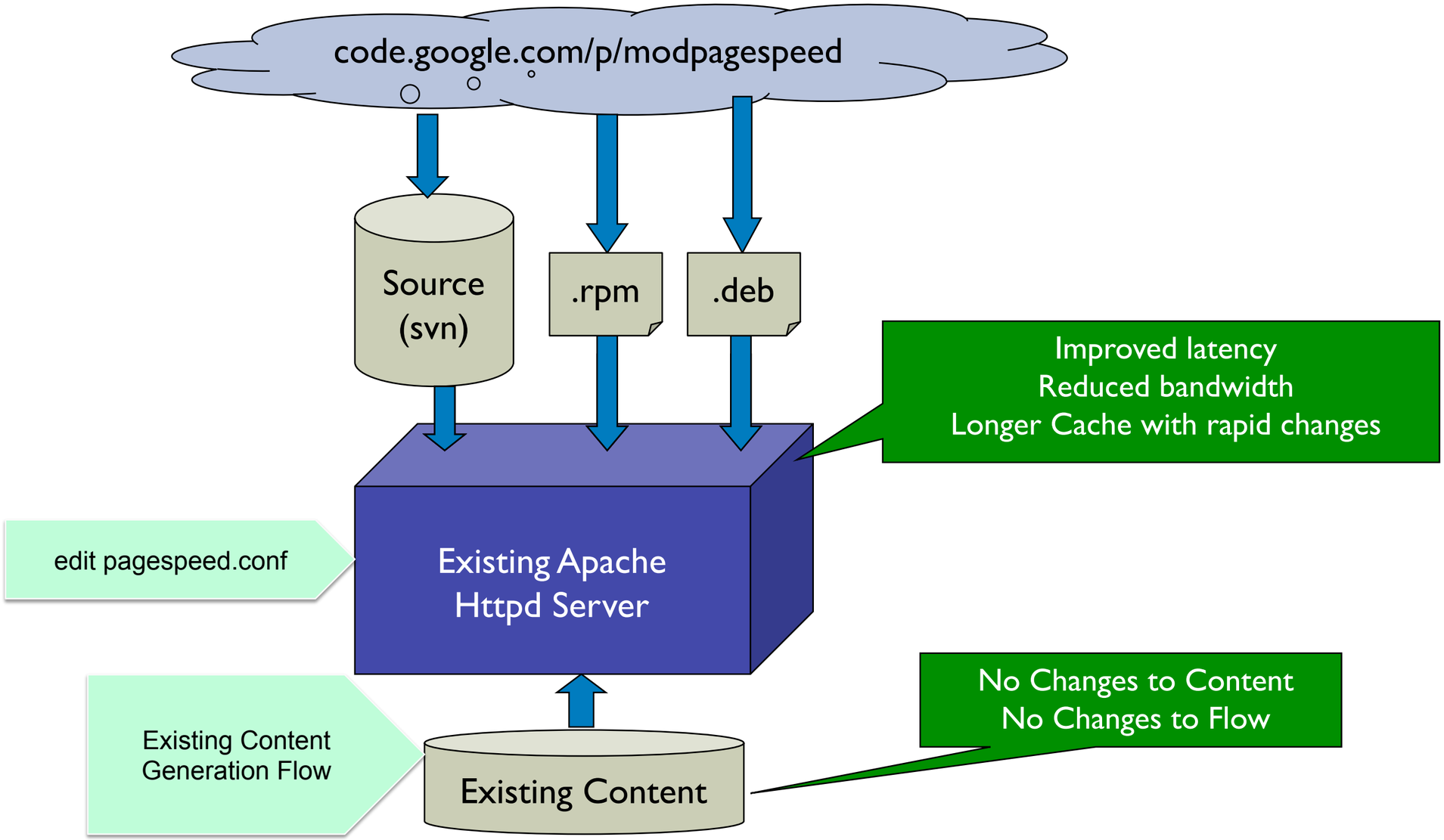
```
<head>
  <link rel="stylesheet" type="text/css"
        href="styles/yellow.css+blue.css+big.css+bold.css.pagespeed.cc.HASH.css”>
</head>
<body>
  <div class="blue yellow big bold">Hello, mod_pagespeed!</div>
</body>
```

