

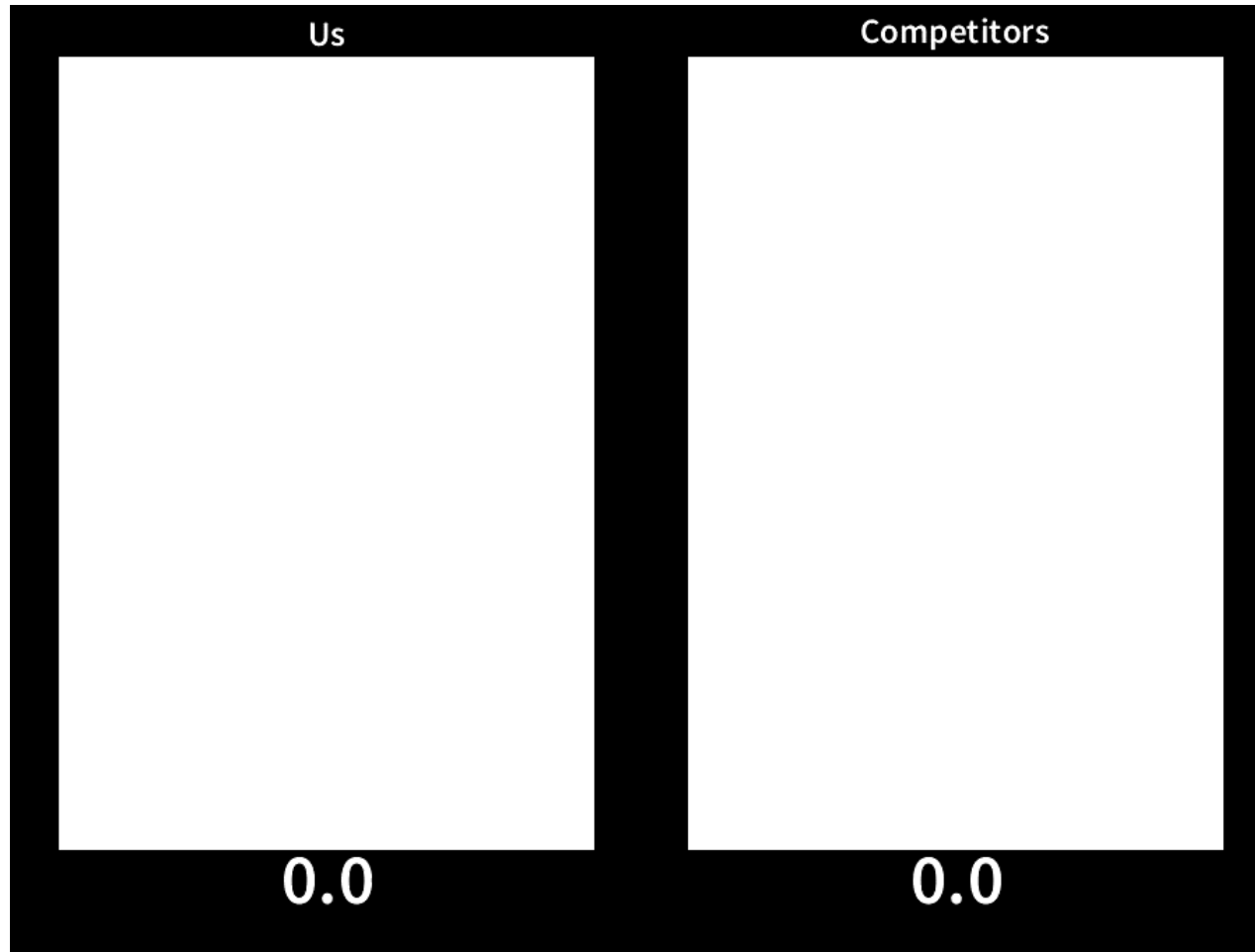
Site Speed: To Measure Is To Know

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eCommera

A CHALLENGE
ACCEPTED
VERSION 3.0



We want to be faster than our competitors



"80-90% of the end-user response time is spent on the front-end. Start there."

