

The background is a dynamic, abstract composition of blue and white light streaks. These streaks originate from the bottom left and fan out towards the top right, creating a sense of high speed and forward motion. The colors range from deep navy blue to bright, almost white highlights where the light streaks are most intense.

# the WPO Industry is Here

[stevesouders.com/docs/velocity-wpo-20101207.pptx](http://stevesouders.com/docs/velocity-wpo-20101207.pptx)

**Disclaimer:** This content does not necessarily reflect the opinions of my employer.



2004





## Blog:

30 March 2010

950  
tweets

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# Fred Wilson's 10 Golden Principles of Successful Web Apps

BY KEIR WHITAKER



**FUTURE OF WEB APPS**  
CONFERENCE 14 MAY 2010 DUBLIN

In February 2010 [Fred Wilson](#), a New York-based tech investor, spoke at the annual [Future of Web Apps](#) conference. In a talk, clocking in at just under 30 minutes, looks at his top 10 principles for creating a successful web app. A full transcript is available below.

## The 10 Golden Principles of Successful Web Apps



27:41

17

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#1. Speed: “First and foremost, we believe that speed is more than a feature. Speed is the most important feature.”

## Think Vitamin Radio

Think Vitamin Radio: Episode #5

0:00

Join host [Keir Whitaker](#), [Ryan Carson](#) and [Mike Kus](#) for Think Vitamin Radio, a bi-weekly chat about web design, development and entrepreneurship. Listen to [previous shows](#).



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Think Vitamin Radio is kindly hosted by [Buzzsprout](#)

## Recent Articles

# Server Delays Experiment: Results

	Distinct Queries/User	Query Refinement	Revenue/User	Any Clicks	Satisfaction	Time to Click (increase in ms)
50ms	-	-	-	-	-	-
200ms	-	-	-	-0.3%	-0.4%	500
500ms	-	-0.6%	-1.2%	-1.0%	-0.9%	1200
1000ms	-0.7%	-0.9%	-2.8%	-1.9%	-1.6%	1900
2000ms	-1.8%	-2.1%	-4.3%	-4.4%	-3.8%	3100

- Means no statistically significant change

- Strong negative impacts
- Roughly linear changes with increasing delay
- Time to Click changed by roughly double the delay



# Search Traffic Impact

Type of Delay	Delay (ms)	Experiment Duration (weeks)	Impact on Average Daily Searches Per User
Pre-header	50	4	Not measurable
Pre-header	100	4	-0.20%
Post-header	200	6	-0.29%
Post-header	400	6	-0.59%
Post-ads	200	4	-0.30%

- Increase in abandonment heuristic = less satisfaction
  - Abandonment heuristic measures if a user stops interacting with search engine before they find what they are looking for
- Active users (users that search more often a priori) are more sensitive



# Importance of performance

- Yahoo!: 400 ms slower = 5-9% drop in full-page traffic



Browsing all articles in **website optimization**

APR

5

19

## FIREFOX & PAGE LOAD SPEED – PART II

Blake Cutler [speed](#), [website optimization](#)

Let's start with the punchline: By making a few minor tweaks to our top landing pages we can drive an additional 100,000 Firefox downloads per year.

60 million is a big number, so let's add a little context. Looking back at our [breaking download day](#) we saw that in 2009, over 60 million people downloaded Firefox. Download Day campaigns per year.

What are the tweaks?

It comes down just one factor — speed. As it stands, our landing pages can be painfully slow. Take a look:

### Mozilla.com IE Landing Page



4.0

### Recent Posts

[Menu Item Usage Study: The 80-20 Rule?](#)

[Why People Don't Upgrade Their Browser – Part IV](#)

[Study: An Update to the Initial Analysis](#)

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[Download Day Campaigns in Firefox](#)

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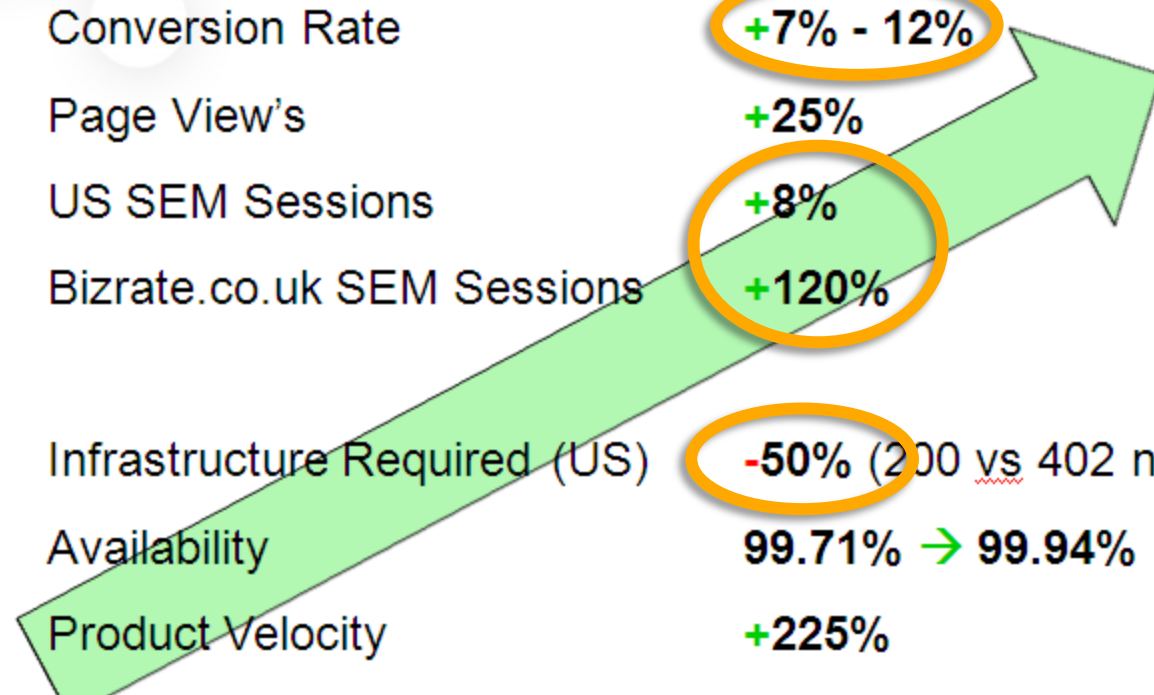
[November 2009](#)