md5 sum of combined CSS file

Combined file Served with 1-year TTL

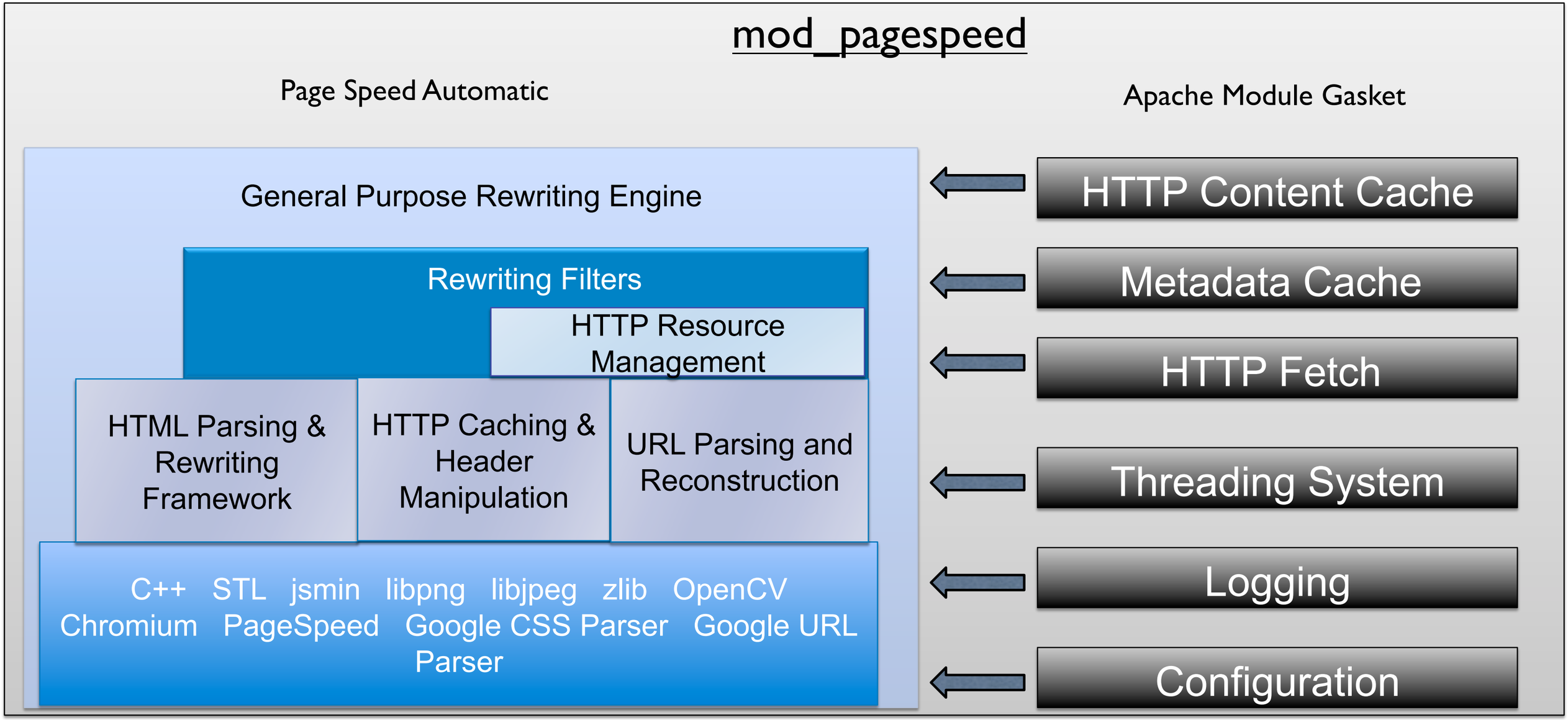
Google I/O 11

mod_pagespeed Adoption Flow



Google I/O 11

