

Website Performance

Thomas Puppe auf der NConf Rostock 2023

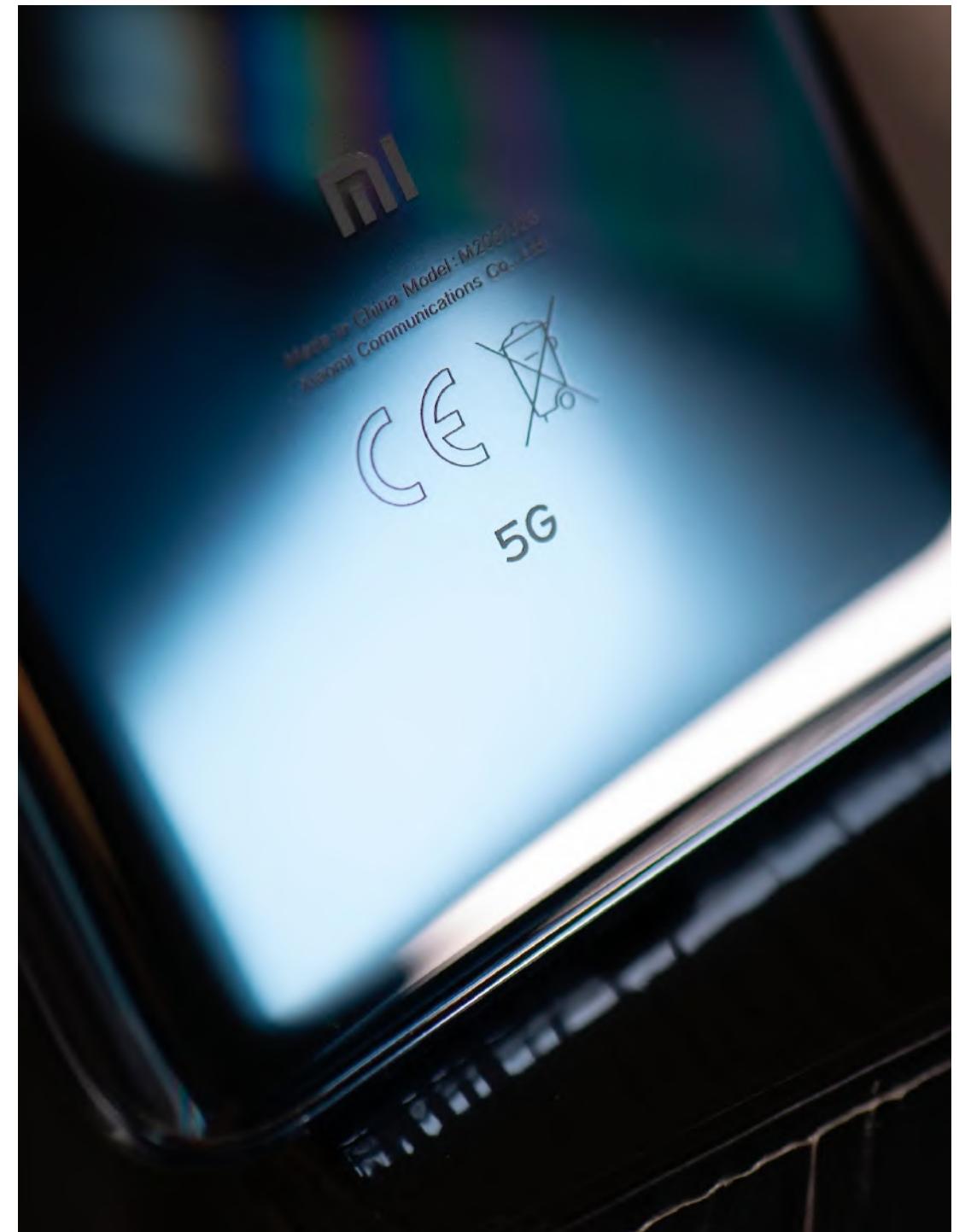
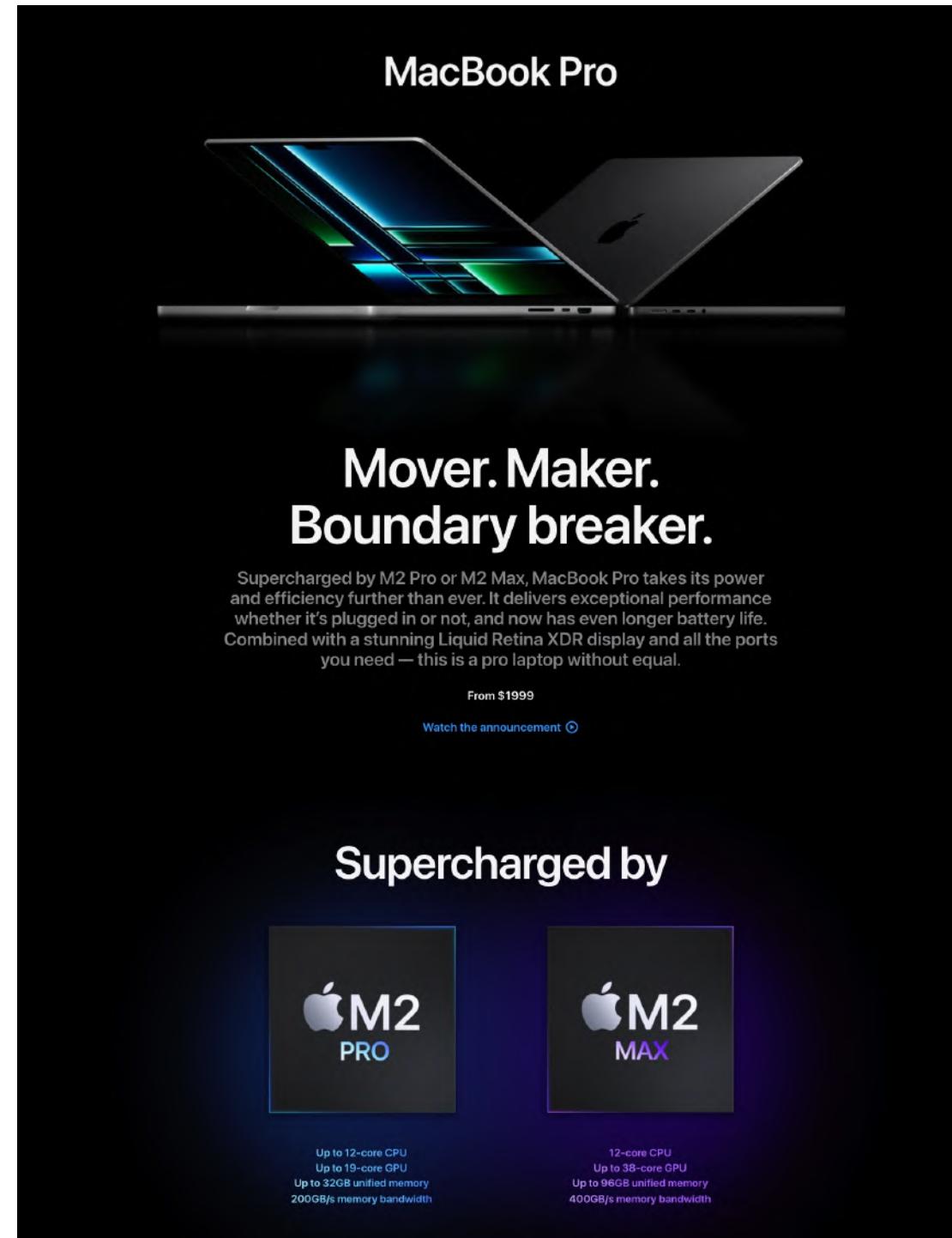


