

Everybody Loves Performance: Easy Audits and Low-Hanging Fruit

DrupalCon Nashville

@guschilds

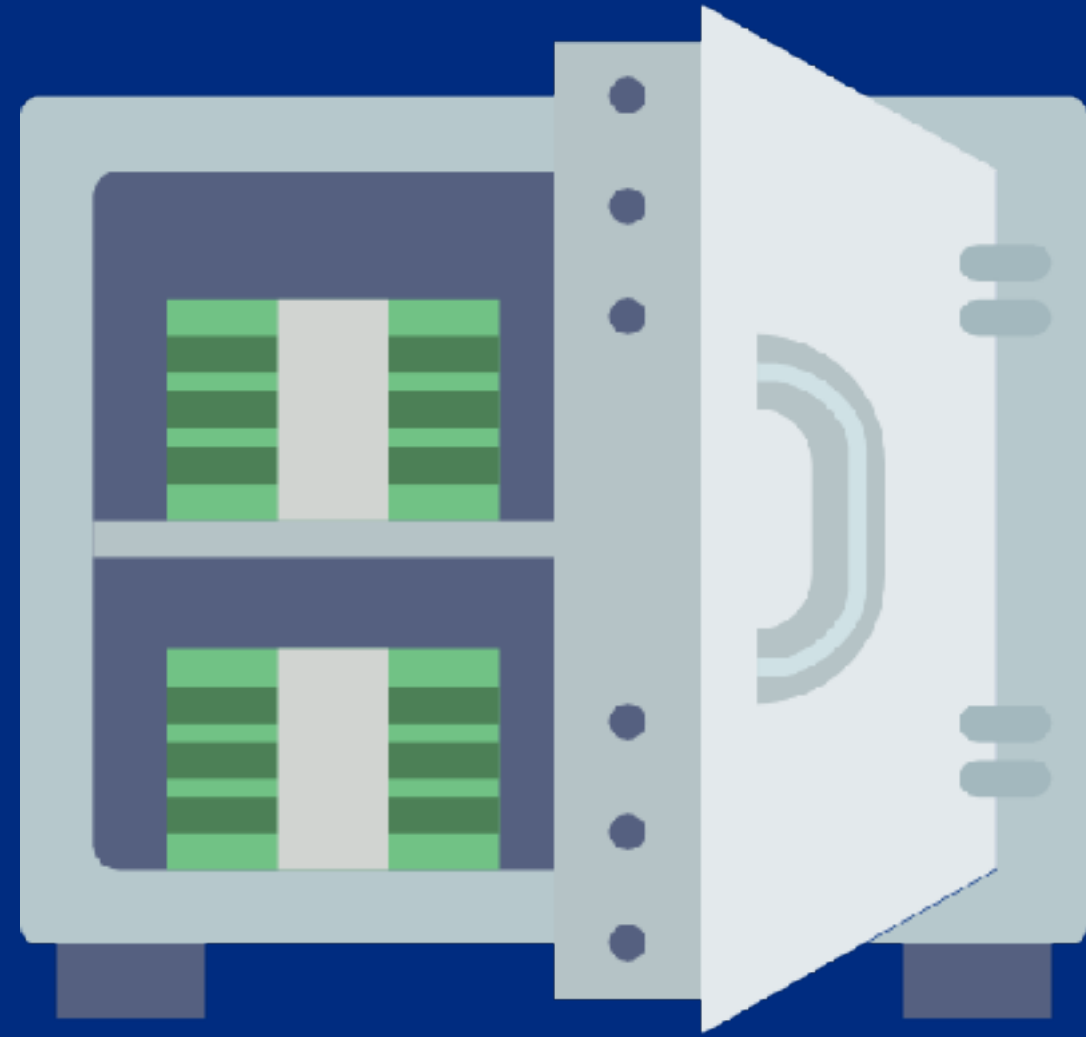
@chromatichq

Amazon sees a 1% decrease in
revenue for every 100ms
increase in load time.

(2008, wpostats.com)

BBC loses 10% of users for
every additional second
of page load time.

(2017, wpostats.com)



1 second = ~ 10% of engagement, revenue

@chromatichq

53% of users abandon sites
that take more than three
seconds to load.

(2016, Google)

PageRank will punish slow
websites starting in July 2018.

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Speed up or lose the race.

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Performance is User Experience.

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- Easy Performance Audits -
- Improving Performance -



Gus Childs

Technical PM, Front-end Developer
@guschilds

@chromatichq



Chromatic

Design, Development, DevOps, Support
chromatichq.com

@chromatichq

- Easy Performance Audits -

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Audits

1. Metrics
2. Tools
3. Benchmarks
4. Goals
5. Results



1. Metrics

What should we measure?

1. Metrics

Speed Index

Time to First Byte

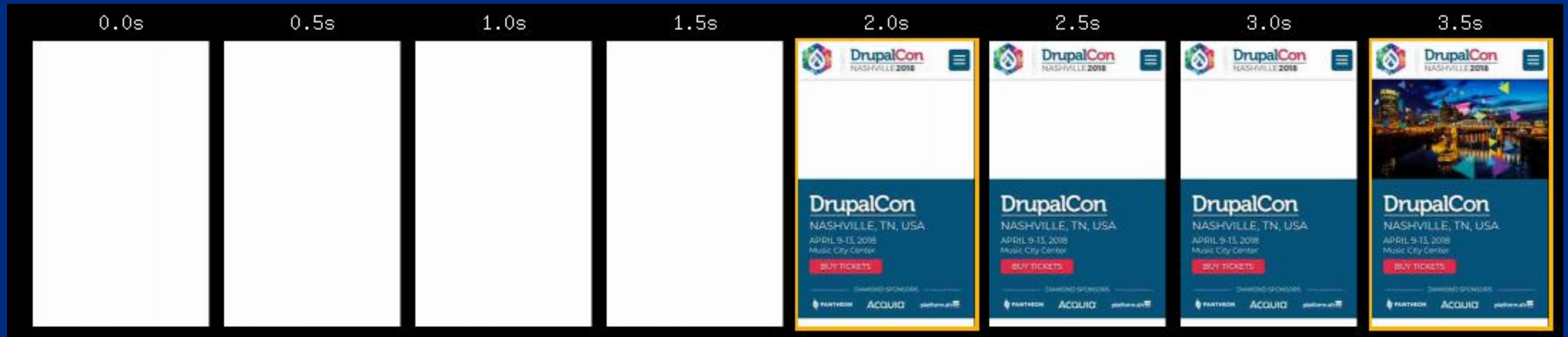
Start Render

Load Time

Fully Loaded

Speed Index

When the content within the viewport is fully visible.
Measures perceived performance.



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“Users don't care what your load times are, they care about having a good experience.”

(keycdn)

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Old metrics still matter!

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Time To First Byte

When the browser's request receives the response's first byte.



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Start Render

When the first non-white content is painted in the browser.



Load Time

When the browser fires the window load event (onload) to signify that the page and its content have loaded.



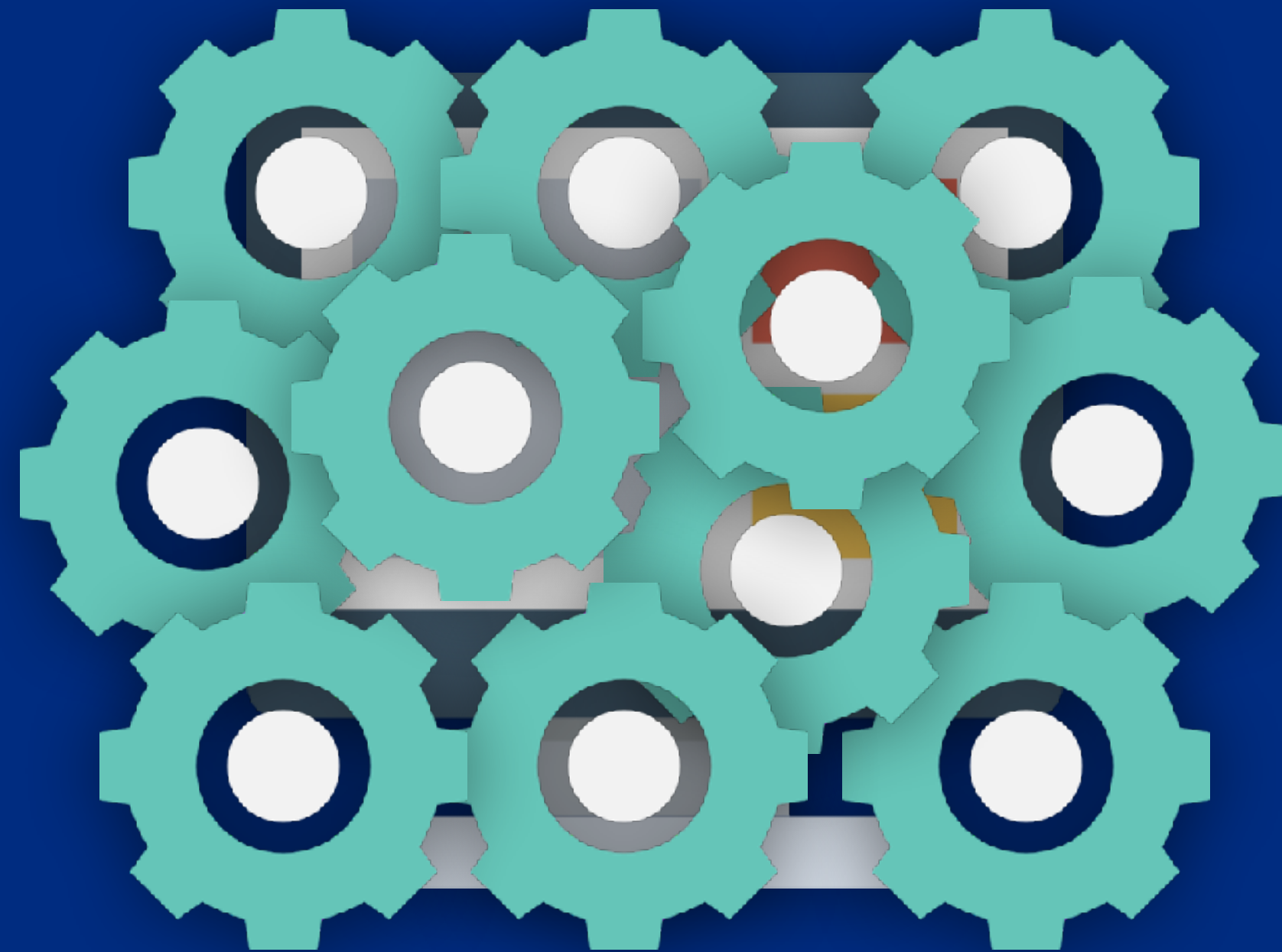
Fully Loaded

When there has been 2 seconds of no network activity, including everything triggered by JavaScript.



Fully Loaded

When there has been 2 seconds of no network activity, including everything triggered by JavaScript.



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1. Metrics

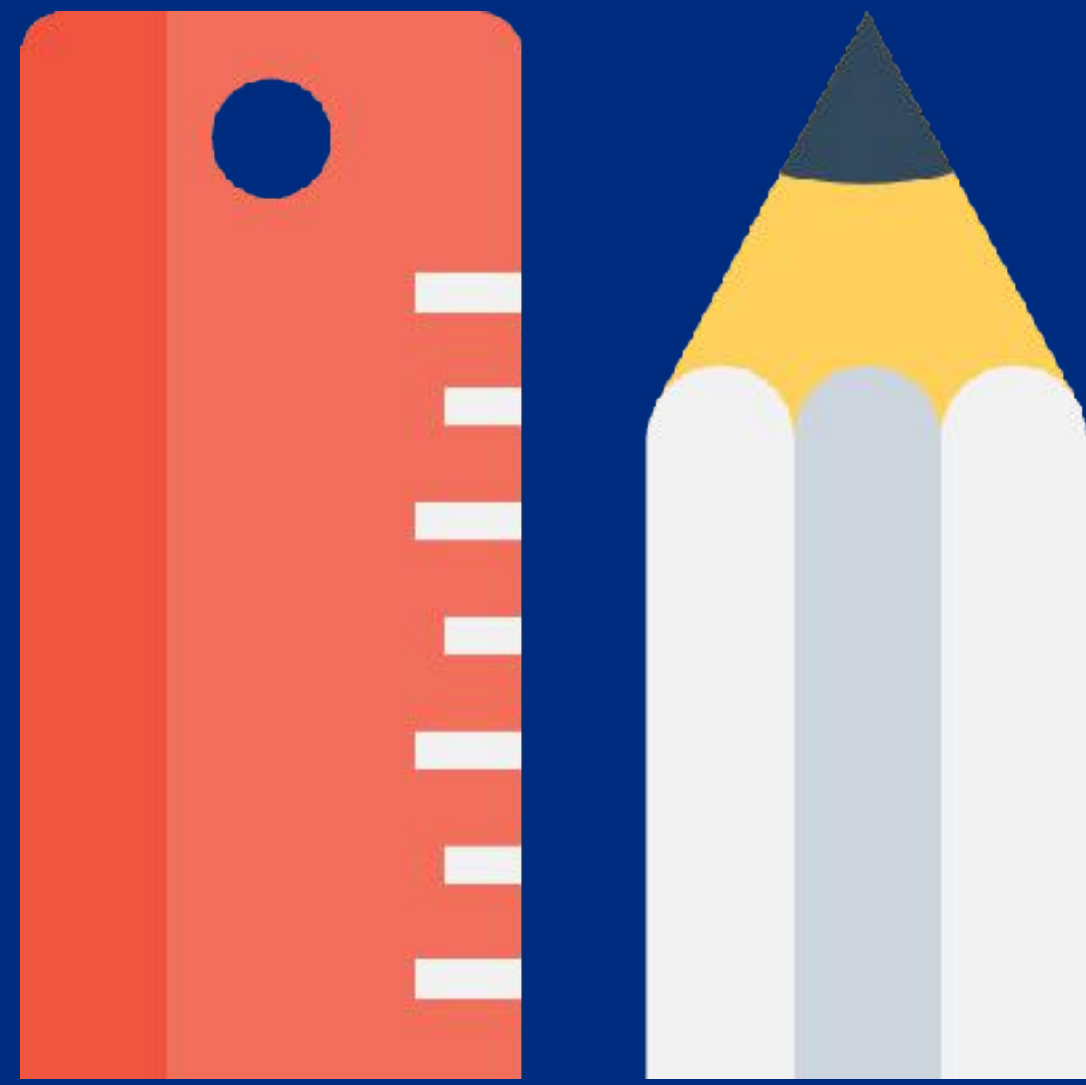
Speed Index

Time to First Byte

Start Render

Load Time

Fully Loaded



2. Tools

How should we measure?

2. Tools

WebPagetest

PageSpeed Insights

Lighthouse

**Be aware of hardware
and network specs for
consistent results.**

WebPagetest

webpagetest.org

(Free. Consistent hardware/network.)

