

# Web Performance at Dotdash Meredith

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# Agenda

Optimization

Monitoring

# **Dotdash Meredith**

## **America's Largest Print / Digital Publisher**

People

 Investopedia

BYRDIE health

allrecipes

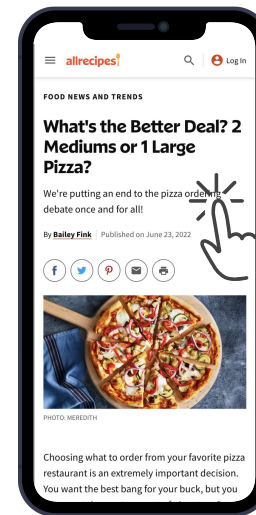
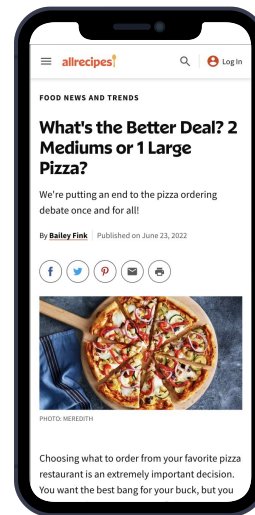
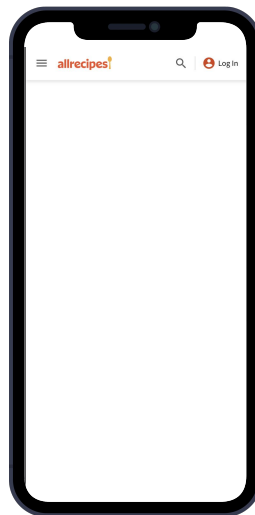
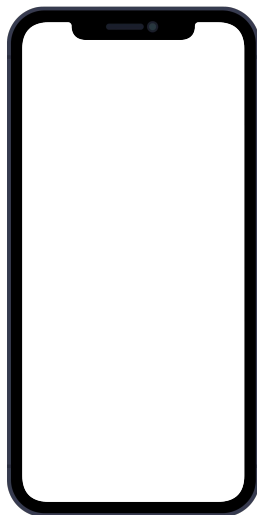
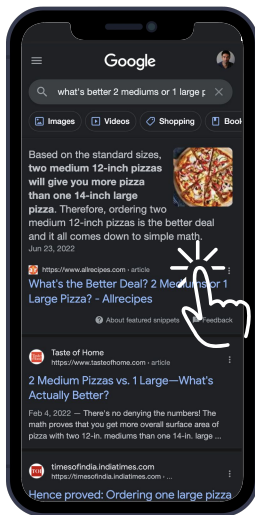
# Dotdash Meredith Playbook

Best Content, **Fastest Sites**, Fewest Ads

# Fastest Sites

# Core Web Vitals & More!

- LCP - “Loading” Performance
- FID - “Interactivity” Performance
- CLS - “Visual Stability”



**TTFB**

**FCP**

**LCP**

**TTI**



## User Request

The user enters a url or clicks a link to request the web page

## Time to First Byte

The time it takes for the server to respond with first byte of information

## First Contentful Paint

First time content shows on the page

## Largest Contentful Paint

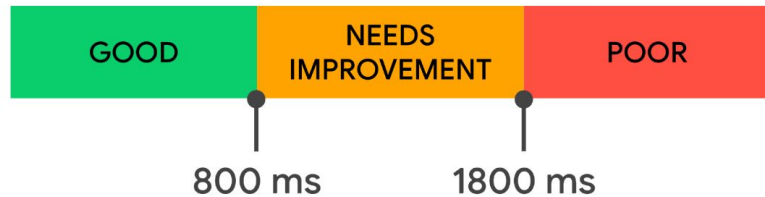
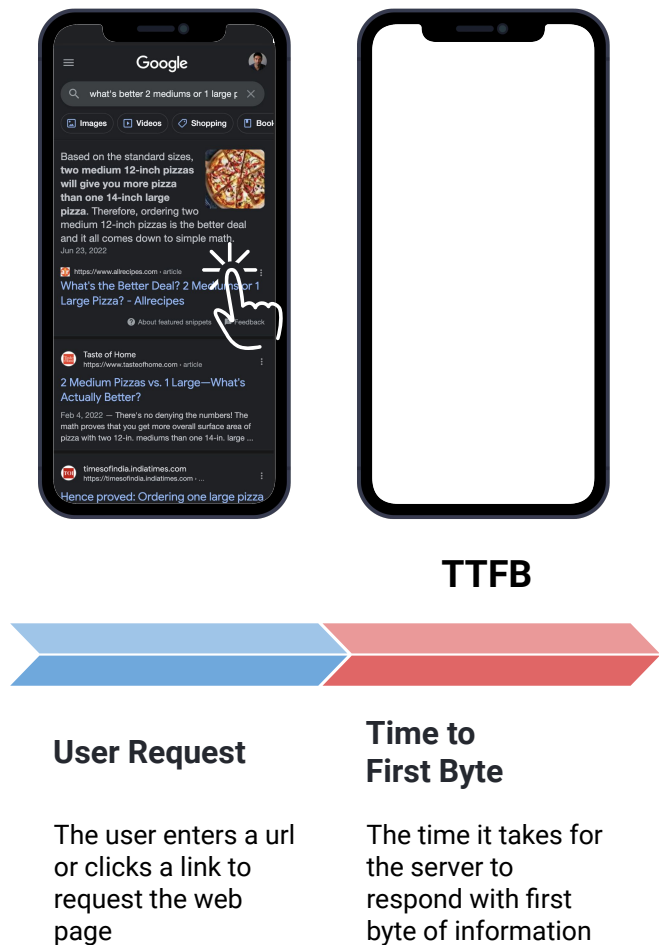
How quickly the main content of the page is loaded (usually first image or title)