Hi, ich bin Thomas



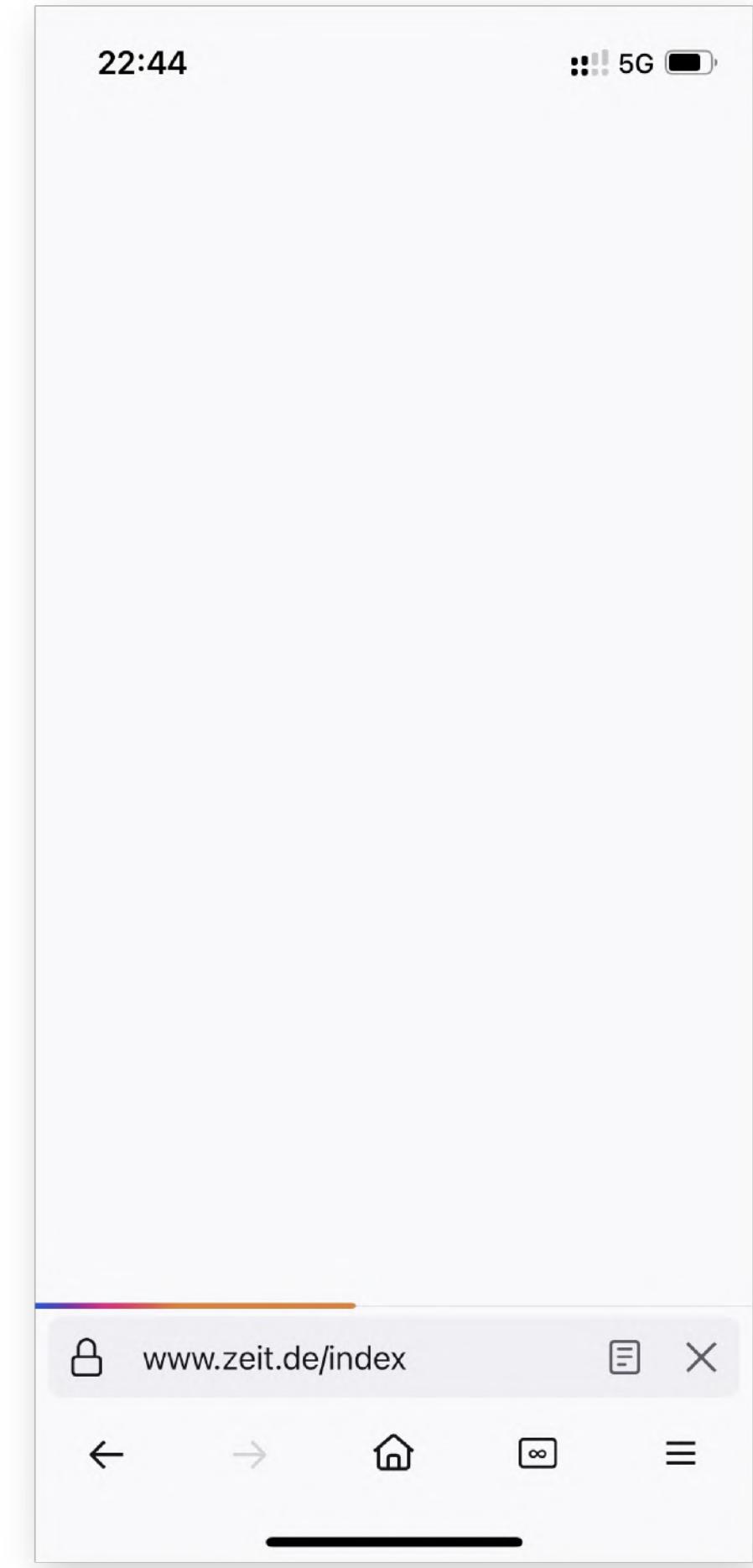
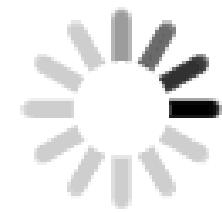
Senior Frontend Developer bei ZEIT Online

#a11y, #leanweb, #webperf



Credits: apple.com, [Lee Campbell auf Unsplash](https://unsplash.com/@leecampbell), [Shiwa ID auf Unsplash](https://unsplash.com/@shiwa_id)

www  **wealthy western web**

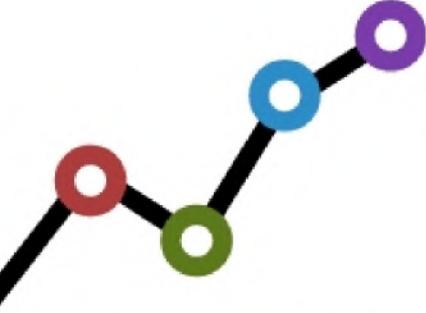




Website Performance ist ein Wettbewerbsvorteil!



WPO stats



Case studies and experiments demonstrating the impact of web performance optimization (WPO) on user experience and business metrics.

Performance studies related to “revenue”



Carpe improved Largest Contentful Paint by 52% and Cumulative Layout Shift by 41% and saw a 10% increase in traffic, a 5% increase in online store conversion rate, and a 15% increase in revenue.

[PERMALINK](#) [SHARE ON TWITTER](#)

#bounce rate #conversion rate #traffic #revenue #2023 #core web vitals



Rakuten 24 ran an A/B test showing improved vitals brought a 53.4% increase in revenue per visitor, 33.1% increase in conversion rate, 15.2% increase in average order value, 35.1% reduction in exit rate and more!

Filter by tag:

#2006 #2008 #2009

#2010 #2011 #2012

#2013 #2014 #2015

#2016 #2017 #2018

#2019 #2020 #2021

#2022 #2023

#abandonment #ads

#bounce rate #conversion

#conversion rate

#core web vitals



Website Performance



TTFB

**Download
Size**

**Asset
Count**

TTFB

Download
Size

Asset
Count

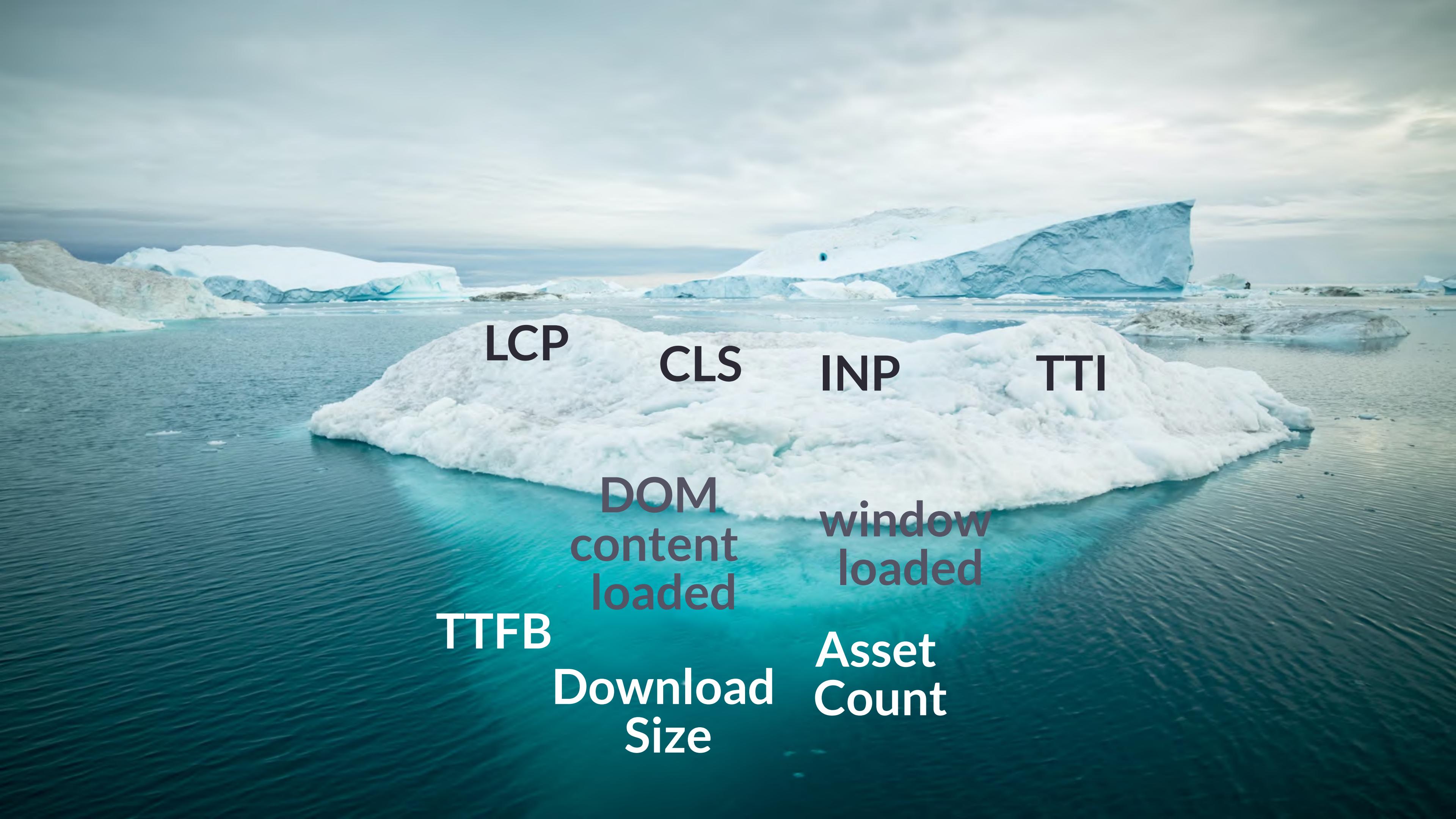
window
loaded

DOM
content
loaded

TTFB
**Download
Size**
**Asset
Count**

window
loaded
DOM
content
loaded

LCP
CLS
INP
TTI



LCP

CLS

INP

TTI

DOM
content
loaded

window
loaded

TTFB

Download
Size

Asset
Count

Aspekte von Website Performance

Aus Usersicht

schnell / schlank / ruckelt nicht

Browser / Technologien

HTML / CSS / Bilder / JavaScript / Schriften / Video / Audio

Priorisierung im Netzwerk und im Browser

Build / Server

Bildformate / Komprimierung / CDN, Cloud / Caching / Netzwerk

Wirkung

Objektive Zahlen / Subjektive Wahrnehmung

Kontrolle

Messung / Testing / Monitoring / SEO Einfluss

Drei Säulen von Website Performance

A

R

O

Drei Säulen von Website Performance

A

AVOID

R

REDUCE

O

OPTIMIZE

Drei Säulen von Website Performance

A

AVOID

Benutzen wir alles?
Brauchen wir alles?

R

REDUCE

Cachen,
Komprimieren,
Minimieren.

O

OPTIMIZE

Ladeverhalten und
Priorisierung.

Drei Fünf Säulen von Website Performance

A R O M A

AVOID

Benutzen wir alles?

Brauchen wir alles?

REDUCE

Cachen,
Komprimieren,
Minimieren.

OPTIMIZE

Ladeverhalten und
Priorisierung

MEASURE

Tooling und
Monitoring

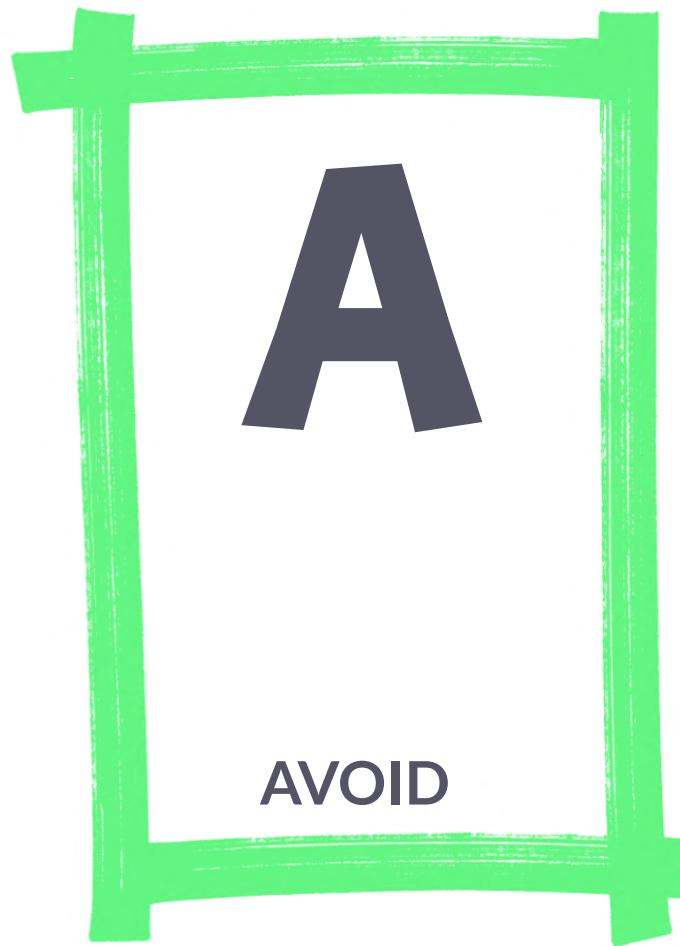
ATTITUDE

Performance
Culture

thomaspuppe.de/talks/nconf-2023

Slides und Links

Drei Fünf Säulen von Website Performance



AVOID

Benutzen wir alles?

Brauchen wir alles?

REDUCE

Cachen,
Komprimieren,
Minimieren.

OPTIMIZE

Ladeverhalten und
Priorisierung

MEASURE

Tooling und
Monitoring

ATTITUDE

Performance
Culture

A woman with short blonde hair, wearing an orange jumpsuit, is shown from the chest up. She has her hands raised to her face, fingers spread, obscuring her eyes and nose. Her expression is neutral. The background is a solid bright yellow.

AVOID

Avoid Stuff:
ungenutzte
Sachen
finden

Browser DevTools

The screenshot shows the Network tab of the Chrome Developer Tools. At the top, there's a search/filter bar with fields for 'Preserve log', 'Disable cache', 'No throttling', and a URL input field containing 'ain:*.zeit.de larger-than:100'. Below the search bar are several filter checkboxes: 'Invert', 'Hide data URLs', 'Hide extension URLs', 'All' (which is selected), 'Doc', 'JS', 'Fetch/XHR', 'CSS', 'Font', 'Img', 'Media', 'Manifest', 'WS', 'Wasm', and 'Other'. Further down, there are checkboxes for 'Blocked response cookies' and 'Blocked requests', and a checkbox for '3rd-party requests' which is also circled in pink.

Name	Status	Type	Initiator	Size	Time	Priority	Cache-Control	Waterfall
common.js idgpnmonknjnojddfkgkljpfnfcklj/js/tool	200 OK	script	common-4aa3a322.js:6 Script	142 kB	155 ms 135 ms	High High	no-cache	
theCard.js idgpnmonknjnojddfkgkljpfnfcklj/js/tool	200 OK	script	theCard-746d34e6.js:6 Script	762 kB	168 ms 134 ms	High High	no-cache	
gpt.js www.googletagservices.com/tag/js	200 OK	script	VM839:1 Script	101 kB	321 ms 91 ms	Low Low	private, max-age=900, sta...	
prebid8.16.0.js	200	script	VM842:1	131 kB	76 ms	Low		

At the bottom, there are summary statistics: 9 / 387 requests, 3.1 MB / 8.1 MB transferred, 7.2 MB / 20.8 MB resources, Finish: 2.2 min, DOMContentLoaded: 1.78 s, and Load: 5.02 s.

Browser Developer Tools Network Tab

Filter: domain, larger-than, status-code, priority, ...