[October 2009](#)

[September 2009](#)



## Performance Summary

- 
- Conversion Rate **+7% - 12%**
  - Page View's **+25%**
  - US SEM Sessions **+8%**
  - Bizrate.co.uk SEM Sessions **+120%**
  - Infrastructure Required (US) **-50%** (200 vs 402 nodes)
  - Availability **99.71% → 99.94%**
  - Product Velocity **+225%**
  - Release Cost **\$1,000's → \$80**

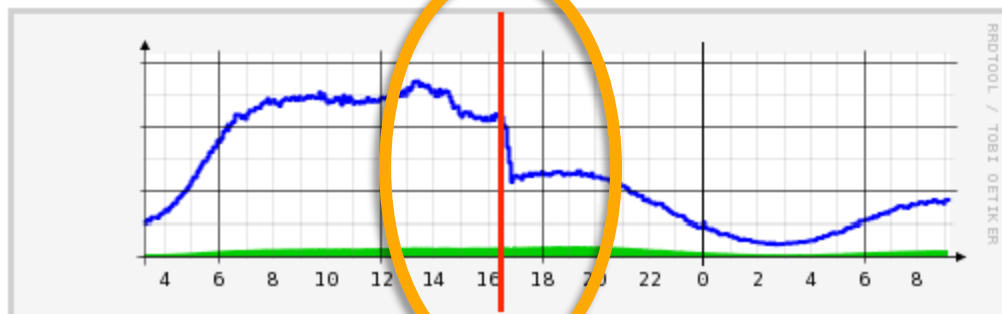
# Improving Performance: Gzip

- Payload reduced in some cases 15x (typically in half)

Empty Cache	Primed Cache
804.8K 1HTML/Text	804.8K 1HTML/Text
284.5K 3JavaScript Files	284.5K 3JavaScript Files
73.4K 2Stylesheet Files	73.4K 2Stylesheet Files
8.0K 20CSS Images	0.0K 20CSS Images
55.0K 60Images	0.0K 60Images
1225.8K Total size	1162.8K Total size
86HTTP requests	86HTTP requests

Empty Cache	Primed Cache
51.6K 1HTML/Text	51.6K 1HTML/Text
0.0K 1XMLHttpRequest	0.0K 1XMLHttpRequest
63.9K 3JavaScript Files	0.0K 1XMLHttpRequest
15.4K 2Stylesheet Files	0.0K 23CSS Images
21.9K 23CSS Images	0.0K 61Images
56.3K 61Images	51.6K Total size
209.3K Total size	86HTTP requests
91HTTP requests	

- User experience performance improvement 13% - 25%
- Network outbound traffic cut in half



NETFLIX





...we've decided to take site speed into account in our search rankings.

## Using site speed in web search ranking

Friday, April 09, 2010 at 11:00 AM  
Webmaster Level: All

You may have heard that here at Google we're obsessed with speed, in our products and on the web. As part of that effort, today we're announcing a change to our search algorithms: site speed. Site speed is now a factor in our search rankings.

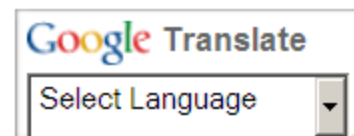
Speeding up websites is important — not just to site owners, but to all internet users. Faster sites create happy users and we've seen in our [internal studies](#) that when a site responds slowly, visitors spend less time there. But faster sites don't just improve user experience; recent data shows that improving site speed also [reduces operating costs](#). Like us, our users place a lot of value in speed — that's why we've decided to take site speed into account in our search rankings. We use a variety of sources to determine the speed of a site relative to other sites.

If you are a site owner, webmaster or a web author, here are some free tools that you can use to evaluate the speed of your site:

- [Page Speed](#), an open source Firefox/Firebug add-on that evaluates the performance of web pages and gives suggestions for improvement.
- [YSlow](#), a free tool from Yahoo! that suggests ways to improve website speed.
- [WebPagetest](#) shows a waterfall view of your pages' load performance plus an optimization checklist.
- In [Webmaster Tools](#), Labs > Site Performance shows the speed of your website as experienced by users around the world as in the chart below. We've also blogged about [site performance](#).

