

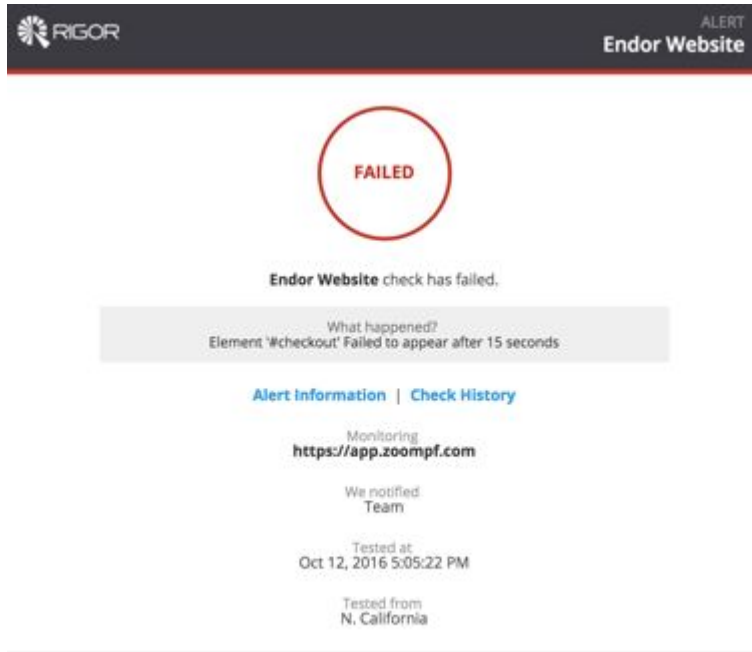
Automating Performance Testing in Pre-production



Billy Hoffman
billy.hoffman@rigor.com



Detecting Problems in Production Sucks



RIGOR ALERT
Endor Website

FAILED

Endor Website check has failed.

What happened?
Element '#checkout' Failed to appear after 15 seconds

[Alert information](#) | [Check History](#)

Monitoring
<https://app.zoompf.com>

We notified
Team

Tested at
Oct 12, 2016 5:05:22 PM

Tested from
N. California

Questions about this alert? Email support@rigor.com. We are always happy to help.



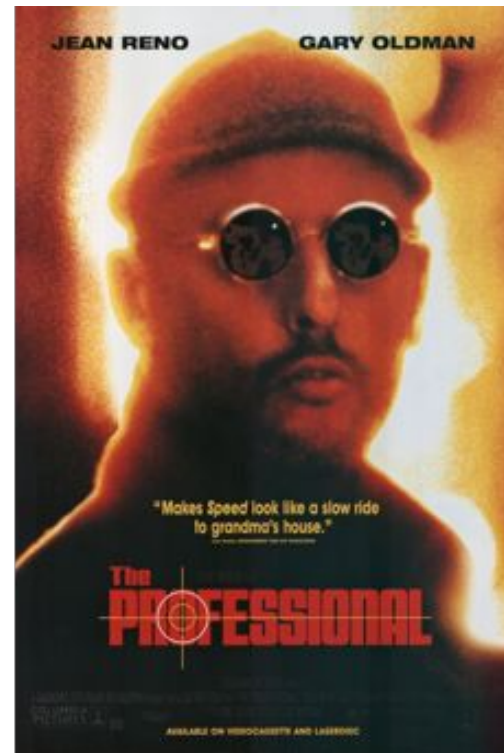
Detecting Problems in Production Sucks



Ideally Catch/Stop Them at the Source



Still Treating Performance As Special



Development Processes are Changing

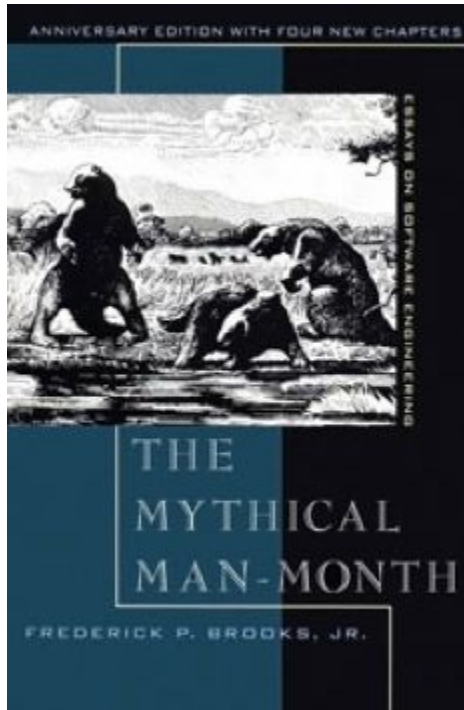


Performance Problems == Bugs!

- *“Unintended Program Behavior”*
- Someone made a mistake
 - IT/Ops
 - Designers
 - Developers
- Big issues and little issues
- Triage



Functional Testing, Early and Often



Dev Manager: *"Before I ship this release..."*

- Are there any SEV 1 functional issues?
- Do my major features work properly?
- Did stability degrade?