Someone
(not me 😞)

The WHY
The HOW
The WHAT

The **WHY?**

User Experience

We all want fast web sites

47% of users
expect load time <2s

<https://blog.kissmetrics.com/loading-time/>



Time is Money

\$100,000 per day:

1 second delay = \$2.5 million lost
per year

[https://blog.kissmetrics.com/
loading-time/](https://blog.kissmetrics.com/loading-time/)



The



Site Speed

What's out there



Chrome Lighthouse

- Google PageSpeed Insights -

<https://developers.google.com/speed/pagespeed/insights/>

Useful to get optimization recommendations although WebPagetest does recommend possible recommendations as well. Some clients receive reports based on this score so it has some significance.

You can also download optimized resources for your sites from the results page.

- [Chrome Lighthouse Plugin](https://github.com/GoogleChrome/lighthouse) – there is rapid development for this plugin as part of a Google initiative 'Do Better Web'. It has several audits, all of them worth checking out – accessibility, good practices, etc. Requires a browser but can be run headless. JSON results available - <https://github.com/GoogleChrome/lighthouse>

WebPagetest (www.webpagetest.org)



WebPagetest (www.webpagetest.org)

Different

locations / browsers / devices

Ability to run a test from a remote location is a strong benefit of WPT – tests are more representative of real usage (mostly due to latency). Google are using WPT to validate performance improvements on Chrome. WebPagetest supports network throttling – for more stable benchmarks. There are various other options – simulating mobile viewport and UA, running on actual mobile devices, A/B tests, getting the Chrome timeline, labelling tests, scripting, etc.



Advanced Testing

Enter a Website URL

Test Location

Browser

Advanced Settings ▼

Apple iPhone 6 (iOS 9)

Apple iPad Mini 2 (Portrait Mode, iOS 9)

North America

Dulles, VA USA (Desktop,Android,iOS 9)

Dulles, VA - Thinkpad T430 (Chrome,Firefox,Edge,IE 11)

Virginia - EC2 (Chrome,IE 11,Firefox)

New York, NY USA (IE 11,Chrome,Firefox)

Virginia - EC2 (Chrome,IE 11,Firefox)

Chrome

Test Settings

Advanced

Chrome

Auth

Script

Block

SPOF

Custom

WebPagetest (www.webpagetest.org)

Different

locations / browsers / devices

Free, open source, private instance

Has pre-configured AWS images – the WPT server and agents – easiest to spin up. Already has a linux agent and the creator

WebPagetest (www.webpagetest.org)