### Site performance

This page shows you performance statistics of your site. You can use this information to improve the speed of your site and create a faster experience for your users. [Learn more](#)



[Gadgets powered by Google](#)

### Useful links

[Google Webmaster Central](#)  
[Webmaster Help Center](#)  
[Google Webmaster Tools](#)  
[Webmaster Central on YouTube](#)

## Google webmaster tools

stevesouders.com

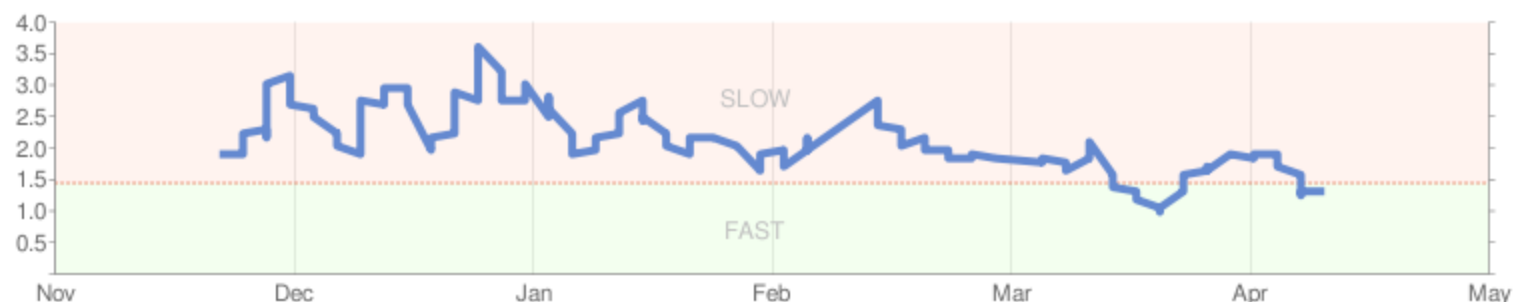
[« Back to Home](#)[Dashboard](#)[+ Site configuration](#)[+ Your site on the web](#)[+ Diagnostics](#)[- Labs](#)[Fetch as Googlebot](#)[Sidewiki](#)**Site performance**

## Site performance

This page shows you performance statistics of your site. You can use this information to improve the speed of your site and create a faster experience for your users. [Learn more](#)

### Performance overview

On average, pages in your site take **1.4 seconds to load** (updated on Apr 13, 2010). This is **faster than 83% of sites**. These estimates are of **medium accuracy** (between 100 and 1000 data points). The chart below shows how your site's average page load time has changed over the last few months. For your reference, it also shows the 20th percentile value across all sites, separating slow and fast load times.



### Example pages

These are some example pages from your site and the time that they take to load in a browser (in seconds).

[URL](#)[Load time](#)[/hpws/imagemap-no.php](#)

1.

[/hpws/expirson.php](#)

0.



# Both

- combine scripts
- combine stylesheets
- add an Expires header
- gzip responses
- put stylesheets at the top
- put scripts at the bottom
- avoid CSS expressions
- make JS and CSS external
- reduce DNS lookups
- minify JS and CSS
- avoid redirects
- remove duplicate scripts
- make Ajax cacheable
- reduce cookie size
- use cookie-free domains
- don't scale images

# YSlow

- use CSS sprites
- use a CDN
- configure ETags
- use GET for Ajax requests
- reduce # of DOM elements
- no 404s
- avoid image filters
- optimize favicon

# Page Speed

- defer loading JS
- remove unused CSS
- use efficient CSS selectors
- optimize images
- optimize order of CSS & JS
- shard domains
- leverage proxy caching



# TEST A WEBSITE'S PERFORMANCE

[Analytical Review](#)[Visual Comparison](#)

Test Location

[Change](#)

Browser

**Advanced Settings ▼**

Connection

Number of Tests to Run

Up to 10

Repeat View

☐ First View and Repeat View ☒ First View Only

Keep Test Private



Label

Test Settings

Auth

Script

Block

Video

☒ Capture Video  
(Beta)

This is an early stage feature

**START TEST**

Provided by

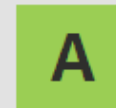
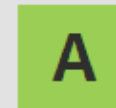
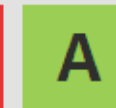




# Web Page Performance Test for

## [www.wikipedia.org/](http://www.wikipedia.org/)

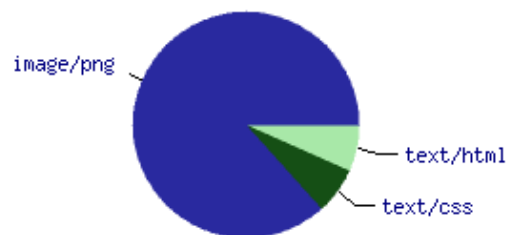
From: Dulles, VA - IE8 - DSL

Keep-alive  
EnabledCompress  
TextCompress  
ImagesCache  
Static  
ContentCombine  
JS/CSS  
FilesUse of  
CDN[Summary](#)[Details](#)[Performance Review](#)[Page Speed](#)[Content Breakdown](#)[Domains](#)[Screen Shot](#)[Raw page data - Raw object data](#)[Export HTTP Archive \(.har\)](#)

	Load Time	First Byte	Start Render	Document Complete			Fully Loaded		
				Time	Requests	Bytes In	Time	Requests	Bytes In
First View	1.968s	0.411s	1.671s	1.968s	15	90 KB	1.968s	15	90 KB