mod_pagespeed Architecture

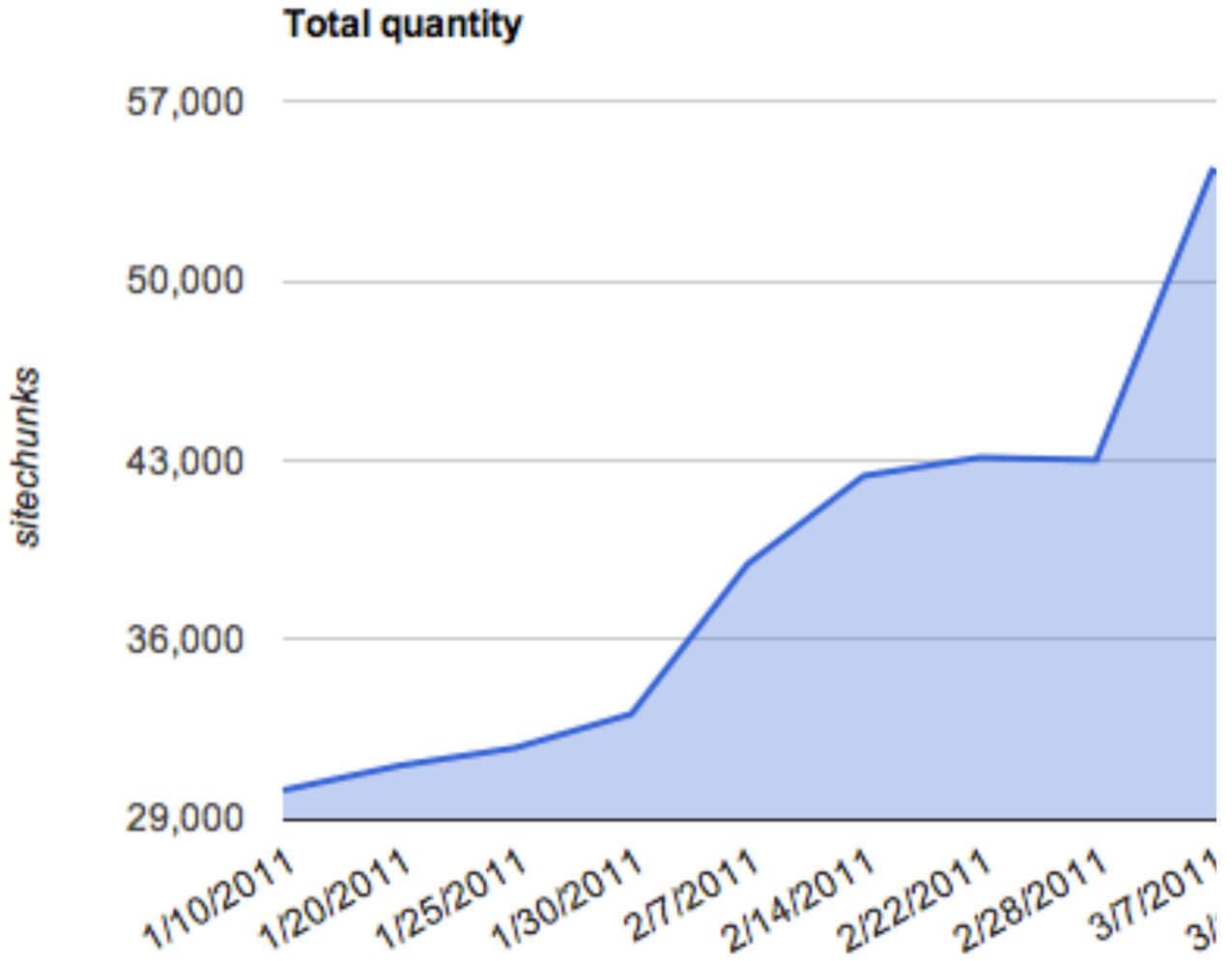


mod_pagespeed Results

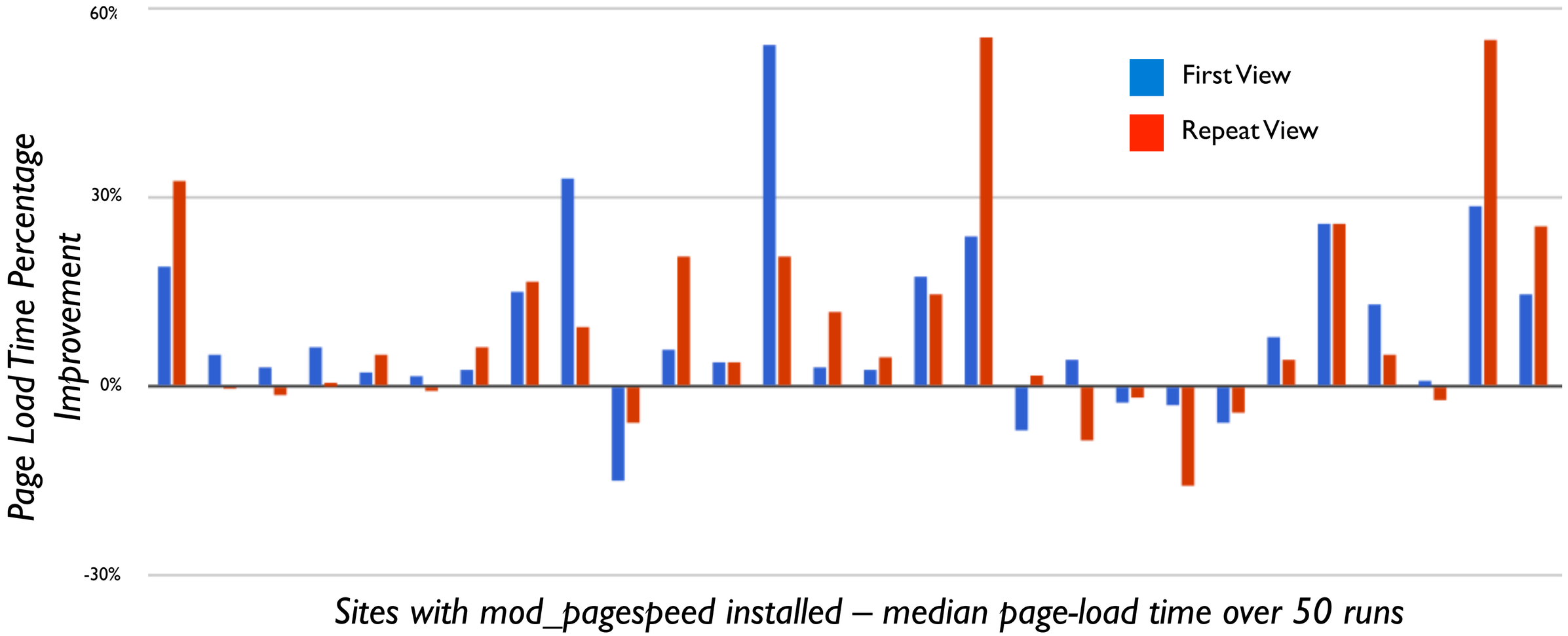
How Much Faster Is The Web Now?