@chromatichq

Test a website's performance

HOME TEST RESULT TEST HISTORY FORUMS DOCUMENTATION ABOUT

Advanced Testing **Simple Testing** Visual Comparison Traceroute

Test Location

Browser

Advanced Settings ▼

Test Settings **Advanced** Chrome Auth Script Block SPOF Custom

Connection

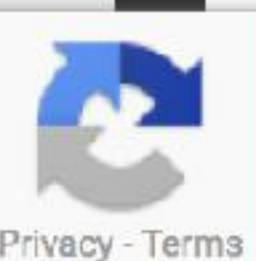
Number of Tests to Run
Up to 9

Repeat View First View and Repeat View First View Only

Capture Video

Keep Test Private

Label

 protected by reCAPTCHA
[Privacy - Terms](#)

Web Page Performance Test for

<https://events.drupal.org/nashville2018>

From: Dulles, VA - Chrome - Cable
3/21/2018, 6:05:31 PM

[Need help improving?](#)

A	A	B	C	F	✓
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN

Tester: VM1-04-192.168.11.91

First View only

Test runs: 3

[Re-run the test](#)

[Raw page data](#) - [Raw object data](#)
[Export HTTP Archive \(.har\)](#)
[View Test Log](#)

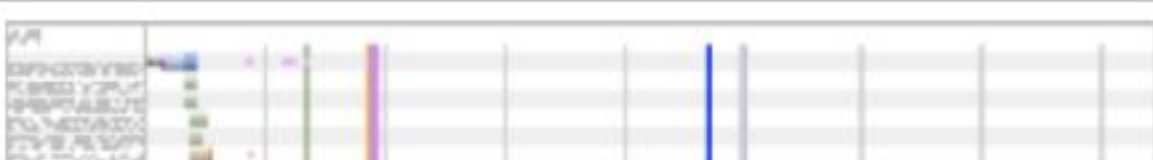
Performance Results (Median Run)

	Load Time	First Byte	Start Render	Speed Index	First Interactive (beta)	Document Complete			Fully Loaded			
						Time	Requests	Bytes In	Time	Requests	Bytes In	Cost
First View (Run 1)	4.702s	0.308s	1.900s	2797	6.086s	4.702s	60	2,317 KB	8.107s	67	2,337 KB	\$\$\$\$\$

[Plot Full Results](#)

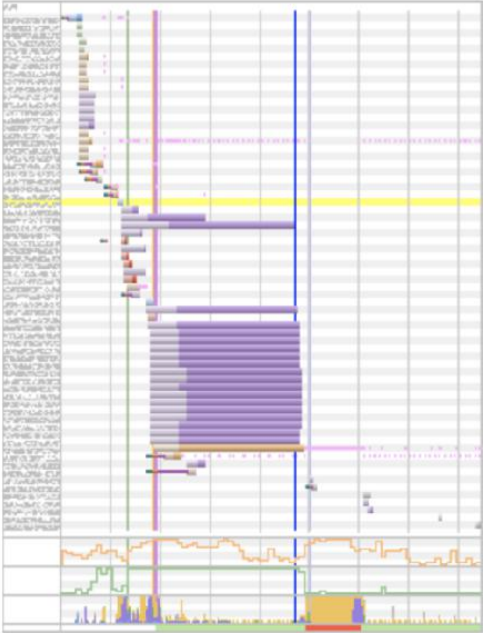

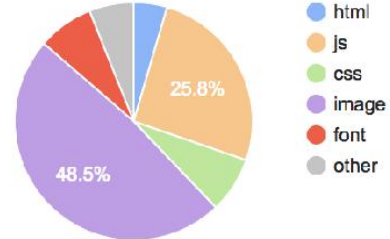
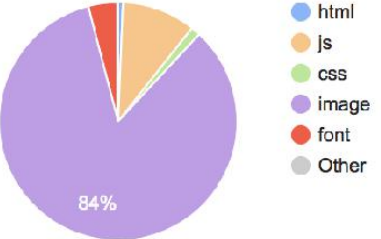
Test Results

Run 1:



	Waterfall	Screen Shot	Video
			

Test Results

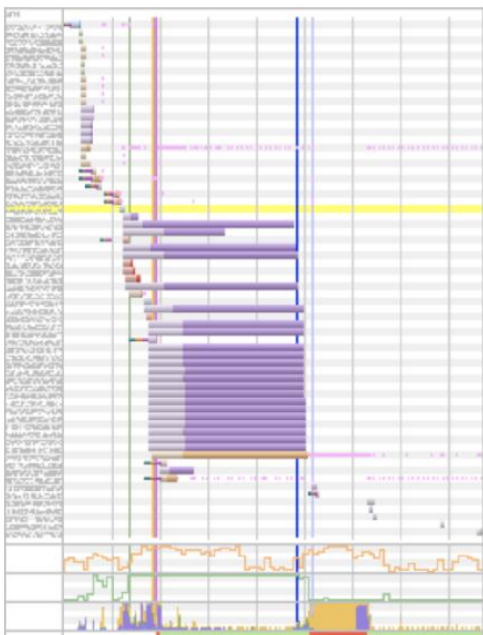

Run 1:

	Waterfall	Screen Shot	Video
<p>First View (4.702s)</p> <p>Timeline (view)</p> <p>Processing Breakdown</p> <p>Trace (view)</p>			<p>Filmstrip View</p> <p>Watch Video</p>
<p>Content Breakdown</p>	<p>Requests</p>  <ul style="list-style-type: none"> html js css image font other 	<p>Bytes</p>  <ul style="list-style-type: none"> html js css image font Other 	

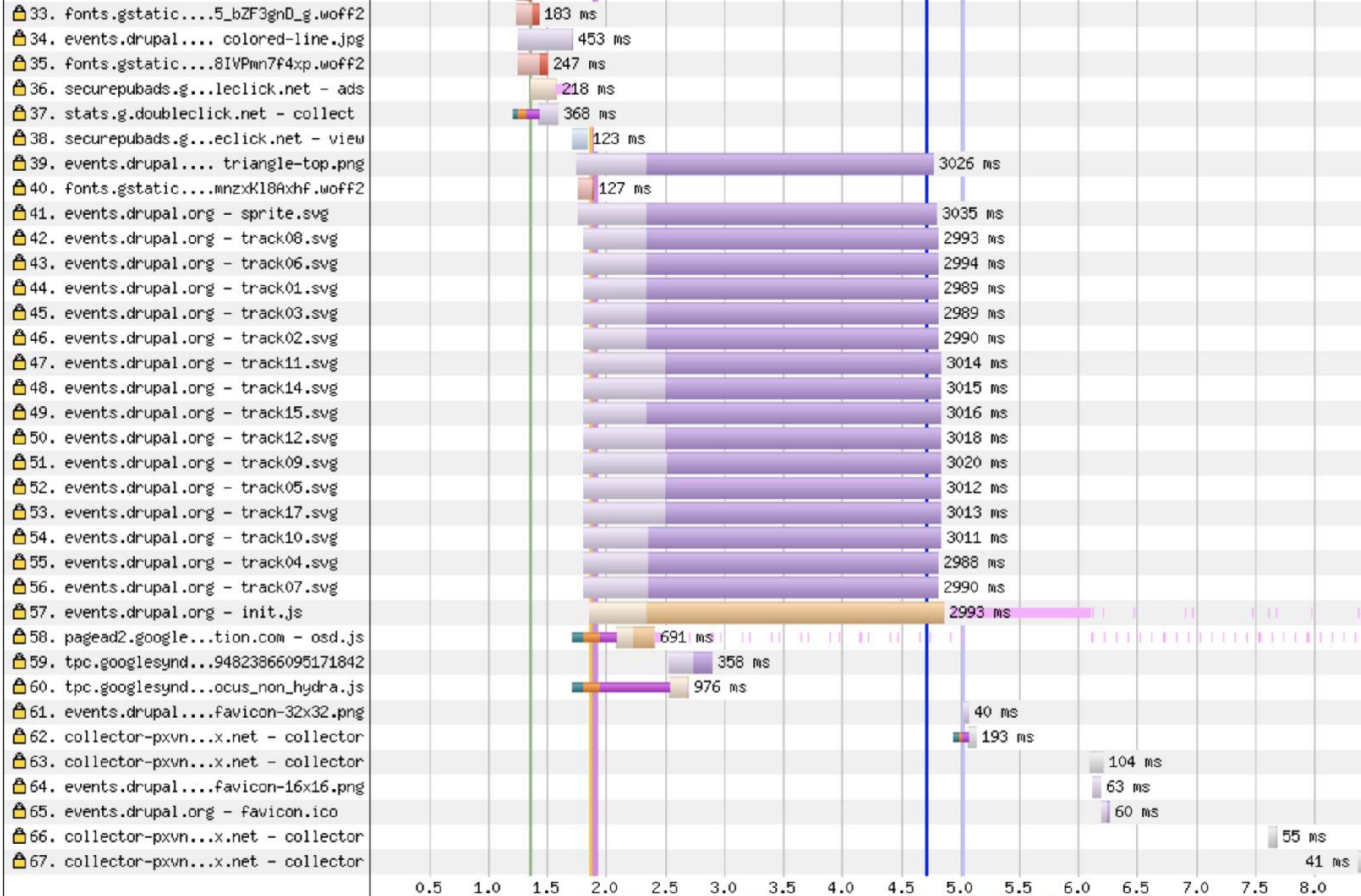
Run 2:

	Waterfall	Screen Shot	Video
<p>First View (5.868s)</p> <p>Timeline (view)</p> <p>Processing Breakdown</p> <p>Trace (view)</p>			<p>Filmstrip View</p> <p>Watch Video</p>

Run 3:

	Waterfall	Screen Shot	Video
<p>First View (4.860s)</p> <p>Timeline (view)</p> <p>Processing Breakdown</p> <p>Trace (view)</p>			<p>Filmstrip View</p> <p>Watch Video</p>

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Compress Images: 74/100

1,836.2 KB total in images, target size = 1,354.1 KB - potential savings = 482.1 KB

WARNING - (1,045.5 KB, compressed = 581.3 KB - savings of **464.3 KB**) -

https://events.drupal.org/sites/all/themes/da_events/nashville2018_full/dist/images/background/cover/cover.jpg

WARNING - (603.8 KB, compressed = 590.7 KB - savings of **13.1 KB**) - https://events.drupal.org/sites/default/files/nashville_cover.jpg

FAILED - (5.0 KB, compressed = 1.9 KB - savings of **3.1 KB**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/background/pattern/colored-line.jpg

WARNING - (18.5 KB, compressed = 17.0 KB - savings of **1.5 KB**) - <https://tpc.googlesyndication.com/simgad/15094823866095171842>

Use Progressive JPEGs: 98/100

1,654.4 KB of a possible 1,672.9 KB (99%) were from progressive JPEG images

FAILED (18.5 KB) - <https://tpc.googlesyndication.com/simgad/15094823866095171842>

Leverage browser caching of static assets: 38/100

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/background/pattern/triangle-top.png

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/nashville2018_full/dist/images/sprite.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/background/pattern/colored-line.jpg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/logo/drupalcon_small.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/background/pattern/triangle-bottom.png

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track17.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/dist/images/background/cover/bg.png

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/nashville2018_full/dist/images/background/cover/cover.jpg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track05.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track01.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track10.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track08.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track03.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track02.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track04.svg

FAILED - (**No max-age or expires**) - https://events.drupal.org/sites/all/themes/da_events/drupalcon/src/images/tracks/track07.svg

Use WebPagetest to:

- Obtain your “official” metrics.
- Find potential improvements.
- Automate repeated tests (advanced).

PageSpeed Insights

developers.google.com/speed/pagespeed/insights/

(Free. Consistent hardware/network.)

@chromatichq



Mobile



Desktop

Speed

Average

1.8s FCP 2.1s DCL

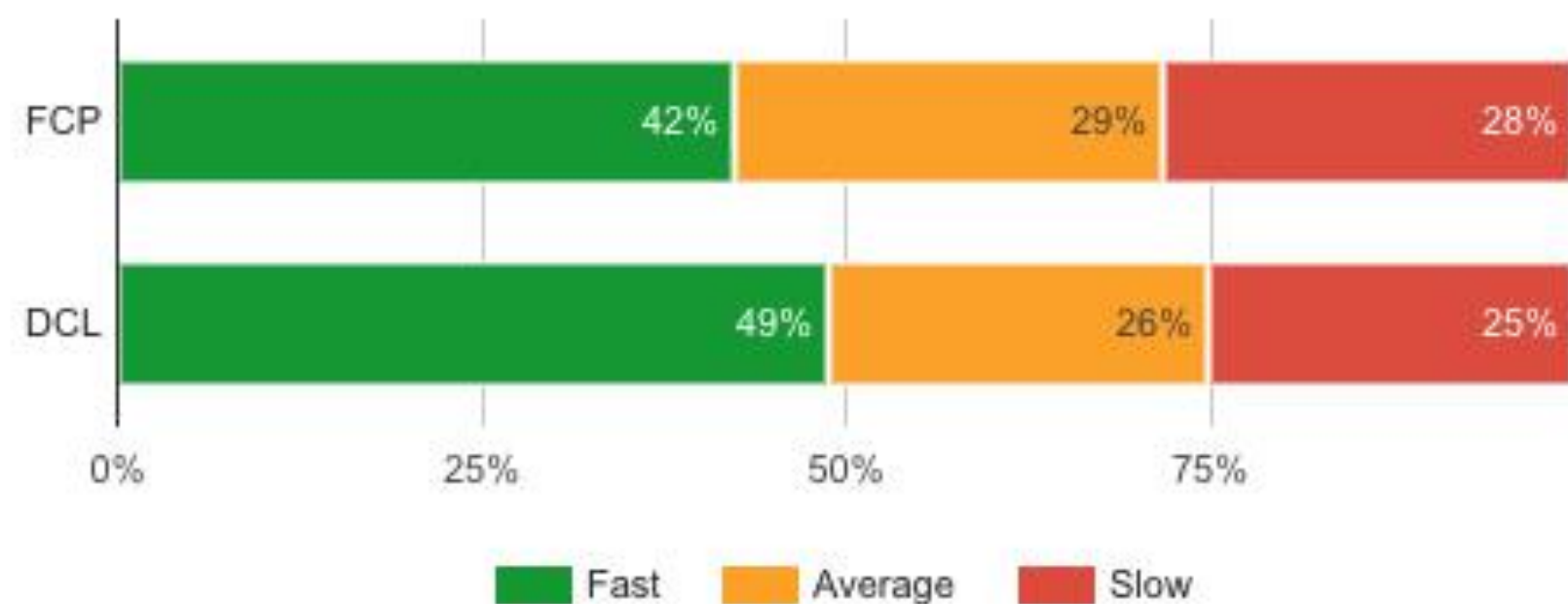
Optimization

Medium

62 / 100

Data from the Chrome User Experience report indicates this page's median **FCP** (1.8s) and **DCL** (2.1s) ranks it in the middle third of all pages. This page has a medium level of optimization because some of its resources are render-blocking. [Learn more.](#)

Page Load Distributions



The distribution of this page's FCP and DCL events, categorized as Fast (fastest third), Average (middle third), and Slow (bottom third).

Page Stats

PSI estimates this page requires 8 additional round trips to load render blocking resources and 2.5 MB to fully render. The median page requires 4 render blocking round trips and 1.2 MB. Fewer round trips and bytes results in faster pages.