Different

locations / browsers / devices

Free, open source, private instance

Visual Comparison

0.5s

1.0s

1.5s

2.0s

0%

13%

14%

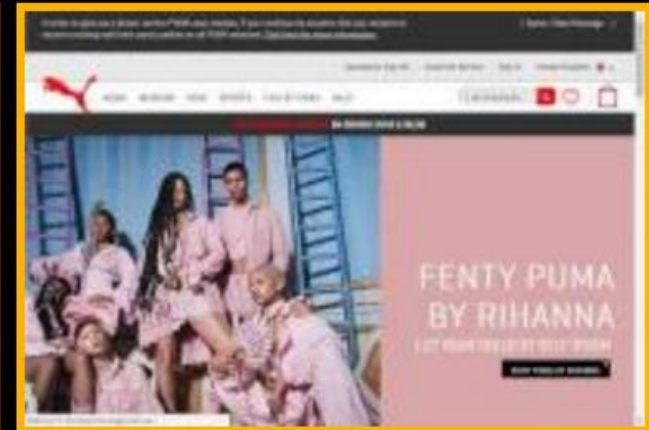
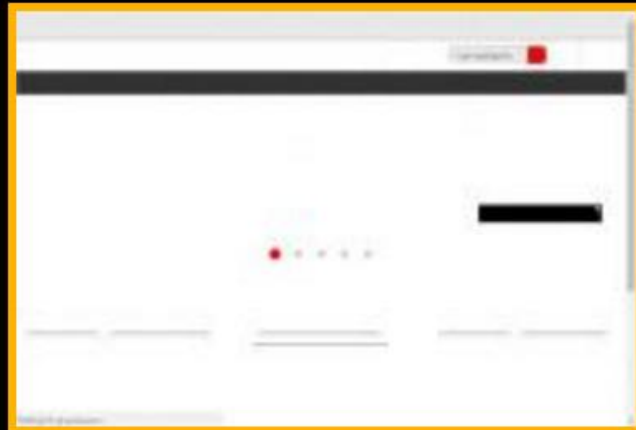
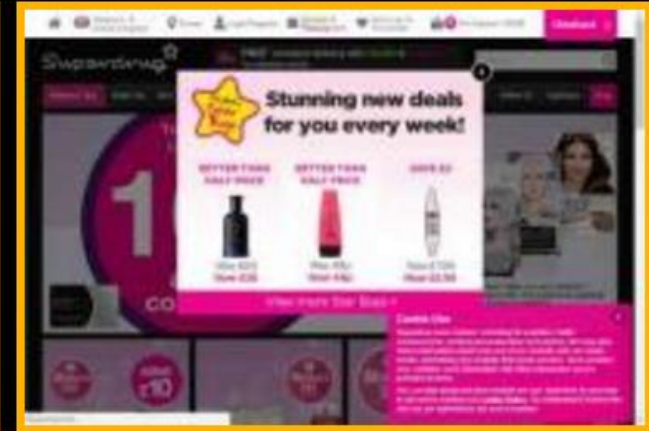
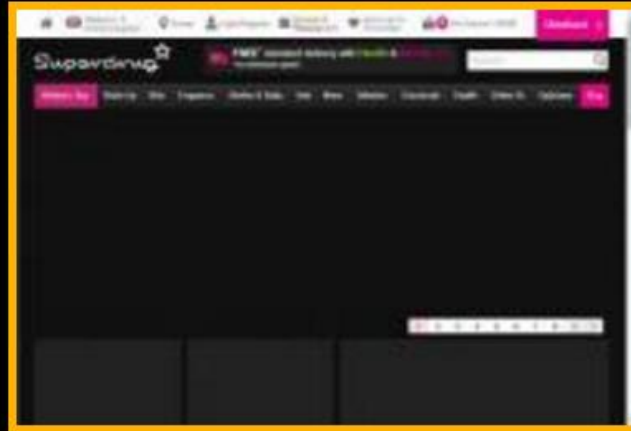
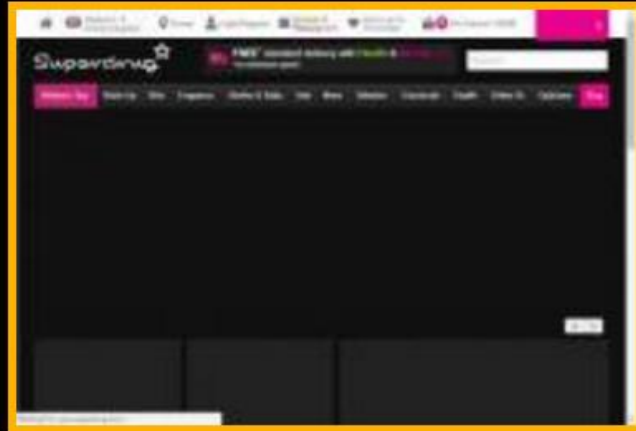
100%

0%

16%

48%

78%



WebPagetest (www.webpagetest.org)