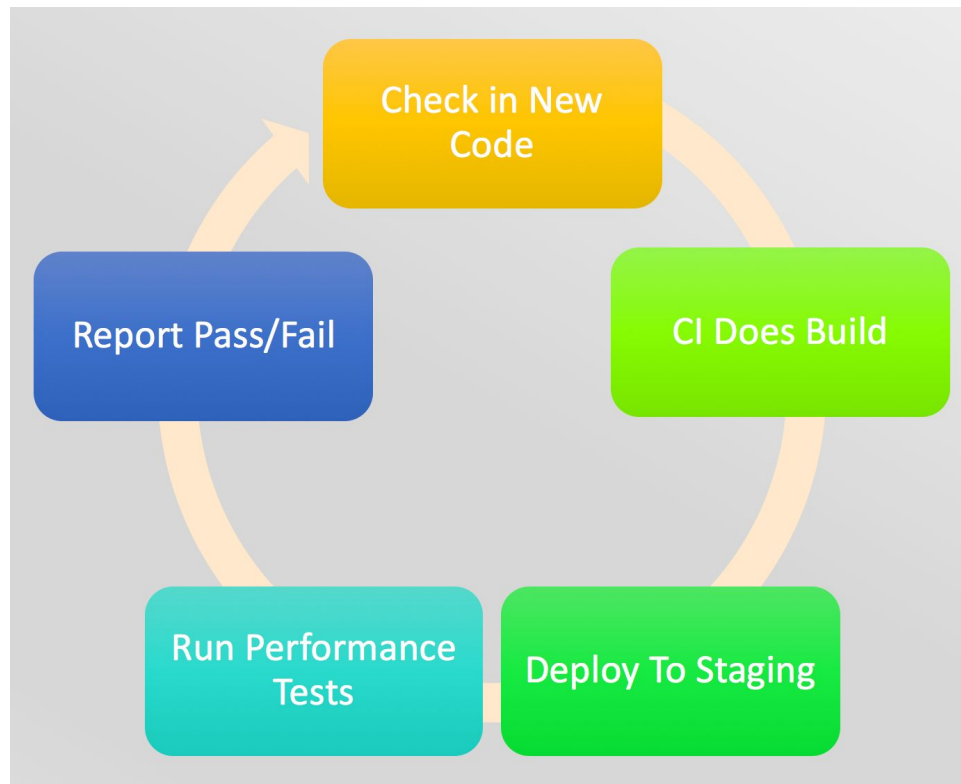


Dev Manager: *“Before I ship this release...”*

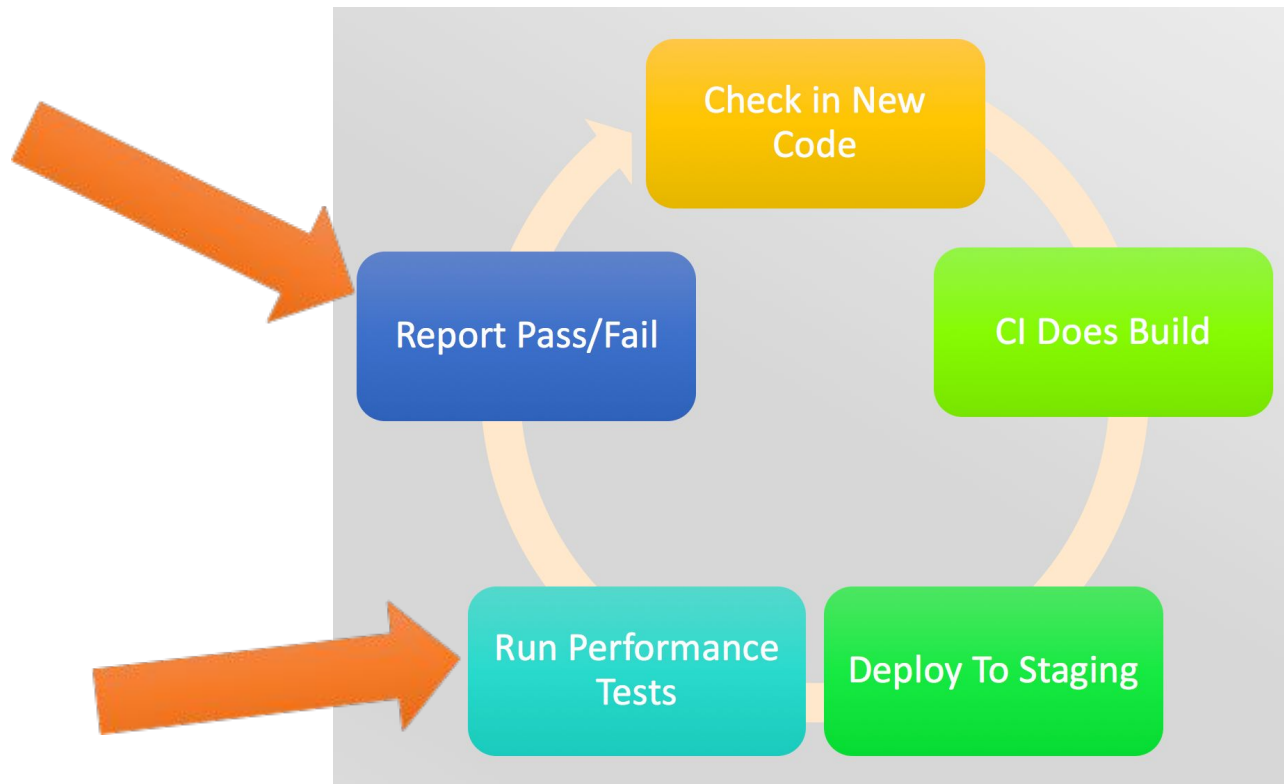
- Are there any SEV 1 **performance** issues?
- Do my major features **perform** properly?
- Did **performance** degrade?



Integrating Performance Testing into Dev Cycle



Integrating Performance Testing into Dev Cycle



What to Test?

- UX Metrics
- Timing Metrics
- Performance Budgets
- Specific Performance Defects

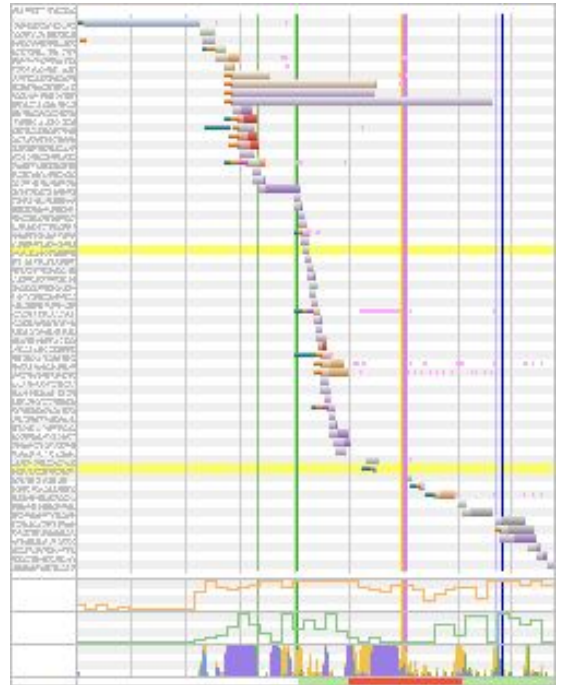
What to Test: UX Metrics

- SpeedIndex
- Start Render
- Visually Complete*



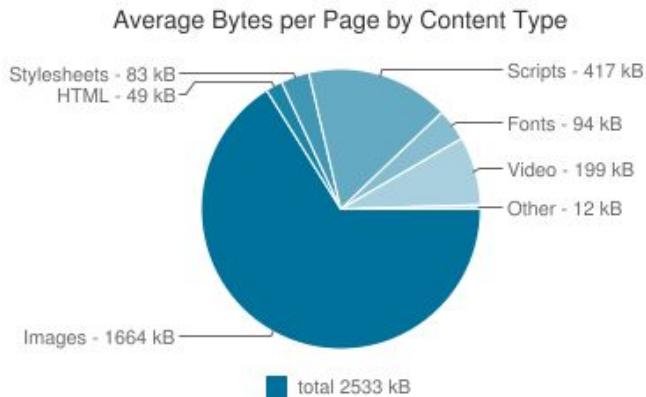
What to Test: Timings + Custom Metrics

- DomContentLoaded
- OnLoad
- Fully Loaded
- Custom Timings + Custom Industry/Company Metrics
 - Time to First Ad
 - Time to Active Call-To-Action

