We ❤ LoAF & INP

- about interactivity & tips to improve -

This is actually a love story...

We love the PageSpeed Community

HI!

we ♥ speed

Karlijn Löwik

CEO & Co-founder RUMvision
Mage-OS NL board member &
Lady Magento co-founder

Erwin Hofman

CTO & Co-founder RUMvision
Web dev + perf consultant &
Google Developer Expert

We love each other

We've been together for 13.5 years, married for 6 years this week

We love speed.. the web performance kind

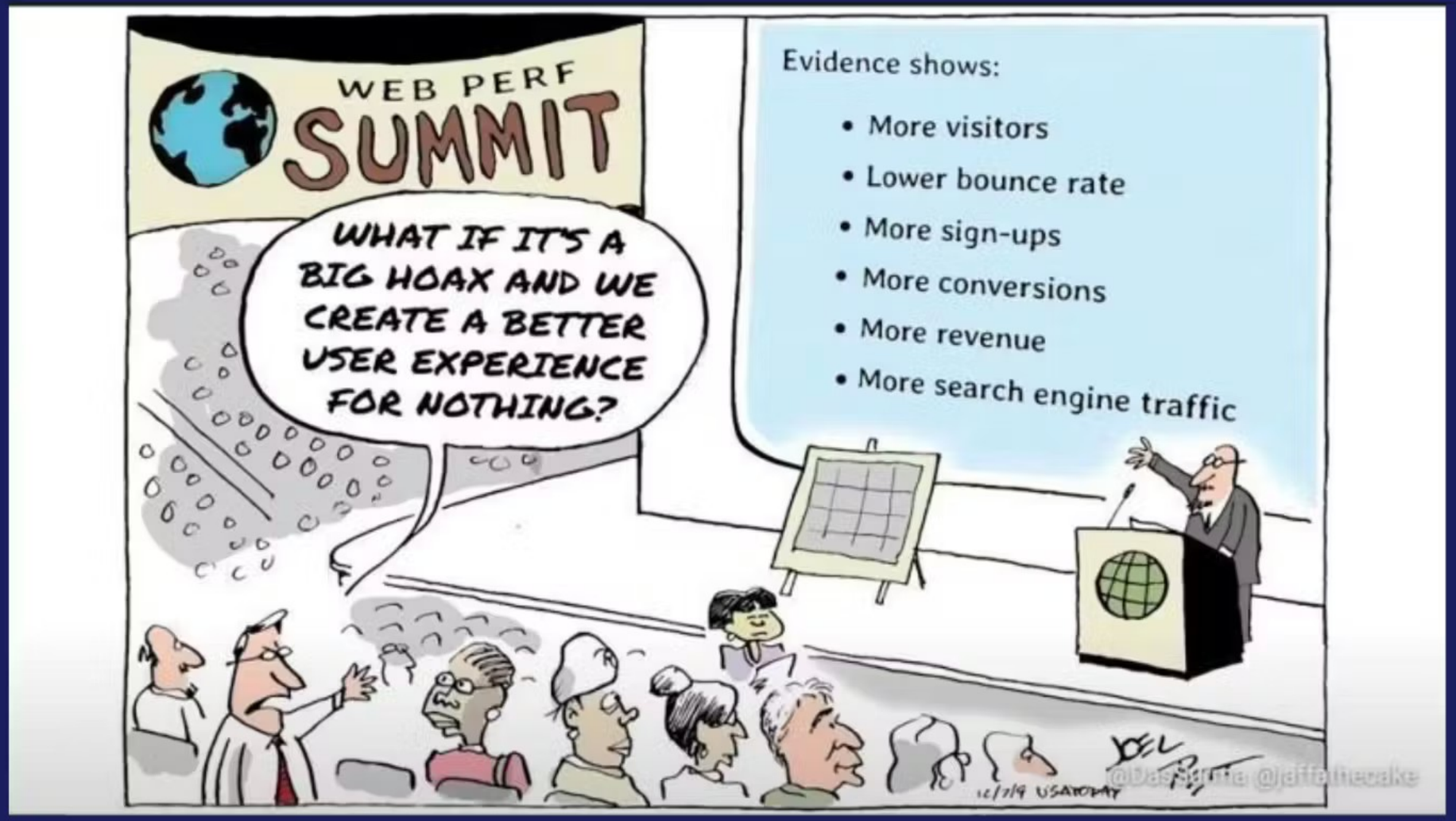
(although Erwin is a big F1 fan too)

Because having good SUX is a very important part of this love story

No, not sex.. although that is also important in a love story 😉

Sitespeed User eXperience

Turns out: SUX sells



eCommerce and site owners love that

And happier users love that too

vodafone

8 %

More sales by making our LCP 31% faster

Swappie

42 %

Mobile revenue boost by improving CWV

Google

62 %

Visitors will not return after bad mobile experience

Deloitte.

-8.3 %

Less bounce after focusing on optimization

To love, you need to be able to interact

- In real life you want to talk, listen, joke, cry and laugh with each other

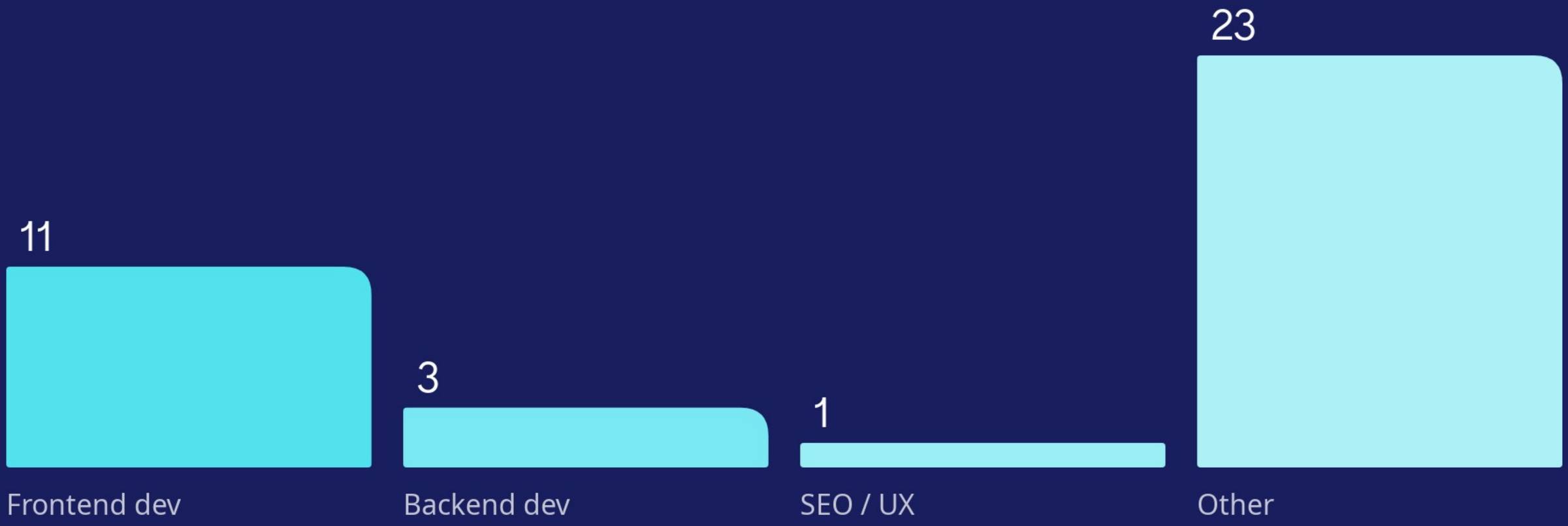
- On a website you want to click & scroll around, see movement, add to cart, dropdowns and slide-outs

To not get frustrated with your loved ones...

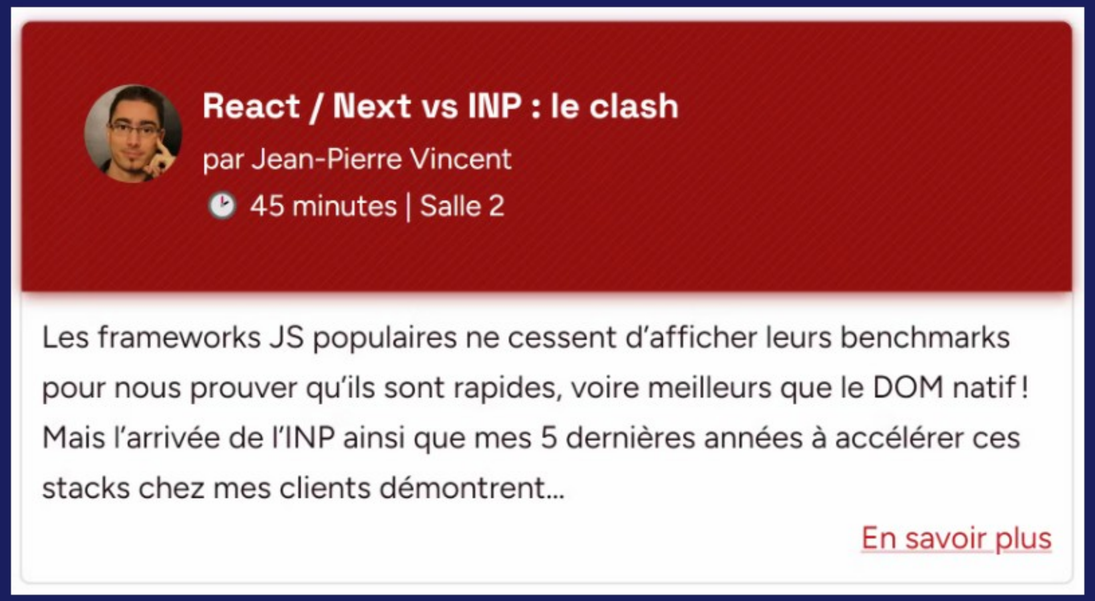
You also need a quick response when interacting

Grab your phone!

Let's get to know each other first! What is your jobtitle?