Optimization Suggestions

Eliminate render-blocking JavaScript and CSS in above-the-fold content

▶ [Show how to fix](#)





Mobile



Desktop

Speed

Average

1.8s FCP 2.2s DCL

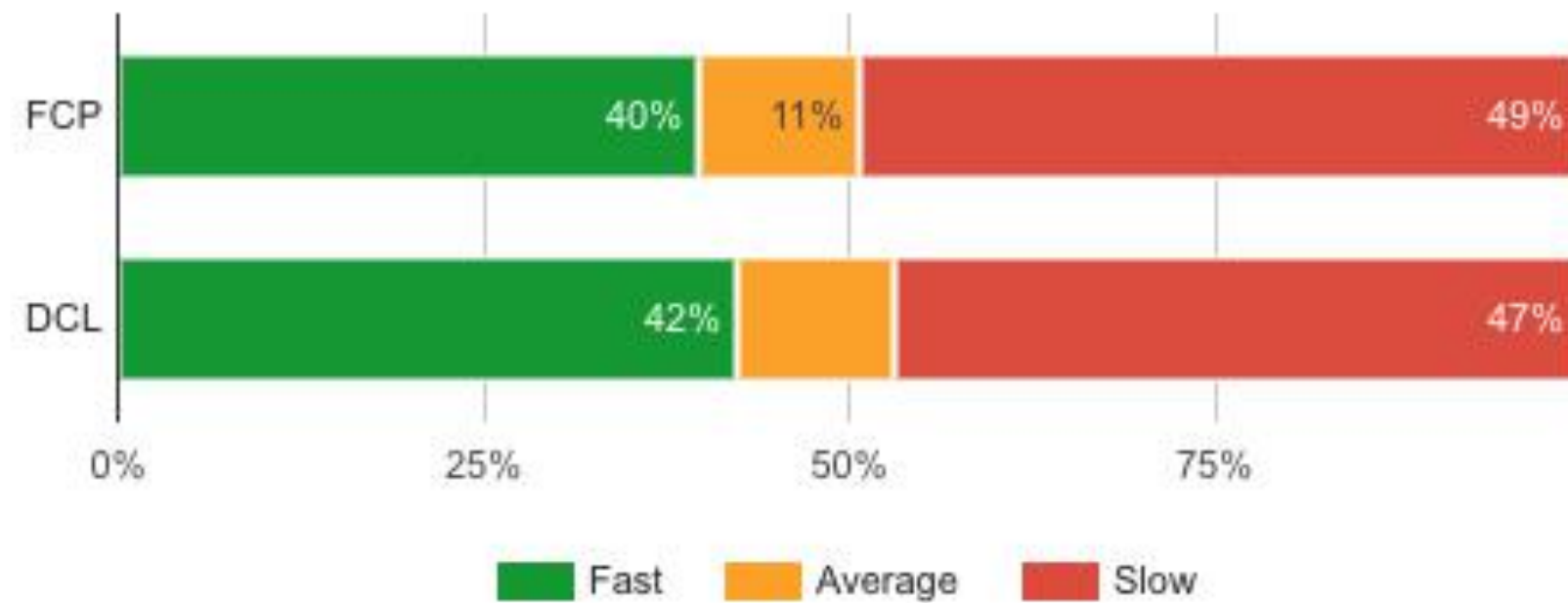
Optimization

Low

47 / 100

Data from the Chrome User Experience report indicates this page's median **FCP** (1.8s) and **DCL** (2.2s) ranks it in the middle third of all pages. This page has a low level of optimization because most of its resources are render-blocking. [Learn more.](#)

Page Load Distributions



The distribution of this page's FCP and DCL events, categorized as Fast (fastest third), Average (middle third), and Slow (bottom third).

Page Stats

PSI estimates this page requires 8 additional round trips to load render blocking resources and 2.3 MB to fully render. The median page requires 4 render blocking round trips and 1.5 MB. Fewer round trips and bytes results in faster pages.

Optimization Suggestions

Optimize images

▶ [Show how to fix](#)





Mobile



Desktop

Speed

Average

1.8s FCP 2.1s DCL

Optimization

Medium

62 / 100

Data from the Chrome User Experience report indicates this page's median **FCP** (1.8s) and **DCL** (2.1s) r page has a medium level of optimization because some of its resources are render-blocking. [Learn mo](#)

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Optimization Suggestions

Eliminate render-blocking JavaScript and CSS in above-the-fold content

▶ [Show how to fix](#)

Enable compression

▶ [Show how to fix](#)

Leverage browser caching

▶ [Show how to fix](#)

Minify JavaScript

▶ [Show how to fix](#)

Optimize images

▶ [Show how to fix](#)

Optimizations Already Present

▶ [Show details](#)

Download optimized [image](#), [JavaScript](#), and [CSS resources](#) for this page.

The speed data is updated weekly, and the optimization results are cached for 30s. To see updated optimization analysis, please wait for 30s before re-running the test.



Optimization Suggestions

Eliminate render-blocking JavaScript and CSS in above-the-fold content

Your page has 12 blocking script resources and 6 blocking CSS resources. This causes a delay in rendering your page.

None of the above-the-fold content on your page could be rendered without waiting for the following resources to load. Try to defer or asynchronously load blocking resources, or inline the critical portions of those resources directly in the HTML.

[Remove render-blocking JavaScript:](#)

<https://ajax.googleapis.com/ajax/libs/jquery/1.8.3/jquery.js>

<https://events.drupal.org/misc/jquery.once.js?v=1.2>

<https://events.drupal.org/misc/drupal.js?p6bkfd>

https://events.drupal.org/...rg_crosssite/js/jquery.timeago.js?p6bkfd

https://events.drupal.org/...ossite/js/drupalorg_crosssite.js?p6bkfd

https://events.drupal.org/...ontrib/field_group/field_group.js?p6bkfd

https://partner.googleadservices.com/gampad/google_service.js

https://events.drupal.org/...ogle_analytics/googleanalytics.js?p6bkfd

https://securepubads.g.doubleclick.net/qampad/google_ads.js

[Optimize CSS Delivery](#) of the following:

<https://events.drupal.org/...f-fncB6ztZfd2huxqgxu4W0-qwma6Xer30m4.css>

<https://events.drupal.org/...B6hBk8Glt5E2o4gGill4hls6VeRN2fAkzoms.css>

<https://events.drupal.org/...zbUPIPTCW2aIY7YT0N7T9QGS629S-ZsTIZ88.css>

https://events.drupal.org/..._xUTIVzxNMcyH8qpCYL4YnRhY400ylttLmAs.css

<https://fonts.googleapis.com/...Montserrat:300,300i,400,400i,500,600,900>

<https://fonts.googleapis.com/...Montserrat:300,300i,400,400i,500,600,900>

[▲ Hide details](#)

Use PageSpeed Insights to:

- Obtain easy-to-digest x/100 score.
- Find potential improvements.

Lighthouse

DevTools & github.com/GoogleChrome/lighthouse

(Free. **Inconsistent** hardware/network.)

@chromatichq

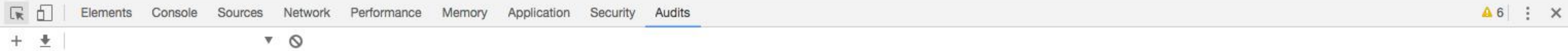
KNOXVILLE, TN, USA
APRIL 9-13, 2018
Music City Center

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DrupalCon unites experts from around the globe who create ambitious digital experiences.
Network, learn, and be inspired.



Audits help you identify and fix common problems that affect your site's performance, accessibility, and user experience. [Learn more](#)

Perform an audit...



Auditing events.drupal.org...

Lighthouse is gathering information about the page to compute your score.

Cancel

Audits help you identify and fix common problems that affect your site's performance, accessibility, and user experience. [Learn more](#)

Perform an audit...



Performance



Progressive Web App



Accessibility



Best Practices



SEO

Performance

These encapsulate your web app's current performance and opportunities to improve it.



Metrics

These metrics encapsulate your web app's performance across a number of dimensions.



Performance

These encapsulate your web app's current performance and opportunities to improve it.

Metrics

These metrics encapsulate your web app's performance across a number of dimensions.



▶ First meaningful paint **6,290 ms**

▶ First Interactive (beta) **10,720 ms**

▶ Consistently Interactive (beta) **14,990 ms**

▶ Perceptual Speed Index: 5,652

48

▶ Estimated Input Latency: 17 ms

100

Opportunities

These are opportunities to speed up your application by optimizing the following resources.

▶ Properly size images

7,050 ms

1,279 KB

▼ Offscreen images

6,330 ms

1,148 KB

Opportunities

These are opportunities to speed up your application by optimizing the following resources.

- ▶ Properly size images  7,050 ms
1,279 KB
- ▼ Offscreen images  6,330 ms
1,148 KB

Consider lazy-loading offscreen images to improve page load speed and time to interactive. [Learn more.](#)

▼ View Details

URL	Original	Potential Savings
 ...cover/cover.jpg (events.drupal.org)	1,046 KB	1,046 KB (100%)
 ...pattern/triangle-top.png (events.drupal.org)	56 KB	56 KB (100%)
 ...pattern/triangle-bottom.png (events.drupal.org)	53 KB	47 KB (89%)

- ▶ Serve images in next-gen formats  5,830 ms
1,057 KB
- ▶ Optimize images  2,270 ms
413 KB
- ▶ Reduce render-blocking scripts  1,500 ms
- ▶ Reduce render-blocking stylesheets  1,040 ms
- ▶ Minify JavaScript  230 ms



This repository

Search

Pull requests

Issues

Marketplace

Explore



GoogleChrome / lighthouse



Watch

384

Star

12,899

Fork

2,465

Code

Issues 303

Pull requests 26

ZenHub

Projects 3

Insights

Auditing, performance metrics, and best practices for Progressive Web Apps <https://developers.google.com/web/too...>

audit best-practices performance-metrics pwa web performance-analysis developer-tools chrome-devtools

2,517 commits

70 branches

49 releases

121 contributors

Apache-2.0

Branch: master

New pull request

Create new file

Upload files

Find file

Clone or download

patrickhulce	core: unify config and CLI settings (#4849)	Latest commit ecb3a8c a day ago
.github	misc(codeowners): revert brendan's leave (#4716)	20 days ago
assets	misc(logos): provide svg logo as png	5 months ago
build/changelog-generator	misc(changelog): tweaks to changelog template and instructions (#3849)	4 months ago
chrome-launcher	Switch to using standalone chrome-launcher package (#3410)	6 months ago
docs	docs(releasing): updates	6 days ago
lighthouse-cli	core: unify config and CLI settings (#4849)	a day ago

Use Lighthouse to:

- Find potential improvements.
- Automate repeated tests (advanced).



Thanks, Google

@chromatichq

SpeedCurve

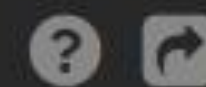
speedcurve.com

(Not free. “Synthetic” tests & RUM.)

@chromatichq



RESPONSIVE: GUARDIAN AND HOME IN US WEST COAST LAST 1 MONTH SHOW SPEEDINDEX ▾



- Changes
- Favorites
- LUX
- Synthetic

SPEEDINDEX

Notes

Apple iPhone 5

3.5s

#4 94% slower

iPhone 6 2x CPU

3s

#3 67% slower

Apple iPad

2s

#2 11% slower

Chrome

1.8s

#1

Firefox

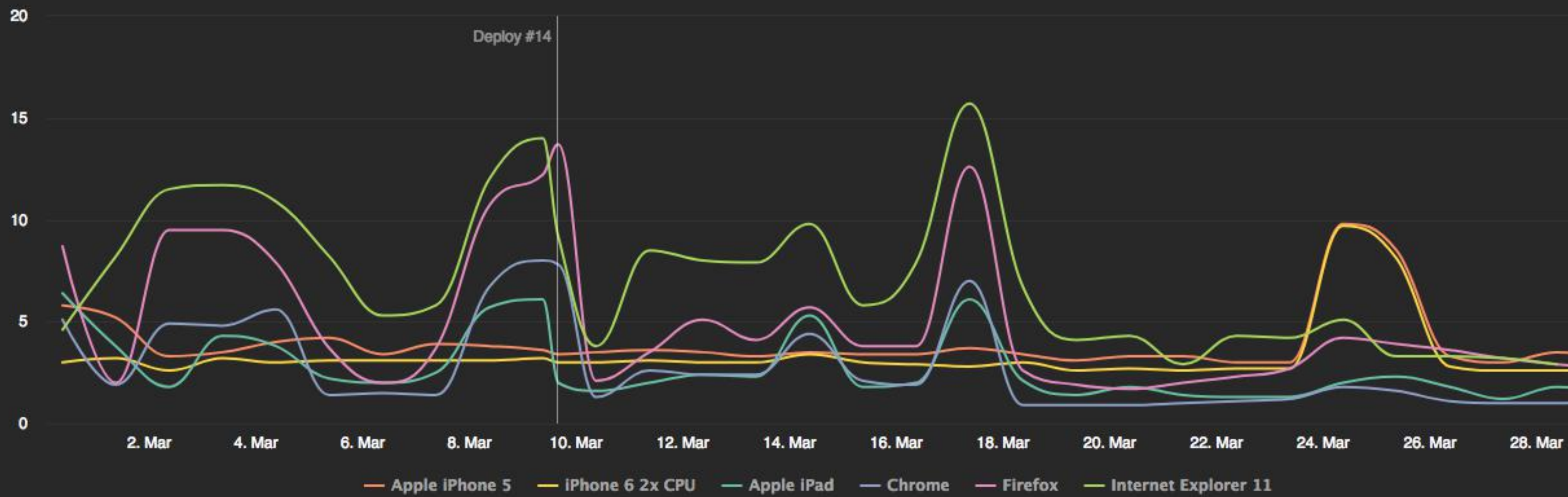
3.7s

#5 106% slower

Internet Explorer 11

5.8s

#6 222% slower



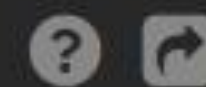
LATEST FILMSTRIPS

VIDEO OPTIONS

0.0s 0.5s 1.0s 1.5s 2.0s 2.5s 3.0s



BENCHMARK: ARTICLE IN APPLE IPAD IN US WEST COAST LAST 1 MONTH SHOW SPEEDINDEX ▾



- Changes
- Favorites
- LUX
- Synthetic

SPEEDINDEX

Notes

Guardian

2s

#2 11% slower

Huffington

1.8s

#1

NY Times

10.4s

#6 478% slower

Smashing

2s

#2 11% slower

TechCrunch

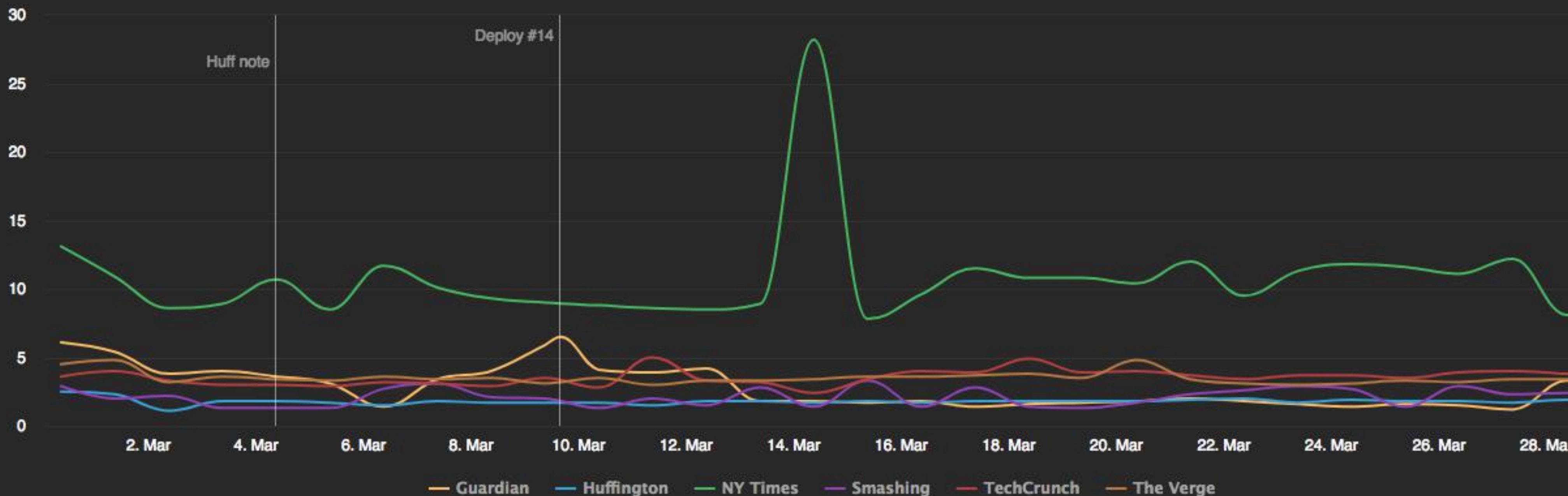
3.5s

#5 94% slower

The Verge

3.4s

#4 89% slower



LATEST FILMSTRIPS

VIDEO OPTIONS

0.0s

0.5s

1.0s

1.5s

2.0s

2.5s

3.0s

Use SpeedCurve to:

Continuously monitor a site across devices against the competition, with a polished UI.