	Waterfall	Optimization Checklist	Screen Shot	Video
First View (1.968s)				<a href="#">Filmstrip View</a> <a href="#">Watch Video</a> <a href="#">Compare to</a>

## Requests

Content  
Breakdown

## Bytes



1.6s

1.7s

1.8s

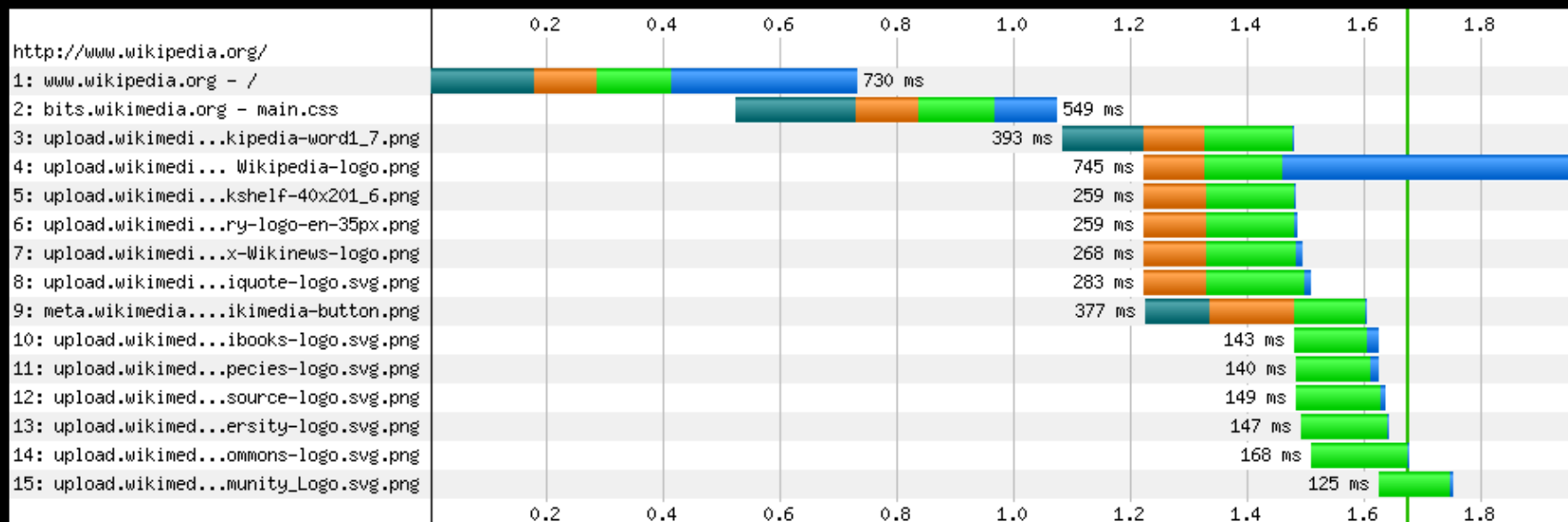
1.9s

☒ [www.wikipedia.org/](http://www.wikipedia.org/)


Export filmstrip as an image...

☐ Slow Motion
Select up to 9 tests and [Create Video](#)
[Thumbnail Size](#)   [Thumbnail Interval](#)

- |  |  |
|--|--|
| <input type="radio"/> Small            | <input checked="" type="radio"/> 0.1 sec |
| <input type="radio"/> Medium           | <input type="radio"/> 0.5 sec            |
| <input checked="" type="radio"/> Large | <input type="radio"/> 1 sec              |
|  | <input type="radio"/> 5 sec              |







# WPO | Web Performance Optimization

drives traffic

improves UX

increases revenue

reduces costs



2004





## Blog:

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30 March 2010

Enter your e-mail address below to receive regular updates on web design, web development and web business. Subscribe today and receive a **FREE 44 PAGE PDF "DESIGNING WEB USER INTERFACES"** by Ryan Singer of [37signals](#).