Who attended this talk? 👍 👎



17 9

To pass Core Web Vitals there are 3 SUXces criteria

Loading speed

=

Largest Contentful Paint (LCP)

The time it takes until the **largest element** (usually the hero) is **loaded**

< 2.5 seconds

Visual stability

=

Cumulative Layout Shift (CLS)

The biggest (5 seconds) sum of **unexpected shifts**, usually by banners and video ads

< 0.1

Interactivity

=

Interaction to Next Paint (INP)

The biggest delay between user interaction and **visual feedback** during the whole page life cycle

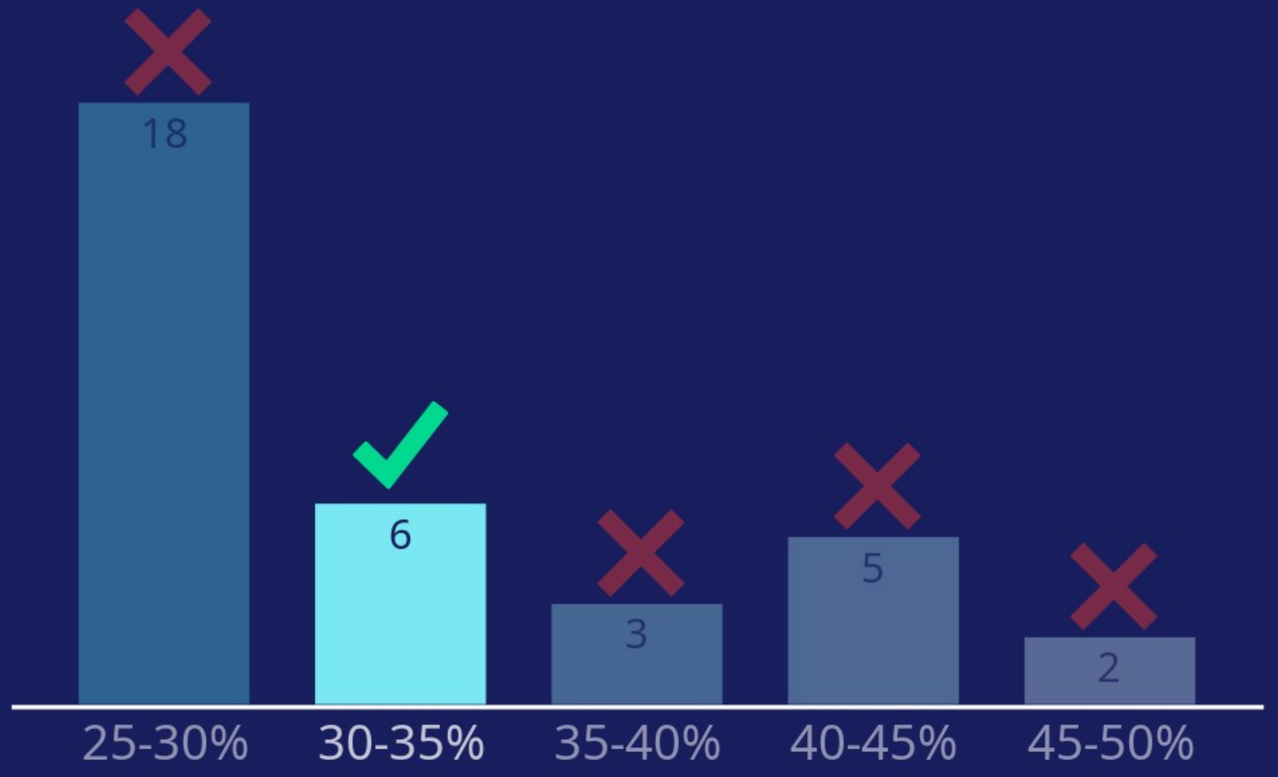
< 200 ms

CRUX 202408, 75TH PERCENTILE

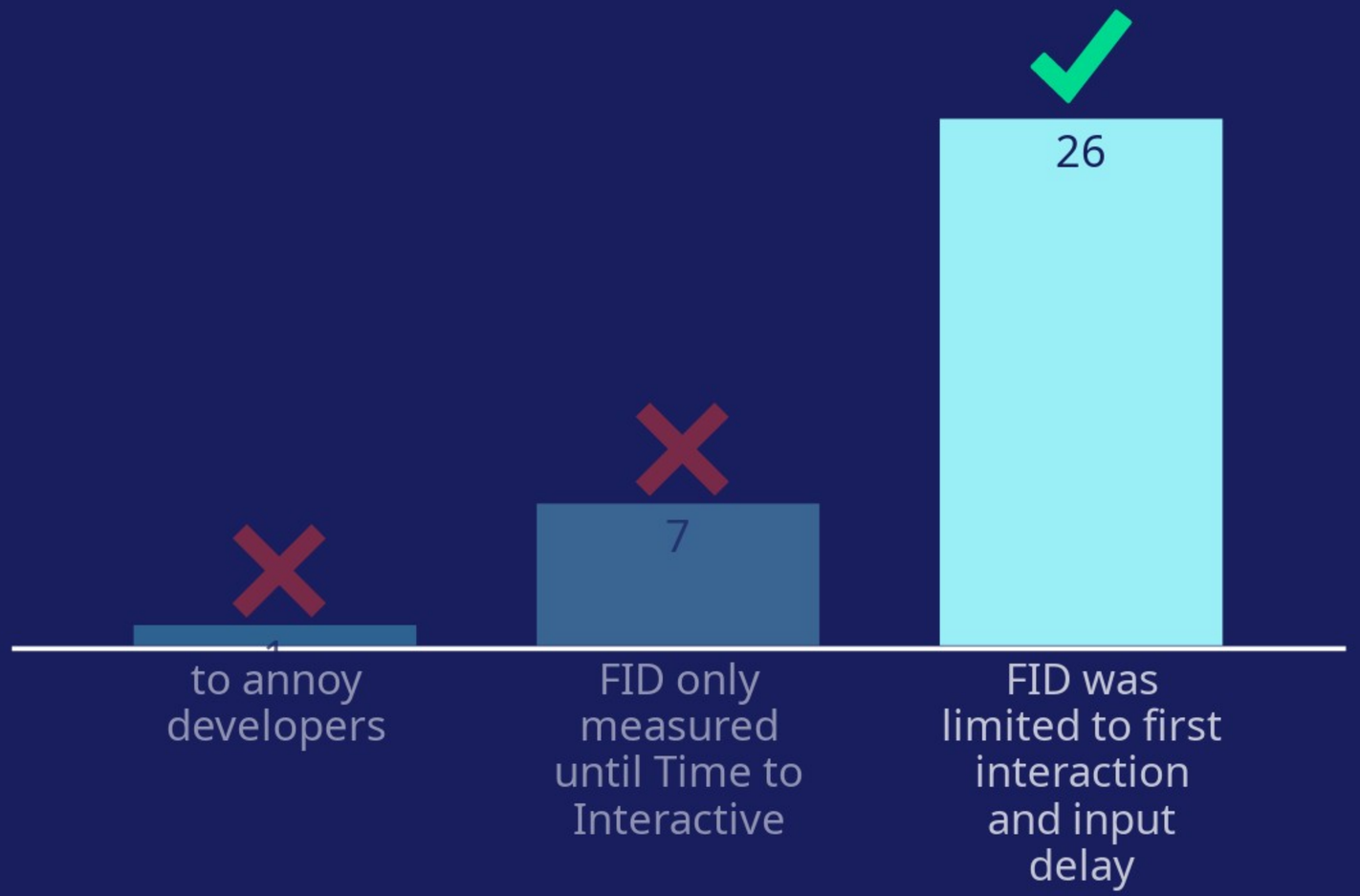
Globally, 24% of tablet and 49% of desktop passed Core Web Vitals

```
SELECT COUNT(origin) FROM chrome-ux-report.materialized.device_summary
WHERE yyyymm=202408 AND device='tablet' AND p75_lcp<=2500 AND p75_inp <= 200 AND p75_cls<=0.1 LIMIT 1
```

What percentage was passing CWV on mobile in August 2024



Why did Google replace FID with INP?



🗓️ March 12th 2024

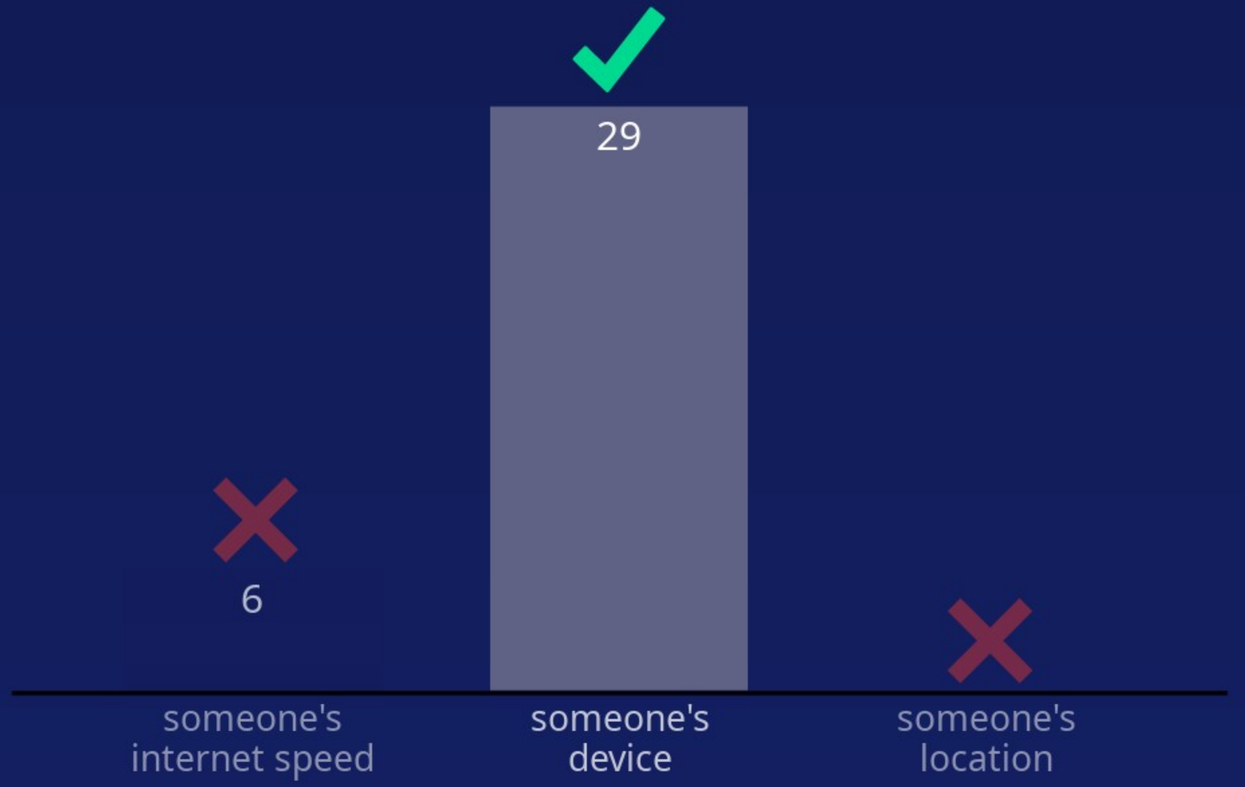
FID got replaced by INP as Core Web Vital

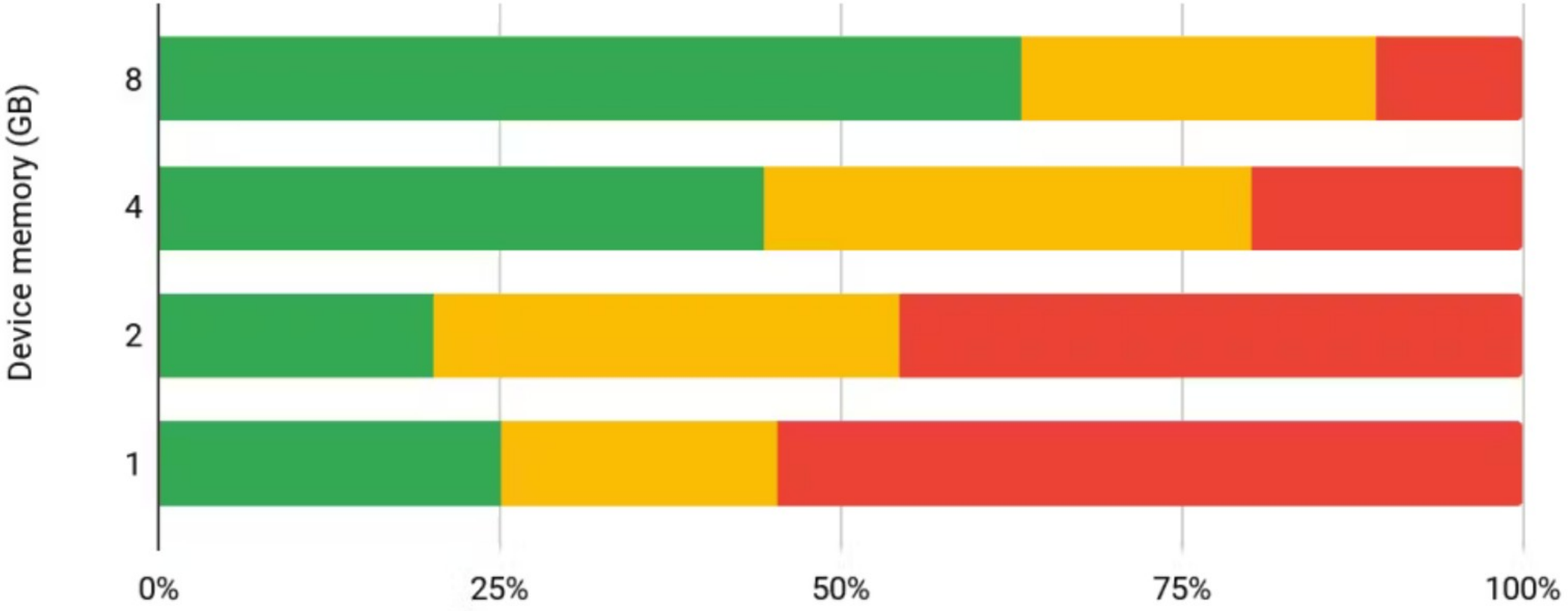
🗓️ September 10th 2024

Google fully removed FID from their tools

a new metric literally doesn't change a thing though!