<https://developer.chrome.com/docs/devtools/network/reference/>

Avoid Stuff:
ungenutzte
Sachen
finden

Browser DevTools
Request Maps

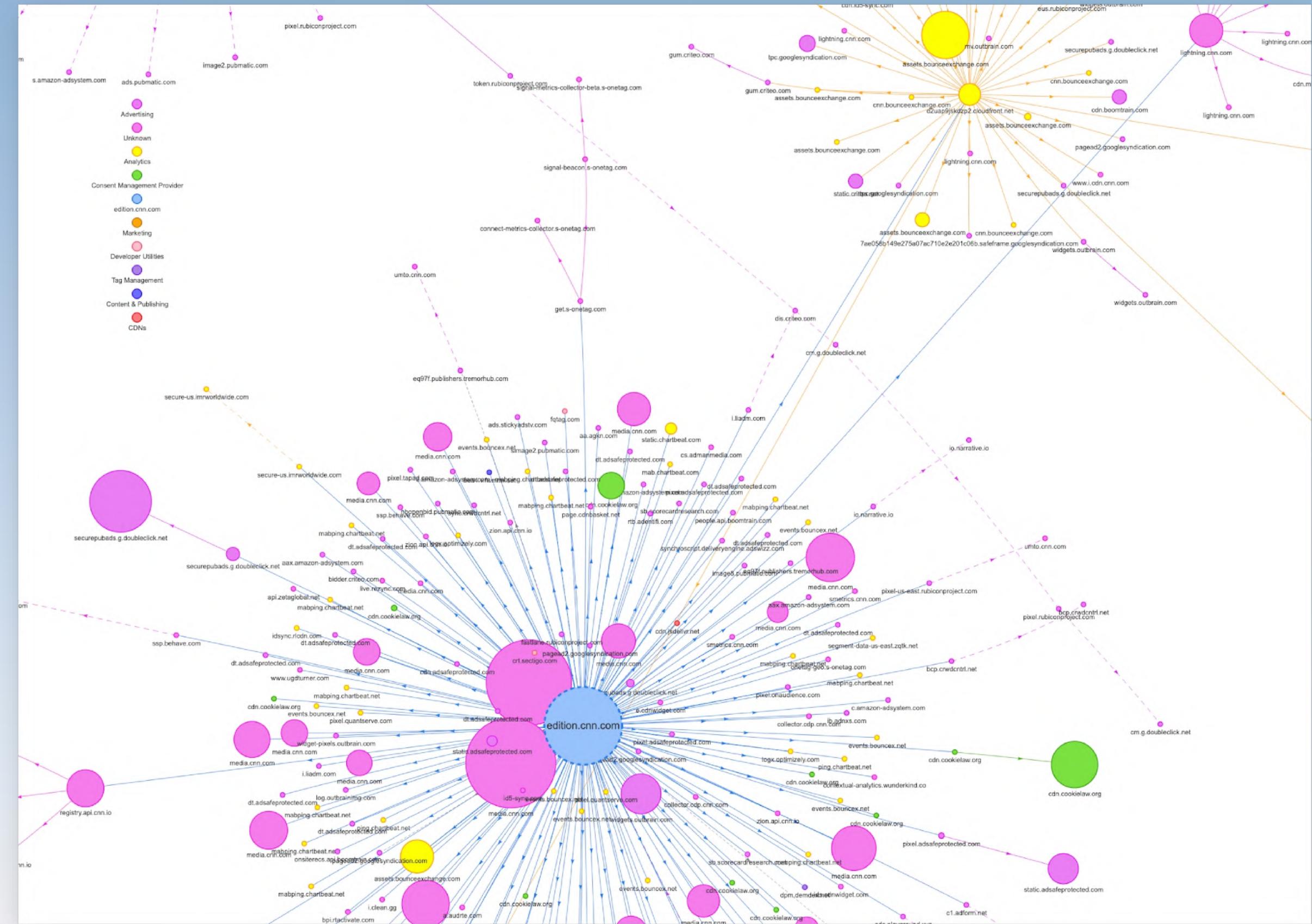
Avoid

Request Maps

- requestmap.webperf.tools
- requestmap.pages.dev

Gute Visualisierung, wenn die Request-Liste in den DevTools nicht ausreicht.

Oder um Stakeholder zu beeindrucken!



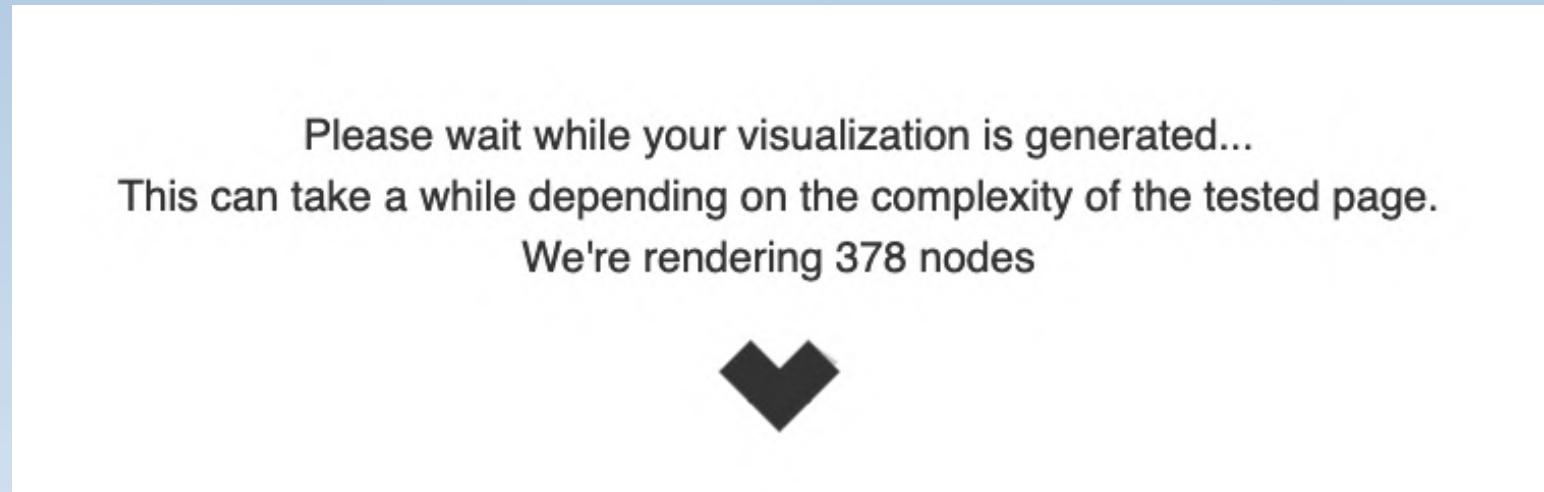
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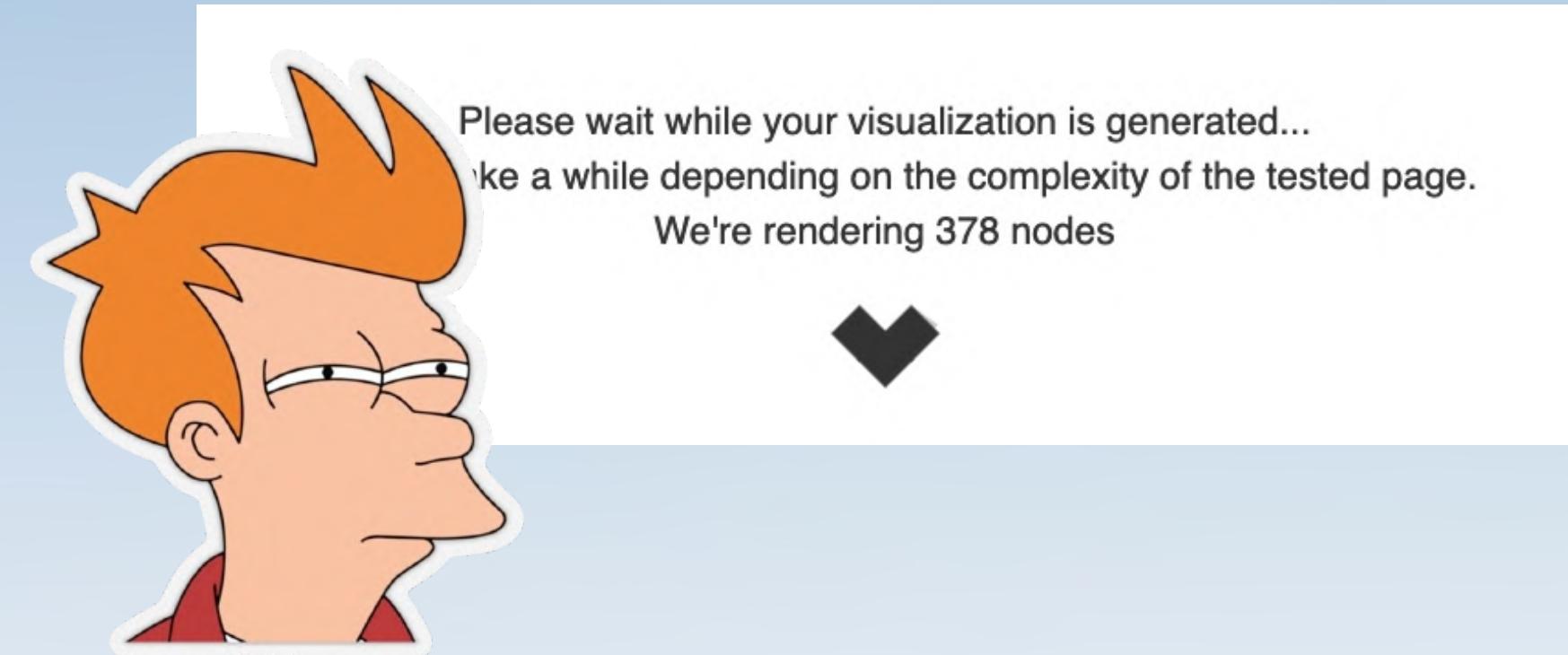
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Request Maps

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Avoid Stuff: ungenutzte Sachen finden