950  
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27:41

Think Vitamin Radio: Episode #5

0:00

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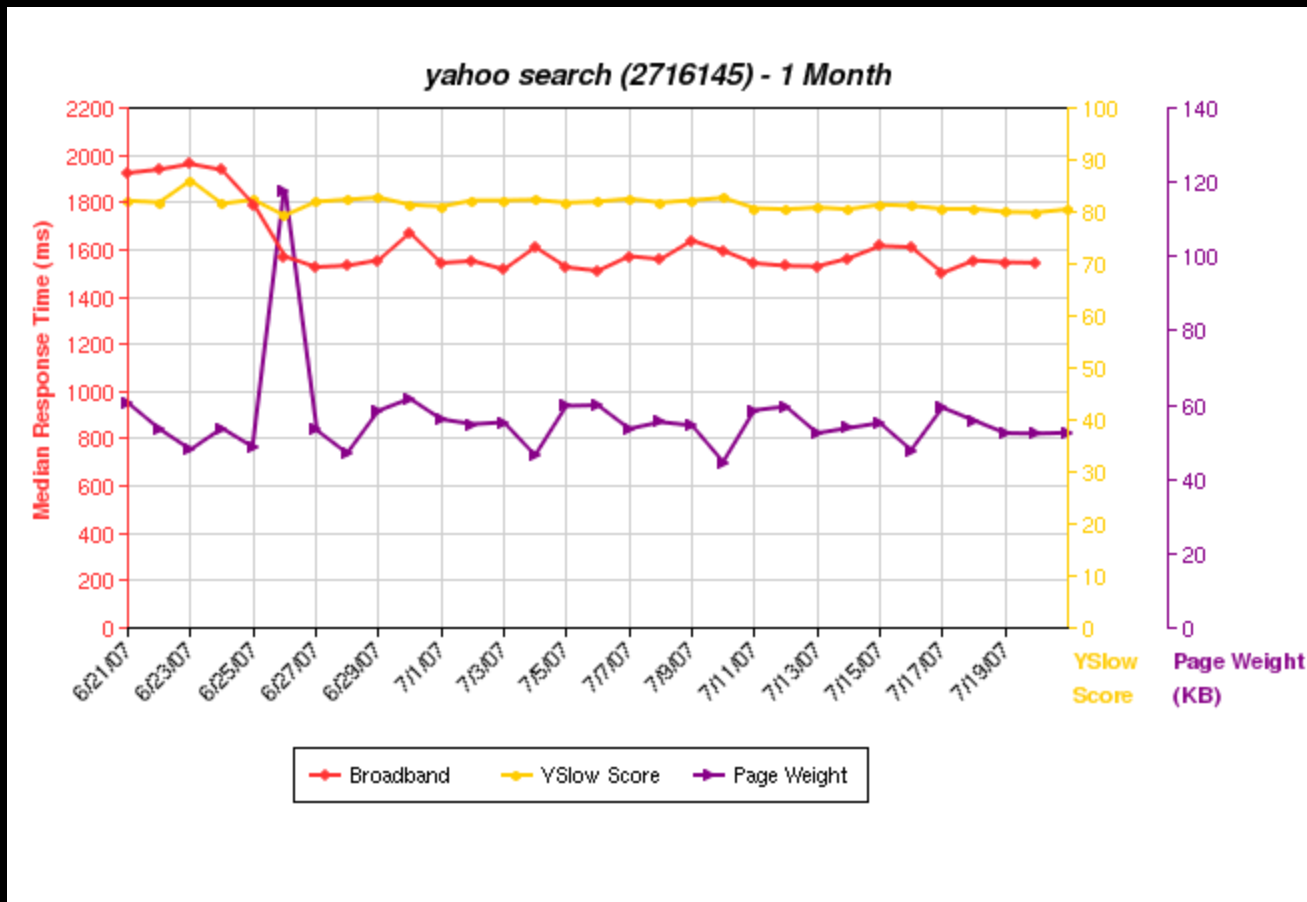


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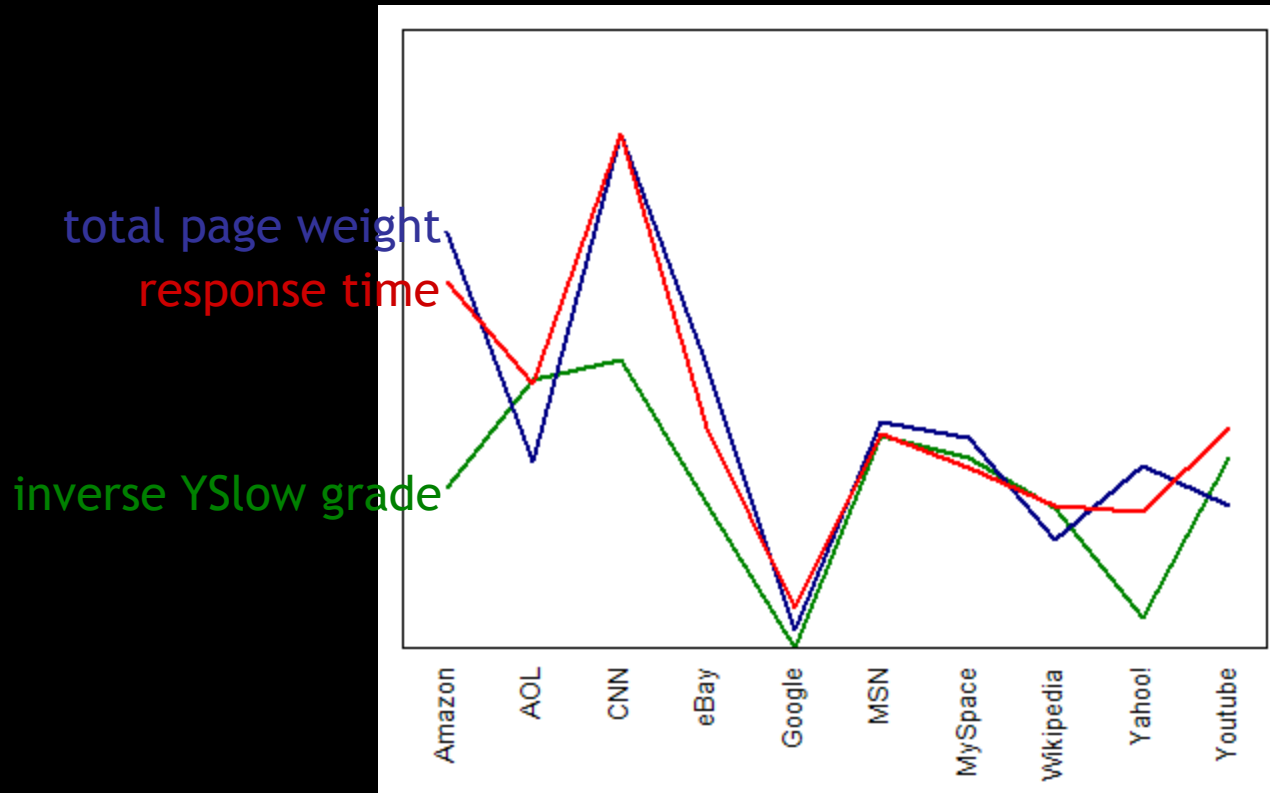
### Recent Articles