## Time to Interactive

Everything has loaded and the browser is ready for interactions



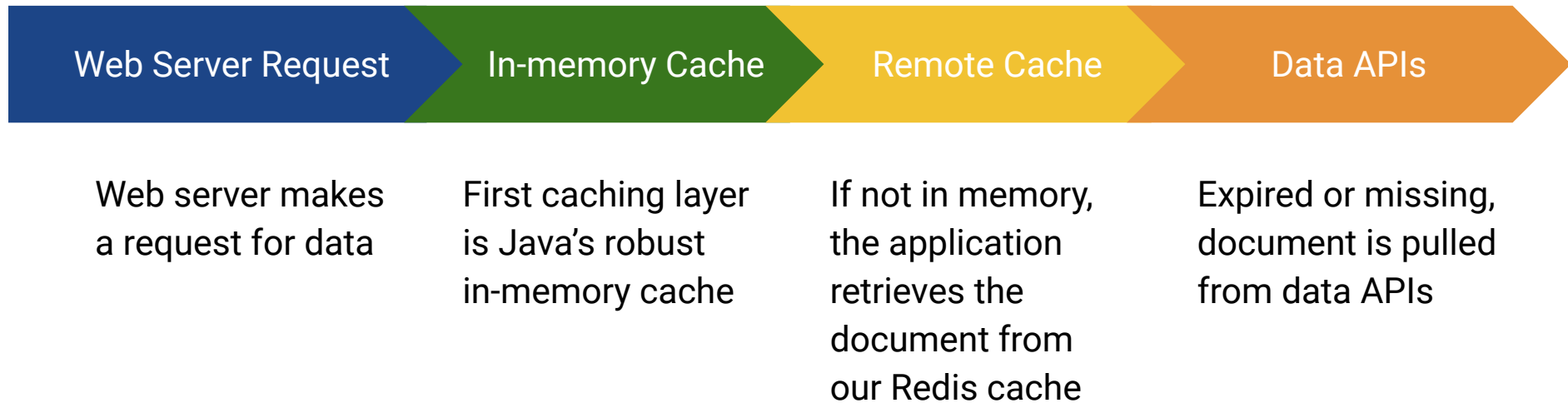
# Optimizing TTFB



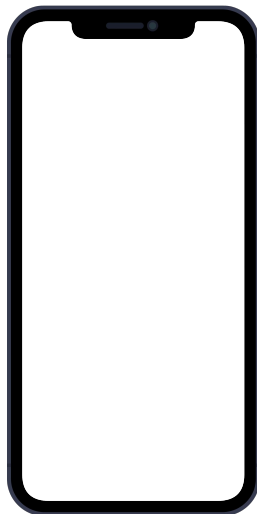
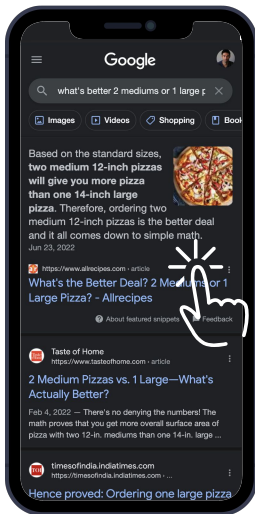
- Include / exclude components based on business logic
- Show / hide based on device type (mobile, tablet, desktop)
- Even AB testing is server side

# Optimizing TTFB:

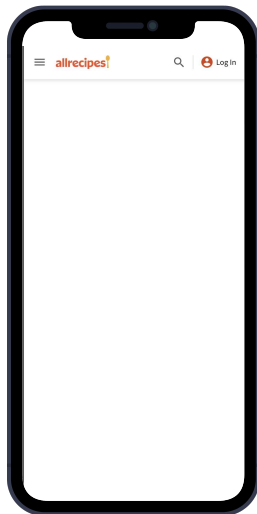
## Layered Caching



# Optimizing FCP



**TTFB**



**FCP**



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First time content shows on the page

# FCP: Frontend Resources

- Minify / uglify
- Lazyloading
- Automatic Bundling



# FCP: Resource Hints

- **dns-prefetch**

- looks up domain
- third party sources

```
<link rel="preconnect" href="//tpc.googlesyndication.com">  
<link rel="preconnect" href="//pagead2.googlesyndication.com">  
<link rel="preconnect" href="//s.skimresources.com">  
<link rel="dns-prefetch" href="//tags.crowdctrl.net">  
<link rel="dns-prefetch" href="//sb.scorecardresearch.com">  
<link rel="dns-prefetch" href="//connect.facebook.net">
```

- **preconnect**

- DNS + connection
- important revenue sources

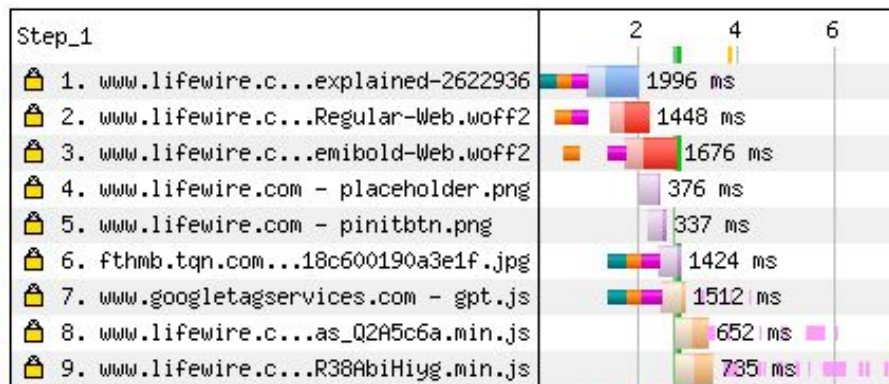
```
link:<://www.lifewire.com/static/3.38.0/font/Graphik-Regular-Web.woff2>; rel=preload; as=font; type="font/woff2"; crossorigin;  
nopush,
```

```
<://www.lifewire.com/thmb/.../a48c0615434c406ea6dd1b49286984e0.jpg>;  
href="https://www.lifewire.com/thmb/.../a48c0615434c406ea6dd1b49286984e0.jpg"; rel=preload; as=image; nopush
```