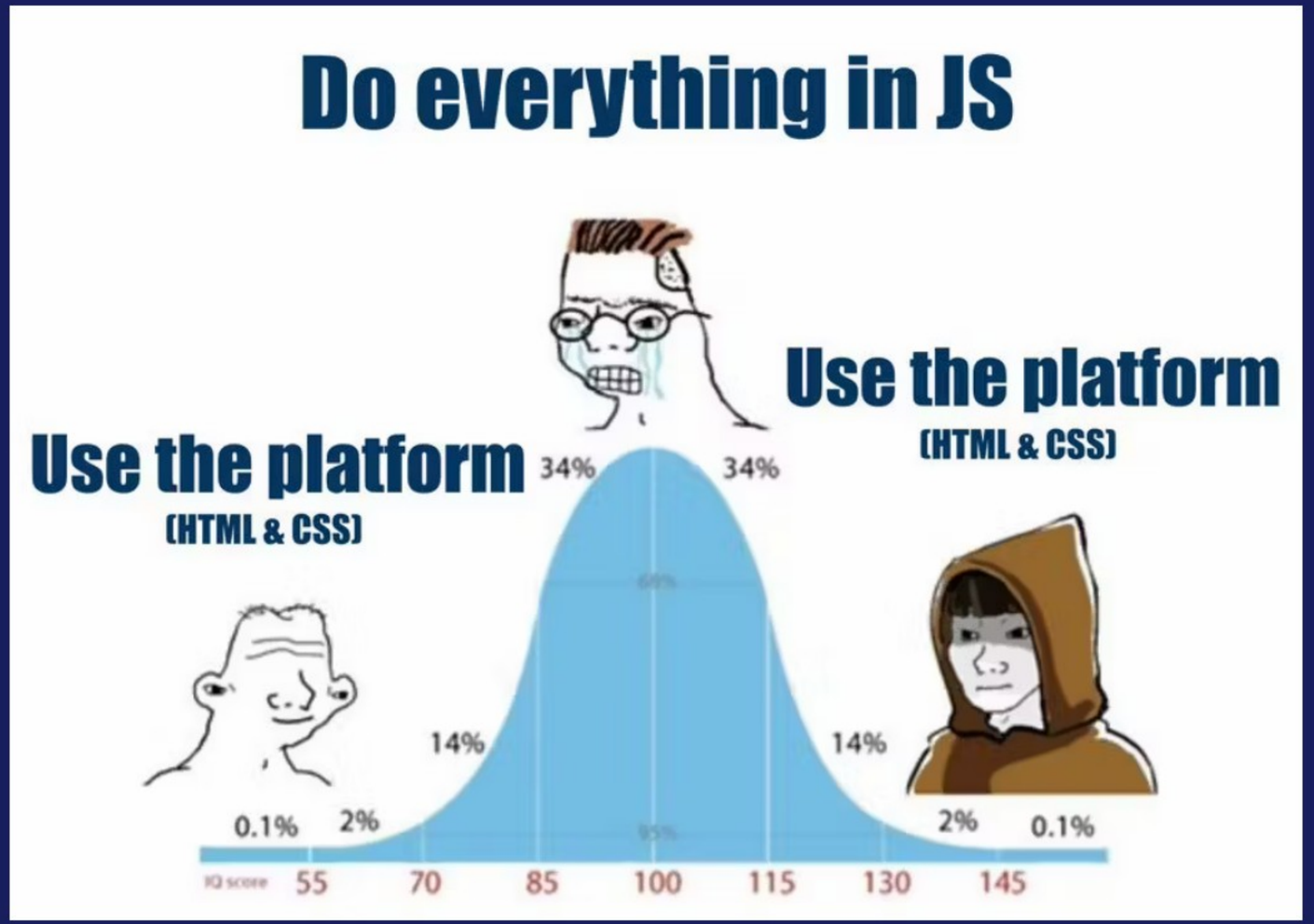
What has the highest correlation with INP?





Google + VISION


const capitalize = (str) =>
str.replace(/(?:^|\s|["'([{])+\S/g, match =>
match.toUpperCase();
);
;
div {
text-transform: capitalize;
}
imgflip.com


Do everything in JS
Use the platform
(HTML & CSS)
Use the platform
(HTML & CSS)
34%
34%
14%
14%
0.1%
2%
2%
0.1%
IQ score
55
70
85
100
115
130
145

linkedin.com/groups/121615/

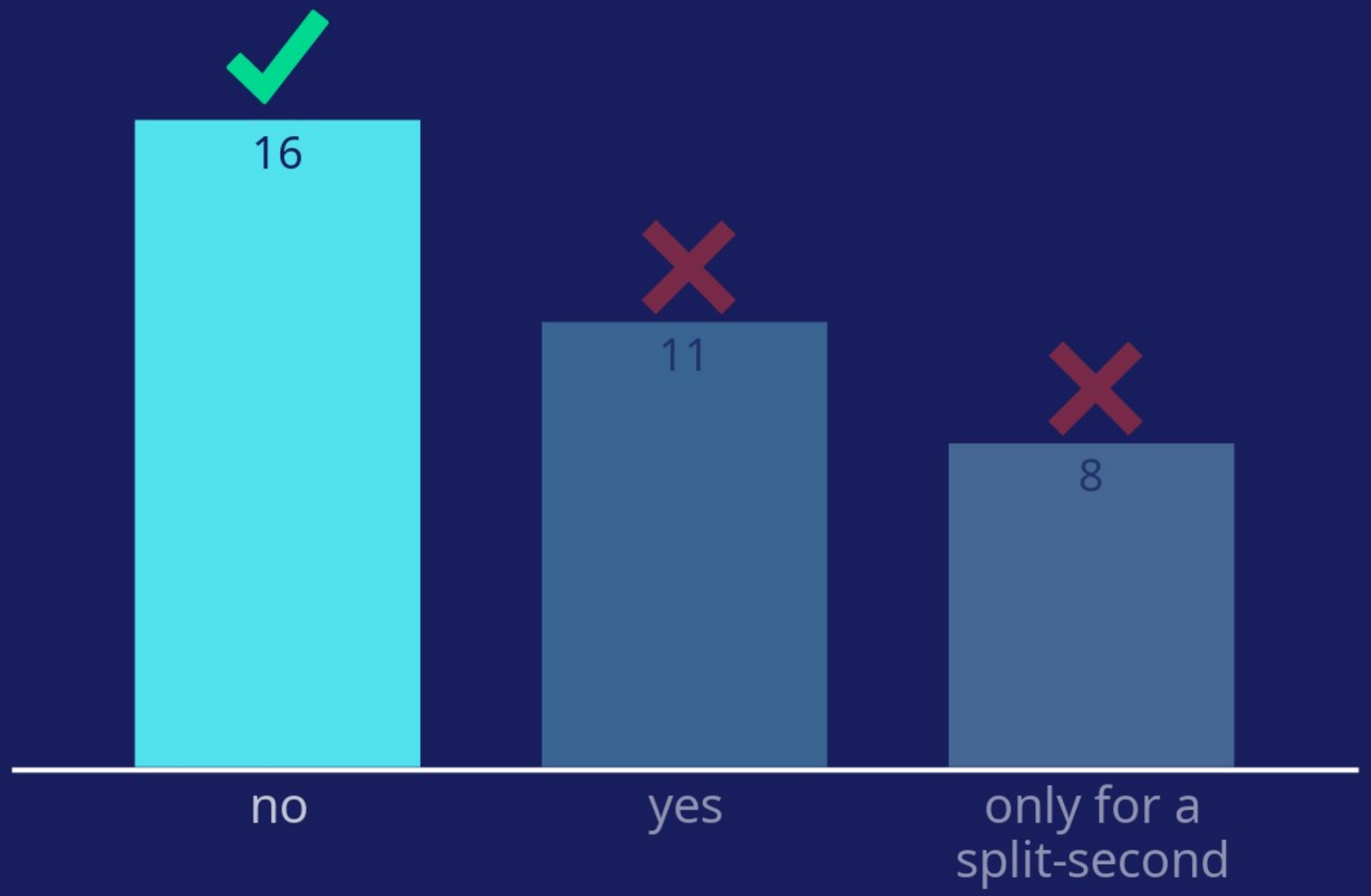
```
// Create an h1 element with text
const h1 = document.createElement('h1');
h1.textContent = 'Hello, World!';
document.body.appendChild(h1);

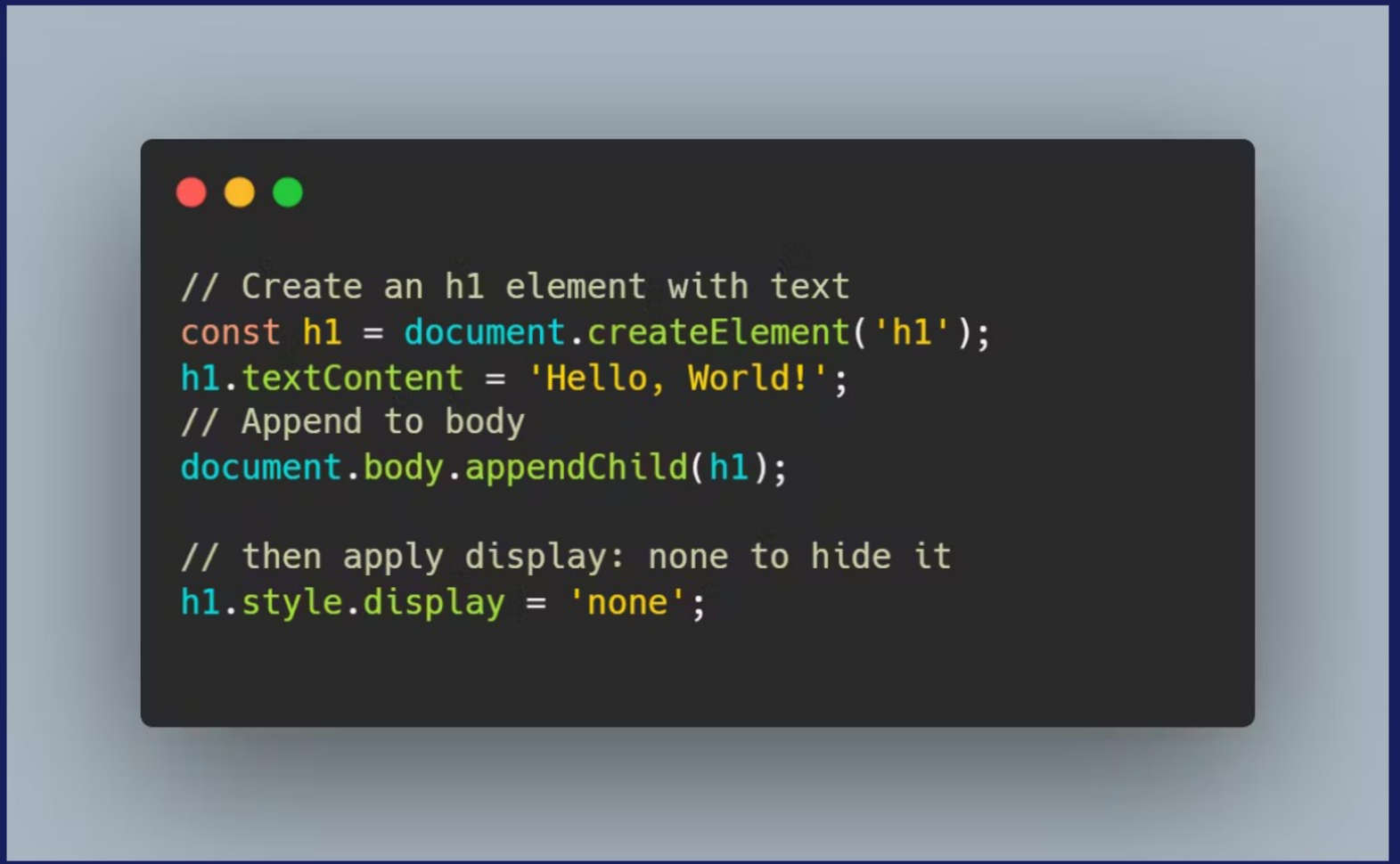
// will the <h1> be visible?

// Apply display: none to hide the h1
h1.style.display = 'none';
```