# Response Time, Page Weight, YSlow Grade





# Strong Correlation

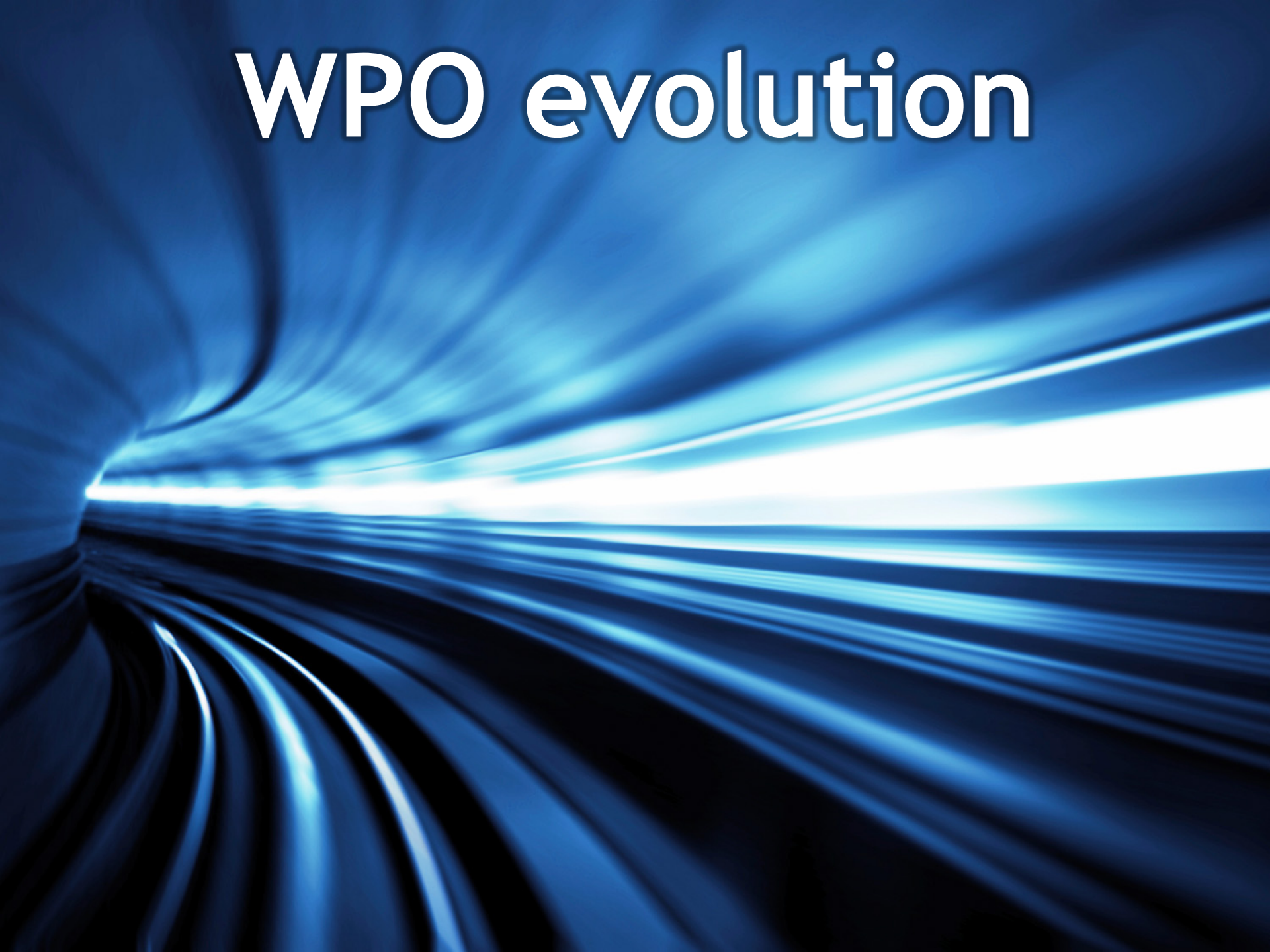


$\text{correlation}(\text{resp time, page weight}) = 0.94$

$\text{correlation}(\text{inverse YSlow, resp time}) = 0.76$

$\text{correlation}(\text{inverse YSlow, page weight}) = 0.59$

# WPO evolution



# WPO evolution

**measure**

Yahoo! Boomerang

[stevesouders.com/episodes](http://stevesouders.com/episodes)

Jiffy

[WebPagetest.org](http://WebPagetest.org)

[ShowSlow.com](http://ShowSlow.com)