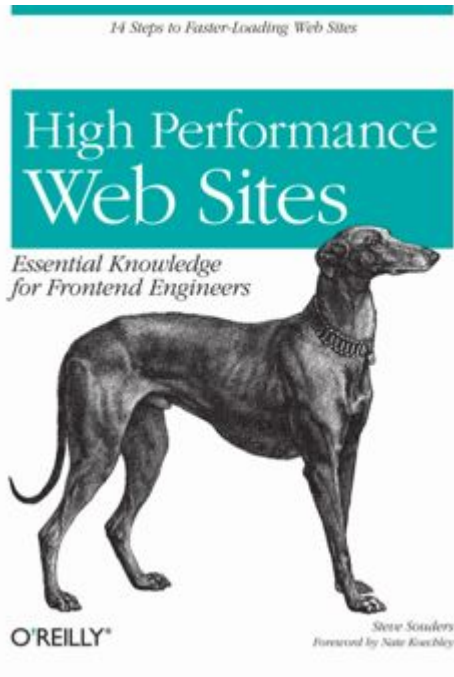


What to Test: Performance Budgets

- Total Content Size
- Content Size by Type
- Content Size by Origin (1PC vs 3PC)
- Different Devices!



What to Test: Specific Problems



- Streaming Audio/Video Checks (13)
 - Video Missing Accept-Ranges Header
 - Candidate HTML5 Video (Animated GIF)
 - HTML5 <AUDIO> Tag without Type
 - HTML5 <VIDEO> Tag without Type
 - Mismatched HTML5 Video Bitrates
 - Oversized HTML5 Video
 - Muted HTML5 Video with Audio Track
 - Unoptimized Audio (<BG SOUND>)
 - Unoptimized Default HTML5 Video
 - Video Not Optimized For Streaming (MP4)
 - Video Not Optimized For Streaming (WebM)
 - Video Seeking Not Optimized (WebM)
 - Video Tags Without Dimensions

What to Test: Specific Problems

Optimized Media Comparison

Below you can see a side by side comparison of the original GIF image to the optimized MP4 video.

Original GIF image (11.7 MB)



Optimized MP4 video (559 KB)



We optimized this GIF image by converting the animated GIF to an H.264 encoded MP4 video. This results

[Download Optimized MP4 video](#)

Response Body

This is an abbreviated response body for the HTML document as returned by the web server.

[Show entire body \(314 KB\)](#) [Show raw hex \(314 KB\)](#)

```

... (response clipped) ... ghts = appInsights; appInsights.trackPageView(); }</script>
    <script type="text/javascript" src="/TGN/js/jquery-1.10.2.min.js"></script>
980. <script type="text/javascript" src="/TGN/js/respond.min.js"></script>
    <script type="text/javascript" src="/TGN/js/jquery.bxslider.min.js"></script>

    <script type="text/javascript" src="/TGN/js/TGN_v4_s_code.js"></script>
985. <script type="text/javascript" src="/TGN/js/mainx45.min.js"></script>
    <script type="text/javascript" src="/TGN/js/Auth_4_0.js"></script>
    <script type="text/javascript" src="/TGN/js/plugins/imagesloaded.pkgd.min.js"></script>
    <script type="text/javascript" src="/TGN/js/surveyShower.js"></script>
    <script type="text/javascript">
990. var AL2016SurveySectionComplete = false;
    v ... (response clipped) ...

... (response clipped) ... nseText);
    }
  });
}

```

How to Fail on Issues

Usually obvious, defect exists or not

Tests / [headspin.io](#) / [Jun 22, 5:42 PM EST](#) /

Video Not Optimized For Streaming (MP4)

MEDIUM

Severity

EASY

Difficulty of Fix

Defect ID: 424

🚩 flags when

This defect flags on MP4 videos whose internal structure has not been optimized for web streaming.

🔇 Mute

★ Severity

Usually obvious, defect exists or not

Tests / [headspin.io](#) / Jun 22, 5:42 PM EST /

Video Not Optimized For Streaming

MEDIUM

Severity

Defect ID: 424

 flags when

This defect flags on MP4 videos whose internal

 Mute

 Severity

Affected URL



<https://headspin.io/resources/headspin/vic>

This url has been identified as a MP4 video, with a body size of 24.4 MB, and was classified a

 Set as Third Party Content  View First Party Content

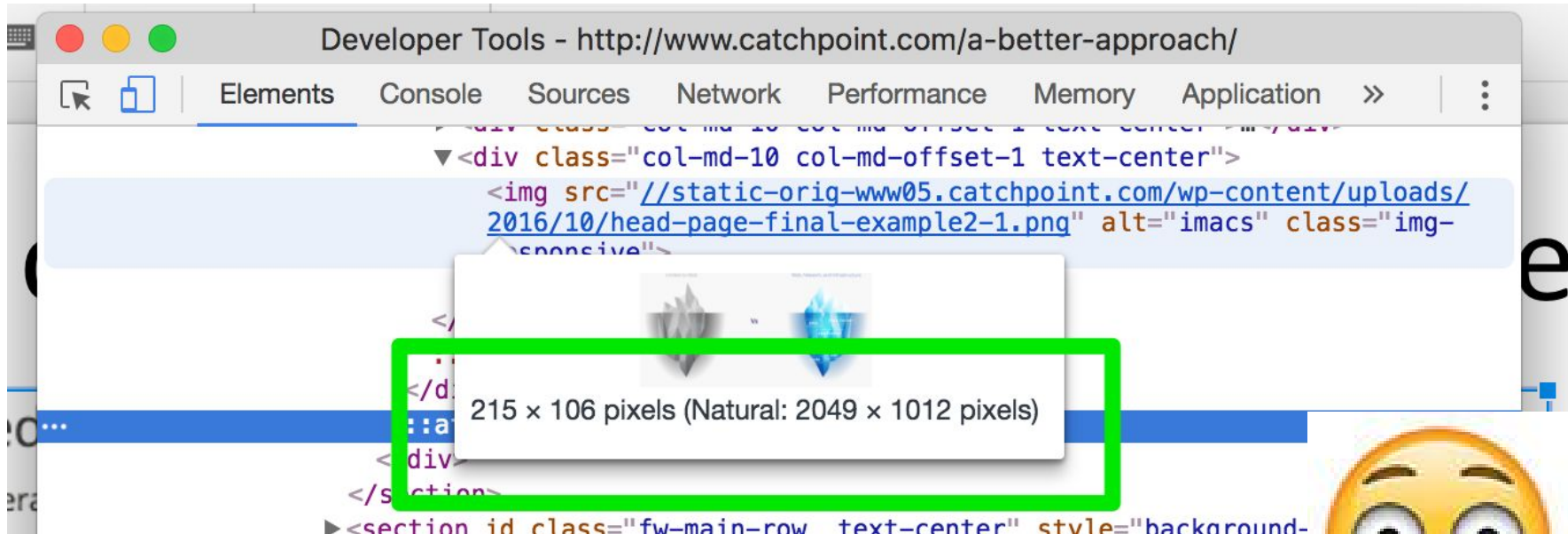
25 MB HERO VIDEO!!!