Browser DevTools

Request Maps

Google Tag Manager ausmisten

Avoid Stuff: ungenutzte Sachen finden

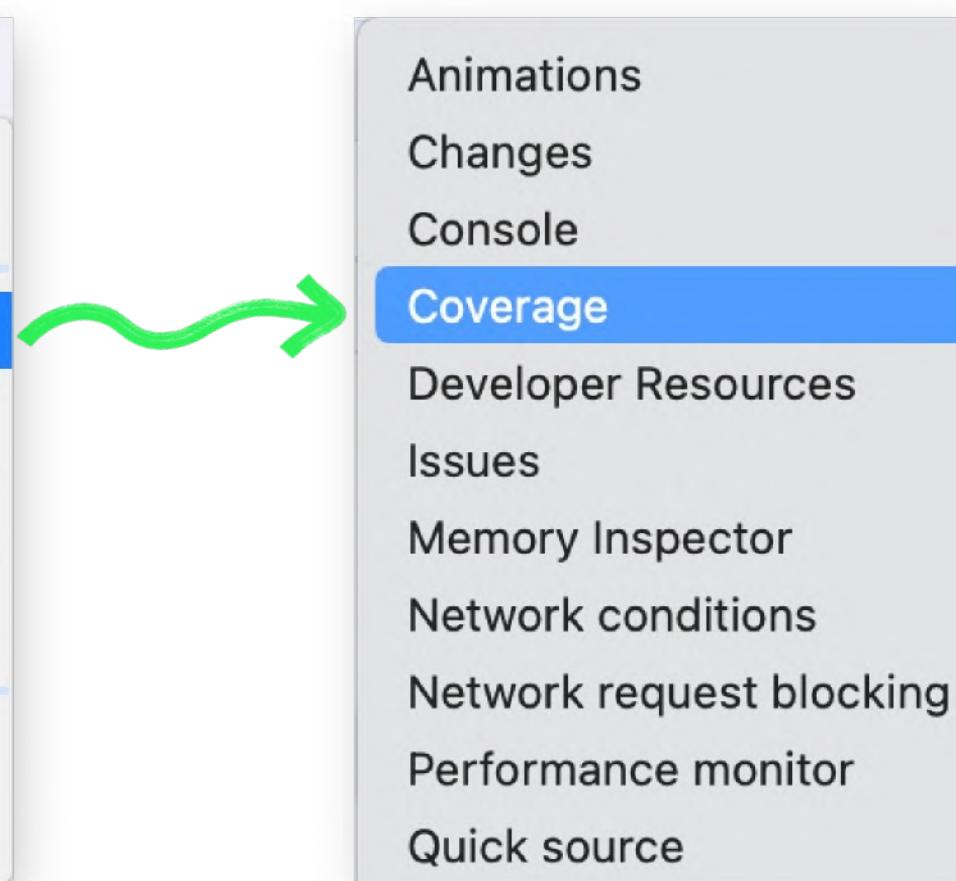
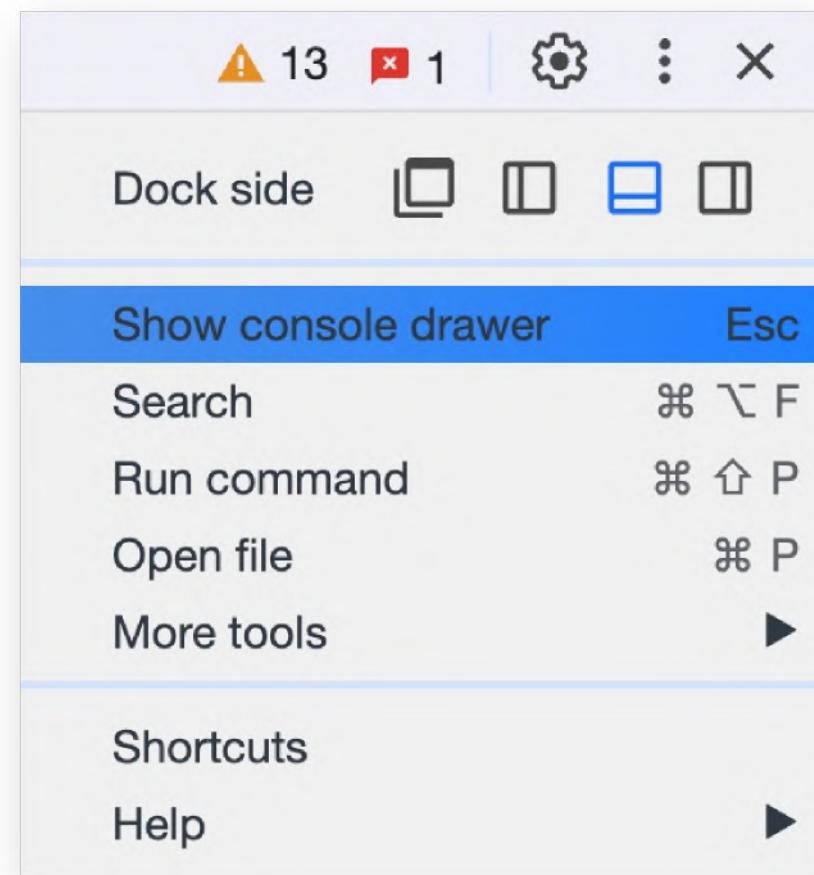
Browser DevTools

Request Maps

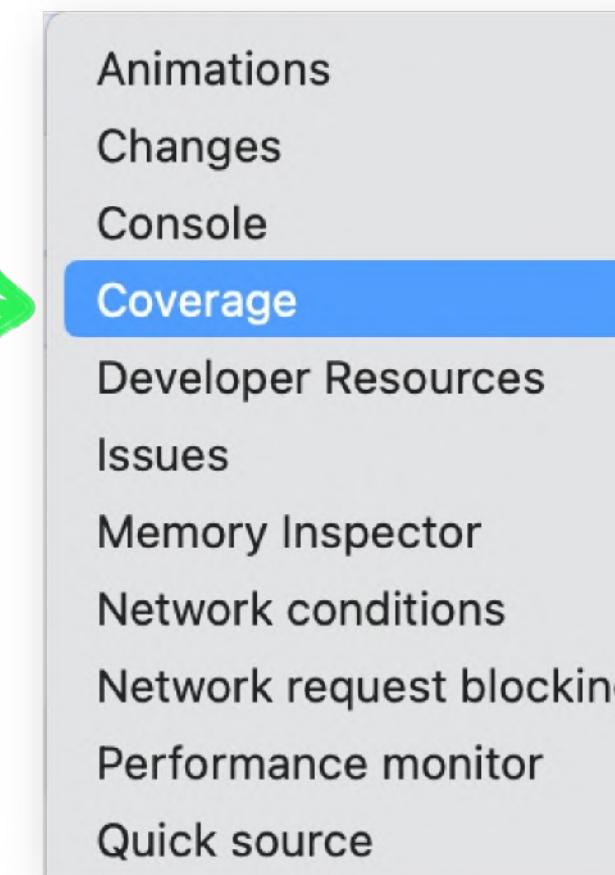
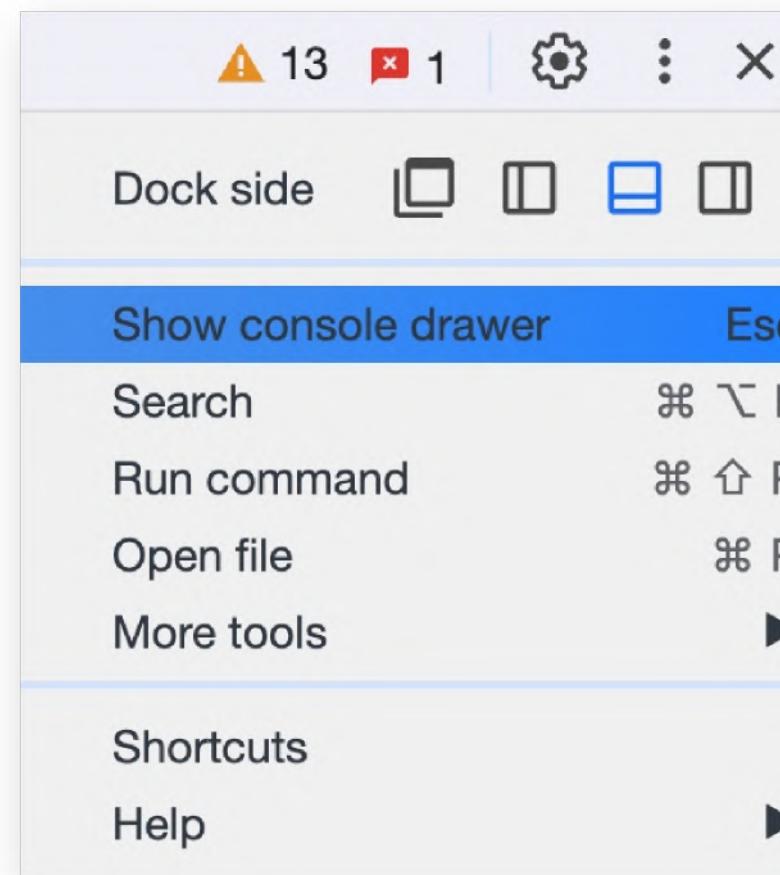
Google Tag Manager ausmisten