mod_pagespeed adoption on the web

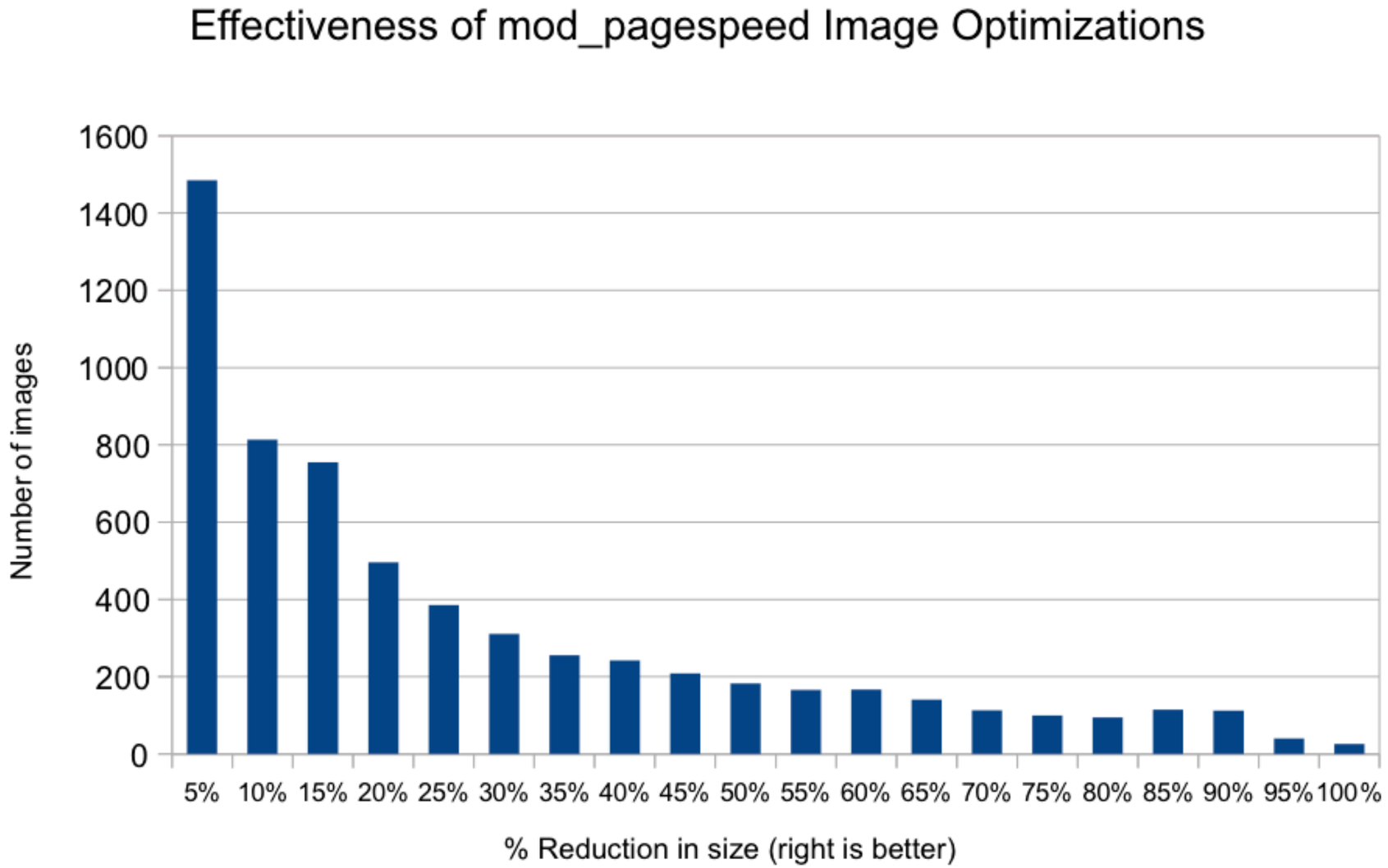
Launch Date	November 3, 2011
DreamHost support	November 5, 2011
Go Daddy support	January 27, 2011
Lines of Code	65,000