Response Headers

These are the HTTP headers returned for this URI

```
HTTP/1.1 200 OK
Content-Type: video/mp4
Content-Length: 25588296
Connection: keep-alive
Date: Wed, 21 Jun 2017 00:24:21 GMT
Last-Modified: Mon, 03 Apr 2017 19:12:11 GMT
x-amz-version-id: .5Vk0hg0VVmMTcVX73dMj4Vf5hJa8Zot
ETag: "694abd4c8aeda441d7206c837e13aae4-4"
Server: AmazonS3
X-Cache: RefreshHit from cloudfront
Via: 1.1 6419ba8f3bd94b651d416054d9416f1e.cloudfront.net (CloudFront)
X-Amz-Cf-Id: 0gsKoZPJUaBUjmuZEQK8nURNLqjvuP-DapcYEbL8wLsCHKTTkNya2w==
```

Or Catchpoint, giving you a 10x image...



Developer Tools - <http://www.catchpoint.com/a-better-approach/>

Elements Console Sources Network Performance Memory Application >>

```
<div class="col-md-10 col-md-offset-1 text-center">  
    
</div>
```

215 x 106 pixels (Natural: 2049 x 1012 pixels)



Or Catchpoint, giving you a 10x image...

ools - <http://www.catchpoint.com/a-better-approach/>

Sources

Network

Performance

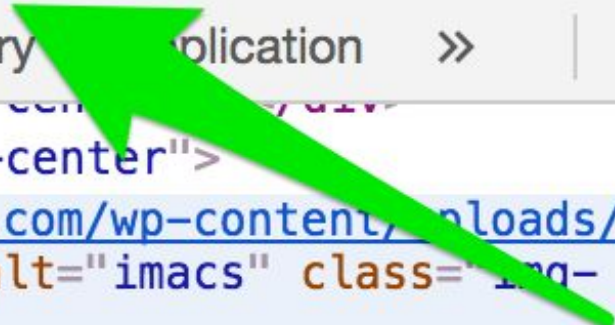
Memory

Application

>>

⋮

```
iv class="col-md-10 col-md-offset-1 text-center">  
ig-ww05.catchpoint.com/wp-content/uploads/  
al-example2-1.png" alt="imacs" class="img-
```



Thresholds may apply

Optimized Media Comparison

Below is an interactive comparison between the original JPEG image (left) and the optimized JPEG image (right).



We optimized this JPEG image by reducing the quality of the JPEG image to 70. This resulted in a savings of 315 KB (77.1%).

[Download Optimized JPEG image](#)

How to Fail on Metrics

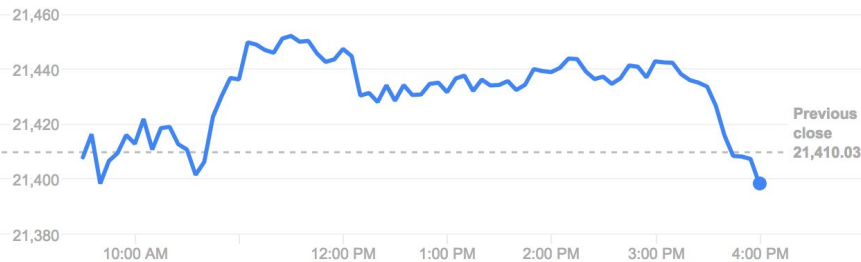
Short Term Thinking

Dow Jones Industrial Average

INDEXDJX: .DJI - Jun 22, 4:20 PM EDT

21,397.29 ↓12.74 (0.06%)

[1 day](#) |
 [5 day](#) |
 [1 month](#) |
 [3 month](#) |
 [1 year](#) |
 [5 year](#) |
 [max](#)



Open	21,407.98
High	21,456.47
Low	21,394.81

Mkt cap	-
P/E ratio	-
Div yield	-

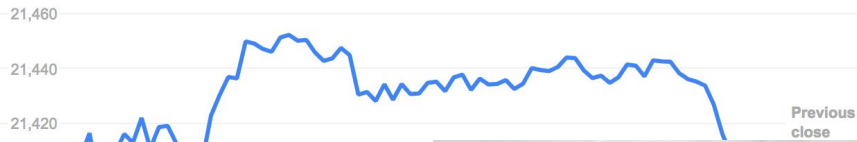
Short Term Thinking

Dow Jones Industrial Average

INDEXDJX: .DJI - Jun 22, 4:20 PM EDT

21,397.29 ↓12.74 (0.06%)

[1 day](#)
[5 day](#)
[1 month](#)
[3 month](#)
[1 year](#)
[5 year](#)
[max](#)



	10:00 AM	12:00 PM	1:00 PM
Open	21,407.98		
High	21,456.47		
Low	21,394.81		



Need Longer Term Context

Dow Jones Industrial Average

INDEXDJX: .DJI - Jun 22, 4:20 PM EDT

21,397.29 ↓12.74 (0.06%)

[1 day](#)
[5 day](#)
[1 month](#)
[3 month](#)
[1 year](#)
[5 year](#)
[max](#)



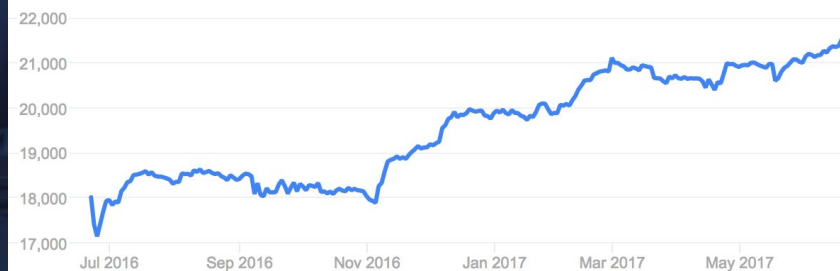
Open	21,407.98
High	21,456.47
Low	21,394.81

Dow Jones Industrial Average

INDEXDJX: .DJI - Jun 22, 4:46 PM EDT

21,397.29 ↓12.74 (0.06%)

[1 day](#)
[5 day](#)
[1 month](#)
[3 month](#)
[1 year](#)
[5 year](#)
[max](#)