Unused CSS/JS via DevTools

Unused CSS/JS



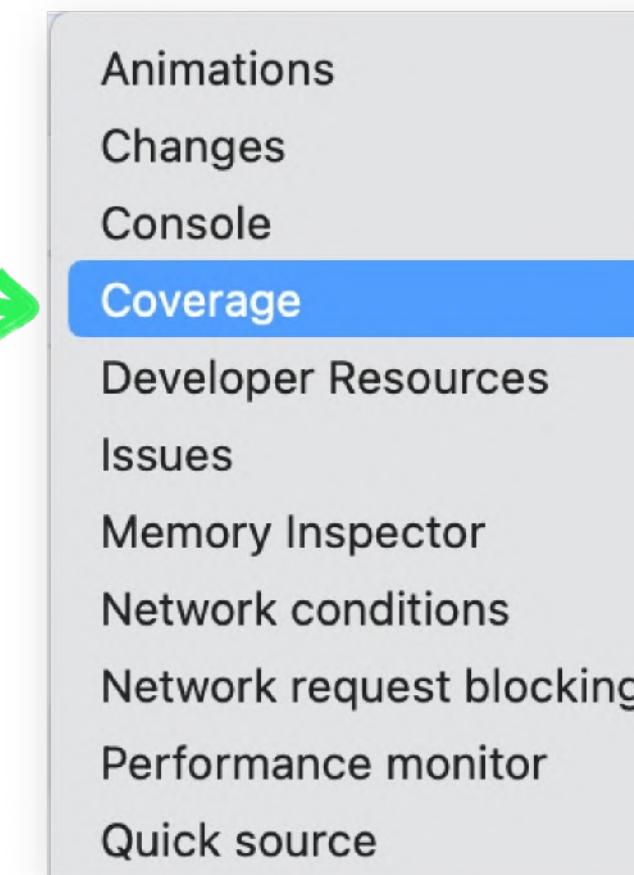
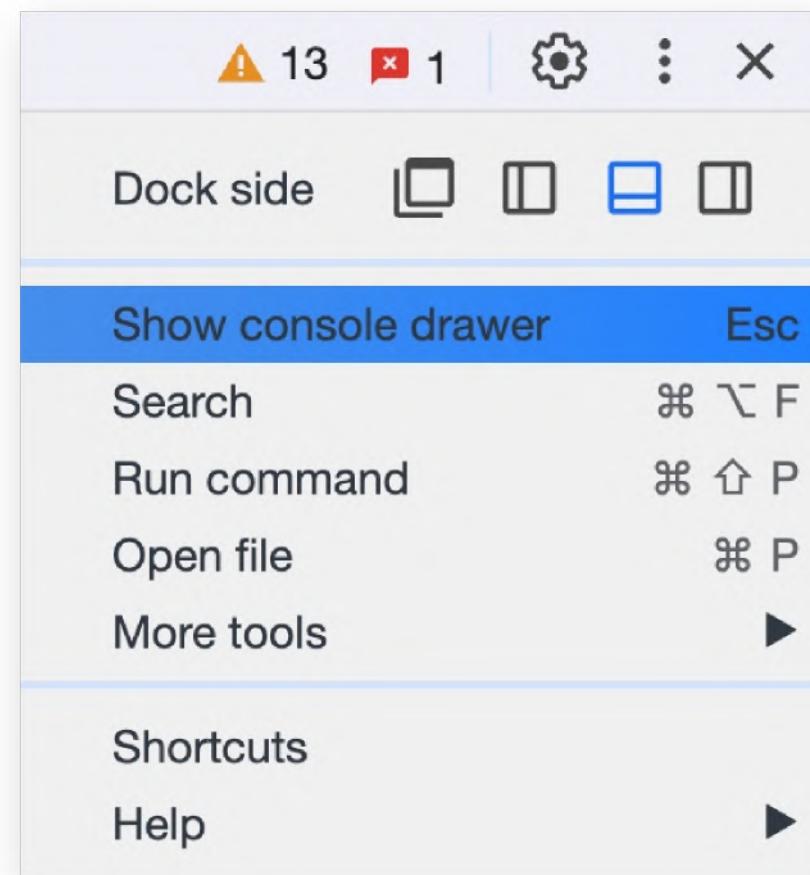
Unused CSS/JS



Unused CSS/JS

A green arrow points from the 'Unused CSS/JS' section title down to this table.

URL	Type	Total Bytes	Unused Bytes	Usage Visualization
https://consent-cdn.zeit.de/wrapperMessagingWithoutDetection.js	JS (per function)	204 217	95 490 46.8%	
https://interactive.zeit.de/wiegehtesi.../app.c0381a78a97b00cf65db.cached.js	JS (per function)	156 095	75 866 48.6%	
https://interactive.zeit.de/g/2022/energiekostenmonitor/.../index.75ca3a4e.css	CSS	99 104	72 859 73.5%	
https://interactive.zeit.de/g/2022/energiekostenmonitor/.../react.8d1c6deb.mjs	JS (per function)	142 733	67 107 47%	
https://static.zeit.de/p/.../centerpage.92c7290fe3f64752971581ffeb39d5b6.css	CSS	97 335	62 054 63.8%	
https://static.zeit.de/p/zeit.... /base.4ac770b16c740c03c50e84fb93f1dd9.css	CSS	49 036	38 825 79.2%	
https://static.zeit.de/static/js/webtrekk/webtrekk_v4.5.3.min-3.js	JS (per function)	75 896	30 541 40.2%	
https://static.zeit.de/iqd/cdn_zeit_async/live/iqadcontroller.js	JS (per function)	302 396	22 570 7.5%	
https://www.zeit.de/index	CSS+JS (per function)	91 860	20 860 22.7%	
https://pixel.adsafeprotected.com/rjss/st/1684785/75510779/skeleton....../index	JS (per function)	47 397	16 785 35.4%	
https://static.zeit.de/p/... /navigation.3f1caf0352cf4094c00c33fee12e352c.css	CSS	23 123	16 505 71.4%	
https://wally.zeit.de/assets/footerbar-296671a5.css	CSS	16 158	16 158 100%	



```
1 .teaser-small-minor_label,.teaser-small_label {  
- color: var(--z-color-60--beyond);  
- display: block;  
- font-family: "TabletGothic","Helvetica Neue",He  
- font-size: .5625em;  
- letter-spacing: .15em;  
- line-height: 1;  
- margin-bottom: .625rem;  
- text-align: right;  
- text-transform: uppercase  
}  
  
.zon-teaser-poster_commentcount,.zon-teaser-news_  
cursor: pointer;  
transition-property: border-color,color,opacity;  
transition-duration: .2s;  
color: inherit;  
position: relative;  
white-space: nowrap;  
z-index: 2
```

Unused CSS/JS

URL	Type	Total Bytes	Unused Bytes	Usage Visualization
https://consent-cdn.zeit.de/wrapperMessagingWithoutDetection.js	JS (per function)	204 217	95 490 46.8%	
https://interactive.zeit.de/wiegehtesi.../app.c0381a78a97b00cf65db.cached.js	JS (per function)	156 095	75 866 48.6%	
https://interactive.zeit.de/g/2022/energiestrommonitor/.../index.75ca3a4e.css	CSS	99 104	72 859 73.5%	
https://interactive.zeit.de/g/2022/energiestrommonitor/.../react.8d1c6deb.mjs	JS (per function)	142 733	67 107 47%	
https://static.zeit.de/p/.../centerpage.92c7290fe3f64752971581ffeb39d5b6.css	CSS	97 335	62 054 63.8%	
https://static.zeit.de/p/zeit.... /base.4ac770b16c740c03c50e84fb93f1dd9.css	CSS	49 036	38 825 79.2%	
https://static.zeit.de/static/js/webtrekk/webtrekk_v4.5.3.min-3.js	JS (per function)	75 896	30 541 40.2%	
https://static.zeit.de/iqd/cdn_zeit_async/live/iqadcontroller.js	JS (per function)	302 396	22 570 7.5%	
https://www.zeit.de/index	CSS+JS (per function)	91 860	20 860 22.7%	
https://pixel.adsafeprotected.com/rjss/st/1684785/75510779/skeleton....../index	JS (per function)	47 397	16 785 35.4%	
https://static.zeit.de/p/... /navigation.3f1caf0352cf4094c00c33fee12e352c.css	CSS	23 123	16 505 71.4%	
https://wally.zeit.de/assets/footerbar-296671a5.css	CSS	16 158	16 158 100%	



Avoid Code: System Features nutzen

Avoid Code:
System
Features
nutzen

Summary / Details

Summary / Details: HTML Reveal Element

Workshop reviews:

► Blendan Smooth

▼ Hoover Sukhdeep

Hal is brilliant. Did I mention Hal is brilliant? He didn't tell me to say that. He didn't tell me to say anything. I am here of my own free will.