# WPO evolution

measure

profile

Firebug

Fiddler

HttpWatch

Speed Tracer

Web Inspector

dynaTrace



# WPO evolution

measure

profile

research

domain sharding

concatenation

sprites vs. MHTML

WebP

prefetch

SPDY, cwnd=10

# WPO evolution

measure

profile

research

**best practices**

High Performance &  
Even Faster Web Sites

High Performance JS  
[code.google.com/speed/](http://code.google.com/speed/)  
[developer.yahoo.com/  
performance/](http://developer.yahoo.com/performance/)  
[stevesouders.com/blog](http://stevesouders.com/blog)  
[perfplanet.com/](http://perfplanet.com/)



# WPO evolution

measure

profile

research

best practices

evangelize

Velocity China!

workshops

university

case studies

blogs

# WPO evolution

measure

profile

research

best practices

evangelize

lint

Page Speed

YSlow



# WPO evolution

measure

profile

research

best practices

evangelize

lint

automate

DEVELOPER

PUBLISHER

BLOG

Home

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Yahoo! Hadoop Blog

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Tue July 24, 2007

## YSlow Release on YDN

by Steve Souders (@stevesouders)

11 Comments



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Yahoo! has released YSlow, their web performance tool, on YDN under an [open source license](#). Steve Souders, Yahoo!'s Chief Performance Yahoo!, made the announcement during his [session at OSCon](#).

YSlow measures web page performance based on the [best practices](#) evangelized by Yahoo!'s Exceptional Performance team. Since many of these best practices focus on the frontend, YSlow is integrated with Joe Hewitt's [Firebug](#), the web development tool of choice for frontend developers.

YSlow has three main views: Performance, Stats, and Components. [Performance view](#) scores the page against each performance rule, generates an overall YSlow grade for the page, and lists specific recommendations for making the page faster. [Stats view](#) summarizes the total page weight, cookie size, and HTTP request count. [Components view](#) lists each component (image, stylesheet, script, Flash object, etc.) in the page along with HTTP information relevant to page load times. It also contains several [tools](#) including JSLint. Try it out!



Steve Souders (@stevesouders)

11 Comments



Buzz up!



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Spreading the Knowledge of Technology Innovators

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[apple blogs](#)

# Press Release

September 12, 2007

## High Performance Web Sites--New from O'Reilly Media: Yahoo's Efficiency Expert Outlines 14 Rules for Faster Pages

Sebastopol, CA--As every web developer knows, Internet users don't like waiting for tiresome page reloads. Unfortunately, the features used by popular sites to make their pages appealing--extensive graphics, rich layout, and the inventive Web 2.0 movement with more responsive features and interactive content--have also pushed browsers to their limits. Without optimization, the frustrating result can be turtle-paced, teeth-grinding web site load times.

So where do you turn if you want to learn how to rev things up? [High Performance Web Sites](#) (\$29.99, O'Reilly) by Steve Souders provides the answer.

"The success of Web 2.0 is dependent on rich applications being fast," says [Steve Souders](#), Yahoo!'s chief performance expert. "And to ensure rich Internet applications provide good user experiences, web developers need to have advanced performance guidelines that go along with these advanced web development paradigms."

Souders has attracted standing-room-only crowds at Web 2.0 Expo and the Open Source Conference by discussing his research and solutions on web performance. He has also racked up an impressive roster of private speaking engagements, including Microsoft, Amazon.com, and other major companies.

Now, in his highly anticipated and important new title, Souder presents what he's learned in an elegant series of engineering steps--14 succinct rules, in fact--that, if implemented, can chip 25 to 50 percent off the response time when users request a page.

Souders developed these rules while optimizing some of the most visited pages on the Web. Even sites already thoroughly vetted, including Yahoo! Search and Yahoo! Front Page, improved from Souders' surprisingly simple performance guidelines. Souders, in his job as Chief Performance Yahoo!, builds tools for performance analysis and evangelizes these best practices and tools across Yahoo!'s product teams.

"The performance best practices I identified at Yahoo! are simple and yet make web pages much faster," observes Souders. "I wanted to share these insights with other web developers to improve the web experience for all users."

"The performance golden rule reveals that only 10 to 20 percent of the user experience is spent retrieving the HTML document, and yet that's where most performance optimization efforts have historically been focused," notes Souders. "The key to dramatically improving web page response times is focusing on the other 80 to 90 percent--the content that is downloaded and the functionality that is executed by the browser after the HTML document arrives. Knowing where to focus is the most important take away from my book."

In his book, each performance rule is supported by specific examples, and code snippets are available on the book's companion web site.



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## Application Performance

months of manual  
development  
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We were so impressed we  
now offer WAX to our  
customers.

*Russell*

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**TALK  
TO US**



### Optimize Explained

See how Optimize can speed up  
your website.

### Test your website speed

URL

Email

[Test it](#) ➤



## Test your website

We'll run your site through our cloud-based **Site Optimizer** service and show you how much faster your site can be.

[Run Test >>](#)

"Our goal is a two-second page load time for our site's visitors. Before testing Site Optimizer, 12% of our site traffic hit that goal. After, that number leaped to 87%. **The decision to implement was clear.**"

*Allen Noren, Vice President of Online at O'Reilly Media*

## Strangeloop Webinar

Find out to create an action plan for fixing your site's performance

[VIEW WEBINAR >](#)

## Strangeloop in action

Watch the O'Reilly home page load with and without Site Optimizer.



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Monitoring & Scoring the performance of **17,908** websites.

Google.com loads in 1.0 seconds...