Different

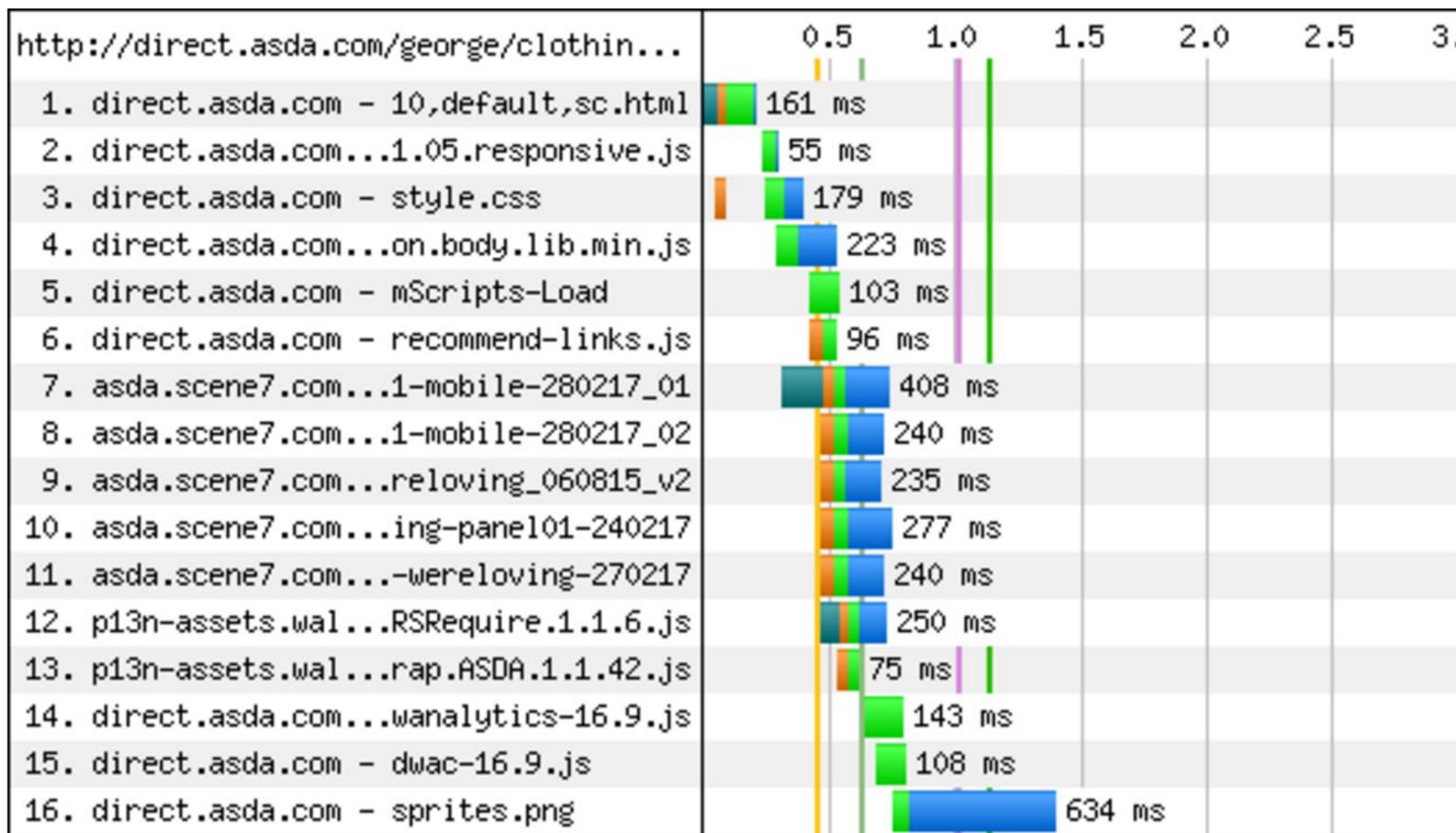
locations / browsers / devices

Free, open source, private instance

Visual Comparison

Request Waterfall

A lot more information on each request in the waterfall – headers, body, etc.



WebPagetest (www.webpagetest.org)

Different

locations / browsers / devices

Free, open source, private instance

Visual Comparison

Request Waterfall

User Journeys

User journeys (workflows) are done using the 'scripting' functionality

WebPagetest (www.webpagetest.org)

Different

locations / browsers / devices

Free, open source, private instance

Visual Comparison

Request Waterfall

User Journeys

SPOF (single point of failure) testing

Bad

Render-blocking javascript:

```
<script src="//www.thirdparty.com/asdf.js">  
</script>
```

Synchronous javascript blocks the HTML parser and rendering of anything after the script. The browser must wait for the file to be downloaded and executed.

SPOF testing

Original	SPOF
0.0	0.0

It happens!!! AWS outage a month ago; Google DPF failure in 2014 results in 55000 'blank' sites; it's much worse in China – because the great firewall of China blocks a lot of domains.

Good



Defer until the DOM is ready:

```
<script src="//www.thirdparty.com/asdf.js" defer>  
</script>
```

Deferred scripts execute after the DOM is ready – at **domInteractive** but before **DOMContentLoaded** – they actually block **DOMContentLoaded** but this isn't an issue. Defer preserves execution order.

The 'async' attribute is not as good as 'defer'. The js file will be executed when it's downloaded, which could still be a wrong time to execute it. Also, it doesn't preserve execution order – another js which depends on it can execute before it.

Scheduling

Jenkins

(<https://jenkins.io/>)



Visualisation

splunk[®]>

(www.splunk.com)

Dashboards

Email notifications

Account management

Other Big Data tools will do as well.

The [ELK stack](#) is becoming more used than Splunk and it's free.