Open	21,407.98
High	21,456.47
Low	21,394.81

Mkt cap	-
P/E ratio	-
Div yield	-

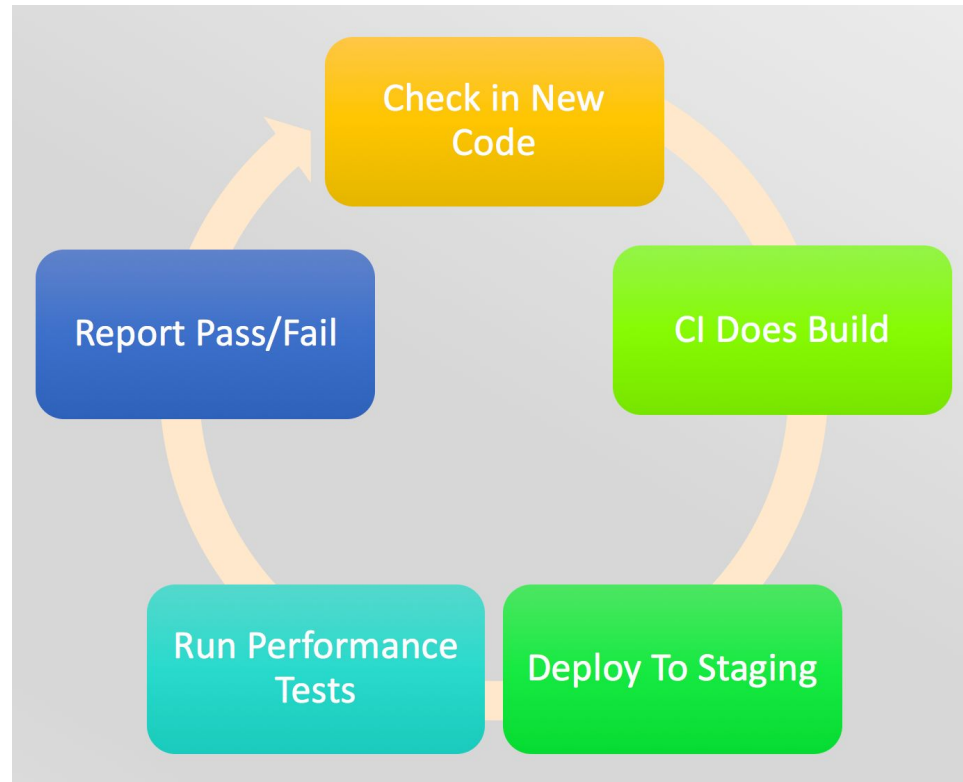


Relative Differences Since...

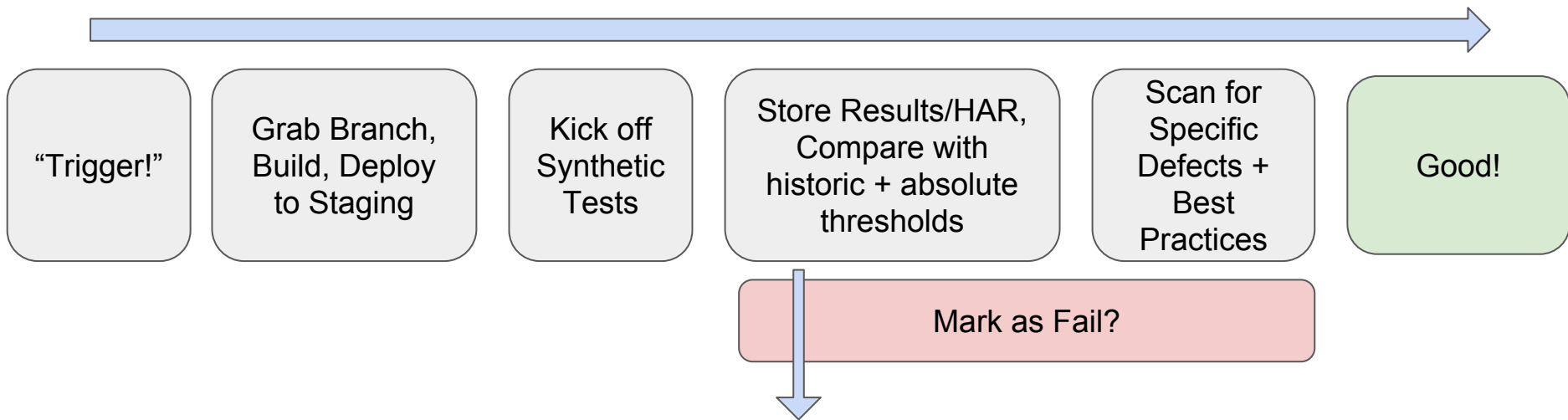
- Last Build (Sanity Check)
- Trailing 3 day median
- 2 Dev Cycles ago (~4-6 weeks)
- X month ago median (3 is good)

Automating Performance Testing (aka “How”)

Integrating Performance Testing into Dev Cycle



Automated Testing Process...



Annotate PRs, Slack, JIRA

Total defect count increased from 58 to 81	Error Alert
Commit e5f99f5	Author Roberta
Total defect count decreased from 81 to 58	Notice
Commit e5f99f5	Author Roberta
1.1 MB in content is not being cached.	Error Alert
Commit e3z22b4	Author Kyle
3 new critical performance defects were detected.	Error Alert
Commit e5b29b1	Author Sam

Add more commits by pushing to the `subject-branch` branch on `remote/repo/username/branch`.



All checks have passed

[Hide all checks](#)

2 successful checks



 **Lighthouse** — Passed. New Lighthouse score would be 100/100.

[Details](#)



 **continuous-integration/travis-ci/pr** — The Travis CI build passed

[Details](#)



This branch has no conflicts with the base branch

Merging can be performed automatically.

Merge pull request ▾

You can also [open this in GitHub Desktop](#) or view [command line instructions](#).



Write

Preview

AA ▾ B i



...Using OSS

MySQL



HTTP Archive
InfluxDB to store
Glue Code



Lighthouse
HAR+ YSlow
WPT Issues
PageSpeed Insights



“Trigger!”