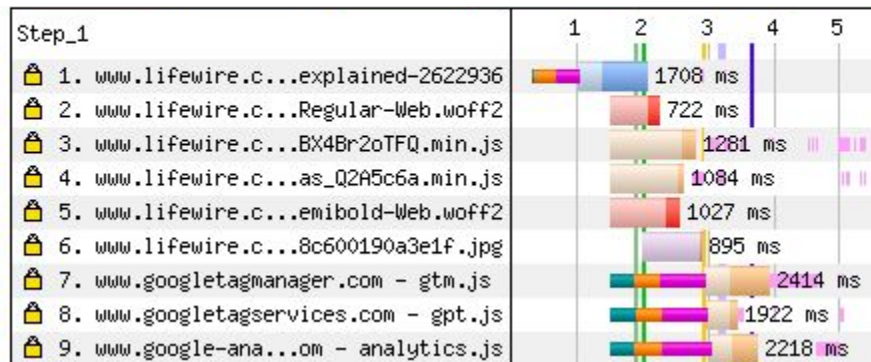
- **preload**

- link header
- critical resources
- limited to ~6-8

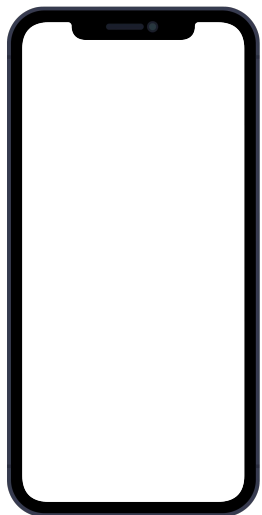
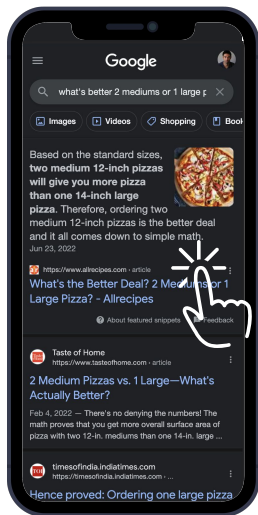
# Before



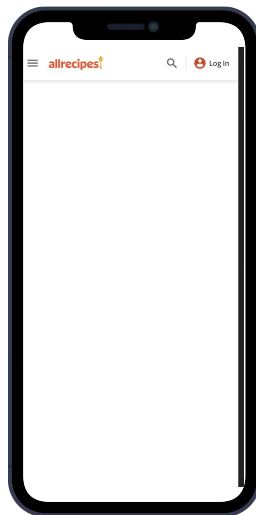
# After



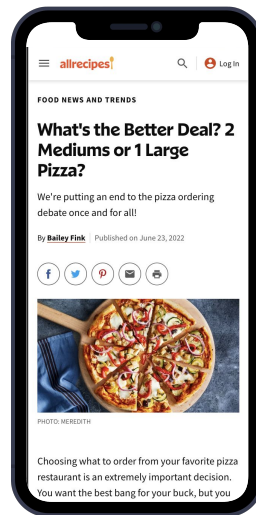
# Optimizing LCP



**TTFB**



**FCP**



**LCP**



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# LCP

Largest Contentful Paint

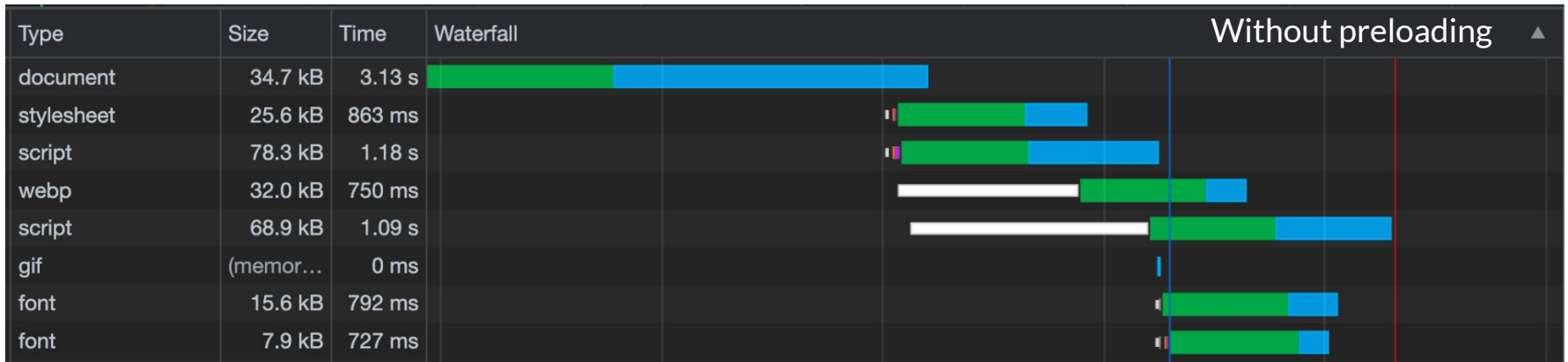




# Optimizing LCP

- LCP = TTFB + FCP
- Font optimization
  - removing glyphs
  - use woff2 format
  - preload using link headers
- Primary Image optimization
  - webp format - avif coming!
  - preload using link headers



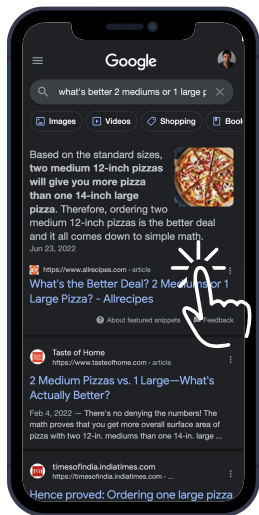


Waiting for server

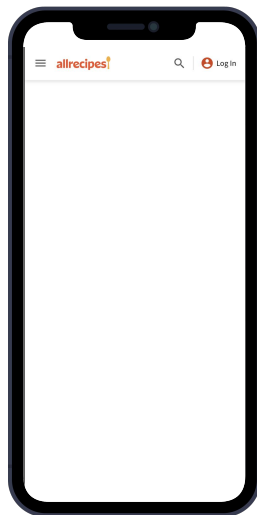
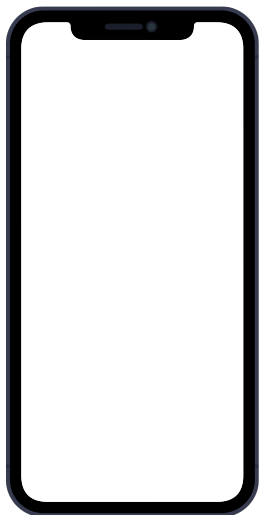
Content Download