Appending a <h1> to the body

Will the <h1> be visible?





```
// Create an h1 element with text
const h1 = document.createElement('h1');
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// Append to body
document.body.appendChild(h1);

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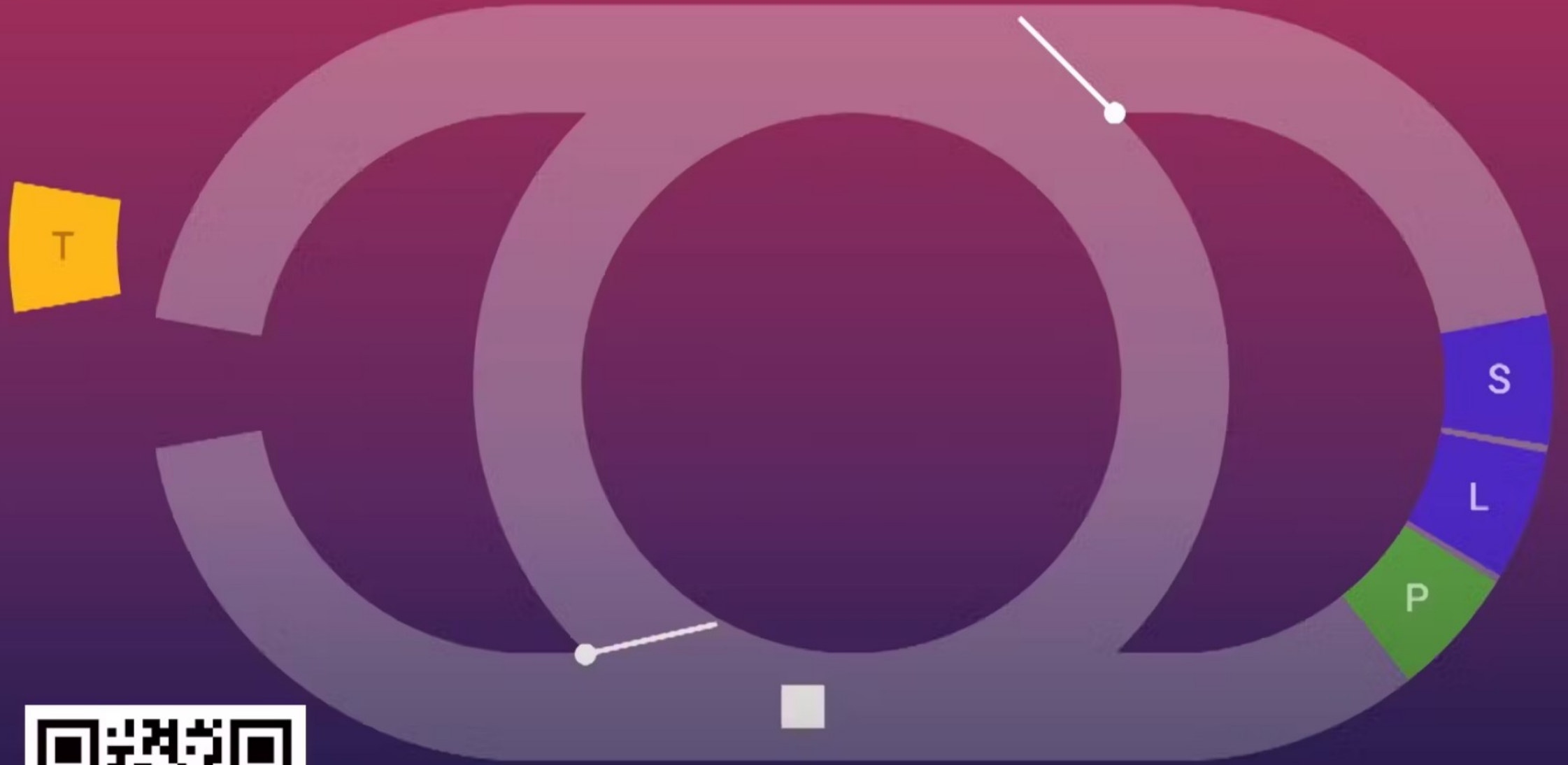
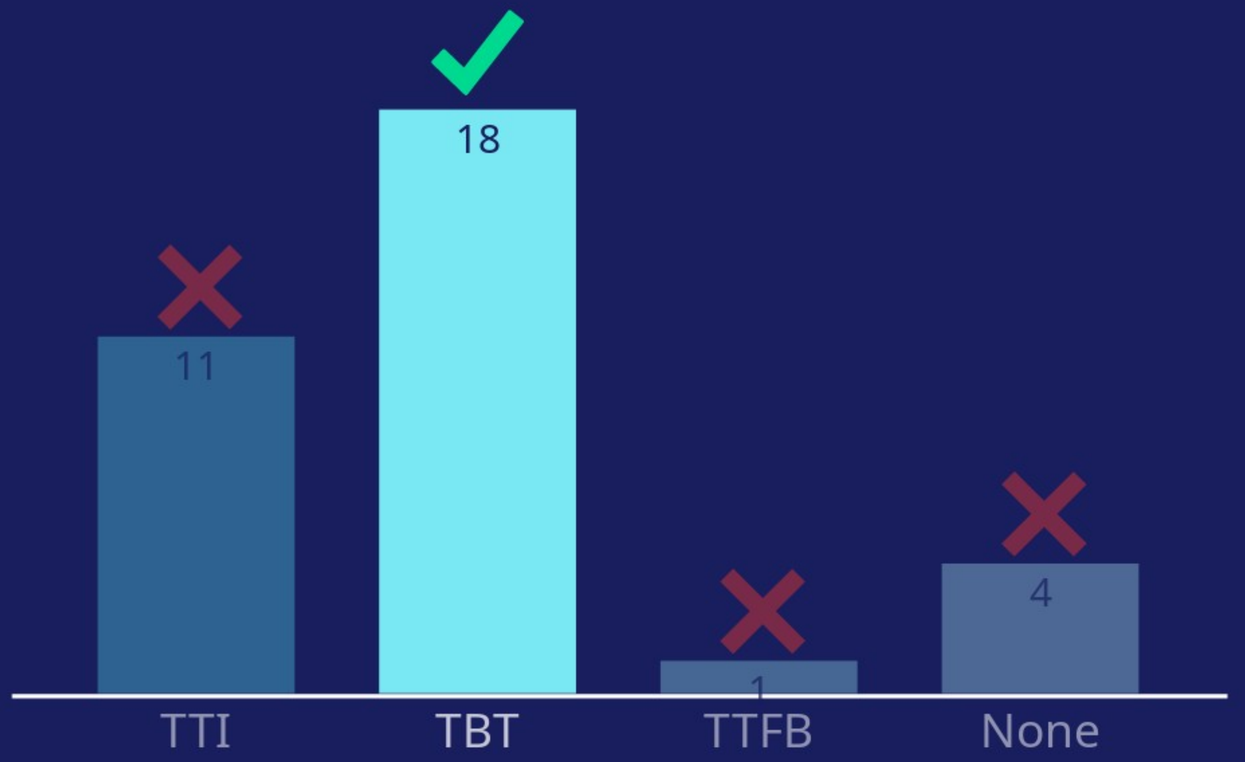


The Event Loop by Jake Archibald

Lazyloads all JavaScript:

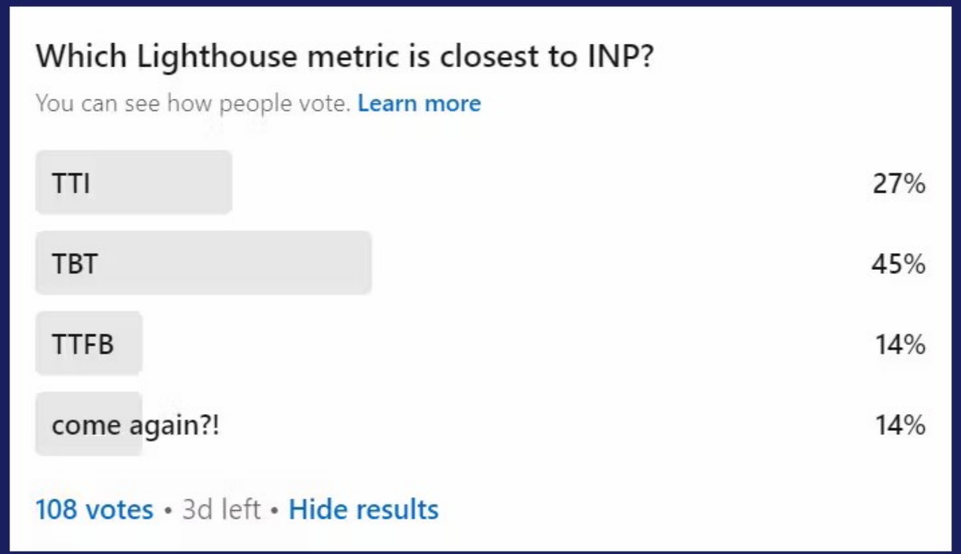

why do we fail
Core Web Vitals
Lighthouse showed
green when we launched
Lighthouse
doesn't equal real UX
nobody
told me that

Which Lighthouse metric is closest to INP?

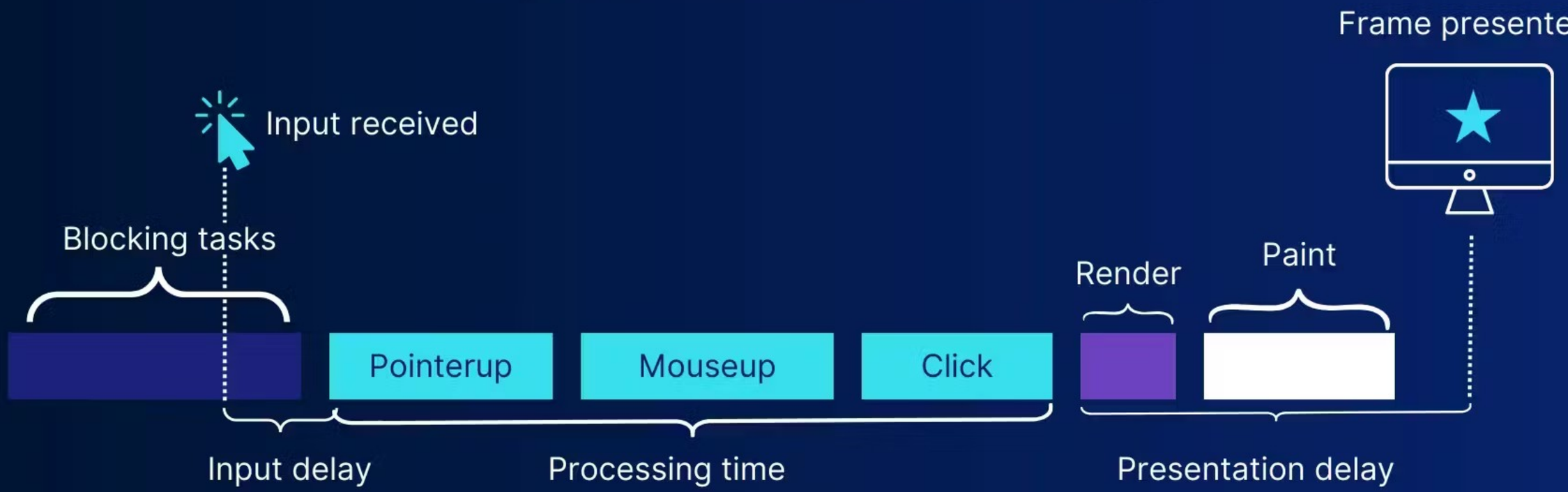


TBT vs INP

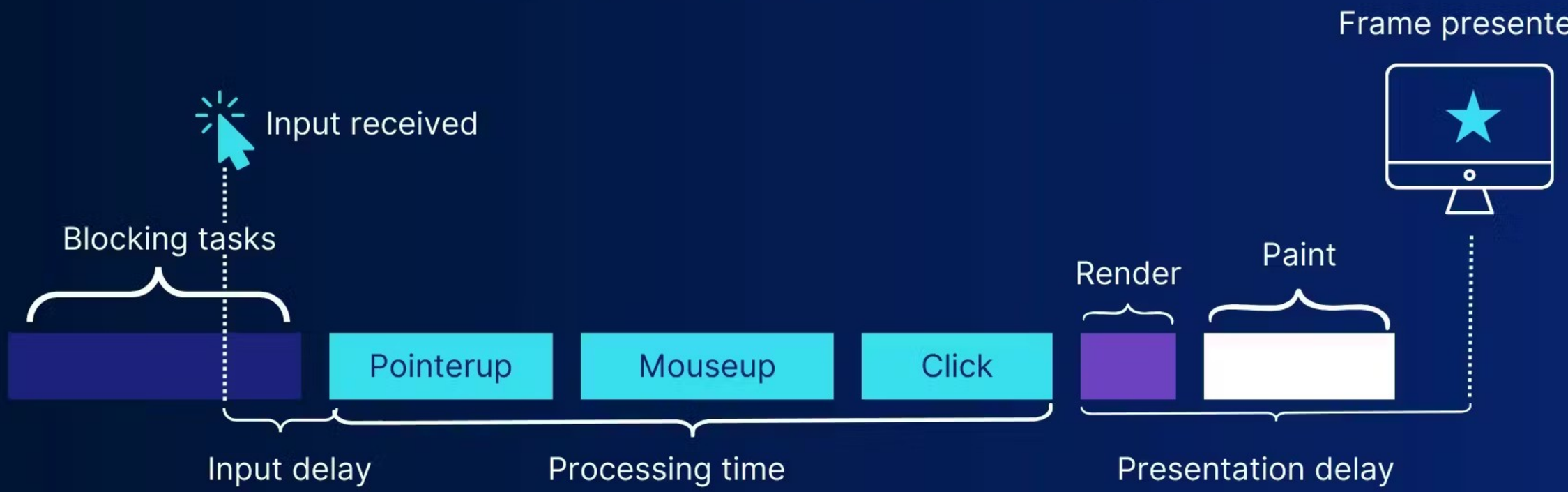
- TBT (Lighthouse)
- INP (Core Web Vitals)
- real users cannot be simulated



The life of an interaction:



The life of an interaction:



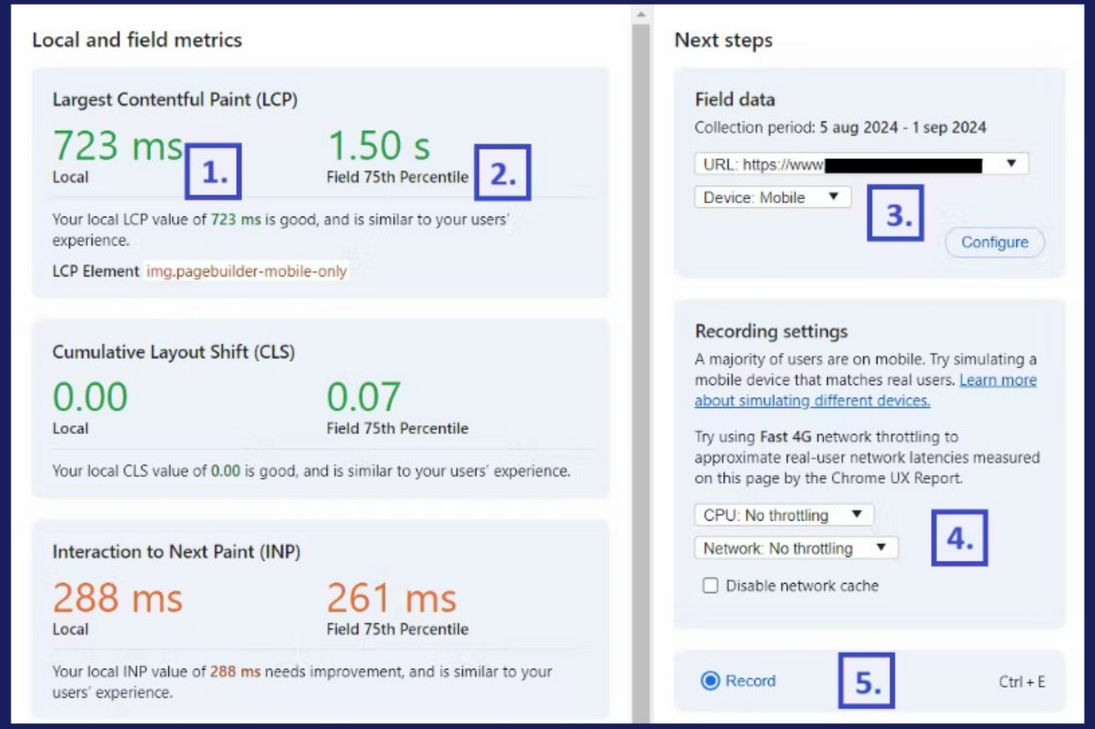