Graphite + Grafana is another free option.

Jenkins Job



REST API



splunk>

WebPagetest REST API is documented very well and gives more options than the UI:

<https://sites.google.com/a/webpagetest.org/docs/advanced-features/webpagetest-restful-apis>

Jenkins Job



1

Run Test

(testID)

REST API

 WEBPAGETEST

Jenkins Job

1



2

No, take
a nap!



Done?

Yes/No

REST API

 **WEBPAGETEST**

Jenkins Job



1

2

Yes

3

REST API



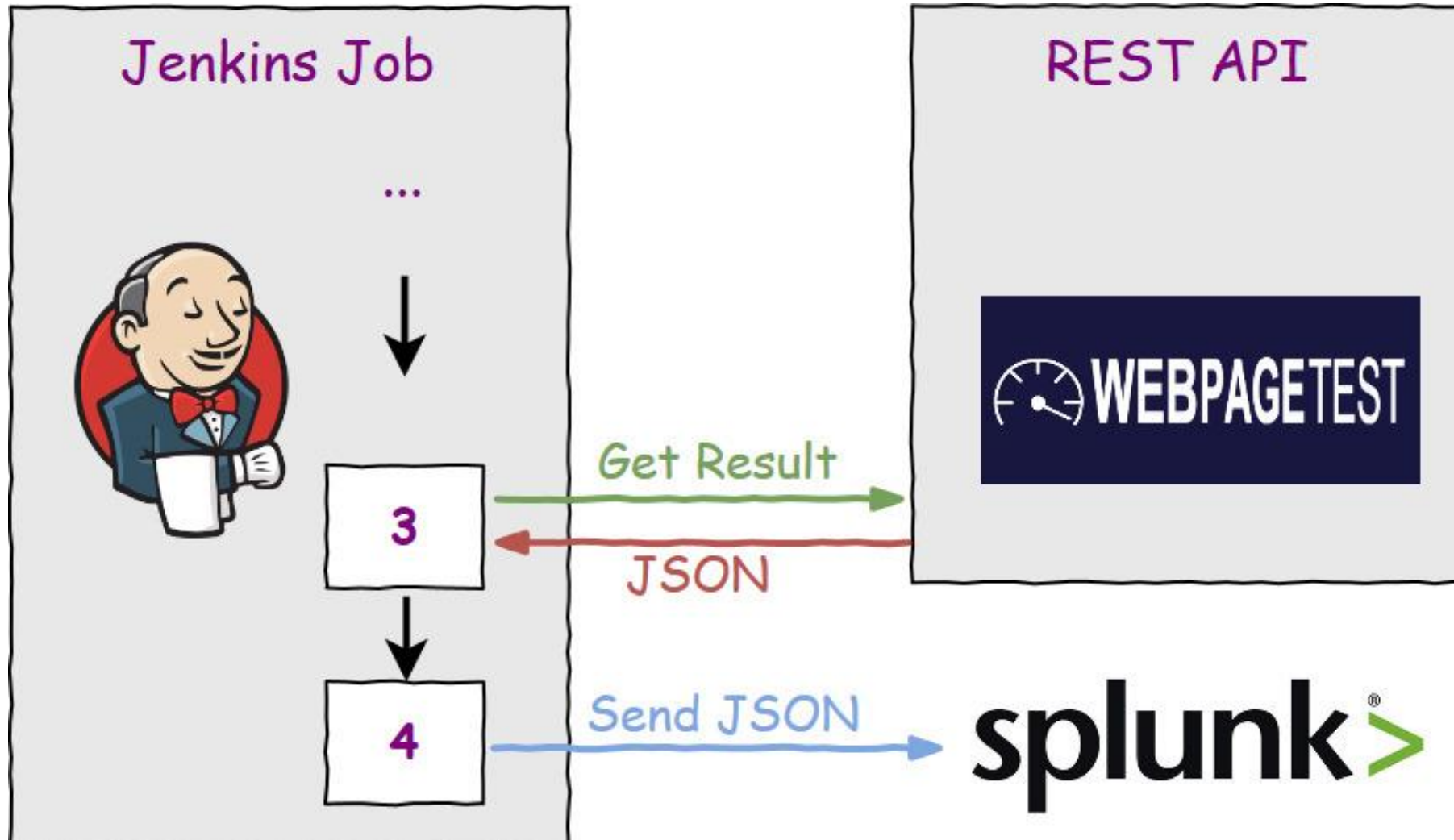
Done?