# Effect of preloaded image

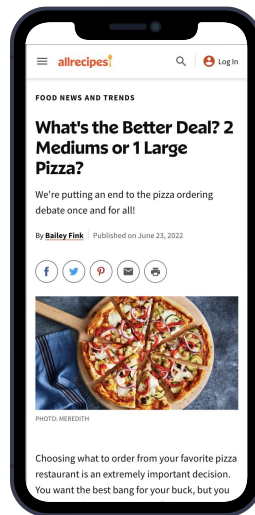




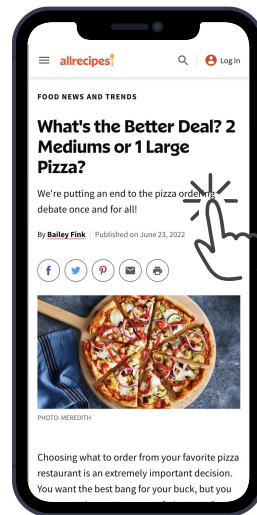
**TTFB**



**FCP**



**LCP**



**TTI**



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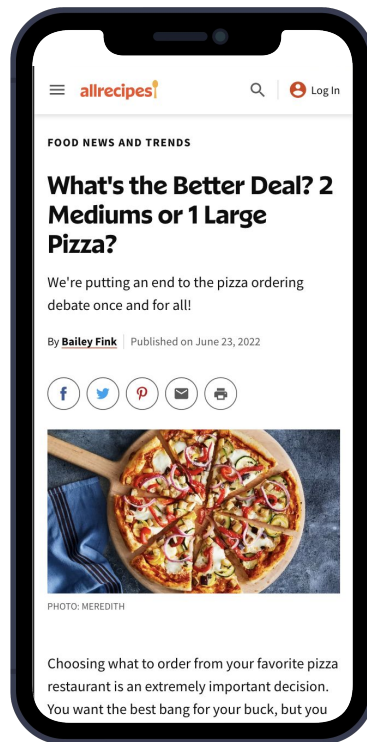
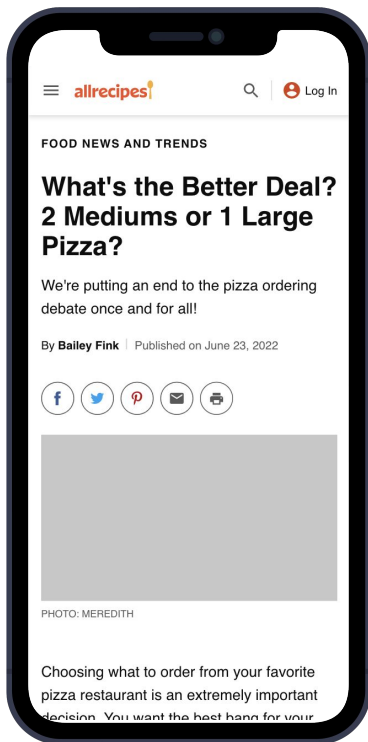
Everything has loaded and the browser is ready for interactions

# CLS

Cumulative Layout Shift



# Optimizing CLS



# THANKS!

Questions? Thoughts?

# Performance Monitoring at DDM

Processes in performance metrics



# Performance Monitoring Goal

*To keep everyone informed about  
the speed of our products*

# Approach

1. *Be curious*
2. *Keep informed*

# What do we use to monitor?

## Feature Development

- Chrome DevTools
- WebPageTest

## Continuous Integration (CI)

- JMeter
- Lighthouse -> LighthouseCI
- WebPageTest

## Application Performance Monitoring

## Internet Performance Monitoring

- Catchpoint
- NewRelic

## Dashboards

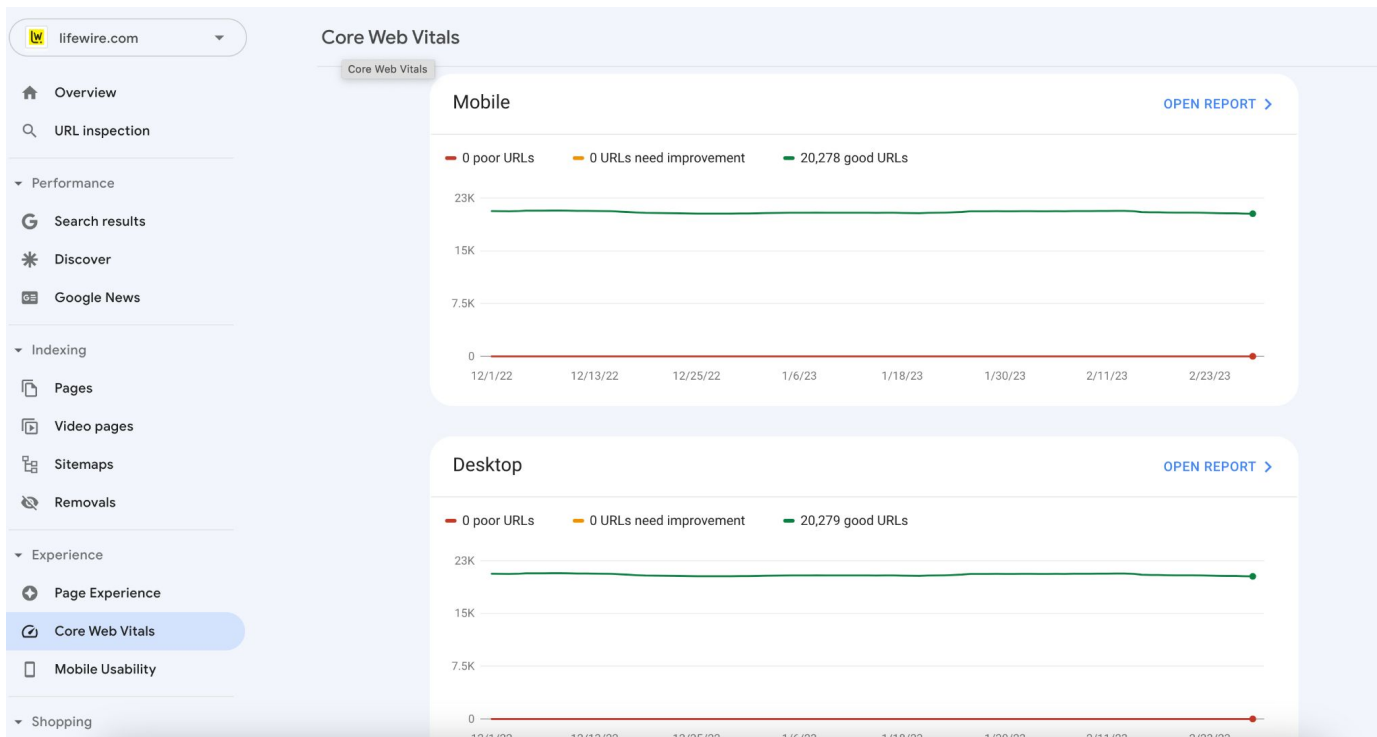
- Grafana
- Looker
- Kibana
- Reports (Confluence, Google Sheets)