► Toasty McToastface

Summary / Details: HTML Reveal Element

Workshop reviews:

► Blendan Smooth

▼ Hoover Sukhdeep

Hal is brilliant. Did I mention Hal is brilliant?
didn't tell me to say anything. I am here of n

► Toasty McToastface



```
<details>
  <summary>Hoover Sukhdeep</summary>
  <p>
    Hal is brilliant. Did I mention Hal is brilliant?
    He didn't tell me to say that. He didn't tell me to say
    anything. I am here of my own free will.
  </p>
</details>
```

Avoid Code: System Features nutzen

System Fonts

Summary / Details

Dialog / Modal Feature

@material/dialog

14.0.0 • Public • Published a year ago

Readme

Code Beta

15 Dependencies

106 Dependents

1.672 Versions

Dialogs

Dialogs inform users about a task and can contain critical information, require decisions, or involve multiple tasks.

There are four types of dialogs:

1. Alert
2. Simple
3. Confirmation
4. Full-screen

Using dialogs

A dialog is a type of modal window that appears in front of app content to provide critical information or ask for a decision. Dialogs disable all app functionality when they appear, and remain on screen until confirmed, dismissed, or a required action has been taken.

Dialogs are purposefully interruptive, so they should be used sparingly.

For additional guidance, refer to the [Material guidelines](#).

Installation

```
npm install @material/dialog
```

Styles

```
@use "@material/dialog";  
  
@include dialog.core-styles;
```

Note: Styles for any components you intend to include within dialogs (e.g. List, Checkboxes, etc.) must also be imported.

JavaScript Instantiation

```
import {MDCDialog} from '@material/dialog';  
const dialog = new MDCDialog(document.querySelector('.mdc-dialog'));
```

Install

```
> npm i @material/dialog
```

Repository

github.com/material-components/mate...

Homepage

github.com/material-components/mate...

Weekly Downloads

625.809



Version

14.0.0

License

MIT

Unpacked Size

1.3 MB

Total Files

44

Issues

398

Pull Requests

91

Last publish

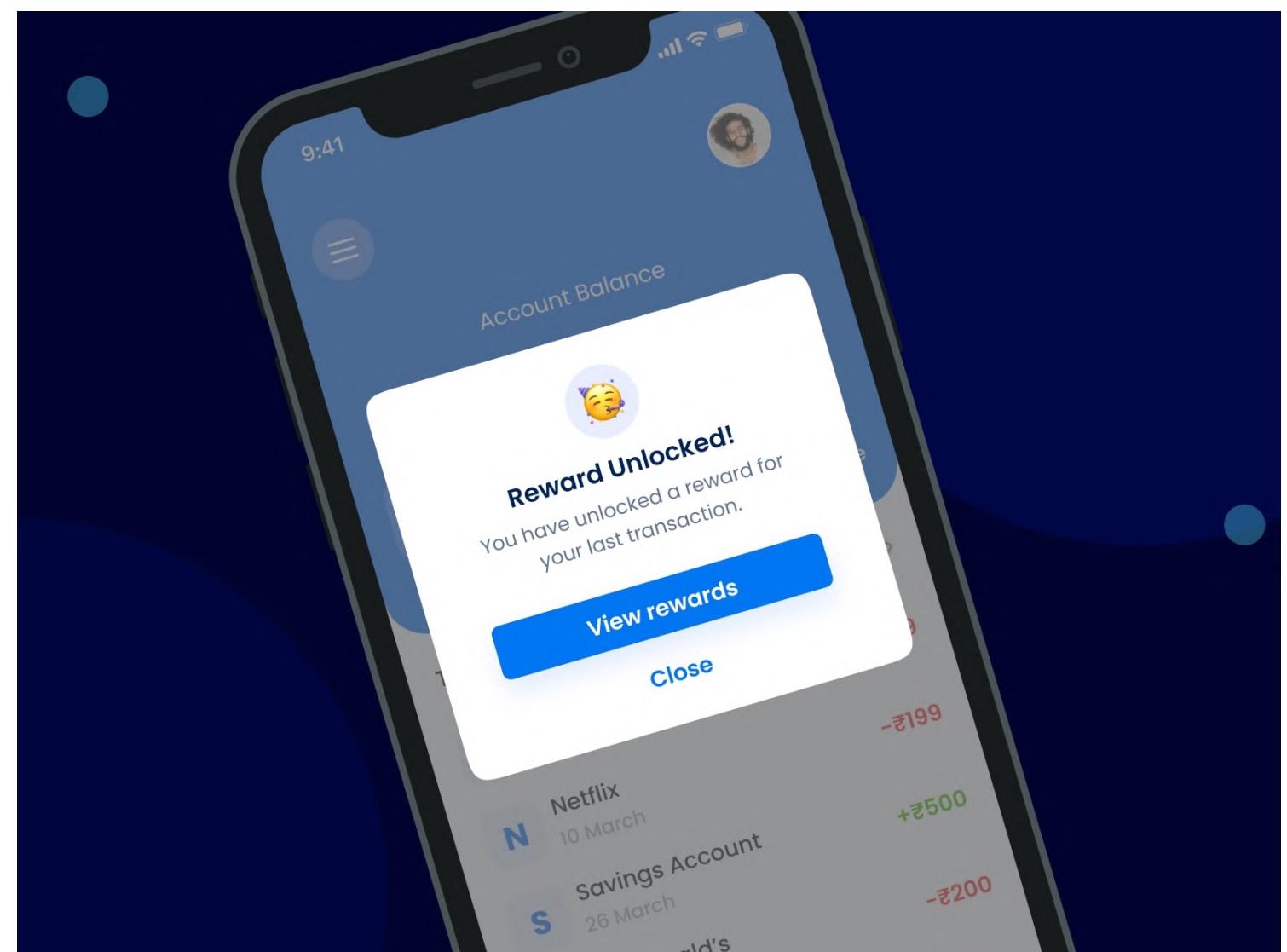
3 days ago

Collaborators

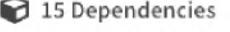
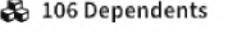


>-Try on RunKit

Report malware



Credits: Aishwarya Vijay Kumar auf Dribbble

 15 Dependencies  106 Dependents  1.672 Vers

Install
nation, require decisions, or
nbsp; > npm i @material/dialog

Repository
 [github.com/material-components/](#)

Homepage
 [github.com/material-components/](#)

Weekly Downloads
625.809

content to provide critical
nality when they appear, and
on has been taken.
aringly.