How fast is your site? Find out: [www.yourcompany.com](http://www.yourcompany.com)

GO!

## How does your site compare?

- 83 [Bing.com](http://Bing.com) is better than **98%** of all sites
- 44 [Boston.com](http://Boston.com) is better than **17%** of all sites
- 43 [Nytimes.com](http://Nytimes.com) is better than **15%** of all sites
- 56 [Amazon.com](http://Amazon.com) is better than **59%** of all sites
- 46 [Cnn.com](http://Cnn.com) is better than **22%** of all sites

## Performance matters because...

*You only have less than a second to make a good impression*



[why web performance matters](#)

Yottaa will help you



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Give us five minutes and we'll **supercharge** your website.

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### Pro

For websites that want more control and insight into what's happening.

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*How does it work?*

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Increase online revenue and strengthen brand and customer loyalty on the Web

### Desktop Virtualization Acceleration™

Improve remote worker productivity with 30% to 500% faster thin client software performance

### Software Distribution Acceleration

Improve FTP productivity with 200% to 500% faster uploads

### Video Acceleration

500% faster video playback and smooth streaming without hiccups and delays

### CDN Acceleration

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### Government Acceleration

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### Gomez Test Results





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Sales or support: 1.888.885.3836



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### Boost visitor satisfaction

Faster websites have higher customer satisfaction and retention rates. 40% of people will leave a site if it takes more than 3 seconds to load. <sup>1</sup>



### Improve Google rankings

Google takes the speed of your website into consideration when they rank your website. A faster site means more Google traffic!



### Increase revenue!

Amazon loses 1% of sales for every 100ms it takes their site

## See it in action



## Join our BETA

★ Name

★ Email

★ Website URL

# Search

0.0s

0.5s

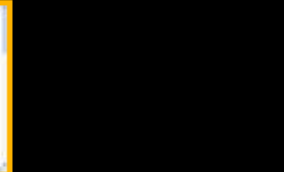
1.0s

1.5s

2.0s

2.5s

Google  
Search



Yahoo!  
Search



Bing




























Ask.com  
Search



AOL  
Search



# Shopping

	0.0s	2.0s	4.0s	6.0s	8.0s
eBay					
Amazon					
Netflix					
Target					
Best Buy					

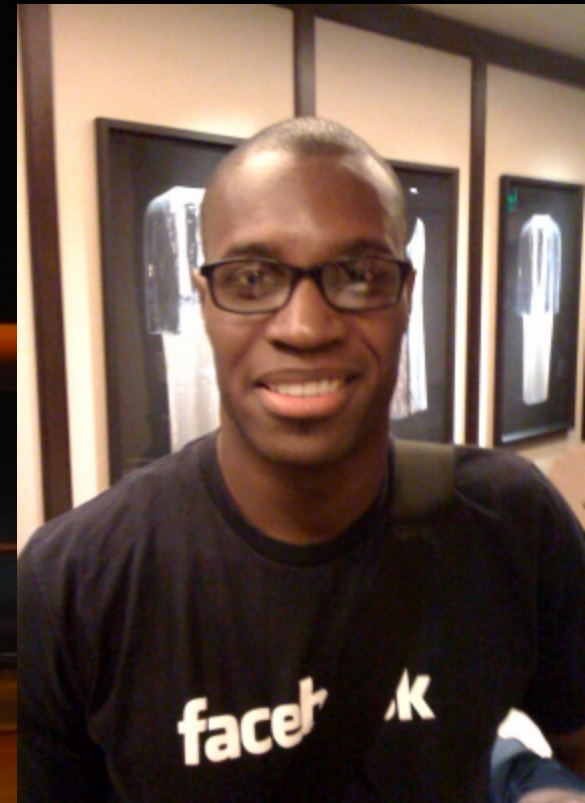




Jenn Lukas  
Happy Cog



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Zappos.com



Makinde Adeagbo  
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for mobile

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profile

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# Velocity

Web Performance and  
Operations Conference

June 22–24, 2010  
Santa Clara, CA



## Velocity Web Performance and Operations Conference Fast by Default

Web performance and operations is an emerging discipline which requires incredible breadth, focusing less on specific technologies and more on how the entire system works together. While people often specialize in particular components, great engineers and developers understand web performance and operations in relation to the whole. The best are able to fly to the 50,000 foot view and see the entire system in motion and then zoom in to microscopic levels and examine the tiny movements of an individual part.

[View the full Velocity schedule >>](#)

Now in its third year, Velocity—the Web Performance and Operations conference from O'Reilly Media—is the premier conference that:

- Provides your web ops and dev teams direct access to the training,

REGISTER NOW  
**AND SAVE**



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Want to send several members of your company to Velocity? Are you a government employee? Instructor or student? Let our [discounts](#) help you make the case to attend.

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JUNE 14-16, 2011  
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*Automated, Optimized, Ubiquitous*

Now in its fourth year, Velocity—the Web Performance and Operations conference from O'Reilly Media is the premier technical event dedicated to optimizing every aspect of your company's website. It's the convergence of performance and site reliability experts and rock stars who share the information critical to building and scaling fast and reliable websites and services. What you'll learn at Velocity is crucial for companies to shine when it hits the fan and will have a positive, direct impact on the bottom line.

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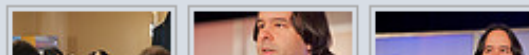
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