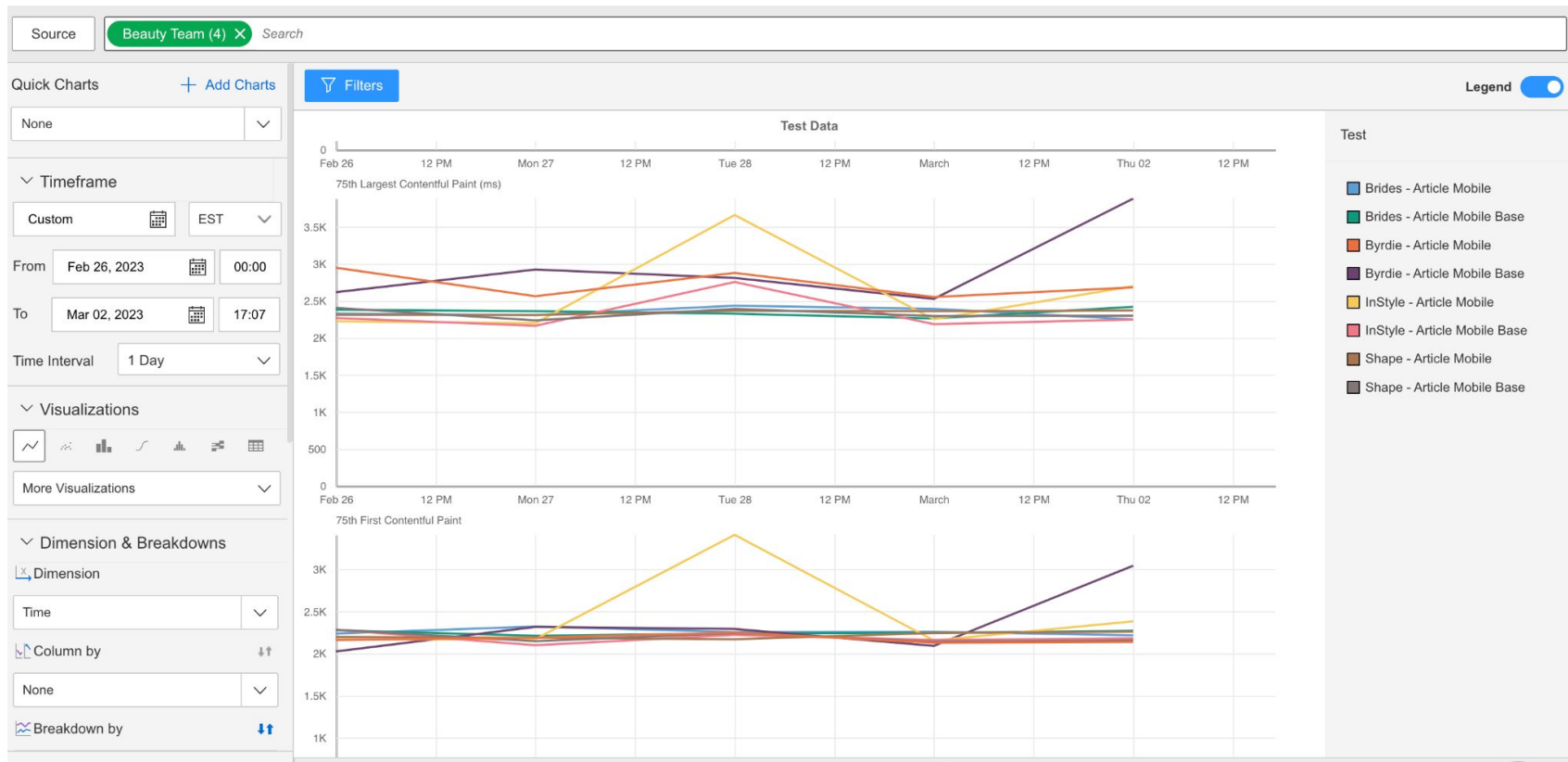
# Who monitors speed?

- **SEO**
- **Observability**
- **Site Reliability**
  - DevOps
  - QA
- **Engineering**
  - Platform teams
  - Brand teams
  - Speed team

# SEO

## Google Search Console



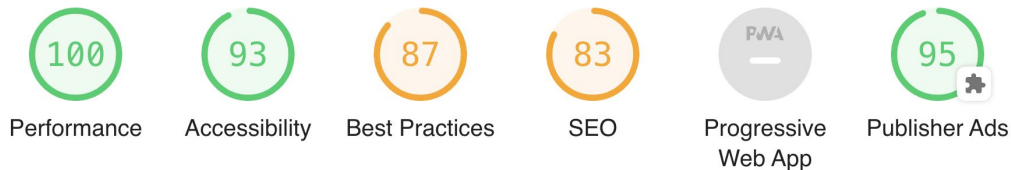


# QA & DevOps - JMeter

*STRUCTUREDCONTENTTEMPLATE-PERFORMANCE-  
RESULTS (TIMEUNIT=MILLISECONDS (MS) )*

	COMPARE BRANCH	TEST BRANCH
APPLICATION_VERSION	1.56.0-MASTER- SNAPSHOT	1.56.0-FEATURE-BHG-910-TAXSC-PRODUCE- SNAPSHOT
AVERAGE_TTFB	98	96
AVERAGE_TTLB	102	100
TTFB_50_PCT	111	109
TTFB_75_PCT	117	116
TTFB_90_PCT	125	123
TTFB_99_PCT	146	141
TTLB_50_PCT	115	113
TTLB_75_PCT	121	120
TTLB_90_PCT	129	127
TTLB_99_PCT	151	149
DATA_URLS	1213	1218

# Engineering - Lighthouse



▲ 0-49   ■ 50-89   ● 90-100

There were issues affecting this run of Lighthouse:

- No ads were rendered when rendering this page.
- No ads were rendered when rendering this page.