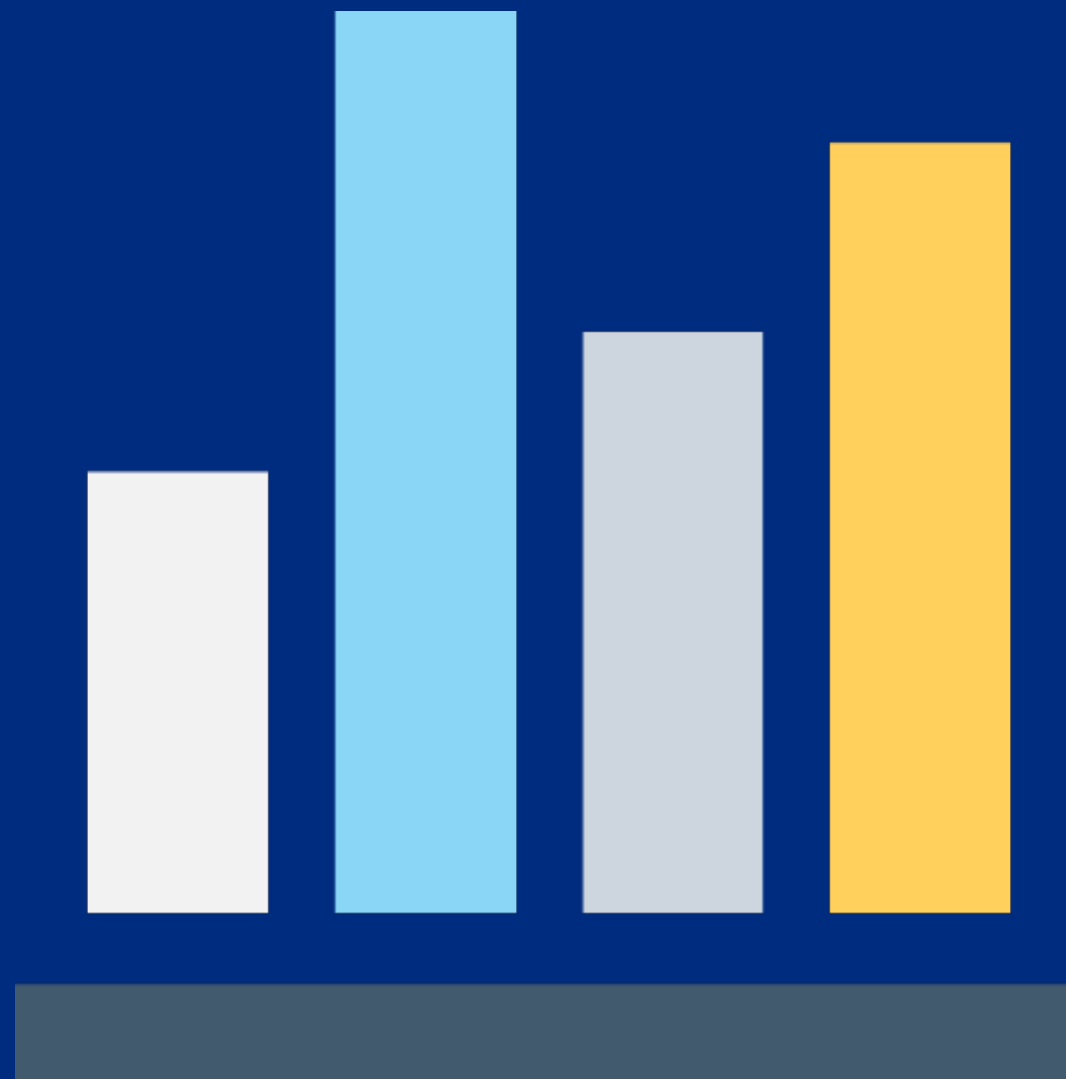
2. Tools

WebPagetest

PageSpeed Insights

Lighthouse

SpeedCurve



3. Benchmarks

What should we measure against?

3. Benchmarks

Identifying competition

Identifying important pages

Measuring the competition

Identifying competition

- Current production site
- Three **direct** competitors in the same space
- Three **indirect** competitors that are killing it



Current production site

@chromatichq



3 direct competitors



3 indirect competitors (that are killing it)



@chromatichq

Identifying important page types

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Important page types

Homepage

PLP (Product Listing Page)

Shop all (PLP that lists all products)

PDP (Product Detail Page)

Collection

Measuring the competition

@chromatichq

Test a website's performance

[HOME](#) [TEST RESULT](#) [TEST HISTORY](#) [FORUMS](#) [DOCUMENTATION](#) [ABOUT](#)

Advanced Testing | **Simple Testing** | **Visual Comparison** | **Traceroute**

Test Location

Browser

Advanced Settings ▼

Test Settings | **Advanced** | **Chrome** | **Auth** | **Script** | **Block** | **SPOF** | **Custom**

Connection


Number of Tests to Run
Up to 9

Repeat View First View and Repeat View First View Only

Capture Video

Keep Test Private

Label

 [Privacy - Terms](#) | [protected by reCAPTCHA](#) | [Privacy - Terms](#)

Web Page Performance Test for

<https://events.drupal.org/nashville2018>

From: Dulles, VA - Chrome - Cable
3/21/2018, 6:05:31 PM

[Need help improving?](#)

A	A	B	C	F	✓
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN

Tester: VM1-04-192.168.11.91

First View only

Test runs: 3

[Re-run the test](#)

[Raw page data](#) - [Raw object data](#)
[Export HTTP Archive \(.har\)](#)
[View Test Log](#)

Performance Results (Median Run)

	Load Time	First Byte	Start Render	Speed Index	First Interactive (beta)	Document Complete			Fully Loaded			
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[Plot Full Results](#)

Test Results

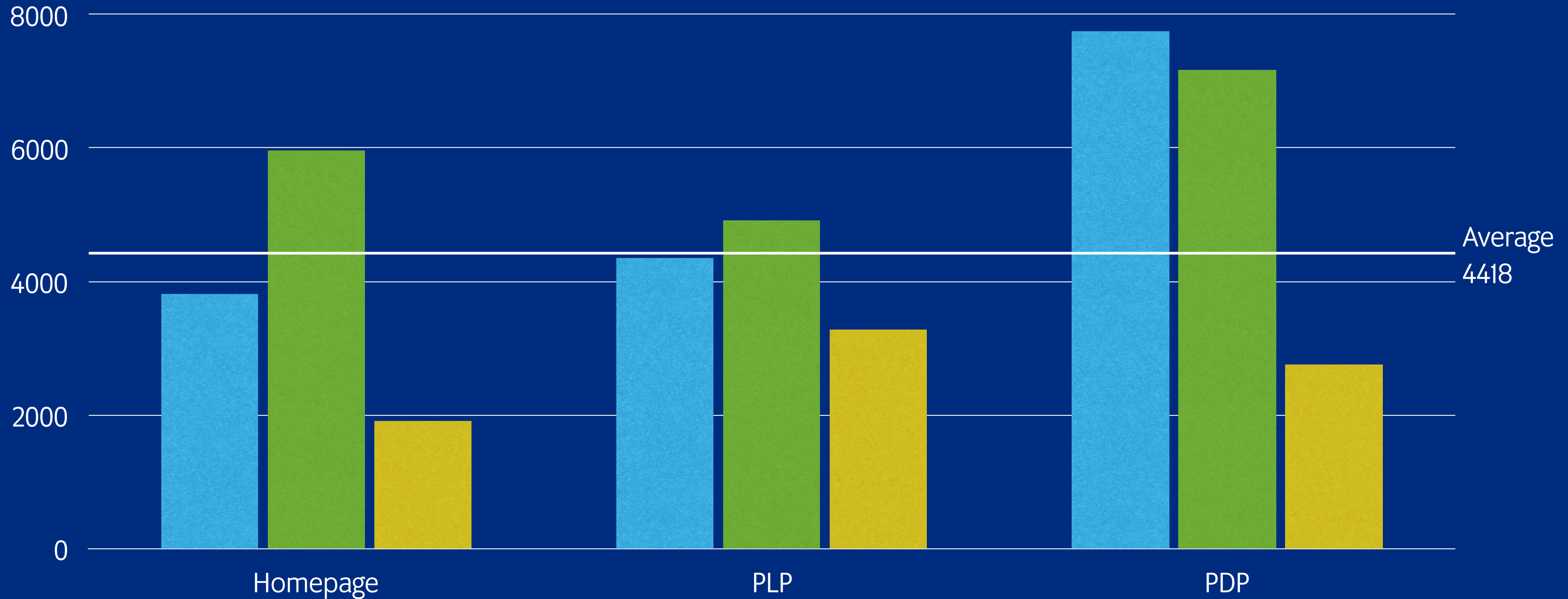
Run 1:

Waterfall	Screen Shot	Video

	Our Brand	Direct Competition			Industry Best of Breed		
	Production	Brand A	Brand B	Brand C	Brand X	Brand Y	Brand Z
Homepage	Link	Link	Link	Link	Link	Link	Link
Speed Index	3817	6596	5072	6210	1575	1690	2478
First Byte	0.286	0.704	0.218	0.465	0.165	0.283	0.262
Start Render	2.276	3.102	1.279	1.583	0.893	0.983	1.995
Load Time	9.265	10.028	9.249	7.419	2.775	3.114	15.923
Fully Loaded	13.219	15.181	12.897	14.084	3.646	9.823	16.370
PLP	Link	Link	Link	Link	Link	Link	Link
Speed Index	4352	3046	8867	2838	3276	2268	2727
First Byte	0.595	0.454	0.191	0.337	0.248	0.497	0.366
Start Render	2.774	1.687	1.394	1.267	3.013	1.686	2.197
Load Time	6.682	15.121	6.586	5.561	10.526	3.942	5.745
Fully Loaded	9.145	19.461	10.278	7.271	11.980	12.112	6.192
Shop all	Link	Link	Link	Link	Link	Link	Link
Speed Index	8841	7590	10487	3128	3160		4731
First Byte	0.869	0.426	0.214	0.419	0.293		0.286
Start Render	2.280	3.979	1.481	1.292	2.275		2.388
Load Time	15.506	14.413	8.505	6.299	9.734		7.551
Fully Loaded	15.881	18.874	12.927	7.549	11.126		8.231
PDP	Link	Link	Link	Link	Link	Link	Link
Speed Index	7737	8709	2652	10132	2561	3178	2992
First Byte	0.287	0.295	0.626	0.374	0.250	0.307	0.235
Start Render	2.181	1.871	2.061	1.269	1.501	1.308	1.994
Load Time	11.289	12.954	11.833	15.634	5.692	3.780	10.230
Fully Loaded	15.490	17.858	15.457	25.302	6.958	22.603	10.660
Collection	Link	Link	Link	Link	Link	Link	Link
Speed Index	3725	14386	5644	3509	2698		6989
First Byte	0.846	0.387	3.961	0.419	0.294		0.221
Start Render	2.588	1.283	5.094	1.183	1.295		2.285
Load Time	6.679	10.836	14.584	6.114	6.216		8.013
Fully Loaded	7.777	24.205	15.697	6.889	8.970		16.614

@chromatichq

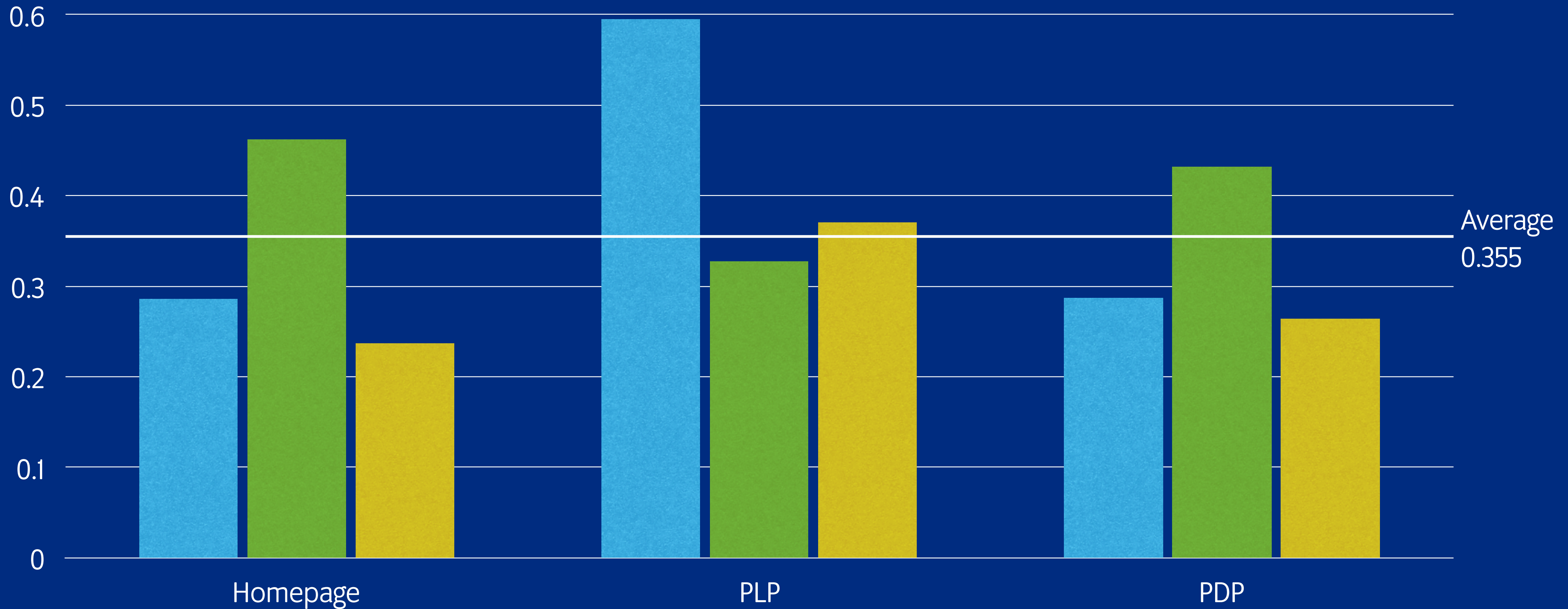
Speed Index (ms)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)

@chromatchq

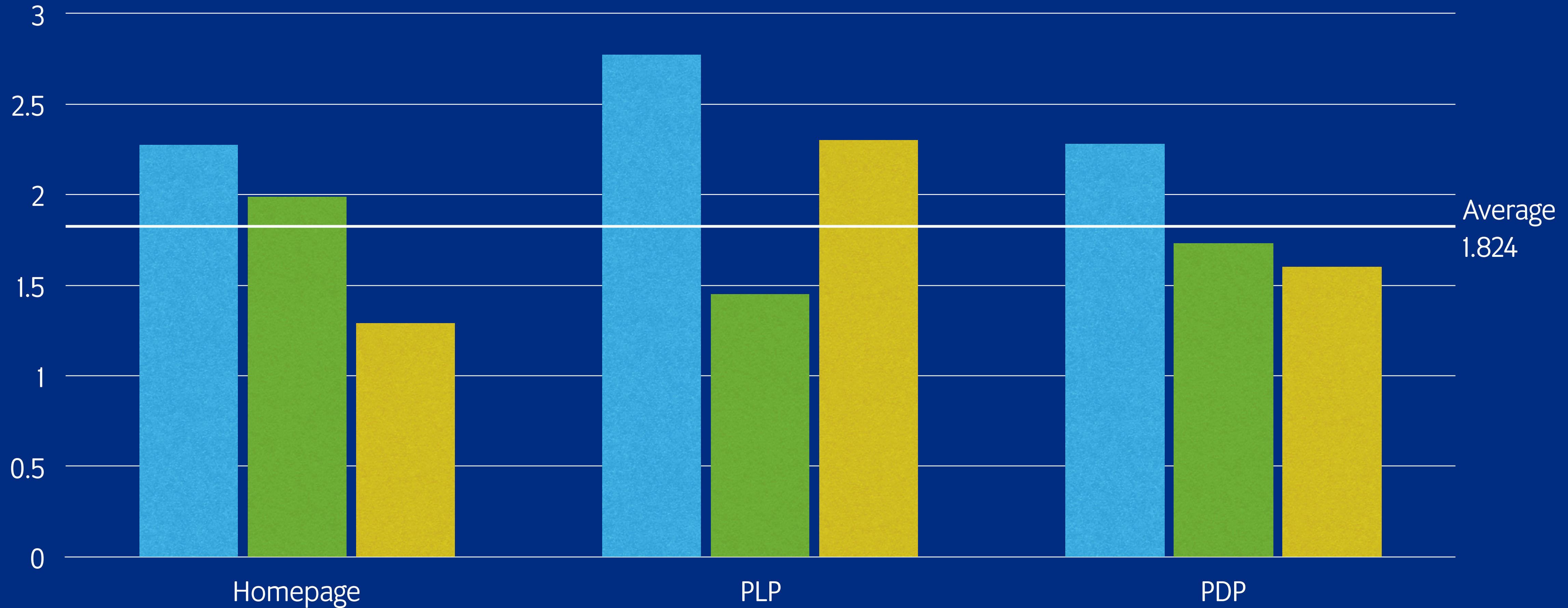
Time to First Byte (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)