Grab Branch,
Build, Deploy
to Staging

Kick off
Synthetic
Tests

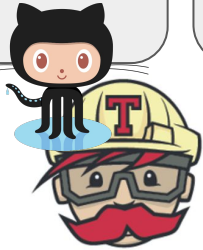
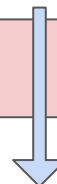
Store Results/HAR,
Compare with
historic + absolute
thresholds

Scan for
Specific
Defects +
Best
Practices

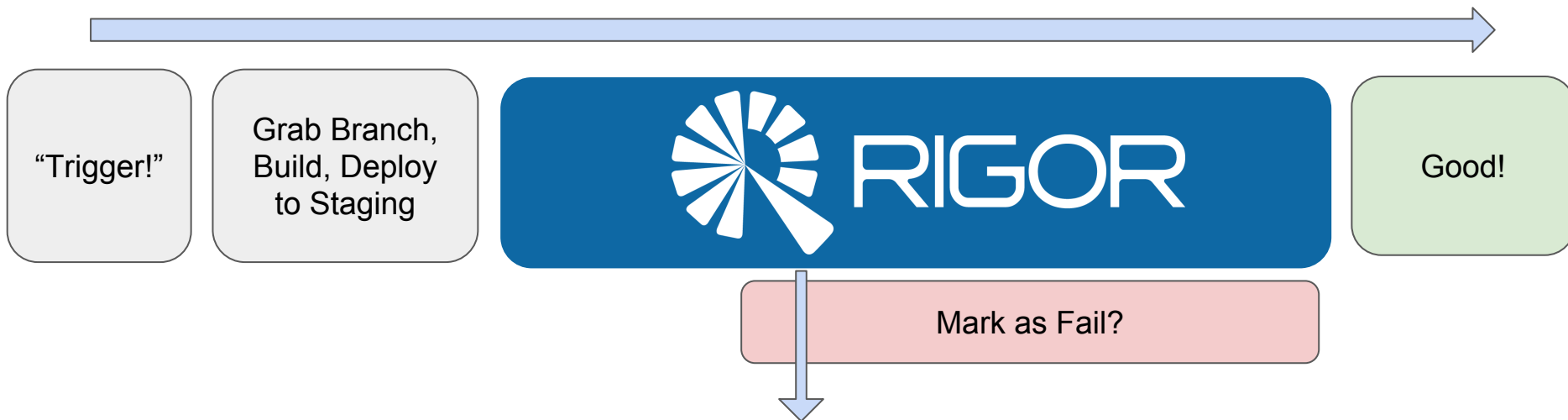
Good!



Mark as Fail?



...Or Pay Us!



Housing.com's Engineering Team Rocks



Rahul Yadav [Follow](#)

Frontend Engineering @ Housing.com

Oct 7, 2016 · 3 min read

Continuous Integration Using WebPagetest and Webpack

When we talked about Housing Go at JSFoo, there were a lot of queries about how we maintain the performance of our app over the time. Below is a description of how we do it.

We started development of Housing Go with the focus on metrics like sizes of the chunks generated using Webpack, Time to First Byte, First Paint, Speed Index etc. We knew to keep the app performant we have to make sure that we optimise and maintain these metrics by following a standard.

Marcel also Rocks

[PROGRAM](#)[VIDEO](#)[EXHIBIT HALL](#)[CONNECT](#)[ABOUT](#)[YOUR ACCOUNT](#)

Avoiding Performance Regression at Twitter

Marcel Duran (Google Inc.)

9:00am-10:30am Tuesday, 06/18/2013

Web Performance, Ballroom CD

Tutorial **Please note:** to attend, your registration must include [Tutorials](#) on Tuesday.

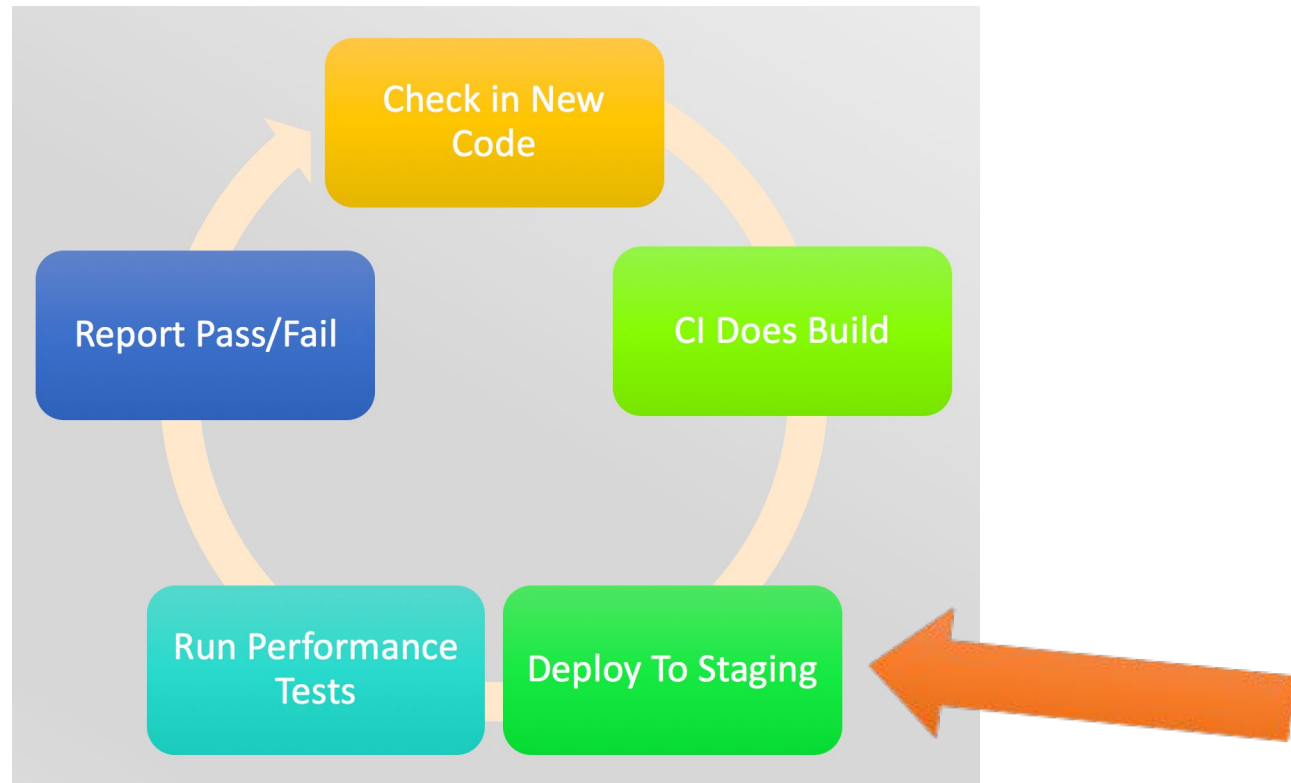
Presentation: [Avoiding Performance Regression at Twitter Presentation \[PDF\]](#)

Average rating:  (3.63, 59 ratings)

Gotcha's



So.... "Staging" ?