mod_pagespeed site latency improvements: 28 sites

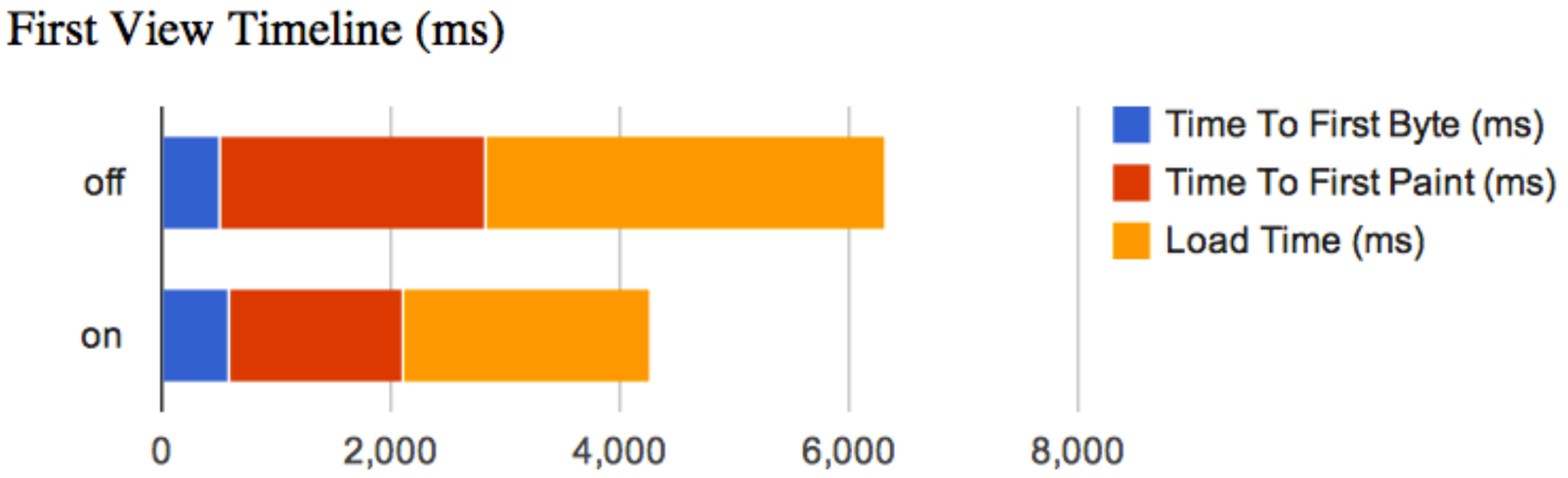


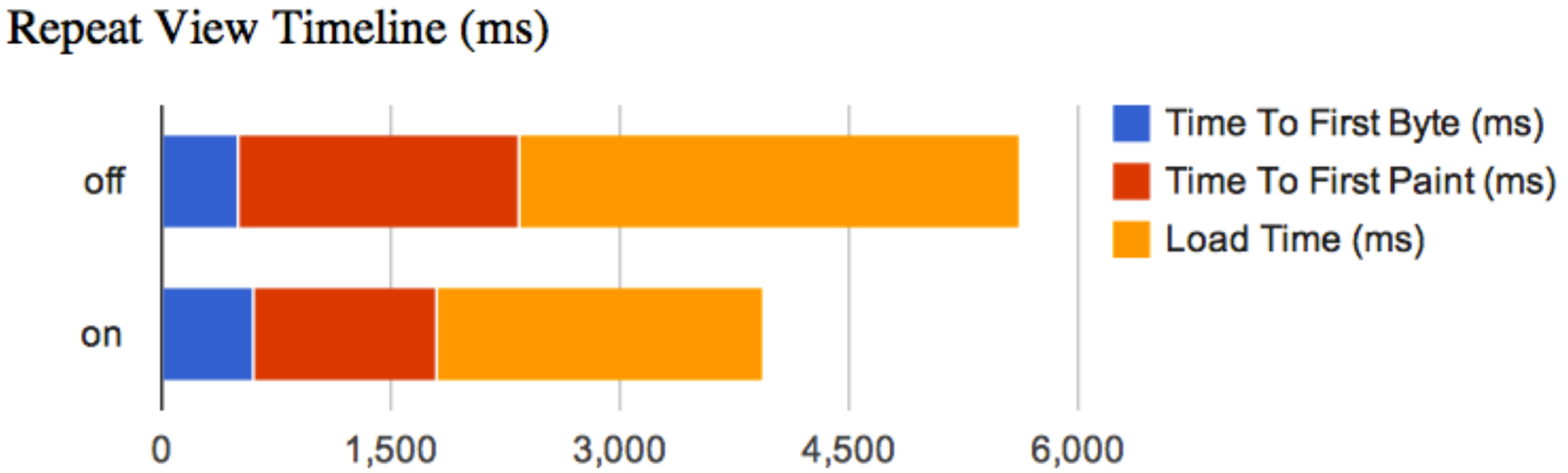
mod_pagespeed image size reduction on the Alexa 1000