## Performance

### Metrics

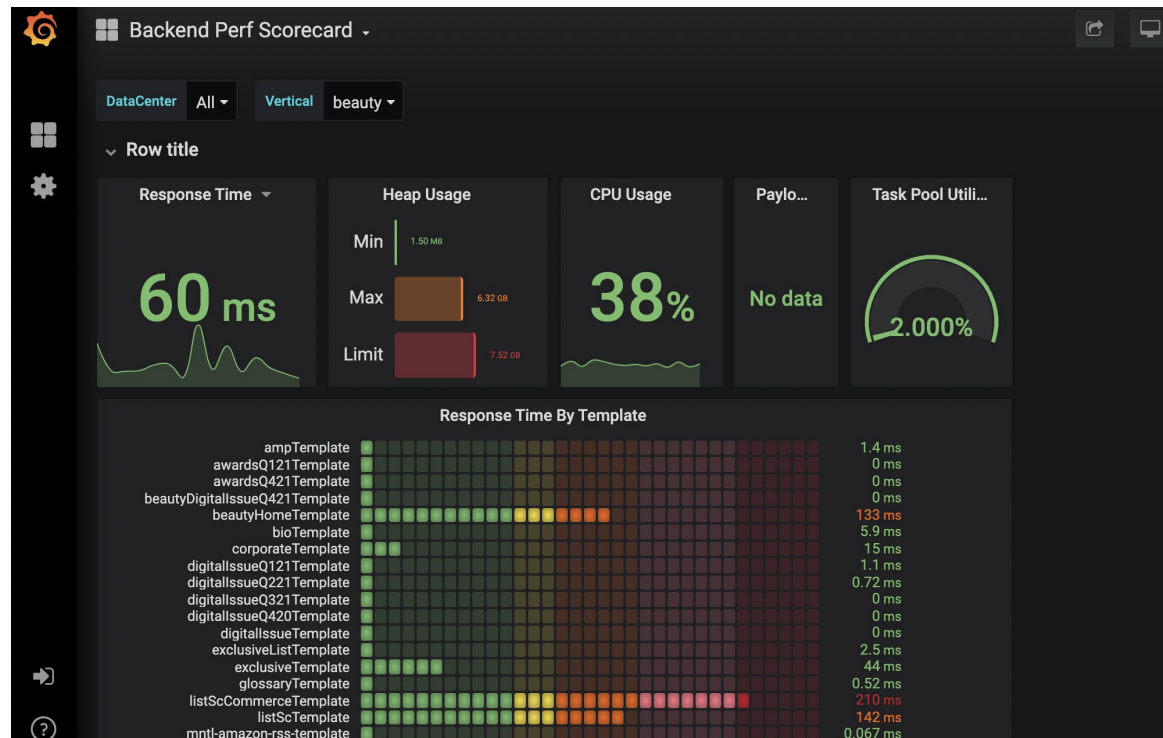
● First Contentful Paint	0.3 s	● Time to Interactive	0.3 s
● Speed Index	0.4 s	● Total Blocking Time	0 ms
● Largest Contentful Paint	0.5 s	● Cumulative Layout Shift	0



# Engineering - Lighthouse

Page	Iteration	Best Practices (%)	Performance (%)	Publisher Ads (%)	cumulative-layout-shift	first-contentful-paint (ms)	largest-contentful-paint (ms)	max-potential-fid (ms)	server-response-time (ms)	speed-index (ms)	total-blocking-time (ms)	time-to-interactive (ms)
<a href="#">Homepage</a>	1	87.00	100.00	95.00	0.0003	358.65	580.21	44.75	71.73	422.00	0.00	358.65
<a href="#">Homepage</a>	2	87.00	100.00	94.00	0.0003	468.98	679.35	45.29	212.12	532.00	0.00	468.98
<a href="#">Homepage</a>	3	87.00	100.00	95.00	0.0003	309.21	518.35	47.08	49.17	372.00	0.00	309.21
<a href="#">Homepage</a>	4	87.00	100.00	95.00	0.0003	306.79	517.26	45.83	46.72	371.00	0.00	306.79
<a href="#">Homepage</a>	5	87.00	100.00	95.00	0.0003	313.86	519.93	45.97	54.07	371.00	0.00	313.86
<a href="#">Homepage</a>	6	87.00	100.00	95.00	0.0003	315.11	521.90	46.91	50.63	385.00	0.00	315.11
<a href="#">Homepage</a>	7	87.00	100.00	95.00	0.0003	308.43	532.75	45.53	49.52	373.00	0.00	308.43
<a href="#">Homepage</a>	8	87.00	100.00	95.00	0.0002	309.34	523.27	45.94	46.07	379.00	0.00	309.34
<a href="#">Homepage</a>	9	87.00	100.00	95.00	0.0003	325.44	541.70	45.97	52.86	397.00	0.00	325.44
<a href="#">Homepage</a>	10	87.00	100.00	95.00	0.0002	315.47	532.65	46.96	51.59	383.00	0.00	315.47
<a href="#">ListSC</a>	1	93.00	99.00	95.00	0.0788	393.93	393.93	46.91	61.06	517.00	0.00	393.93
<a href="#">ListSC</a>	2	93.00	99.00	95.00	0.0788	414.29	414.29	50.80	77.58	537.00	0.80	1278.14
<a href="#">ListSC</a>	3	93.00	99.00	95.00	0.0788	387.81	387.81	51.44	58.61	541.00	0.00	407.36
<a href="#">ListSC</a>	4	93.00	99.00	95.00	0.0788	383.78	383.78	49.39	64.57	506.00	0.00	383.78
<a href="#">ListSC</a>	5	93.00	99.00	95.00	0.0788	412.67	412.67	51.82	76.91	576.00	0.00	436.21
<a href="#">ListSC</a>	6	93.00	99.00	95.00	0.0788	388.39	388.39	47.04	51.92	558.00	0.00	388.39
<a href="#">ListSC</a>	7	93.00	99.00	95.00	0.0788	396.19	396.19	48.42	58.81	562.00	0.00	396.19
<a href="#">ListSC</a>	8	93.00	99.00	95.00	0.0788	398.23	398.23	47.04	54.20	515.00	0.00	398.23
<a href="#">ListSC</a>	9	93.00	99.00	95.00	0.0788	411.12	411.12	51.17	64.16	573.00	0.00	431.36
<a href="#">ListSC</a>	10	93.00	99.00	93.00	0.0788	390.37	390.37	58.20	59.45	514.00	8.20	1245.11
<a href="#">Flex</a>	1	93.00	99.00	95.00	0.0788	358.71	358.71	45.31	78.38	736.00	0.00	358.71
<a href="#">Flex</a>	2	93.00	99.00	95.00	0.0788	351.20	398.97	48.13	78.14	478.00	0.00	351.20
<a href="#">Flex</a>	3	93.00	99.00	95.00	0.0788	344.63	390.36	41.91	77.90	508.00	0.00	344.63

# Backend Teams



# How do we monitor speed?

# Chase Waterfalls

## Alert

- Monitoring infrastructure triggers an alert
- A daily report indicates metrics increase