Yes/No

Get Result

JSON

Actually a Splunk 'forwarder' watches for changes in files/dirs and sends the new json pieces to its 'indexer' (the process that converts the data and inserts it into the Splunk internal DB)

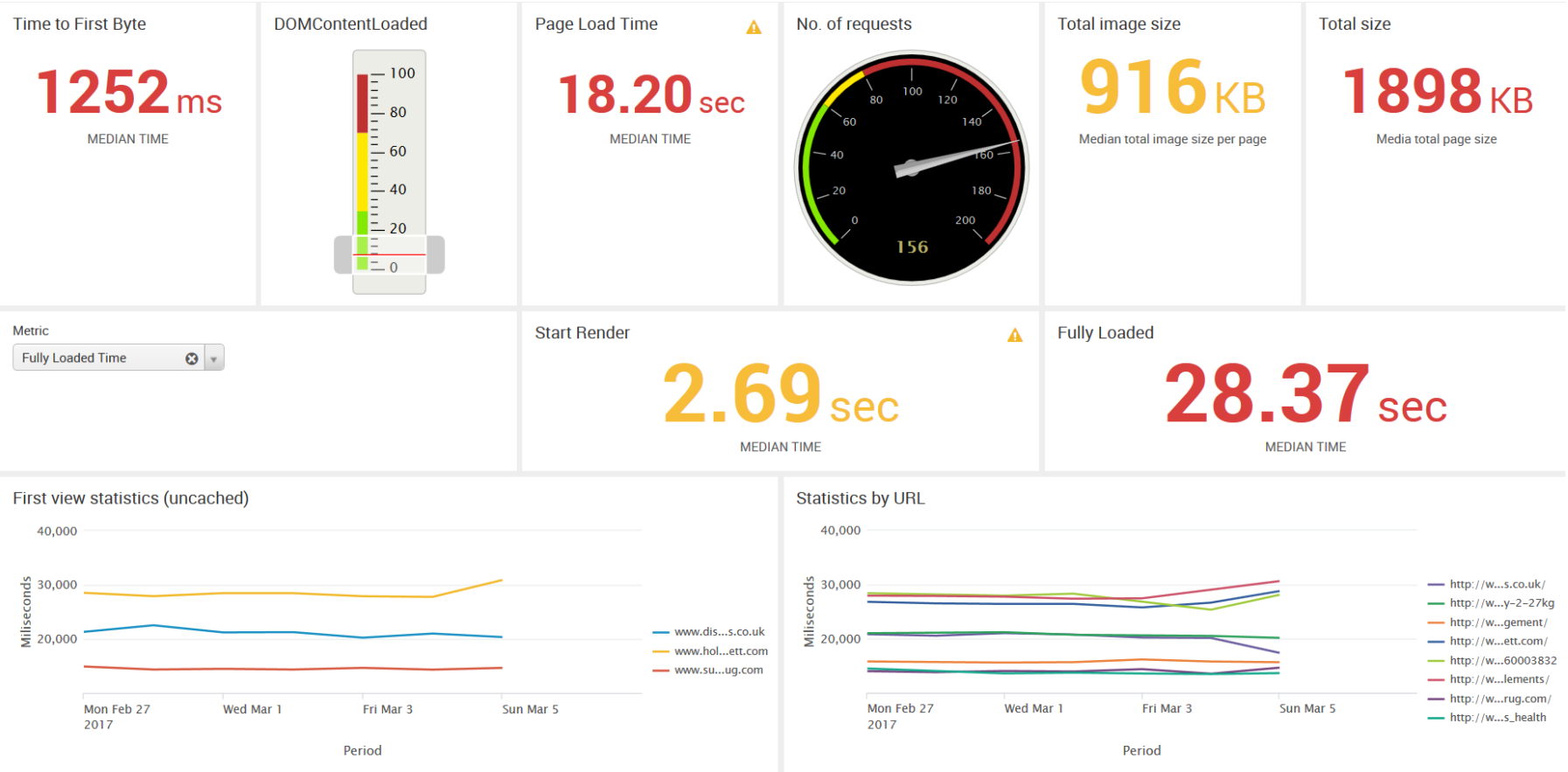


The



Too many metrics. They don't reflect the user perceived performance. Page Load (onload event) Is the most popular metric to measure performance. This is wrong and there are examples that Show how this can be cheated or returns false positives or is irrelevant -