INP phases breakdown

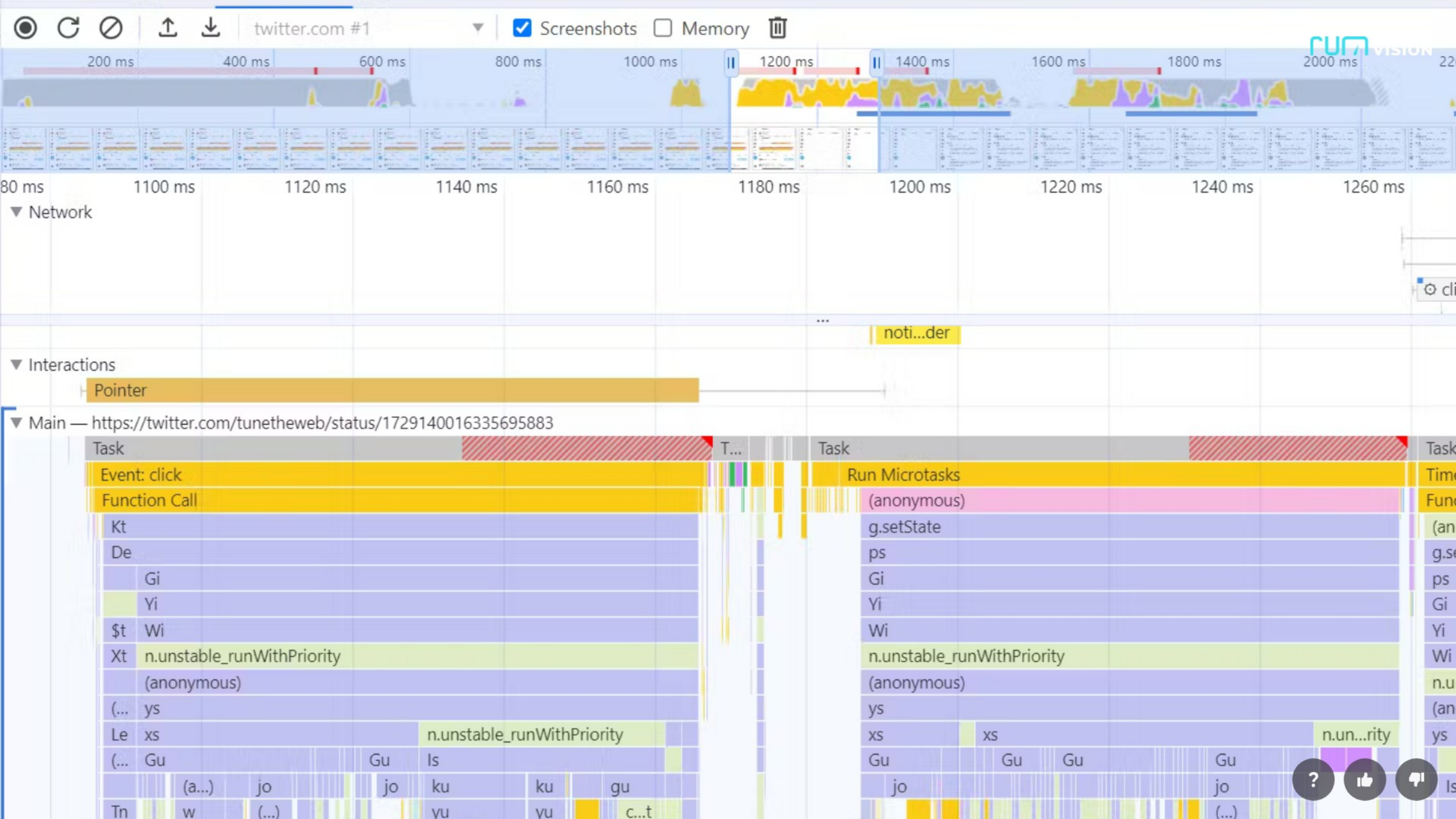
22% input delay	36% processing time	42% presentation delay
56 ms	**89** ms	**104** ms

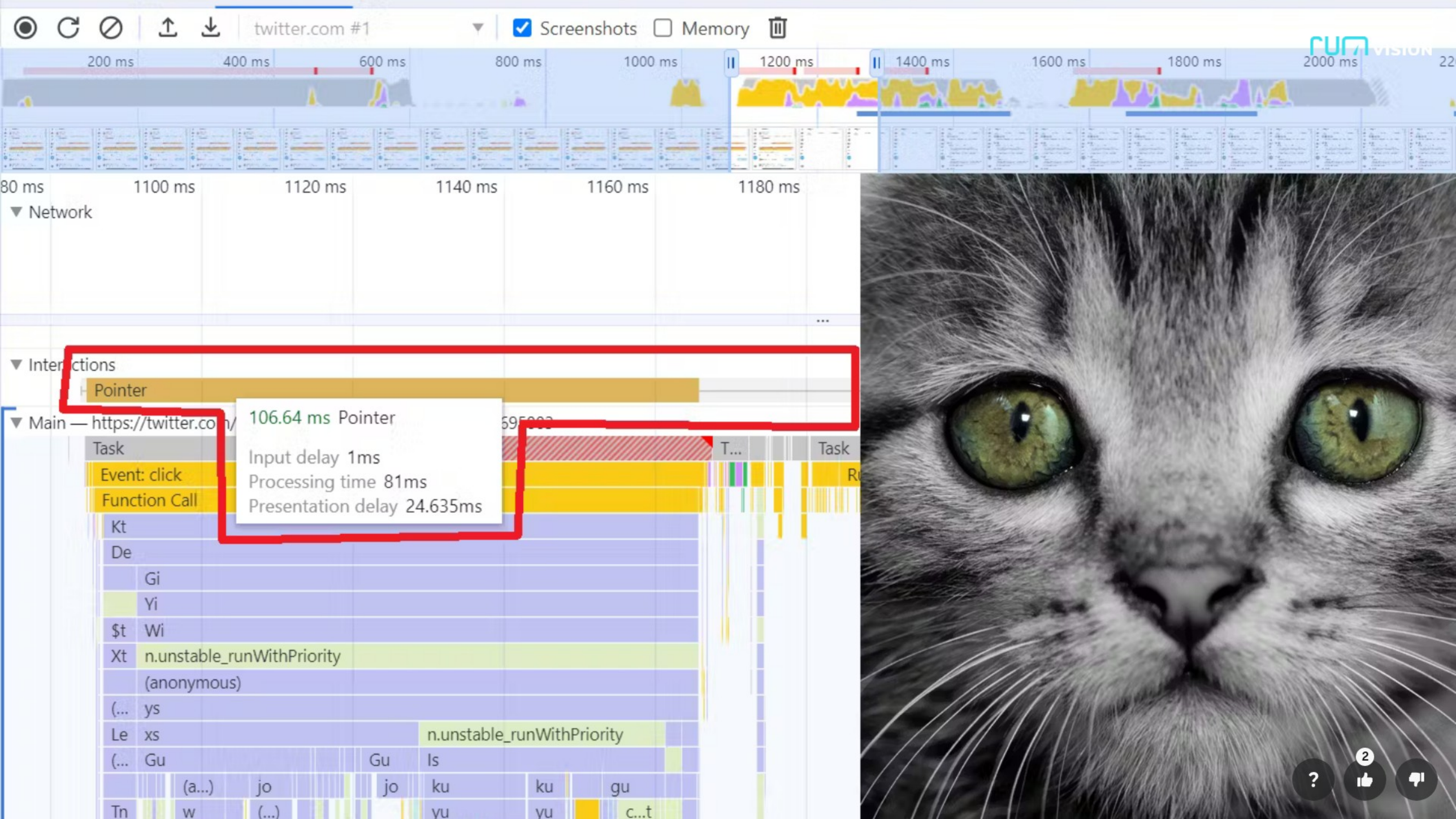
🗓️ Chrome 121
→ Whiskers

🗓️ Chrome 123
→ LoAF

🗓️ Chrome 129
→ new Performance panel
→ Scheduler.yield




twitter.com #1
Screenshots
Memory
200 ms
400 ms
600 ms
800 ms
1000 ms
1200 ms
1400 ms
1600 ms
1800 ms
2000 ms
1100 ms
1120 ms
1140 ms
1160 ms
1180 ms
1200 ms
1220 ms
1240 ms
1260 ms
Network
noti...der
Interactions
Pointer
Main — https://twitter.com/tunetheweb/status/1729140016335695883
Task
Event: click
Function Call
Run Microtasks
(anonymous)
g.setState
n.unstable_runWithPriority


twitter.com #1
Screenshots
Memory
200 ms
400 ms
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800 ms
1000 ms
1200 ms
1400 ms
1600 ms
1800 ms
2000 ms
1100 ms
1120 ms
1140 ms
1160 ms
1180 ms
Network
Interactions
Pointer
106.64 ms Pointer