Where to Test

- *“Staging”* == any common, pre-prod environment
 - Stable
 - Consistent
 - Functional
- Development
 - Sanity Check before commits/PR
- Production
 - Still Important

Keep Staging Similar to Production

Staging

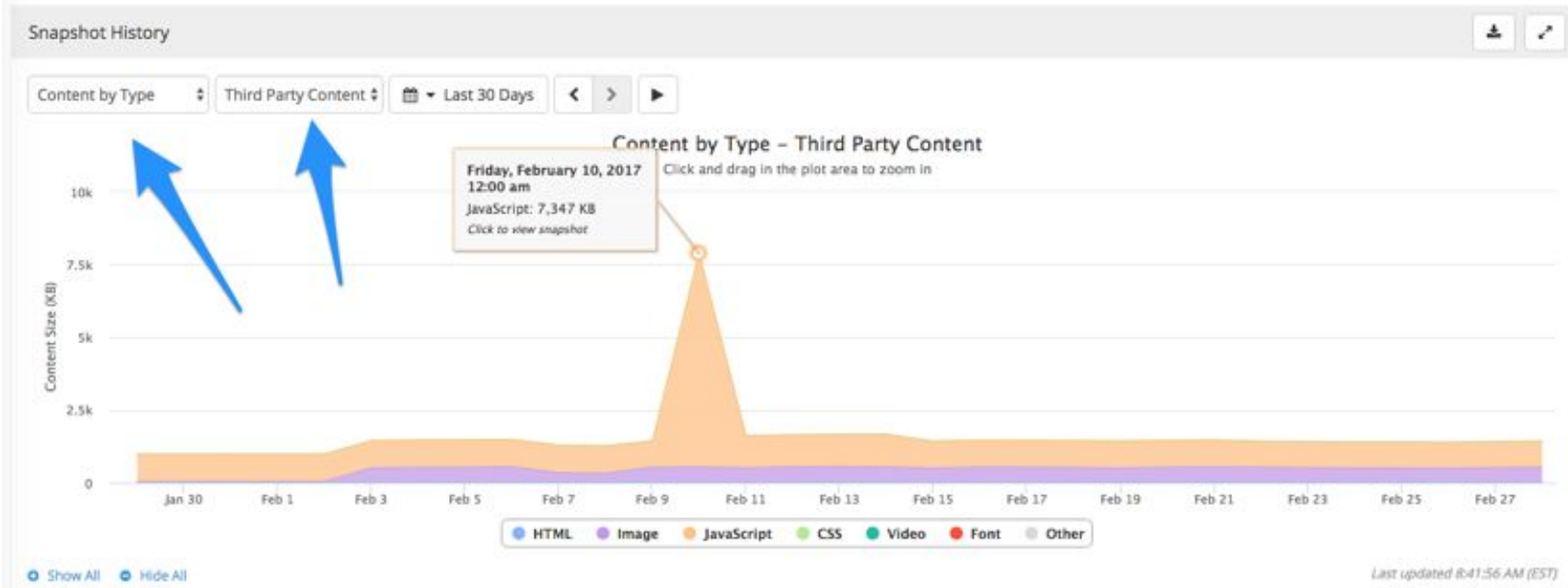


Production



Don't Forget Third Parties!