@chromatichq

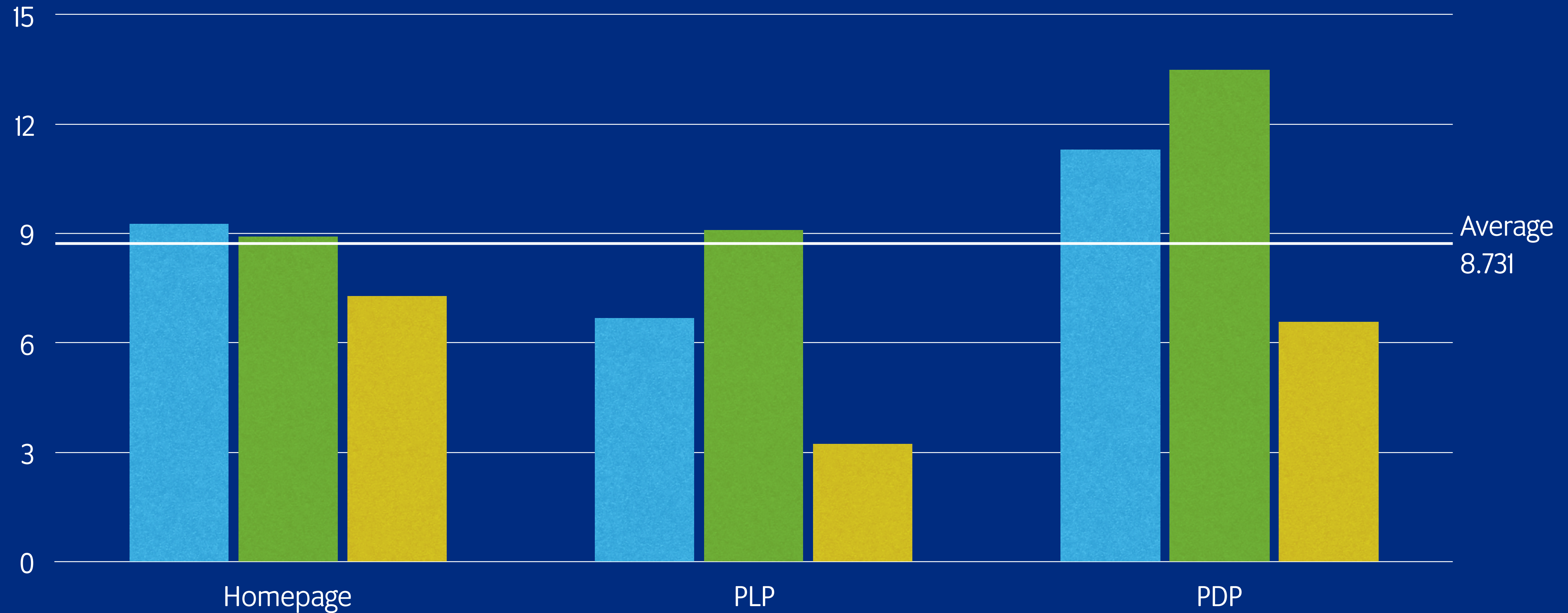
Start Render (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)

@chromatichq

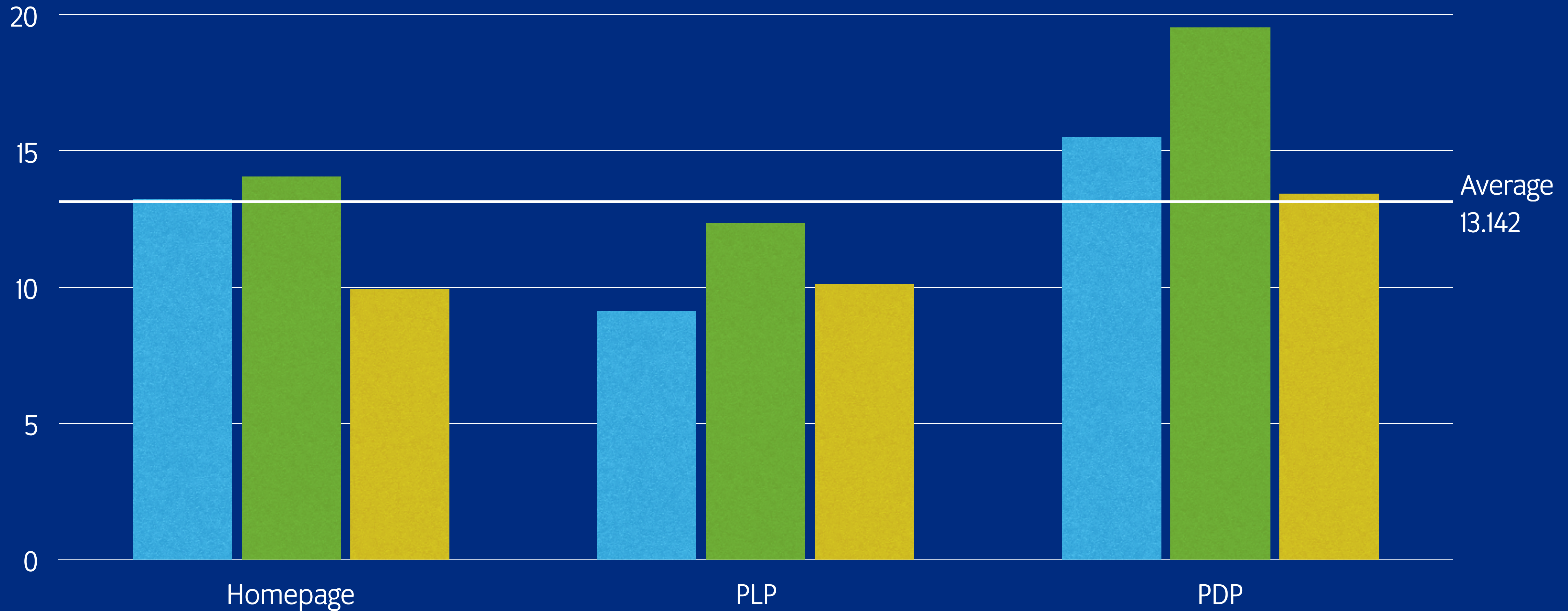
Load Time (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)

@chromatichq

Fully Loaded (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)

@chromatichq



4. Goals

How fast is fast enough?

“Beat the competition by 20%.”

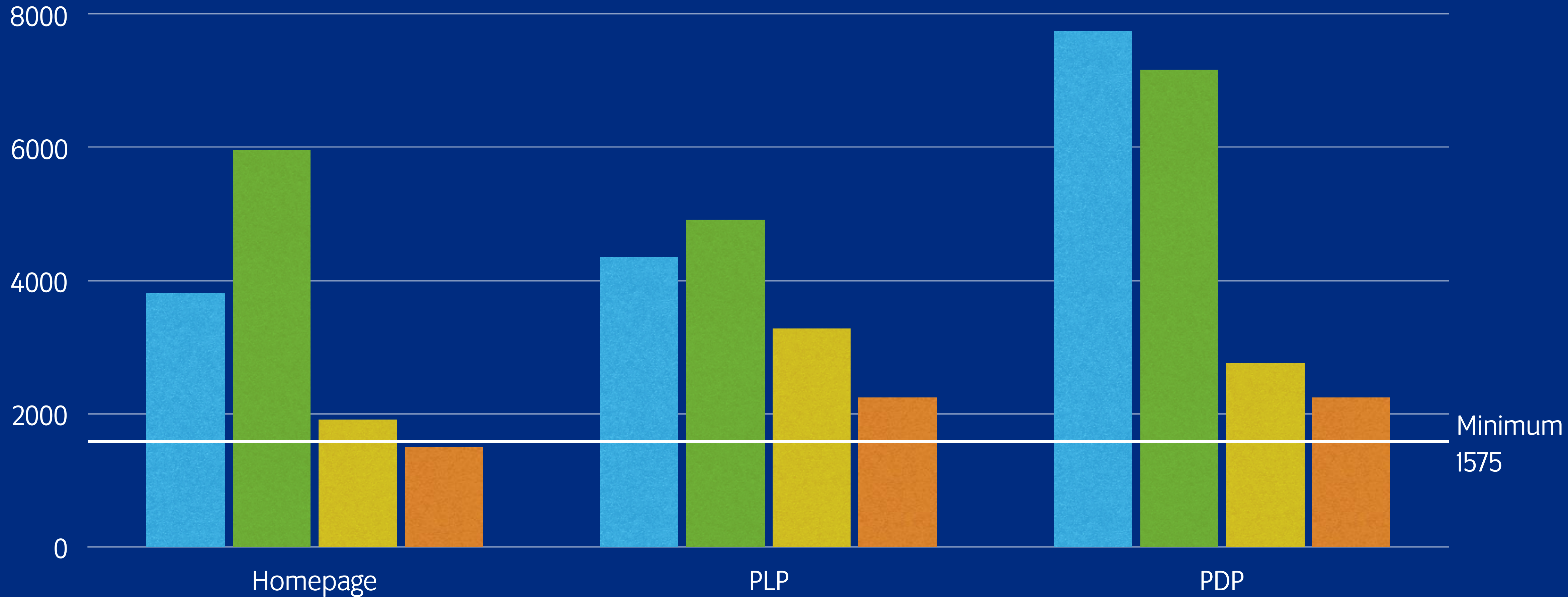
@chromatichq

Be ambitious.

@chromatichq

	Comparisons			Goals
	Range	Average	Best	
Homepage				
Speed Index	5021	5959	1575	1500
First Byte	0.539	0.462	0.165	0.20
Start Render	2.209	1.988	0.893	1.00
Load Time	13.148	8.899	2.775	3.00
Fully Loaded	12.724	14.054	3.646	5.00
PLP				
Speed Index	6599	4917	2268	2250
First Byte	0.306	0.327	0.191	0.20
Start Render	1.746	1.449	1.267	1.00
Load Time	11.179	9.089	3.942	4.00
Fully Loaded	13.269	12.337	6.192	6.00

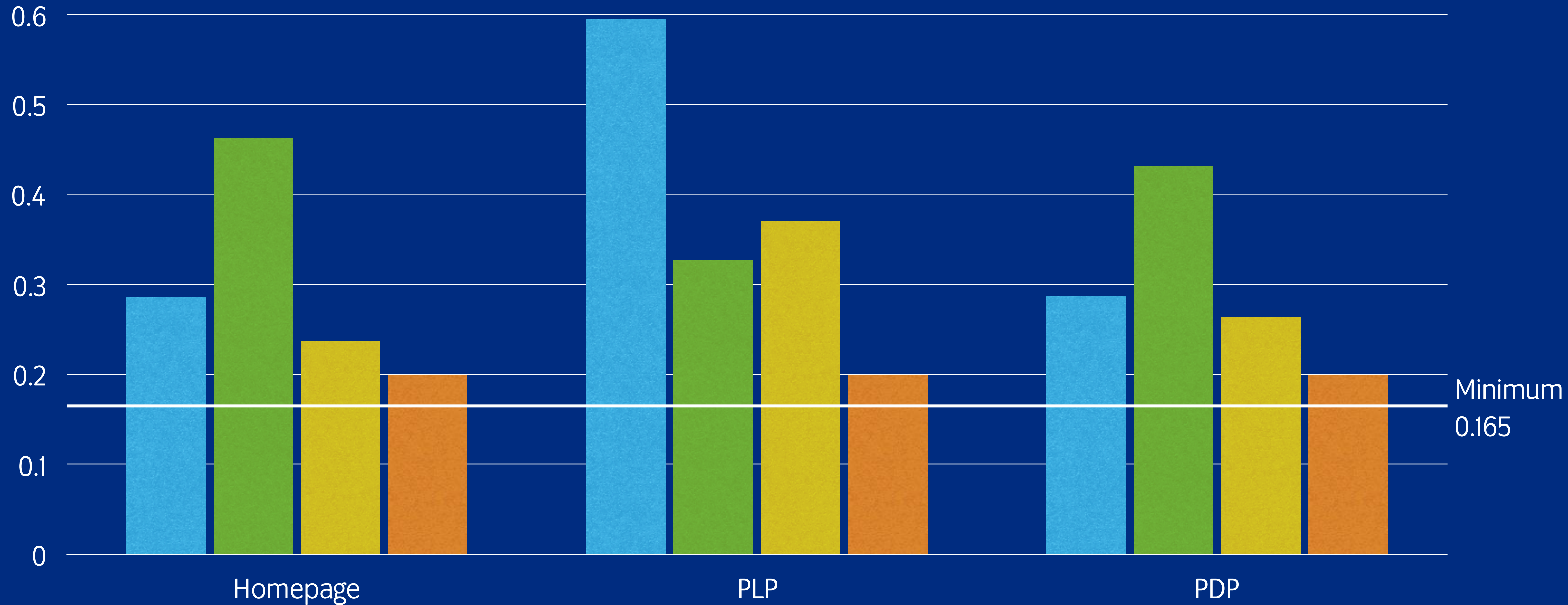
Speed Index (ms)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals

@chromatichq

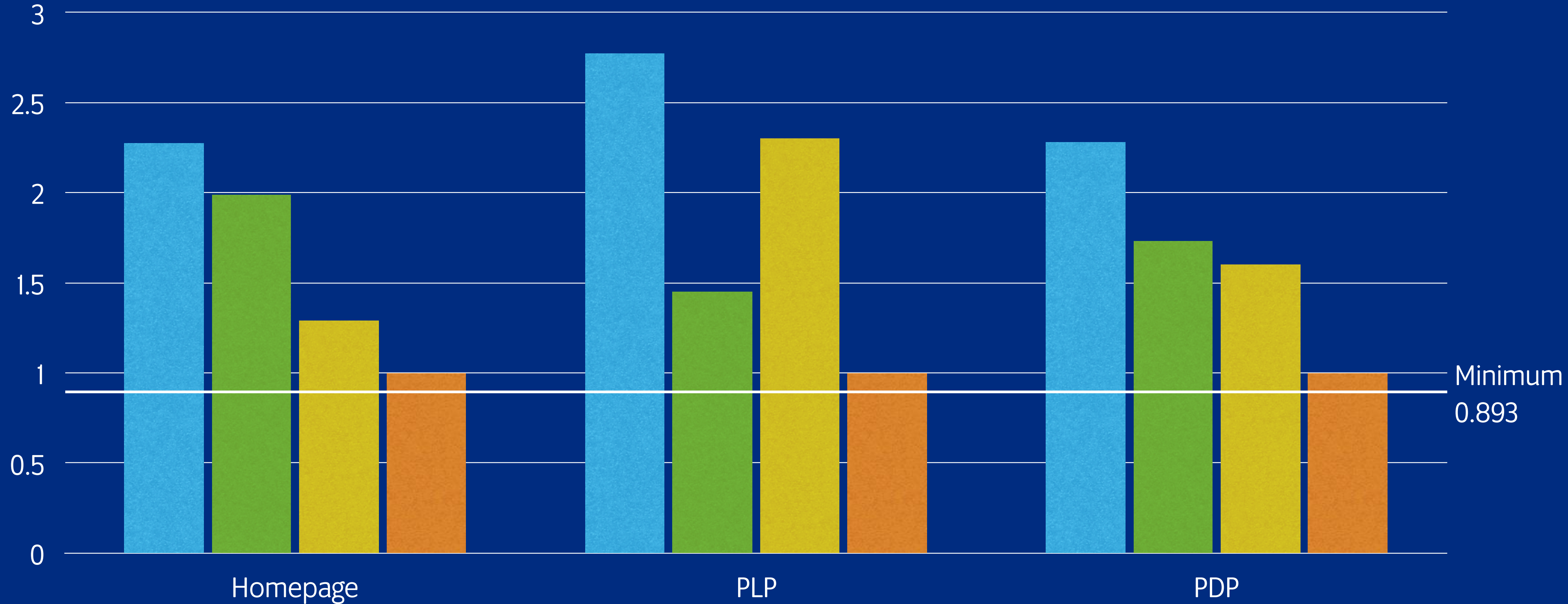
Time to First Byte (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals

@chromatichq

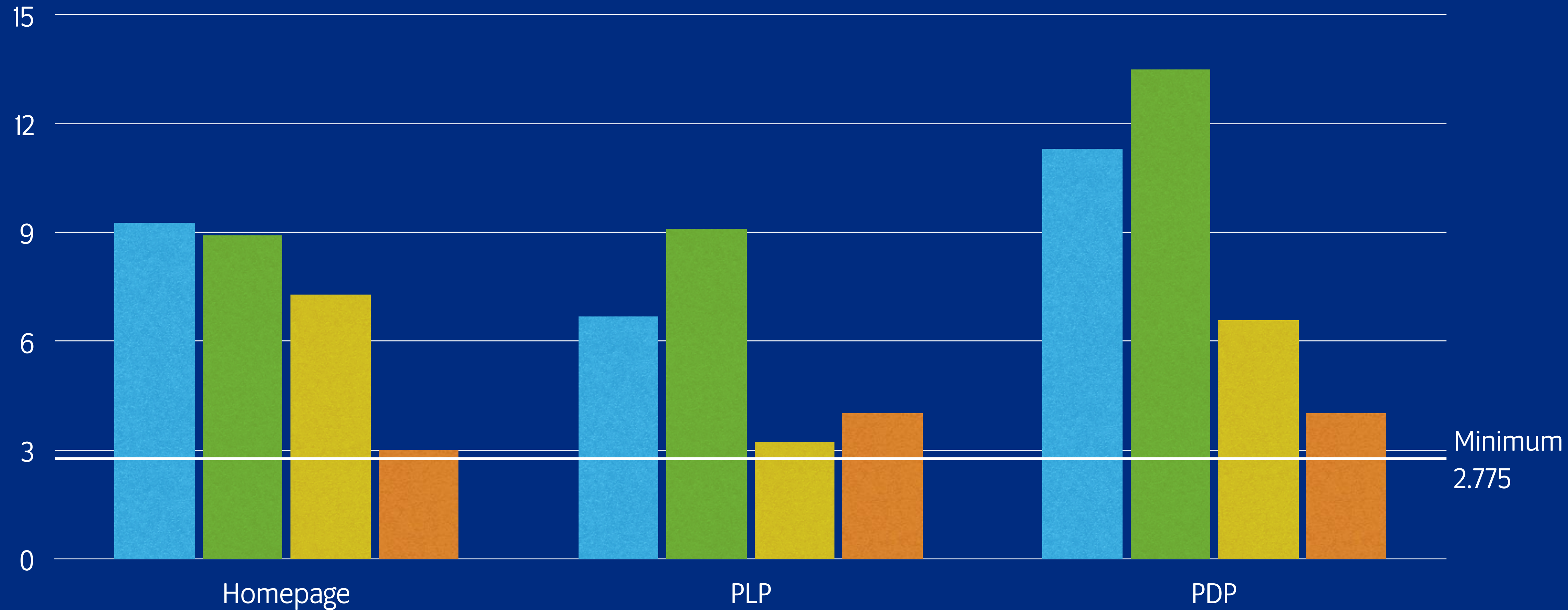
Start Render (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals

@chromatichq

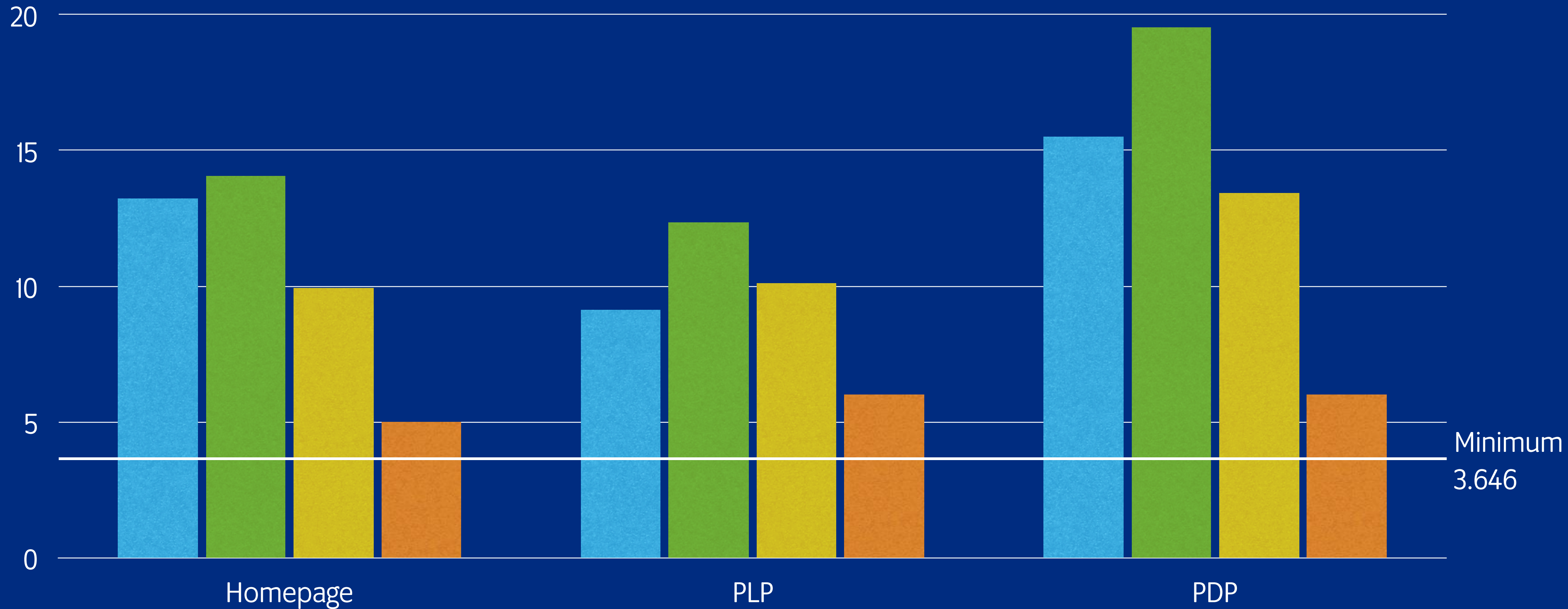
Load Time (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals

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Fully Loaded (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals

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5. Results

How are we doing?

Track weekly results.

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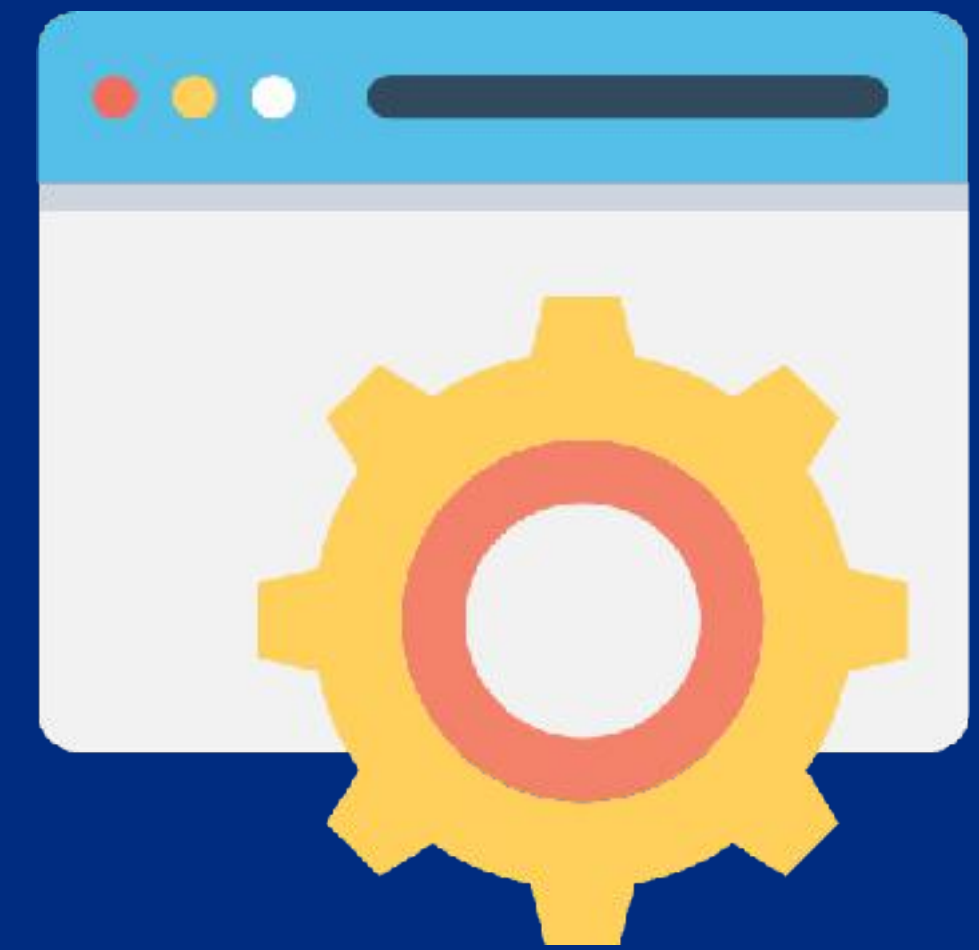
	Weekly audits													
	9/20	9/27	10/4	10/11	11/1	11/8	11/16	11/21	11/30	12/15	12/20	1/4	1/11	1/18
Homepage	Link													
Speed Index	3703	2766	3934	4472	4762	4386	2444	1933	1547	1317	1386	1361	2323	
First Byte	0.248	0.277	0.245	0.341	0.294	0.979	0.251	0.269	0.243	0.289	0.219	0.193	0.211	
Start Render	1.682	1.797	1.798	1.797	1.997	2.389	2.297	1.669	1.169	1.015	1.208	1.191	1.300	
Load Time	5.955	5.332	5.626	5.331	5.728	6.128	5.344	5.788	3.495	3.448	3.336	3.833	3.901	
Fully Loaded	12.874	9.959	10.261	9.979	9.801	10.056	5.694	6.450	4.007	3.800	4.279	8.142	8.171	
PLP	Link													
Speed Index	2938	3196	3280	3670	2651	2183	2366	2340	2372	1866	1858	1860	1635	
First Byte	0.781	1.028	0.661	0.708	0.818	0.812	0.349	0.294	0.519	0.335	0.220	0.250	0.200	
Start Render	2.492	2.970	2.279	2.267	2.085	1.811	1.982	2.006	2.188	1.811	1.790	1.595	1.600	
Load Time	7.419	8.707	6.415	7.026	5.686	5.662	4.435	4.238	5.101	4.339	4.171	6.104	4.766	
Fully Loaded	12.241	13.819	10.847	11.619	9.801	9.907	5.653	5.310	5.501	4.802	4.711	10.459	9.062	
Shop all	Link													
Speed Index	3470	3040	2466	2941	2955	2964	2594	2570	2610	1957	1985	1884	1462	
First Byte	0.819	0.859	1.151	1.157	2.001	1.793	0.283	0.237	0.327	0.289	0.249	0.209	0.308	
Start Render	2.679	2.661	2.391	2.484	2.861	2.666	2.396	0.188	1.912	1.883	1.902	1.810	1.400	
Load Time	25.435	29.043	8.951	10.093	8.967	10.629	6.978	7.114	7.100	8.336	7.553	7.640	9.090	
Fully Loaded	25.480	29.087	13.794	15.022	13.464	15.217	8.868	8.428	9.817	8.694	7.972	13.976	13.423	
PDP	Link													
Speed Index	3311	2205	4130	1972	3130	3156	2550	2315	2674	2412	2898	2756	2340	
First Byte	1.019	0.277	0.358	0.260	0.304	0.362	0.305	0.285	0.251	0.254	0.246	0.218	0.195	
Start Render	2.377	1.670	2.275	1.586	1.493	2.394	1.478	0.173	1.490	1.496	1.906	1.693	1.000	
Load Time	7.412	7.370	7.049	7.406	23.514	7.752	6.071	5.367	5.522	5.282	5.717	5.821	5.038	
Fully Loaded	12.239	12.320	11.003	12.096	23.562	12.343	6.444	5.844	5.999	5.689	6.719	10.224	9.364	
Collection	Link													
Speed Index	4378	2965	2826	1848	2940	2812	2412	2154	2045	1926	1985	1858	1742	
First Byte	1.650	0.311	0.230	0.238	0.475	0.313	0.267	0.297	0.219	0.223	0.229	0.264	0.191	
Start Render	3.084	2.202	1.692	1.512	2.787	2.675	2.182	1.895	1.396	1.500	1.783	1.565	1.700	
Load Time	6.227	5.917	5.022	5.141	6.052	5.874	5.938	4.334	3.687	3.754	4.429	4.782	4.644	
Fully Loaded	10.853	10.660	9.786	9.745	10.568	10.288	6.250	4.686	4.036	4.154	4.756	9.348	9.665	