Input delay 1ms
Processing time 81ms
Presentation delay 24.635ms
Main — https://twitter.com/
Task
Event: click
Function Call
Kt
De
Gi
Yi
$t Wi
Xt n.unstable_runWithPriority
(anonymous)
(... ys
Le xs
n.unstable_runWithPriority
(... Gu
Gu Is
(a...) jo
jo ku
ku gu
Tn w
(...) yu
yu c...t

How to track INP?

- Lighthouse + (new) DevTools Performance panel
- but what applies to you might not apply to me
- So: RUM + LoAF API (and track in all browsers)

How to measure INP

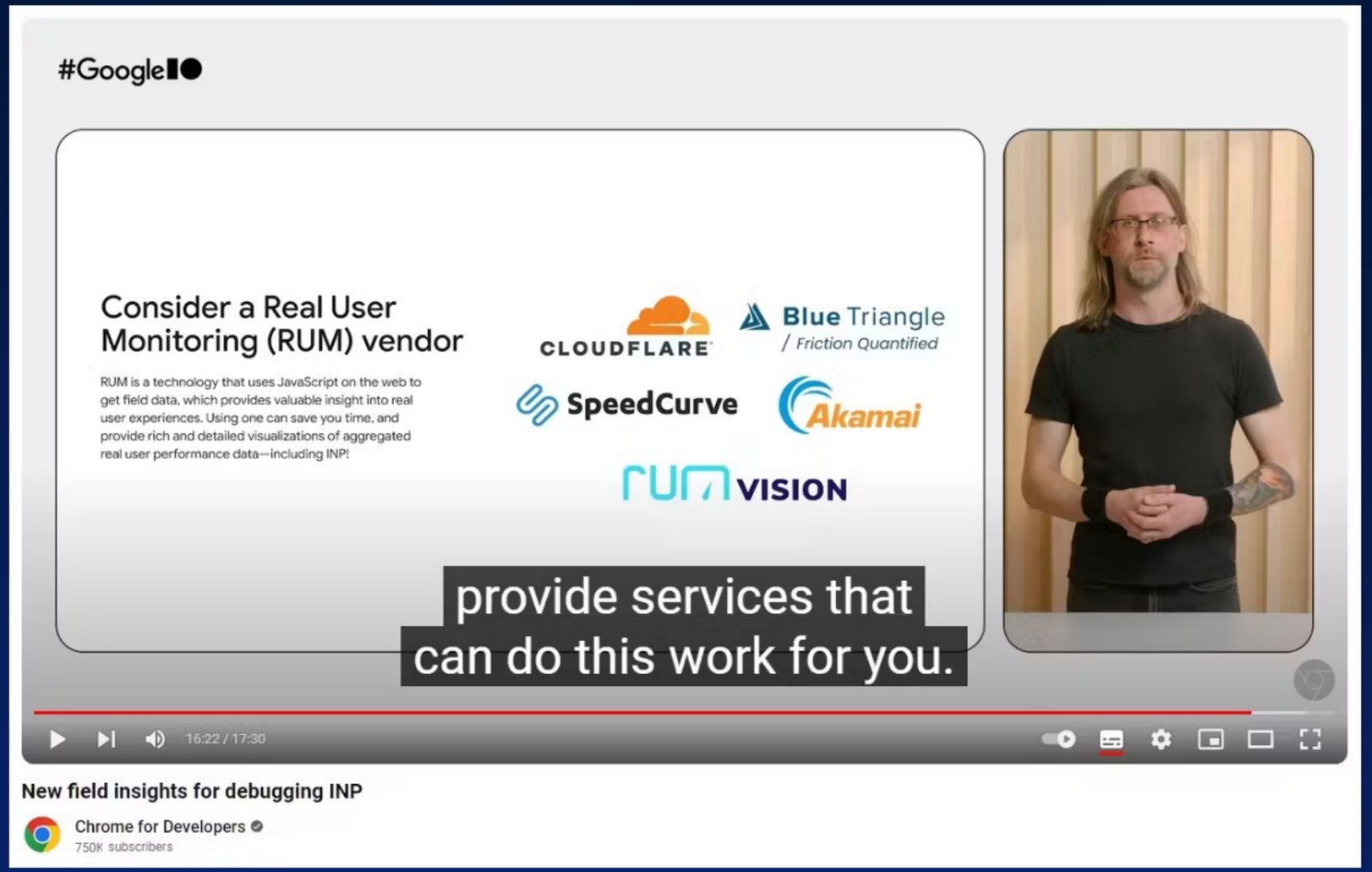
INP can be measured both in the field and in the lab through a variety of tools.

> **Key point:** The best way to measure your website's INP is by gathering metrics from actual users in the field. If you're accustomed to relying on lab data for assessing performance, take some time to read Why lab and field data can be different (and what to do about it).

In the field

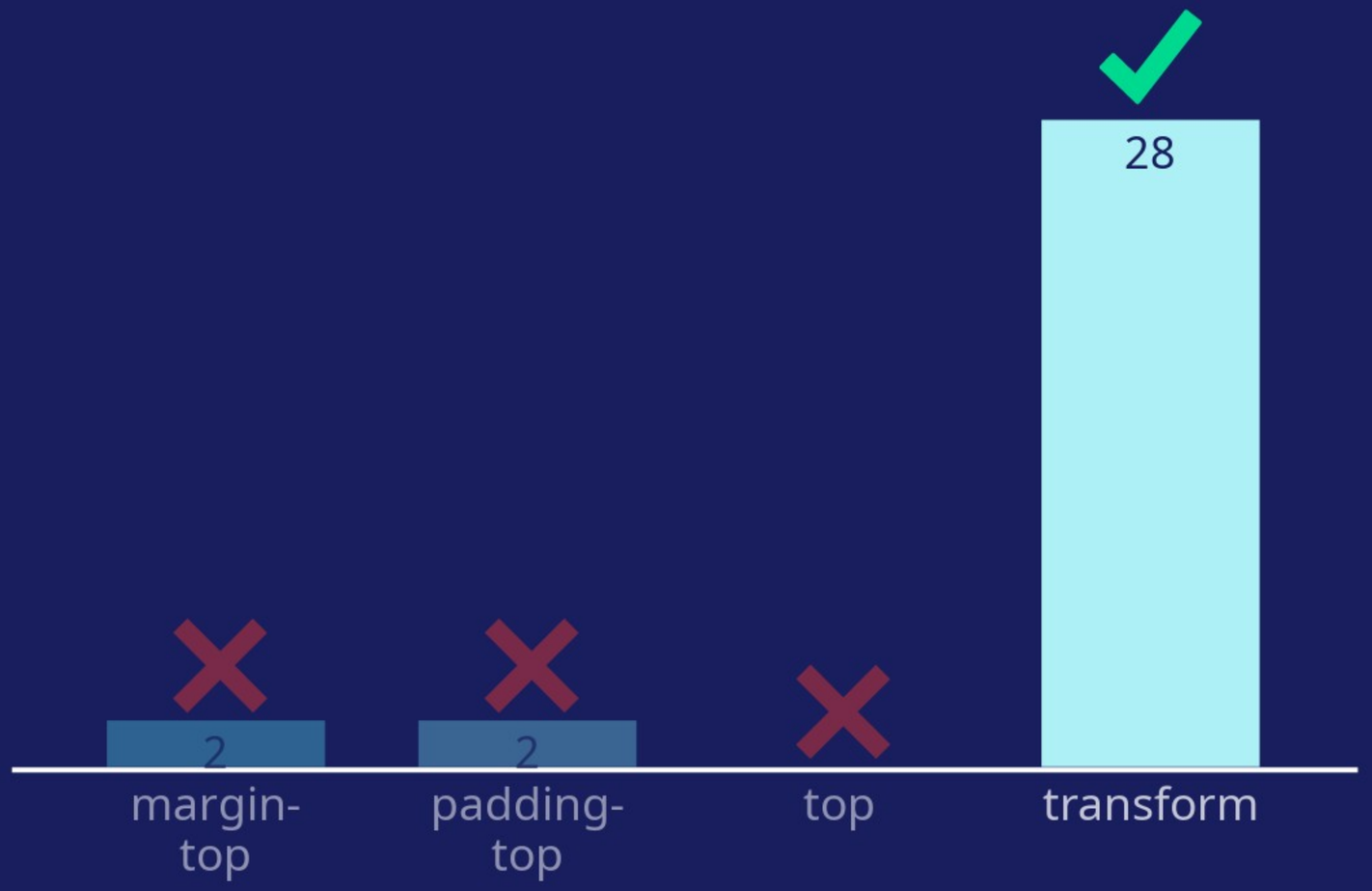