## Explore Dashboards

- Check for changes across all infrastructure to rule things out
- Dive into greater detail on the specific metric, comparing types of averages
- Look at individual record charts

## Form Hypothesis

- Based on chart graphs, identify problematic threshold(s)
- Understand corresponding metric
- Formulate hypothesis

## Inspect Waterfalls

- Inspect the waterfalls for corresponding records
- Identify problem via comparisons or unusual activity

## Alert

Daily Looker email report  
shows upward trend in LCP



Site Performance

### Lighthouse Performance

26m ago

Vertical: Name

is Lifewire

Performance Date

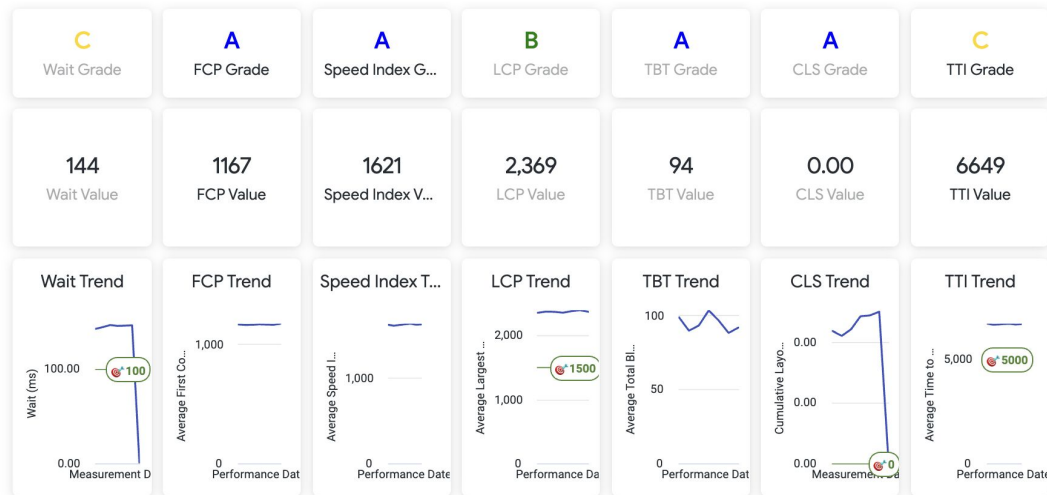
is in the last 7 complete days

Template Type

is not null and is not VIDEO or JWPLAYERVI...

Form Factor

is mobile



Please note: All metrics are mobile only EXCEPT Wait and CLS. They are for both desktop and mobile at the moment.