<https://www.stevesouders.com/blog/2013/05/13/moving-beyond-window-onload/>



Perceived Performance



Speed Index



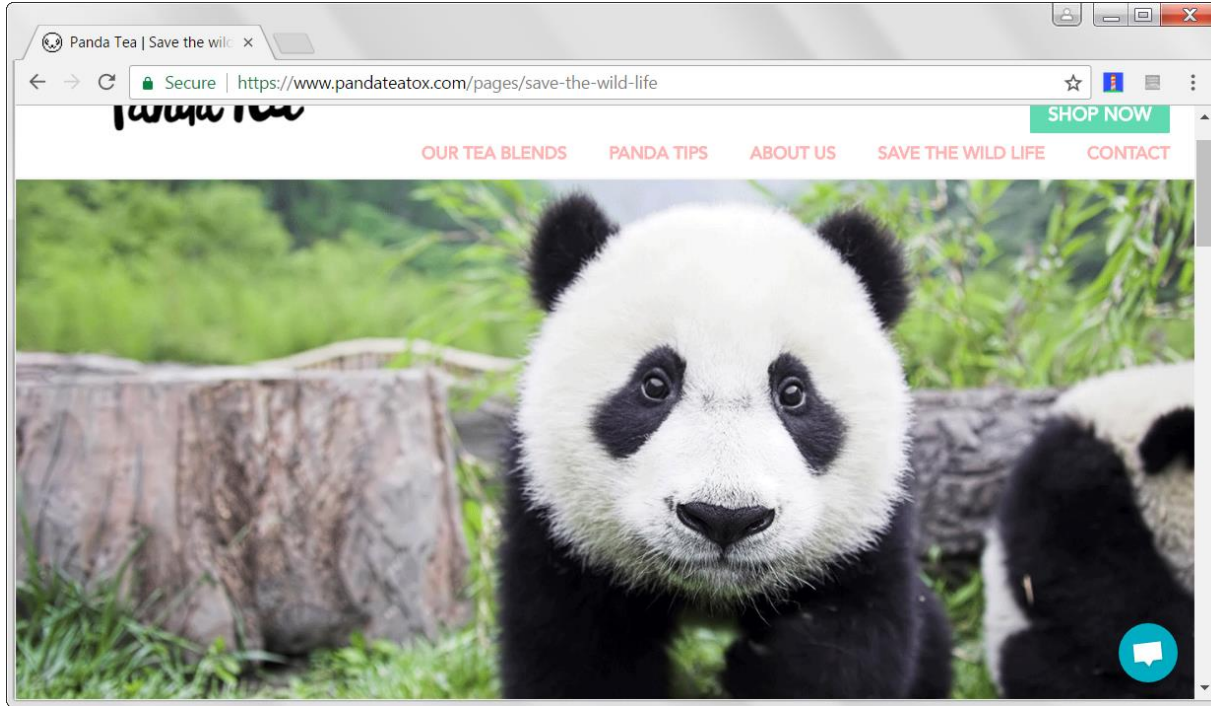
The issue with Speed Index is that it treats all pixels as equals, while some content is of secondary importance.

Also, it is a bit difficult to explain how it is calculated and what the value means.

Also, it gives false positives where there are carousels spinning constantly or when last-minute pop-ups appear or content shifts.

First Meaningful Paint

Hero Image



Hero images are FMP for most e-commerce types of pages (home, Product Details, etc.). They are a big visual change on the screen, the user feels as if the site is almost loaded and 'dares' to go on and interact with it.

A similar metric is Time to Inreactive = Time to First Meaningful Paint + appearance of a call-to-action item (a menu or a button to reveal a menu, for example).

User Timing API

Almost all browsers support it - <http://caniuse.com/#feat=user-timing>.

More info and examples:

<https://speedcurve.com/blog/user-timing-and-custom-metrics/>



```
onload="performance.mark('mark_hero_img')"
```

The WHY
The HOW
The WHAT

Thank you!

Sava Sertov

QA Technical Lead

eCommera

www.qachallengeaccepted.com

Resources

Steve Souders' blogs

<https://blog.kissmetrics.com/loading-time/>