Case Study: androidacademy.com

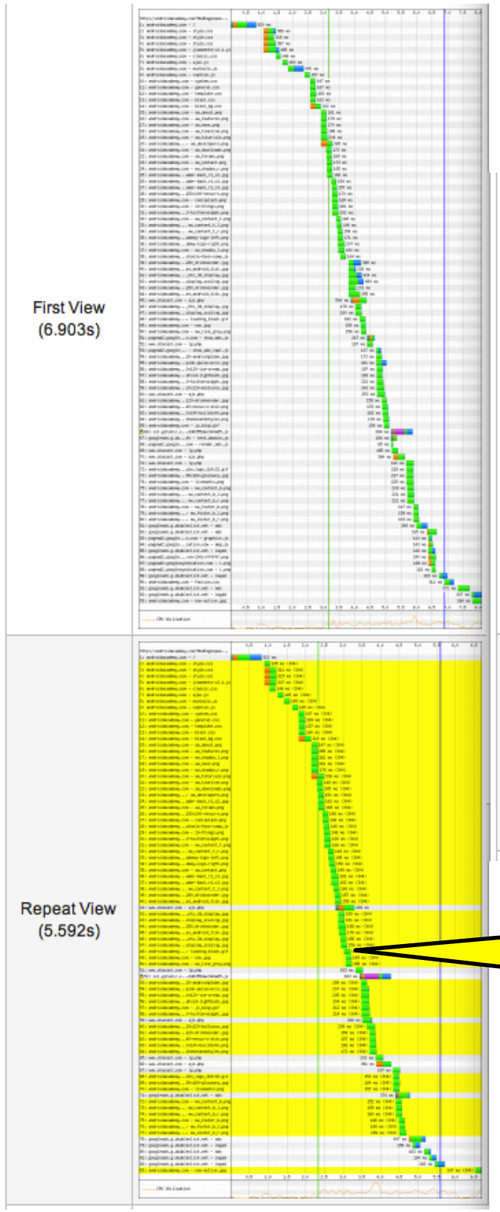
androidacademy.com timeline (median of 50 runs)