Ideally, your journey in optimizing INP will start with field data. At its best, field data from Real User Monitoring (RUM) will give you not only a page's INP value, but also contextual data that highlights what specific interaction was responsible for the INP value itself, whether the interaction occurred during or after page load, the type of interaction (click, keypress, or tap), and other valuable information.

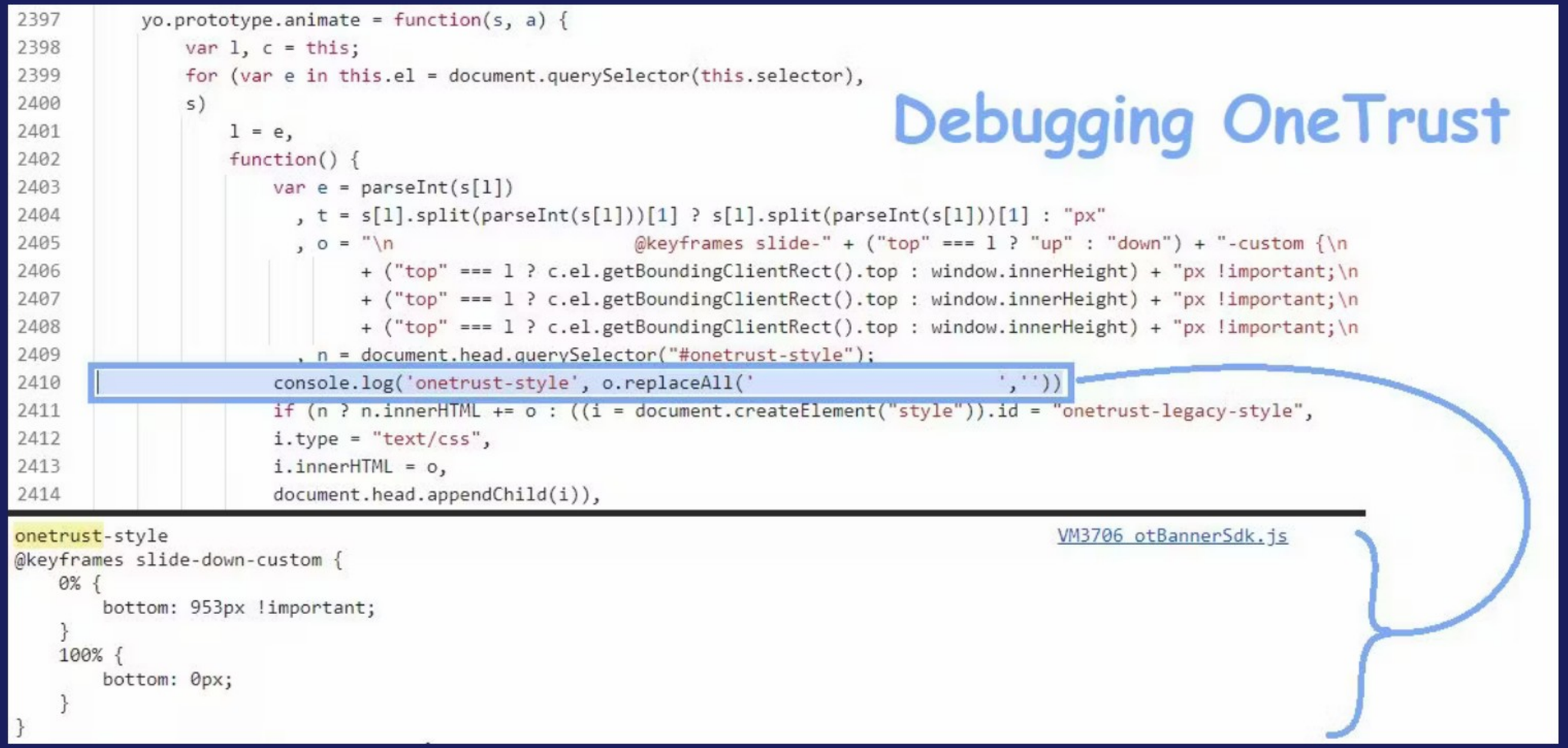
You can't improve what you don't measure



Explainer video INP by Google

Best CSS property to animate elements?





OneTrust being bad for performance

APRIL 14, 1994

Tobacco company CEOs declare - under oath - that nicotine is not addictive

Debugging this is why we love LoAF

Long Animation Frames

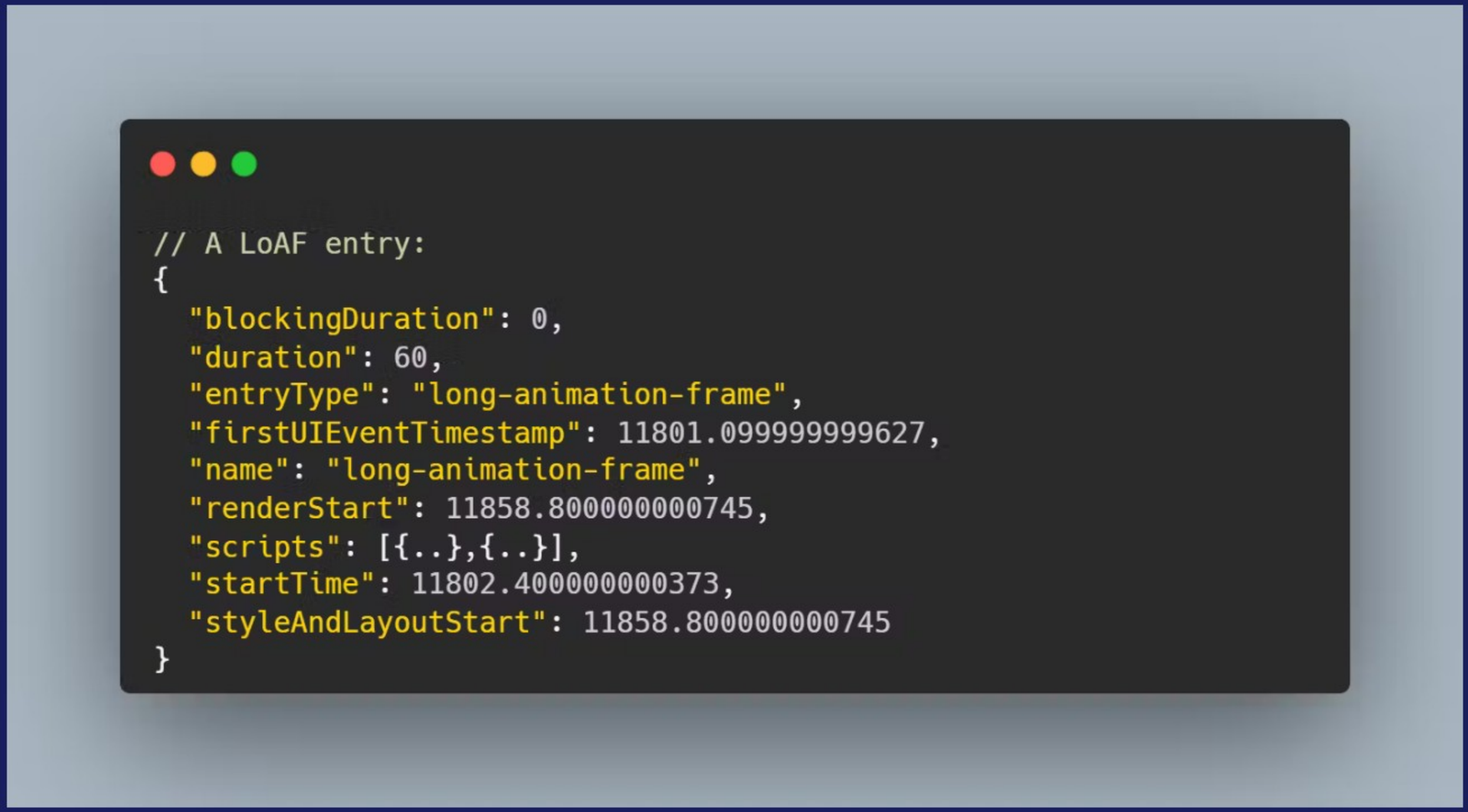
> Longtask came short, so we needed to reframe them

– Noam Rosenthal (chrome web platform engineer) & Karlijn Löwik