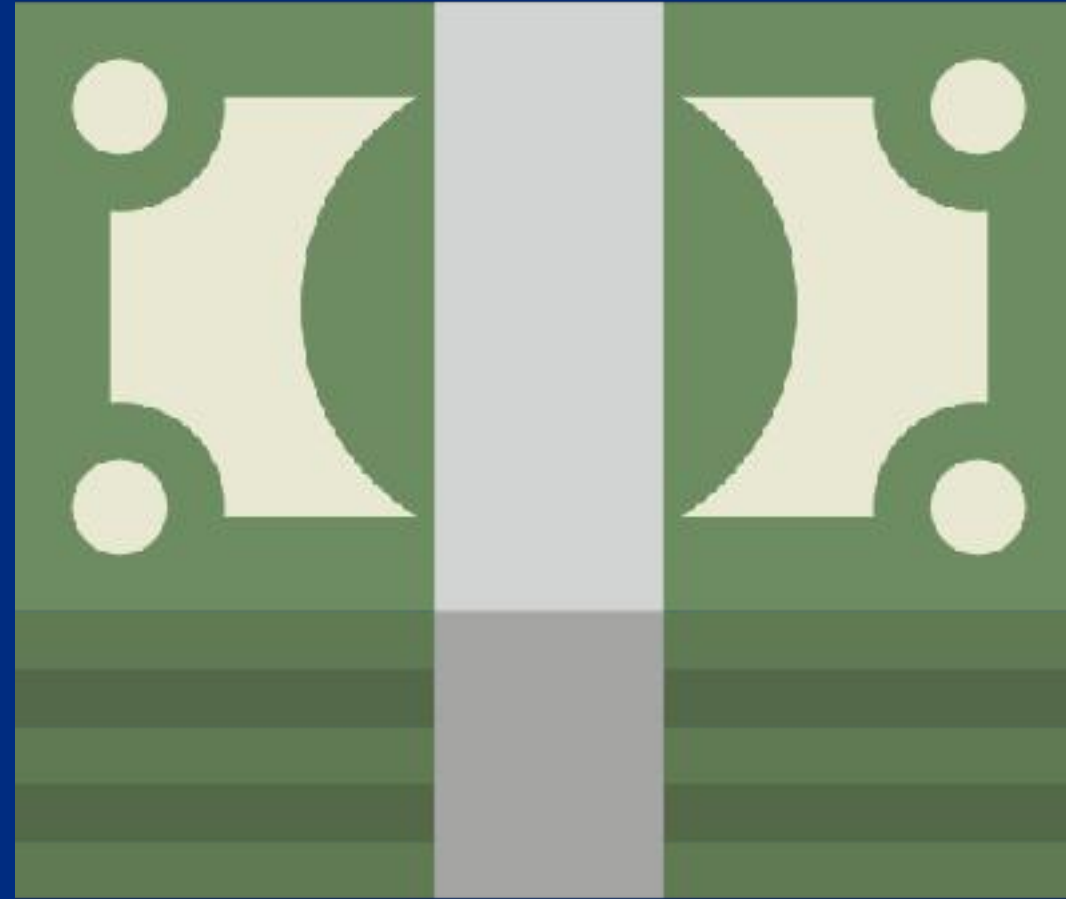
**Modal
windows**



**Image
carousels**



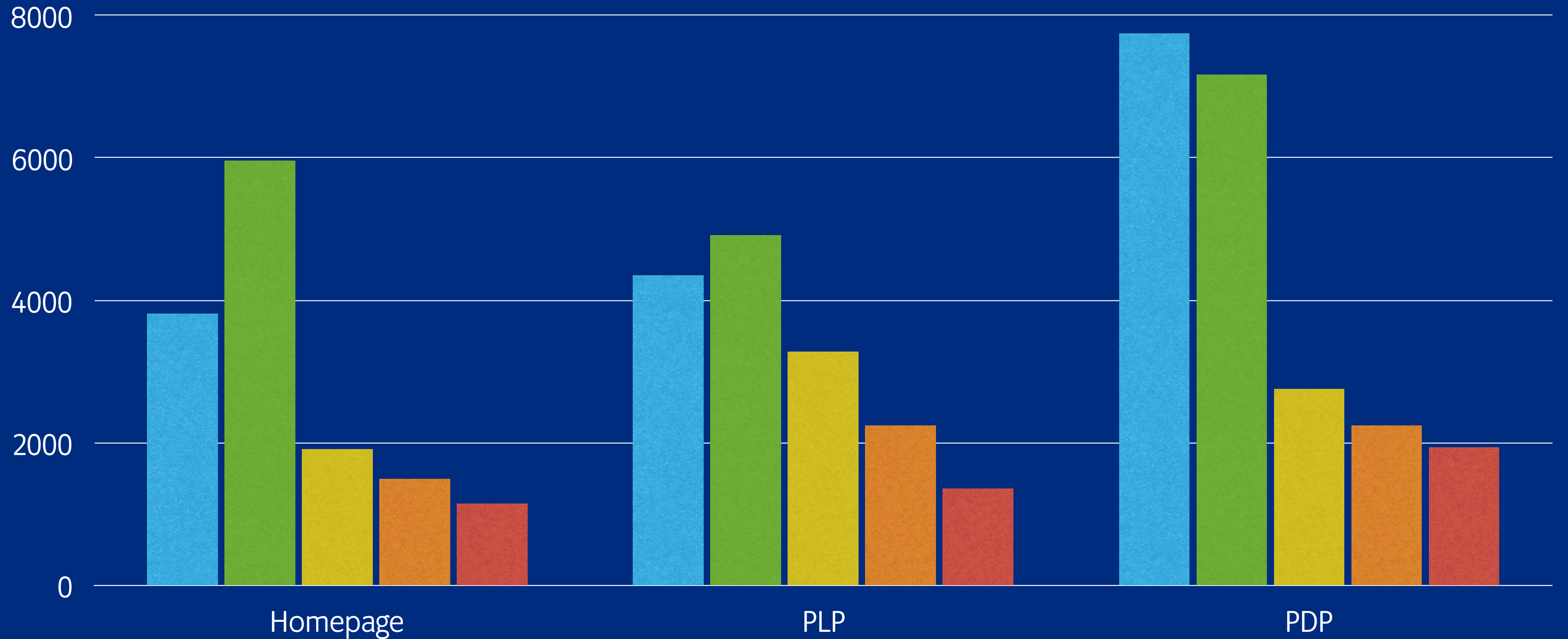
**Third-party
scripts**



“Are we sure they’re worth the impact they’ll have on revenue?”

	Weekly audits												
	11/30	12/15	12/20	1/4	1/11	1/22	1/23	2/8	2/15	2/22	3/1	3/8	3/15
Homepage													
Speed Index	1547	1317	1386	1361	2323	1760	1305	1436	1817	1163	1184	1232	1147
First Byte	0.243	0.289	0.219	0.193	0.211	0.687	0.219	0.204	0.187	0.191	0.174	0.223	0.306
Start Render	1.169	1.015	1.208	1.191	1.300	1.100	1.100	1.300	1.100	0.900	1.100	0.900	1.000
Load Time	3.495	3.448	3.336	3.833	3.901	8.179	5.335	5.806	31.500	5.683	5.234	5.260	7.010
Fully Loaded	4.007	3.800	4.279	8.142	8.171	9.038	8.277	7.675	34.134	7.408	8.927	8.908	10.893
PLP													
Speed Index	2372	1866	1858	1860	1635	1497	1103	1079	1192	1131	1534	1602	1364
First Byte	0.519	0.335	0.220	0.250	0.200	0.222	0.206	0.260	0.197	0.228	0.289	0.249	0.230
Start Render	2.188	1.811	1.790	1.595	1.600	1.100	1.000	0.800	1.100	1.000	1.200	1.200	1.200
Load Time	5.101	4.339	4.171	6.104	4.766	5.244	5.831	5.585	4.336	4.412	6.432	6.600	4.795
Fully Loaded	5.501	4.802	4.711	10.459	9.062	6.999	9.759	12.851	6.927	6.778	12.260	8.908	11.556
Shop all													
Speed Index	2610	1957	1985	1884	1462	1002	783	786	822	815	987	1343	1264
First Byte	0.327	0.289	0.249	0.209	0.308	0.192	0.204	0.208	0.229	0.223	0.245	0.274	0.226
Start Render	1.912	1.883	1.902	1.810	1.400	0.800	0.700	0.700	0.700	0.700	0.800	1.000	1.100
Load Time	7.100	8.336	7.553	7.640	9.090	9.862	8.786	10.010	9.827	6.670	11.190	8.375	11.215
Fully Loaded	9.817	8.694	7.972	13.976	13.423	12.106	13.733	14.055	11.178	8.193	15.960	19.732	20.267
PDP													
Speed Index	2674	2412	2898	2756	2340	2168	2202	1798	1419	1669	2036	2014	1941
First Byte	0.251	0.254	0.246	0.218	0.195	0.293	0.276	0.204	0.182	0.235	0.224	0.250	0.228
Start Render	1.490	1.496	1.906	1.693	1.000	1.500	0.800	1.100	0.800	0.900	1.200	1.100	0.900
Load Time	5.522	5.282	5.717	5.821	5.038	5.844	5.836	6.310	5.476	5.656	5.989	6.108	6.013
Fully Loaded	5.999	5.689	6.719	10.224	9.364	7.908	9.799	16.452	8.178	9.043	14.122	15.511	14.401
Collection													
Speed Index	2045	1926	1985	1858	1742	1961	1834	1339	1577	2084	2045	2162	2196
First Byte	0.219	0.223	0.229	0.264	0.191	0.216	0.184	0.195	0.189	0.245	0.237	0.257	0.209
Start Render	1.396	1.500	1.783	1.565	1.700	0.800	1.600	0.900	1.200	1.200	1.100	1.100	0.800
Load Time	3.687	3.754	4.429	4.782	4.644	4.614	4.701	5.660	6.718	5.462	4.295	5.046	5.056
Fully Loaded	4.036	4.154	4.756	9.348	9.665	6.627	8.936	9.579	9.044	7.750	8.535	6.723	6.918

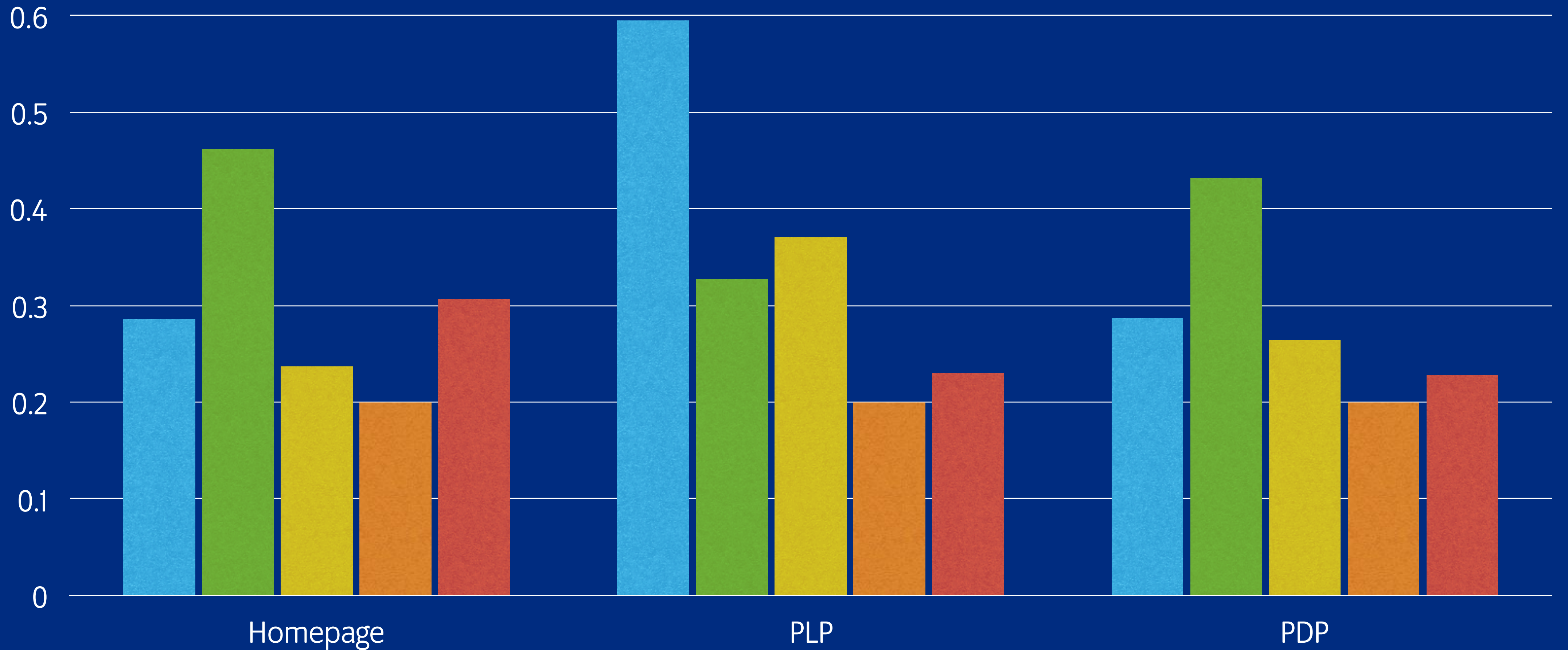
Speed Index (ms)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

@chromatchq

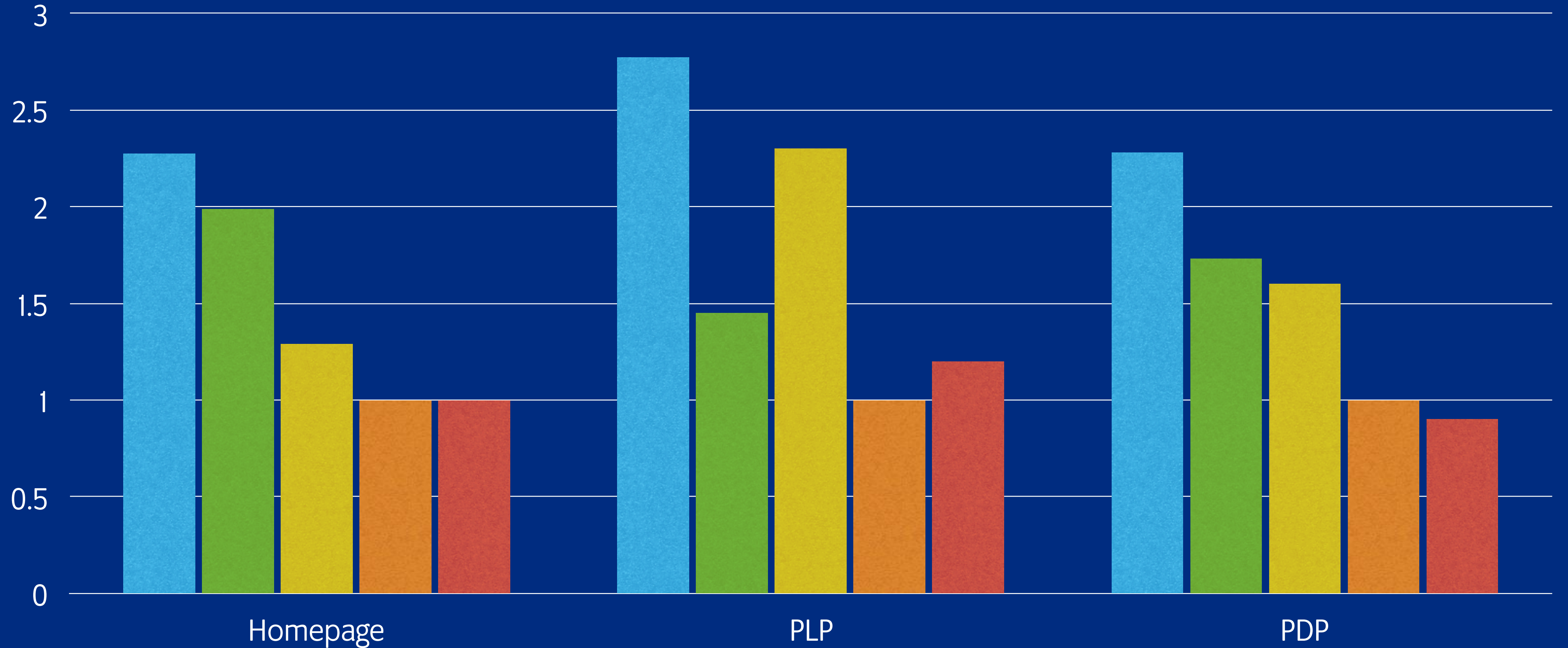
Time to First Byte (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