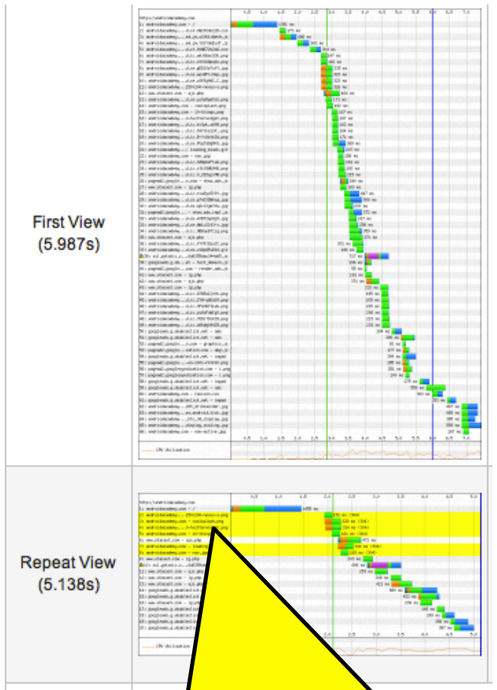


androidacademy.com waterfall from webpagetest.org

mod_pagespeed off



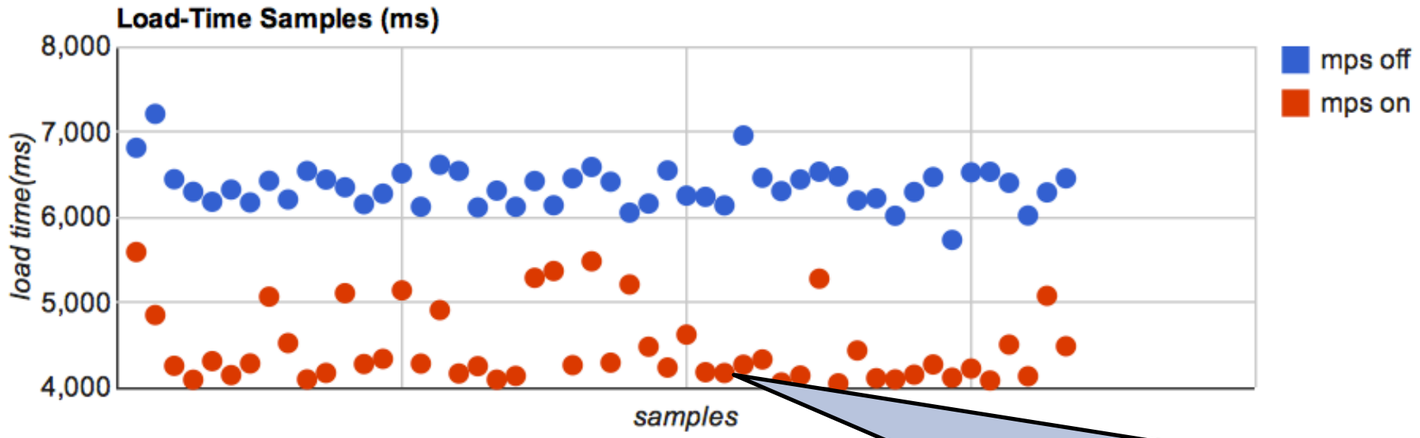
mod_pagespeed on



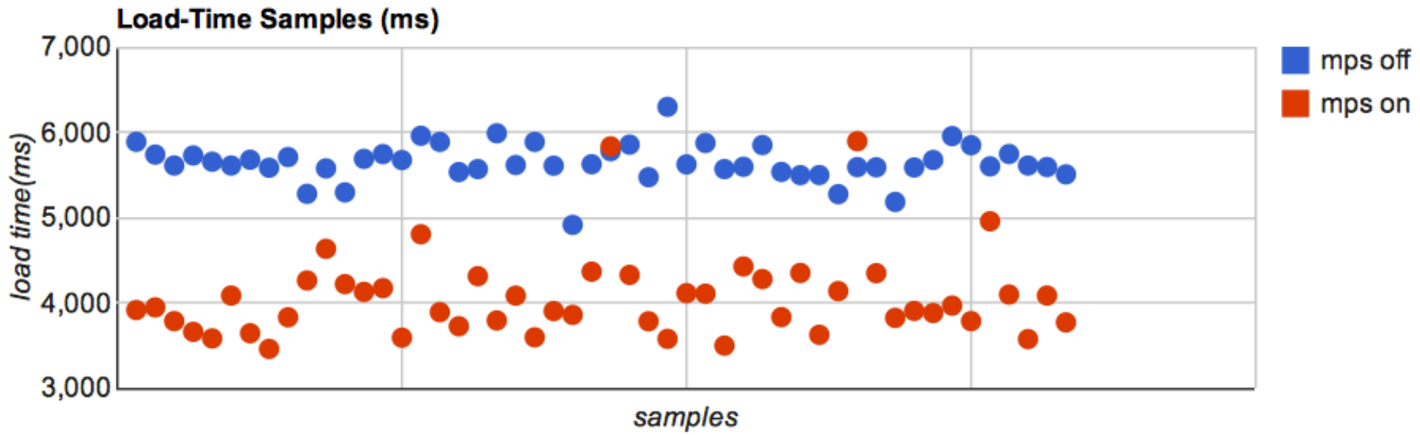
304 (not modified) responses

androidacademy.com: consistency & test methodology

First View Load Time (ms) over 50 Samples



Repeat View Load Time (ms) over 50 Samples



Significant measurement variance, but conclusive results

mod_pagespeed roadmap

- Make more of the web faster: 60,000 sites is a start…
  - High-volume partners (Hosting Providers, CDNs)
  - Leveraged integrations with servers, proxies, caches, etc
  - Extreme Support
- Make the web *more* fast
  - Image spriting, WebP
  - Deferring JavaScript execution
- Measure Better
  - Which filters have the highest impact?
  - Help users evaluate mod_pagespeed benefits

mod_pagespeed: Automatically Make Your Web Sites Faster

Read About It	http://code.google.com/speed/page-speed/docs/module.html
Try It	http://www.modpagespeed.com
Download It	http://code.google.com/speed/page-speed/download.html
Discuss It	http://groups.google.com/group/mod-pagespeed-discuss

Agenda

Feedback: http://goo.gl/VF47I
Twitter: #TechTalk
#wpo
#io2011

mod_pagespeed	Joshua Marantz
WebP	**Richard Rabbat**
Opera and WebP	Håkon Wium Lie

Google I/O 11

WebP: an image format for the World Wide Web

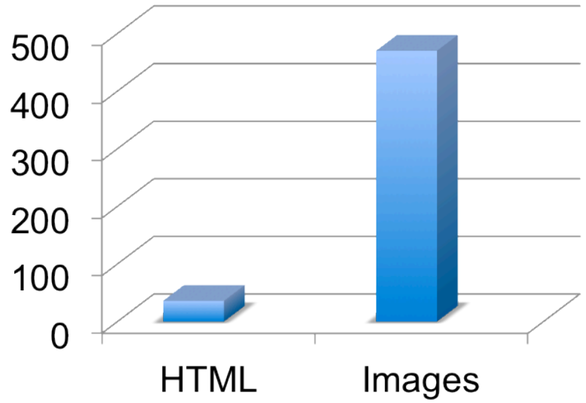
The state of images on the Web

- Most of the images are JPEG images

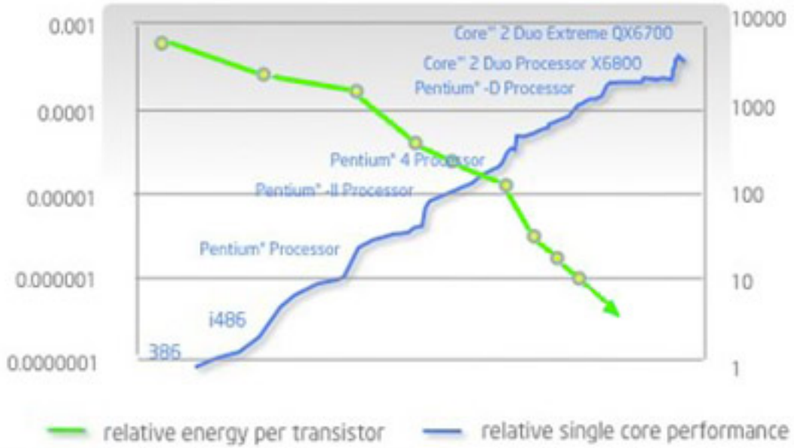
- GIF for specific use-cases such as transparency and animation