```
const observer = new PerformanceObserver((list) => {
  console.log(list.getEntries());
});

observer.observe({ type: 'long-animation-frame', buffered: true });
```

Observe LoAFs (see buffered flag)

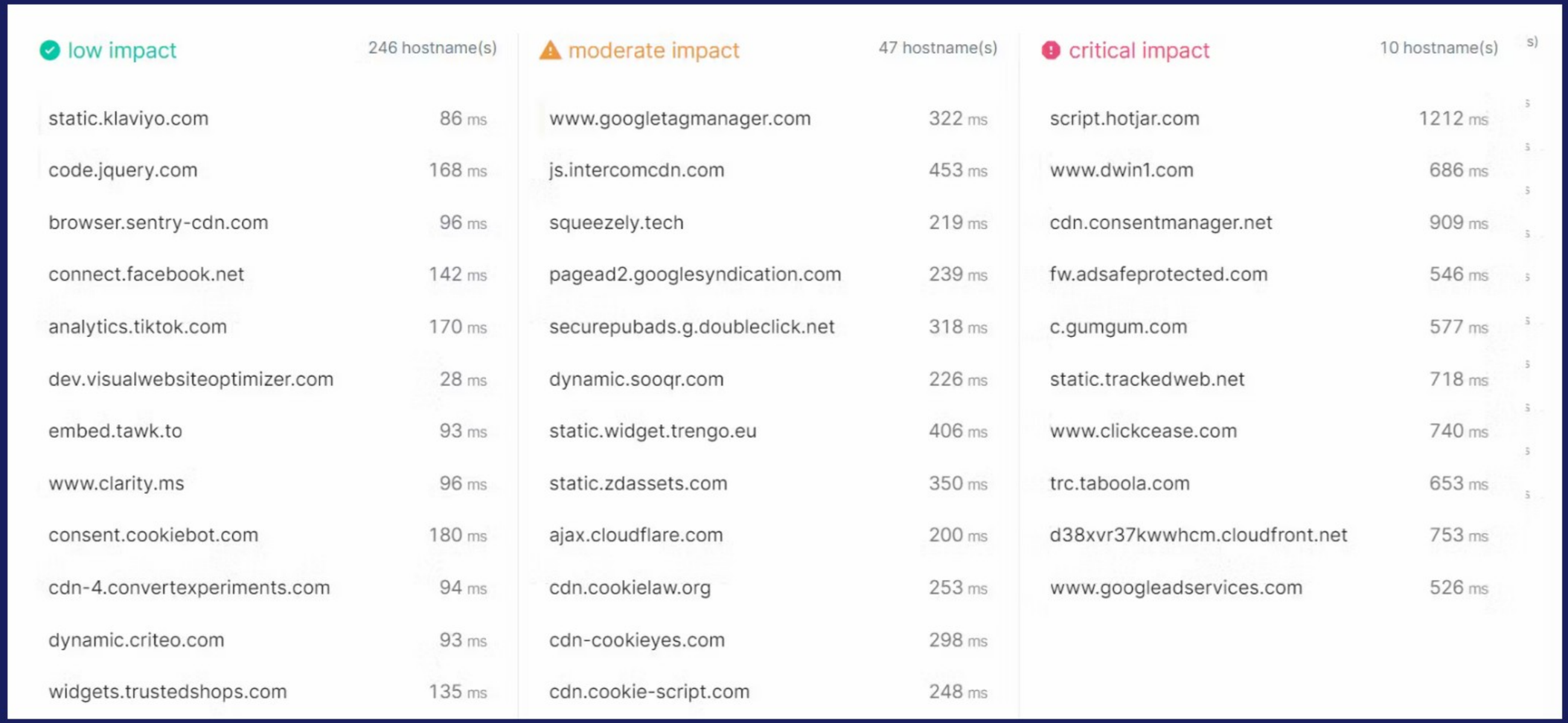


```
// A LoAF entry:
{
  "blockingDuration": 0,
  "duration": 60,
  "entryType": "long-animation-frame",
  "firstUIEventTimestamp": 11801.099999999627,
  "name": "long-animation-frame",
  "renderStart": 11858.800000000745,
  "scripts": [{..},{..}],
  "startTime": 11802.400000000373,
  "styleAndLayoutStart": 11858.800000000745
}
```

A LoAF entry

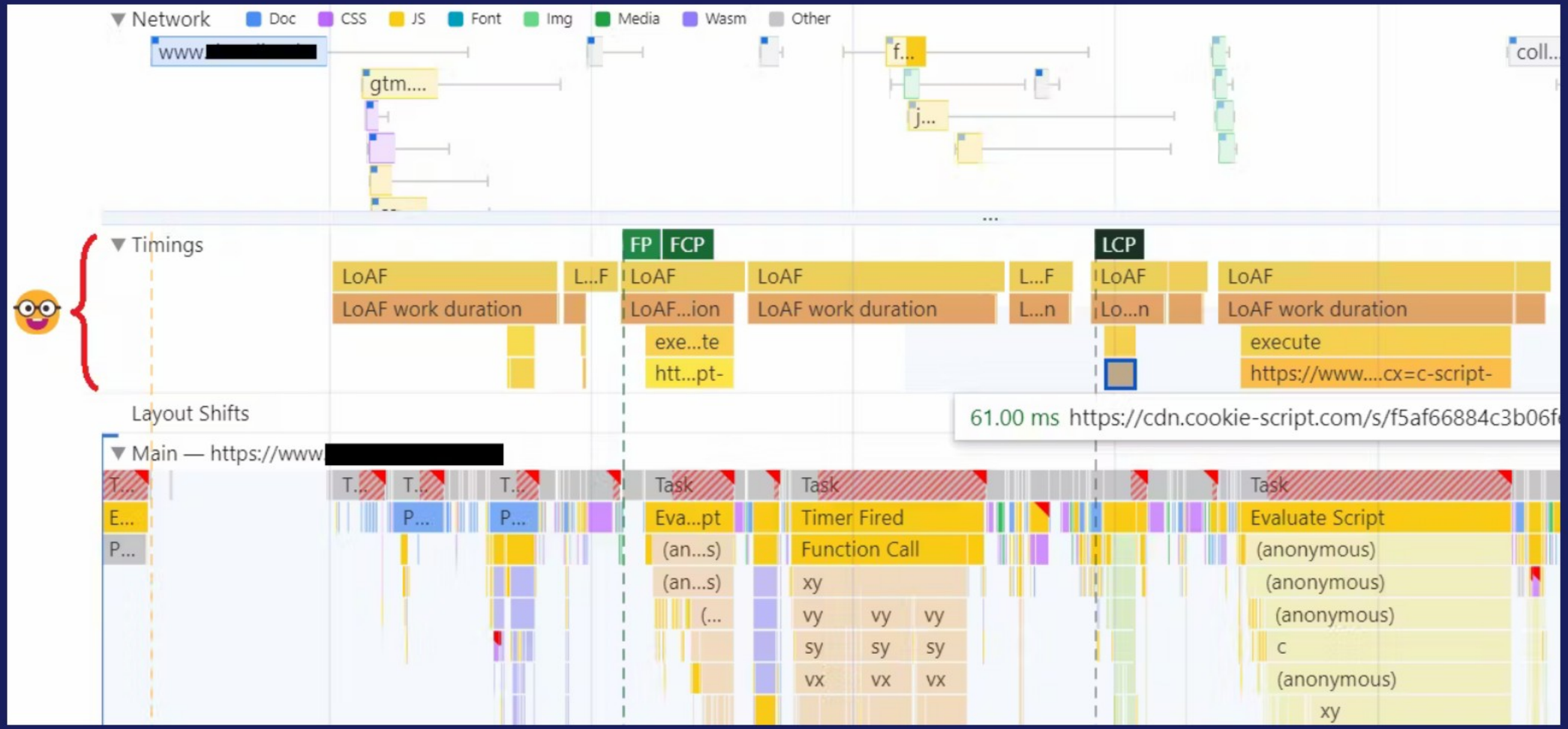
```
{
  ..
  "scripts": [
    {
      ..
      "duration": 45,
      "invoker": "DOMWindow.onclick",
      "invokerType": "event-listener",
      "sourceURL": "https://web.dev/js/index-ffde4443.js",
      "sourceFunctionName": "myClickHandler",
      "sourceCharPosition": 17796,
      ..
    }
  ],
  ..
}
```

Array of script-entries that contributed to a long animation frame



low impact	246 hostname(s)	moderate impact	47 hostname(s)	critical impact	10 hostname(s)
static.klaviyo.com	86 ms	www.googletagmanager.com	322 ms	script.hotjar.com	1212 ms
code.jquery.com	168 ms	js.intercomcdn.com	453 ms	www.dwin1.com	686 ms
browser.sentry-cdn.com	96 ms	squeezely.tech	219 ms	cdn.consentmanager.net	909 ms
connect.facebook.net	142 ms	pagead2.googlesyndication.com	239 ms	fw.adsafeprotected.com	546 ms
analytics.tiktok.com	170 ms	securepubads.g.doubleclick.net	318 ms	c.gumgum.com	577 ms
dev.visualwebsiteoptimizer.com	28 ms	dynamic.sooqr.com	226 ms	static.trackedweb.net	718 ms
embed.tawk.to	93 ms	static.widget.trengo.eu	406 ms	www.clickcease.com	740 ms
www.clarity.ms	96 ms	static.zdassets.com	350 ms	trc.taboola.com	653 ms
consent.cookiebot.com	180 ms	ajax.cloudflare.com	200 ms	d38xvr37kwwhcm.cloudfront.net	753 ms
cdn-4.convertexperiments.com	94 ms	cdn.cookielaw.org	253 ms	www.googleadservices.com	526 ms
dynamic.criteo.com	93 ms	cdn-cookieyes.com	298 ms		
widgets.trustedshops.com	135 ms	cdn.cookie-script.com	248 ms		

Exact third party impact by RUMvision



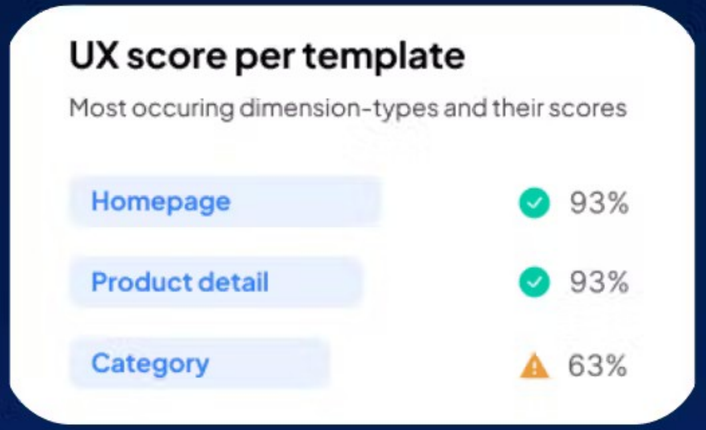
Add LoAFs to your *Timings* section

How to improve INP?

- bfcache
- Use less JS
- Scheduler.yield
- Prevent layout trashing
- Use content-visibility
- Regularly review unused third parties

Real time control of SUX is within your reach

3 reasons why you need RUM in eCommerce or when you do a lot of changes in your code:



1. Validation

Sites are always changing. Make sure you check trends after a release.

2. Optimization

Visualizing issues easily saves developer time for fixing them. Everyone wins.

3. Assurance

Never let new **to you** 3rd parties or codechanges *regress* SUX and CWV, and **thus your bottom line**.

Leaderboard

Questions? Ask them now! If time allows..

0 questions
0 upvotes

Remember, SUX sells!

Just a 0.1-second boost in site speed can increase conversions by 8.4% and grow basket size by 9.2%.
Do not let lack of the right insights **cost you money. Focus on real people!**

Thanks for your time, any questions, we're around all day, and sponsoring the afterparty!

Book your free demo now!