Performance Snapshots



Don't Forget the (emulated) network



Only Testing Parts of the Whole



Test Entire Flows, Not Just Pages

Blog Search User Flow

Basic **Steps** Advanced Dev

+ Add Step

1 Click Search icon

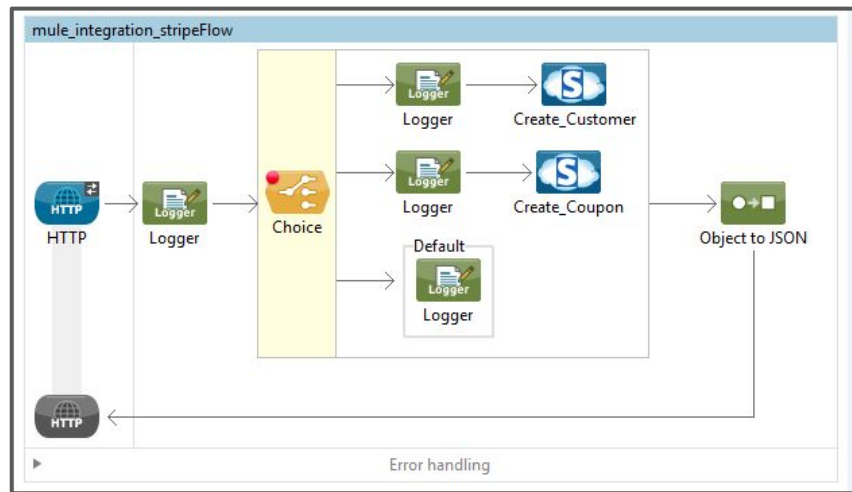
Click

2 Type "ux"

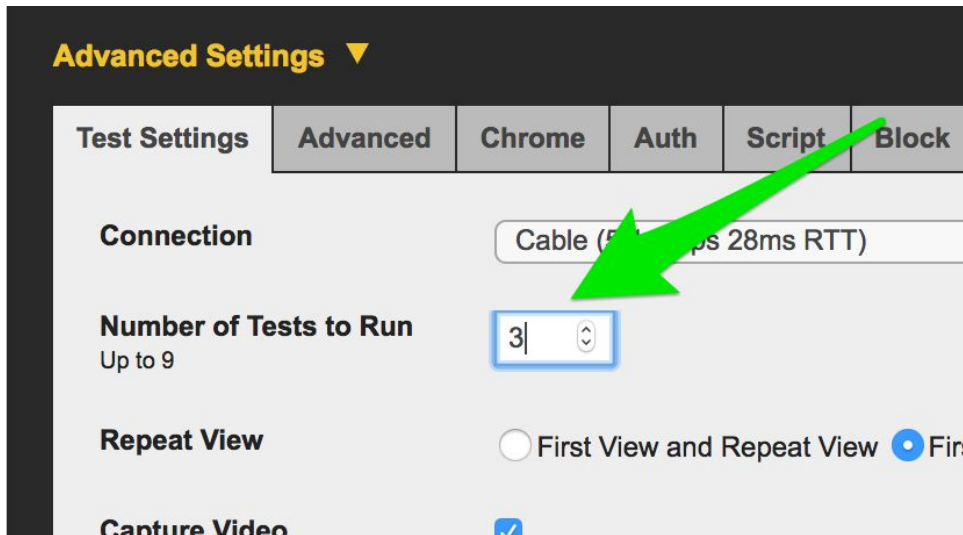
Fill in field

3 Click "Submit"

Click

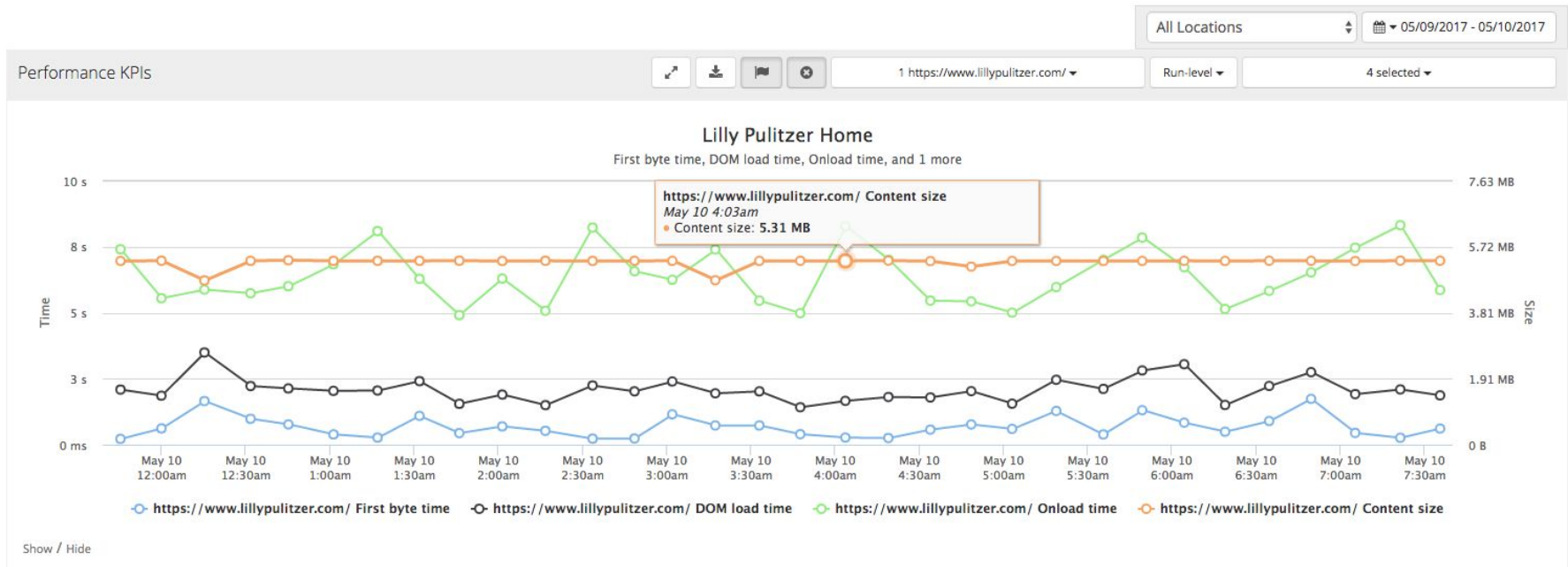


Network Jitter Skewing Metrics

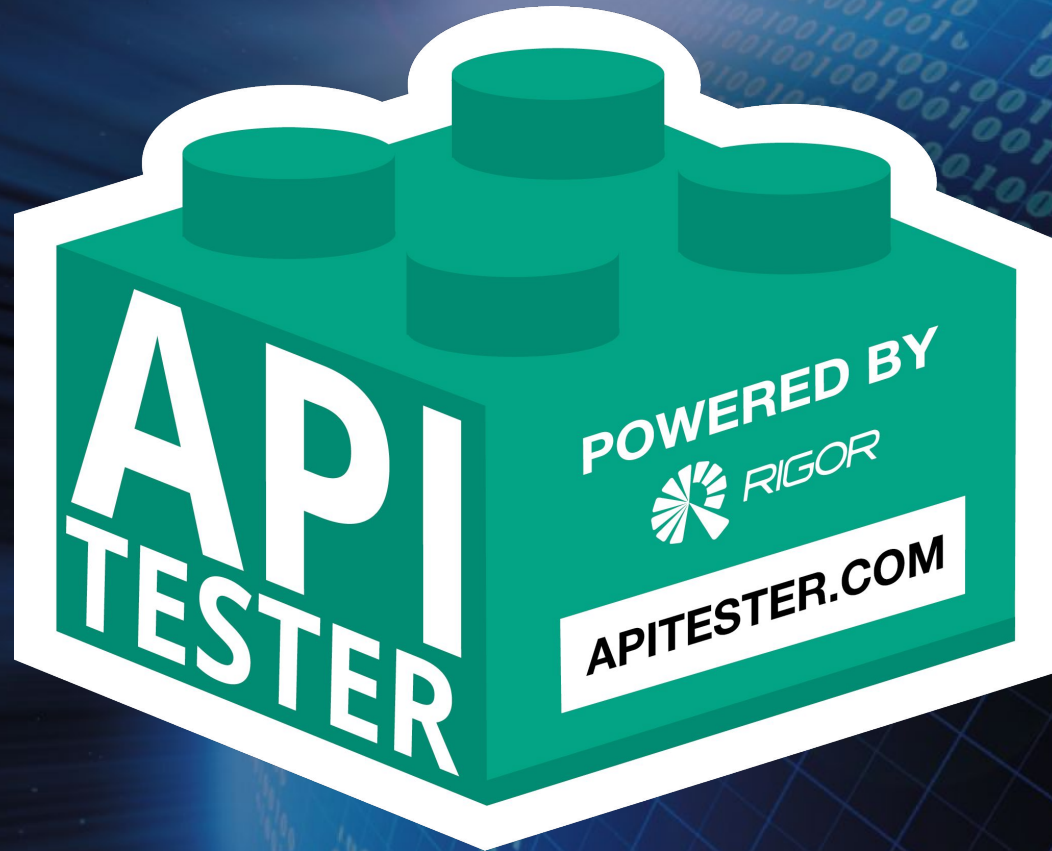


Closing the Loop with Production

Lilly Pulitzer Home Performance KPIs



FREE TOOL - [APITester.com](https://apitester.com)



FREE TOOL - APITester.com

API TESTER
BETA

Sign In

Create an Account



Guided Tour

Example Test Configuration

Use to insert a new step anywhere.

Collapse / Expand

1	Request	Get a single post				
	GET	https://jsonplaceholder.typicode.com/posts/42				
Headers + Add a Request Header						
2	Assert	Check the status code				
	Response Code	equals (numeric)		200		
3	Extract	Extract the user id				
	JSON	Response Body	\$.userid	→	custom.	user_id

FREE TOOL - APITester.com

Share Test Config ✕

Note that by creating a share link, you will be making this test configuration accessible to anyone with the link. Please do not share sensitive information in this manner.

Create Share Link

All Tests

Here are tests that you've created along with the test's status. You can click on them to view the test details or edit the test's steps, run one or more tests at once, or delete tests that you no longer use.

Search by test name...

<input type="checkbox"/>	Status [▲]	Name [▾]	
<input type="checkbox"/>	✓	Product Search Last run Today 1:06:47 PM UTC PASSED	  
<input type="checkbox"/>	✓	Create a User Last run Today 1:06:47 PM UTC PASSED	  
<input type="checkbox"/>	✓	Product Pre-order Last run Today 1:06:47 PM UTC PASSED	  
<input type="checkbox"/>	✓	Store Location Search Last run Today 1:06:47 PM UTC PASSED	  

Run Selected Tests

Questions



Billy Hoffman

billy.hoffman@rigor.com