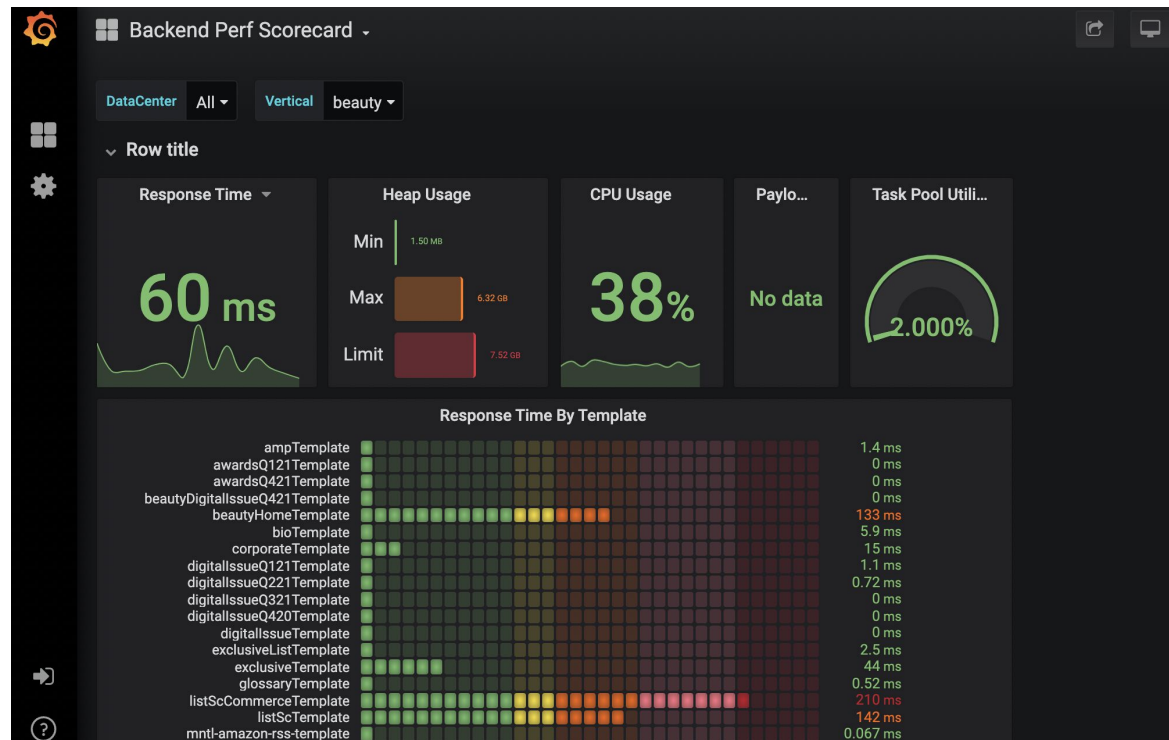
Alert

Explore  
Dashboards

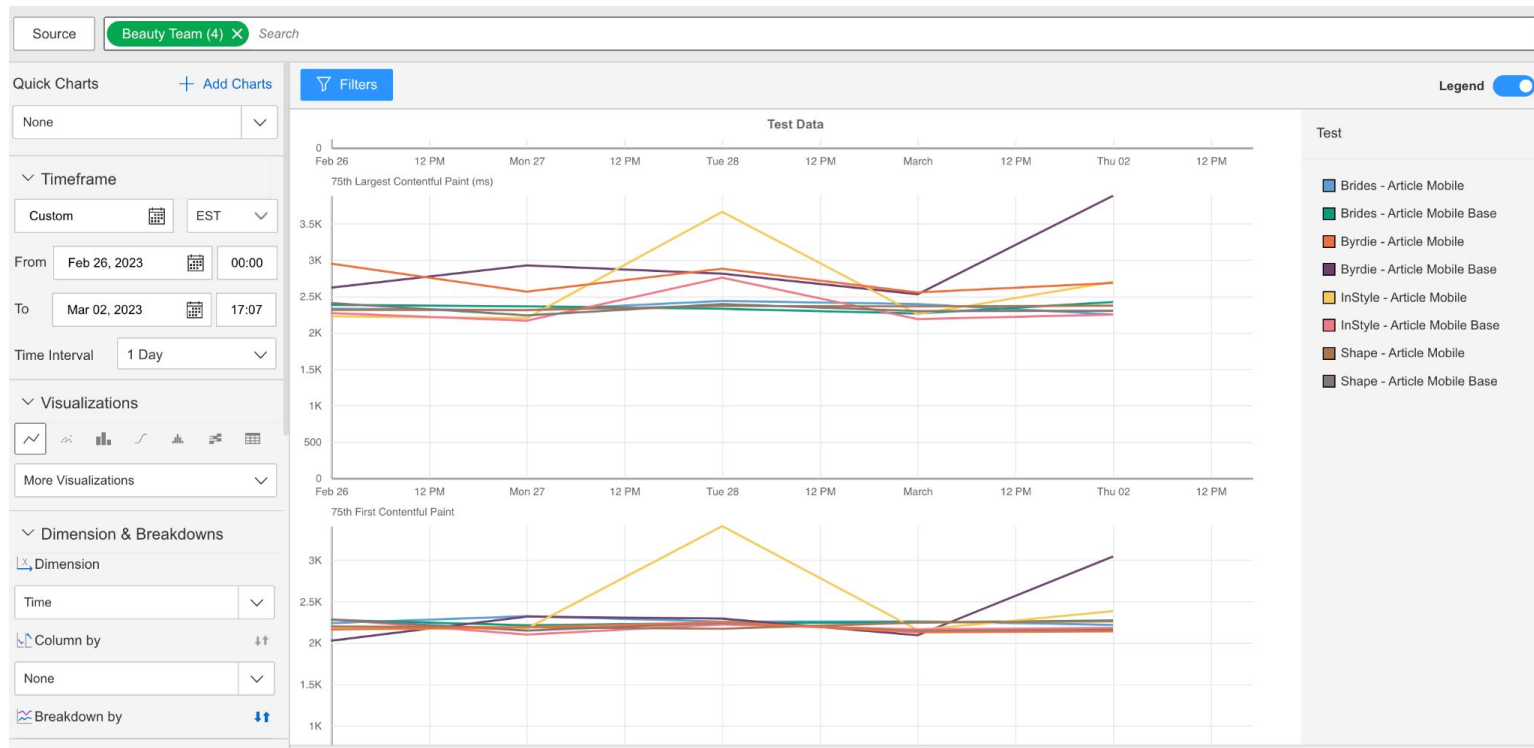
Looker dashboard shows  
upward trend in LCP

Verify if issue is caught in  
Lighthouse and/or  
Catchpoint

# Grafana



# Catchpoint Explorer Chart





Alert

Explore  
Dashboards

Form  
Hypothesis

Looker dashboard shows  
upward trend in LCP

Verify if issue is caught in  
Lighthouse and/or  
Catchpoint

LCP alone has been  
impacted, might be  
related to a recent update  
with our images

Alert

Explore  
Dashboards

Form  
Hypothesis







































Inspect  
Waterfalls

Looker dashboard shows  
upward trend in LCP

Verify if issue is caught in  
Lighthouse and/or  
Catchpoint

LCP alone has been  
impacted, might be  
related to an update with  
our images

# Catchpoint Explorer Record View

<div><div><div><div><div></div><div>Search File Name, Host</div></div></div><div><div>File Type</div><div>All</div><div></div></div><div><div>Request</div><div>All</div><div></div></div><div><div>Zone</div><div>All</div><div></div></div></div></div>												
#	File Name	Host	IP Address	Response Code	Protocol	Content Encoding	Largest ...	1000ms	2000ms	3000ms	4000ms	5000ms
19	 /e/dtb/bid?src=3446&u=http...	aax-dtb-cf.amaz...	18.160.77.31	200	HTTP/2.0							
20	 /static/1.50.0/cache/eNpdjD...	www.travelandle...	151.101.206.137	200	HTTP/2.0	gzip						
21	 /services/pub?anId=926268...	pixel.adsafeprot...	18.213.243.141	200	HTTP/2.0							
22	 /ut/v3/prebid	ib.adnxs.com	68.67.160.117	200	HTTP/1.1							
23	 /hbjson?sp=trustx	grid.bidswitch.net	35.211.165.199	200	HTTP/1.1	gzip						
24	 /translator?source=prebid-cli...	hbopenbid.pubm...	104.36.115.111	204	HTTP/2.0							
25	 /cygnus?s=479140&v=8.1&...	htlb.casalemedi...	172.64.154.237	200	HTTP/2.0							
26	 /openrtb2/auction	prebid-server.ru...	3.224.44.2	200	HTTP/2.0	gzip						
27	 /iu3?cm3ppd=1&d=dtb-pub...	s.amazon-adsys...	52.46.151.131	302	HTTP/1.1							
28	 /iu3?cm3ppd=1&d=dtb-pub...	s.amazon-adsys...	52.46.151.131	200	HTTP/1.1							
29	 /static/1.50.0/cache/eNpdjD...	www.travelandle...	151.101.206.137	200	HTTP/2.0	gzip						
30	 /v3/pr?exlist=n-index_snb_n...	s.amazon-adsys...	52.46.151.131	200	HTTP/1.1							
31	 /cksync?cs=31&type=tam&r...	cs.media.net	104.112.153.122	302	HTTP/1.1							
32	 /ecm3?ex=media.net&id=31...	s.amazon-adsys...	52.46.151.131	200	HTTP/1.1							
33	 /suid/101959?ntv_r=https://s...	jadserve.postrel...	52.205.119.86	302	HTTP/2.0							
34	 /ecm3?ex=nativo.com&id=6...	s.amazon-adsys...	52.46.151.131	200	HTTP/1.1							
35	 /usermatch?s=192259&cb=...	ssum-sec.casale...	192.40.36.238	302	HTTP/1.1							
36	 /usermatch?cb=https://s.am...	ssum-sec.casale...	192.40.36.238	200	HTTP/1.1							
37	 /w/1.0/cm?id=e818ca1e-0c2...	u.openx.net	35.244.159.8	302	HTTP/2.0							

# thanks.

## We're hiring!

<https://www.dotdashmeredith.com/careers>

🎵 *Go chasing waterfalls* 🎵