@chromatchq

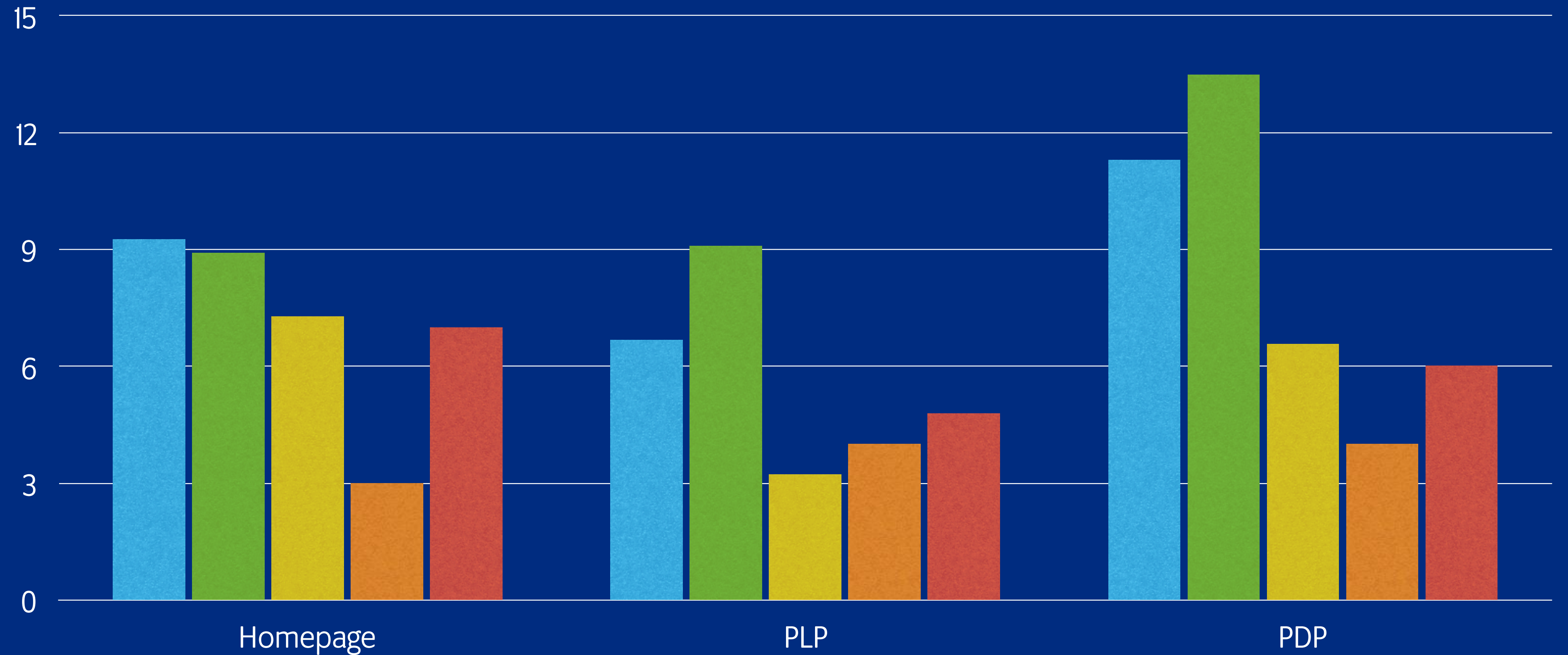
Start Render (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

@chromatichq

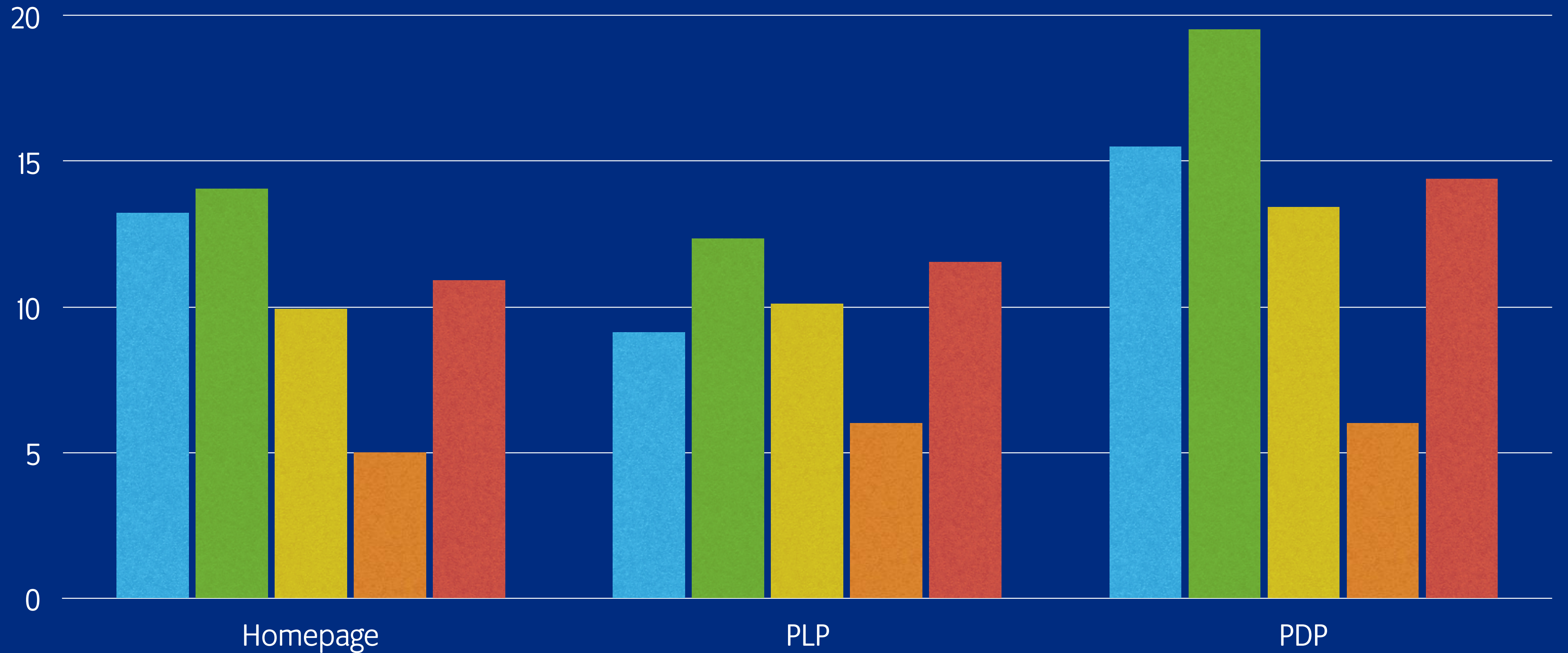
Load Time (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

@chromatchq

Fully Loaded (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

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Mission accomplished!
But how did we get there?

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- Improving Performance -

“Premature optimization
is the root of all evil”

(Donald Knuth, author of *The Art of Computer Programming*)

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**Dedicate pre-launch time to focus
on improving performance.**

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**Your custom code is a small
piece of the performance pie.**

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Look at the bigger picture.

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Determine what each metric is telling you.

Time To First Byte

Google *might* already be punishing TTFBs higher than .4s.
Think of it as a race's starting line. How can we lower it?



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“Is my website cached and
is that properly configured?”

Investigate response headers, expiration, URL/pattern configuration, etc.

Also, Drupal caching can be enabled but broken.

“Do I need to upgrade or tune my server’s hardware/software?”

Shows itself in TTFB when cache is bypassed and the request hits origin.

Consider disk space, RAM, PHP7 vs PHP5, MySQL tuning, etc.

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“Am I using a CDN? Should I be?
What about Varnish, Redis, etc.?”

Also TTFB, as CDNs reduce the physical distance of a round trip.
It won't serve everything, so up the origin cache game as well.

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“Can I reduce the number of redirects?”

Each redirect adds another round trip, impacts TTFB.

Start Render

How can we get content painting faster?



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“Can I reduce, relocate, prefetch, inline, or defer any of the subsequent requests?”

Requests within `<head>` are often render blocking.

Consider a Service Worker (see: Progressive Web App).

Load Time

How can we get to a usable page asap?



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“Can I enable HTTP/2?”

Reduces impact of individual requests. Huge gains!

(Requires HTTPS.)

“Have I optimized my CSS and JS?”

Consider aggregation, minification, compression, caching, etc.

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“Have I optimized my images?”

Consider compression, formats, sizing, caching, lazyloading, etc.

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“Have I optimized my fonts?”

Consider compression, character sets, caching, and delivery.

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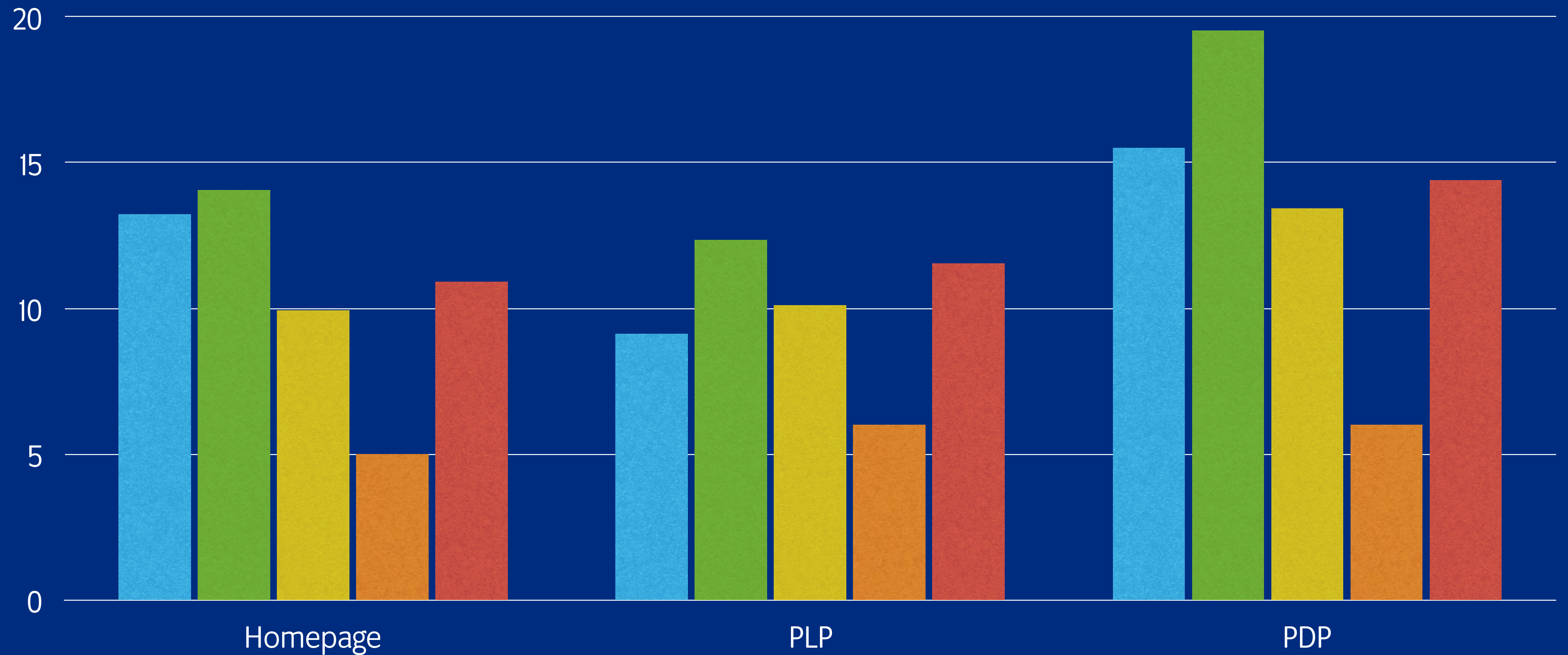
Fully Loaded

How can we get out of the user's way asap?



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Fully Loaded (s)



- Current site before rebuild
- Direct Competition (average)
- Indirect Competition (average)
- Goals
- Rebuild at launch

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“Are my third party scripts under control?”

They're typically the culprits with a large Fully Loaded time.

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Speed Index

Fixing the older metrics will largely fix the Speed Index, though some techniques can shave a bit more time off.
(Critical CSS, lazyloading, etc.)





Mission accomplished!

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So what did we learn?

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1 second = ~ 10% of engagement, revenue

Audits

1. Metrics
2. Tools
3. Benchmarks
4. Goals
5. Results



1. Metrics

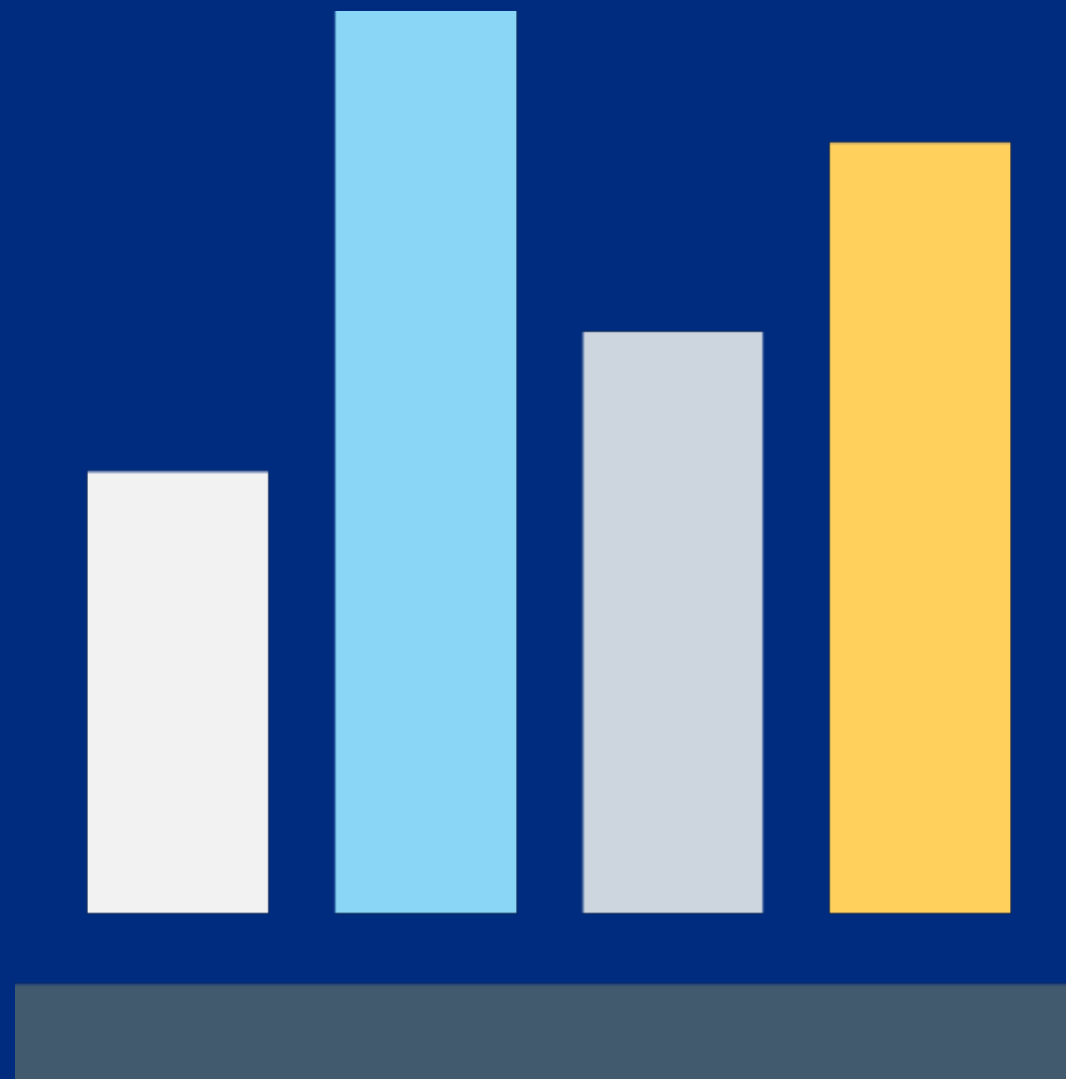
Speed Index, Time To First Byte, Start Render,
Load Time, and Fully Loaded



2. Tools

WebPagetest, PageSpeed Insights,
Lighthouse, SpeedCurve

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3. Benchmarks

Identify your competition and important page types. Measure them.



4. Goals

Use the benchmarks to create ambitious goals.



5. Results

Track results weekly to follow progress and inform decisions.



**Dedicate pre-launch time to focus
on improving performance.**

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**Determine what each metric is telling you.
Identify ways to improve them. Execute.**



Only you can improve performance!

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Go forth and conquer!

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Thank you for your time!

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Any questions?

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