- PNG for high-quality icons, text, graphs and really high-end digital photos

- An image is worth a 1000 words –almost literally



- Lossy compression stuck at JPEG, but the world has changed…



Source: Intel Corporation

- Algorithmic improvements

Google™ 11 I/O DEVELOPER CONFERENCE

Google™ 11 I/O

WebP – or how to squeeze every byte of data

- Based on VP8 bitstream, it's basically a key frame
- PSNR study: 900K JPEGs
  a. WebP compression: -39.8% bytes
  b. JPEG re-compression: -14.2% bytes
- SSIM study: 26K PNGs
  a. JPEG compress q=75.
  b. Identify ssim
  c. WebP compress for equivalent ssim
  - WebP is 40.4% smaller

- Performant at low bit-rate, the wireless use-case

WebP

JPEG

- Delightful at high bit-rate

PNG

WebP

Images at http://www.mathias-schindler.de/2010/10/22/webp-file-format-remarks/ . Reproduced with permission of Mathias Schindler

WebP – speed improvement for site

JPEG

http://www.imagescompare.com/images/jpeg.html

				Document Complete			Fully Loaded		
Load Time	First Byte	Start Render	Result (error code)	Time	Requests	Bytes In	Time	Requests	Bytes In
0.650s	1.584s	2.580s	0	0.650s	1	0 KB	8.652s	10	729 KB

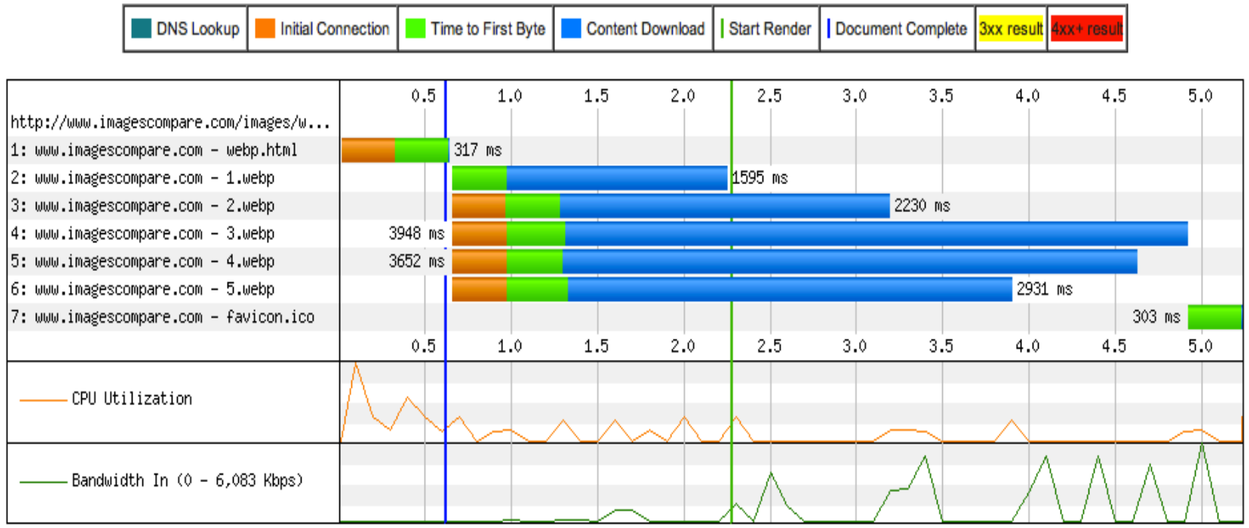
Waterfall View

WebP

http://www.imagescompare.com/images/webp.html

				Document Complete			Fully Loaded		
Load Time	First Byte	Start Render	Result (error code)	Time	Requests	Bytes In	Time	Requests	Bytes In
0.610s	0.640s	2.270s	0	0.610s	1	1 KB	5.231s	7	529 KB

Waterfall View



Google I/O 11

WebP – speed and beyond. Delight your users!

- “Make the encoder good first” – Sep 2010
- “it should probably beat JPEG much more readily now” –Apr 2011
- New features announced today
  - eXtensible Metadata Platform (XMP)
  - Animation
  - 3D - stereoscopy
  - Tiling
  - Spriting – the fun way
  - Lossless
  - JNI interface

- Product support

- Hardware support with vp8 compatibility
- Completely new study on the compression improvement over JPEG
- Speed: 2x faster codec

- Example spriting proposal:

```
<img src = “group.webp#john”>
<img src = “group.webp#jack”>

Group.webp is a multi-image
that contains 2 images with
tag #john and #jack
No weird CSS to write ☺
```

- Example 3D

```
<img src = “3d.webp#left”>
<img src = “3d.webp#right”>
```

Agenda

Feedback: http://goo.gl/VF47I
Twitter: #TechTalk
#wpo
#io2011

mod_pagespeed	Joshua Marantz
WebP	Richard Rabbat
Opera and WebP	**Håkon Wium Lie**

Google I/O 11

Google™
11