Version
14.0.0 License
MIT

Unpacked Size
1.3 MB Total Files
44

Issues
398 Pull Requests
91

Last publish
3 days ago

Collaborators



dialogs (e.g. List, Checkboxes,
tor('.mdc-dialog'));

[->Try on RunKit](#) [Report malware](#)

```
<dialog>
  <form method="dialog">
    <p>
      Content
    </p>
    <button>
      Close
    </button>
  </form>
</dialog>
```

```
dialog { ... }
dialog[open] { ... }
```

```
dialog::backdrop {
  background: red;
}
```

```
const dialog = document.querySelector('dialog');

// Show the dialog as non modal
dialog.show();

// Show dialog as modal
dialog.showModal();

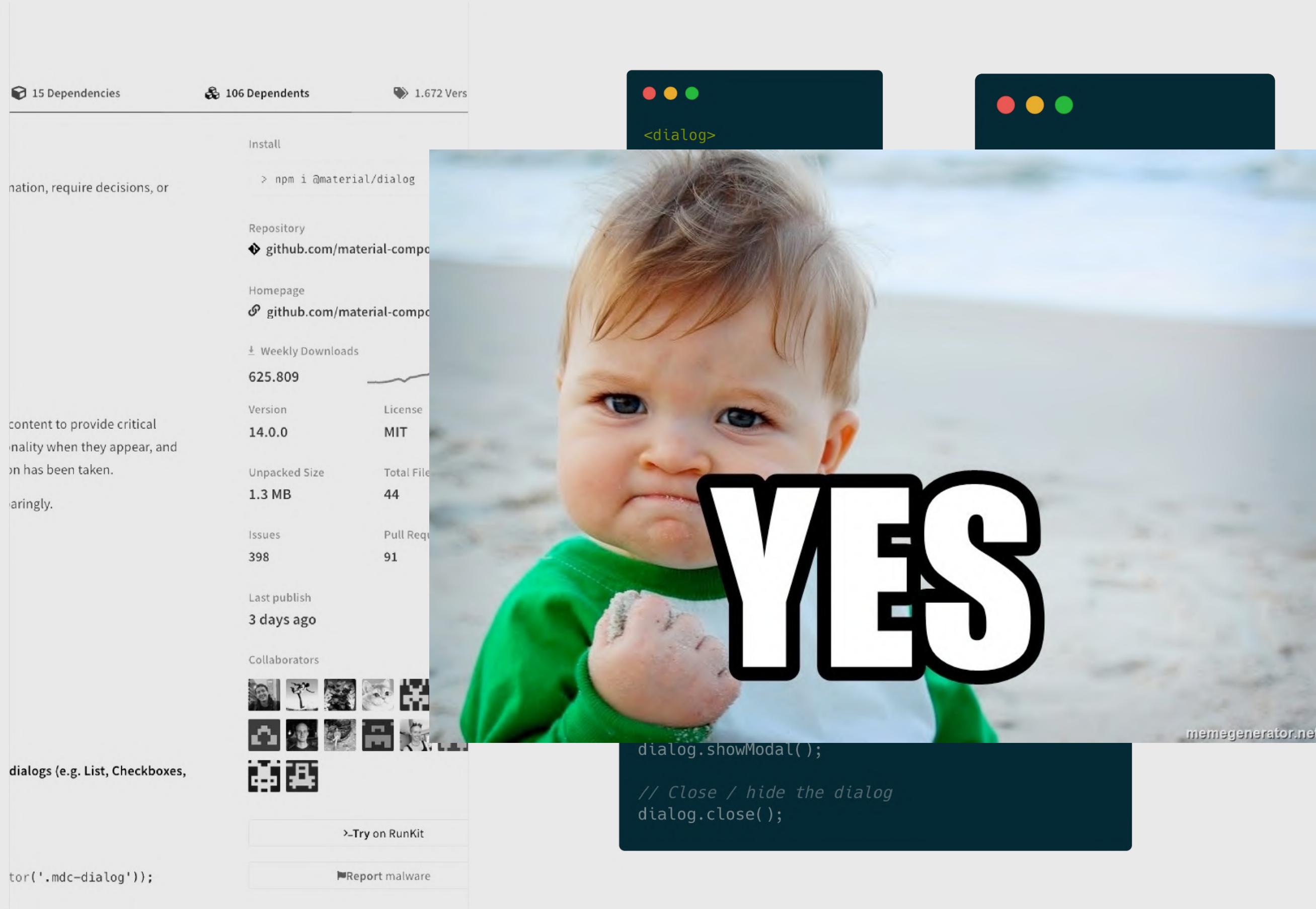
// Close / hide the dialog
dialog.close();
```

Dialog element - LS

Method of easily creating custom dialog boxes to display to the user with modal or non-modal options. Also includes a ::backdrop pseudo-element for behind the element.

[Current aligned](#) [Usage relative](#) [Date relative](#) [Filtered](#) [All](#) [⚙️](#)

Chrome	Edge *	Safari	Firefox	Opera	IE
			2-52		
4-31			1 53-79	10-18	
2 32-36	12-18	3.1-15.3	1 4 80-97	3 19-23	
37-116	79-116	15.4-16.5	98-116	24-101	6-10
117	117	16.6	117	102	11
118-120			17.0-TP	118-120	



Dialog element 📄 - LS

Method of easily creating custom dialog boxes to display to the user with modal or non-modal options. Also includes a ::backdrop pseudo-element for behind the element.

Current aligned	Usage relative	Date relative	Filtered	All	⚙️
Chrome	Edge *	Safari	Firefox	Opera	IE
4-31			2-52		
32-36	12-18	3.1-15.3	1 53-79	10-18	
37-116	79-116	15.4-16.5	1 80-97	19-23	
117	117	16.6	117	102	6-10
118-120			17.0-TP	118-120	

Avoid Code:
System
Features
nutzen

System Fonts
Summary / Details
Dialog / Modal Feature
Formular Validierung

Formularvalidierung nativ



Formularvalidierung nativ



```
<input id="email" type="email" required />
```

Formularvalidierung nativ



```
<input id="lowercaseFoodWithB" type="text"
       required minlength="4" maxlength="20"
       pattern="b[a-z]" />

<input name="pin" type="password" required
       pattern="\d{4,4}" />
```

Formularvalidierung nativ

```
<input id="email" required />

<style>
  input:invalid {
    border: 2px dashed red;
  }

  input:invalid:required {
    background-image: linear-gradient(to right, pink, lightgreen);
  }

  input:valid {
    border: 2px solid black;
  }
</style>
```

Formularvalidierung nativ

```
● ● ●

<input type="number" min="0" step="5" max="100">

<style>
  input:invalid:out-of-range:before {
    content: "This is not 'Nam, this is bowling. There are rules!"
  }
</style>
```

Avoid Code:
System
Features
nutzen

System Fonts
Summary / Details
Dialog / Modal Feature
Formular Validierung
System Fonts

Avoid Code

System Fonts nutzen

Vielleicht kannst du auf Webfonts verzichten. Die System-Schriften auf den Betriebssystemen sind vielfältig.

- <https://modernfontstacks.com/>
- <https://gist.github.com/don1138/5761014>
- <https://meowni.ca/font-style-matcher/>

System UI	Transitional	Old Style	Humanist	Geometric Humanist
ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>system-ui</u> , sans-serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Charter</u> , "Bitstream Charter", "Sitka Text", <u>Cambria</u> , serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: "Iowan Old Style", "Palatino Linotype", "URW Palladio L", P052, serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Seravek</u> , "Gill Sans Nova", Ubuntu, <u>Calibri</u> , "DejaVu Sans", source-sans-pro, sans-serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Avenir</u> , Montserrat, Corbel, "URW Gothic", source-sans-pro, sans-serif;
Classical Humanist	Neo-Grotesque	Monospace Slab Serif	Monospace Code	Industrial Display
ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Optima</u> , Candara, "Noto Sans", source-sans-pro, sans-serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Inter</u> , Roboto, "Helvetica Neue", "Arial Nova", "Nimbus Sans", Arial, sans-serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: "Nimbus Mono PS", "Courier New", monospace;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: ui-monospace, "Cascadia Code", "Source Code Pro", Menlo, Consolas, "DejaVu Sans Mono", monospace;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: <u>Bahnschrift</u> , "DIN Alternate", "Franklin Gothic Medium", "Nimbus Sans Narrow", sans-serif-condensed, sans-serif;
Rounded Sans Display	Slab Serif Display	Antique	Didone Display	Handwritten Display
ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: ui-rounded, <u>Hiragino Maru Gothic ProN</u> , Quicksand, Comfortaa, Manjari, "Arial Rounded MT", "Arial Rounded MT Bold", Calibri, source-sans-pro, sans-serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: Rockwell, "Rockwell Nova", "Roboto Slab", "Calibri", serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: Superclarendon, "Bookman Old Style", "URW Bookman", "URW Bookman L", "Georgia Pro", Georgia, serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: Didot, "Bodoni MT", "Noto Serif Display", "URW Palladio L", P052, Sylfaen, serif;	ABCDEGHIJKLM NOPQRSTUVWXYZ abcdefghijklm nopqrstuvwxyz 1234567890 100 200 300 400 500 600 700 800 900 font-family: "Segoe Print", "Bradley Hand", Chilanka, TSCu_Comic, casual, cursive;

Avoid Code: System Features nutzen

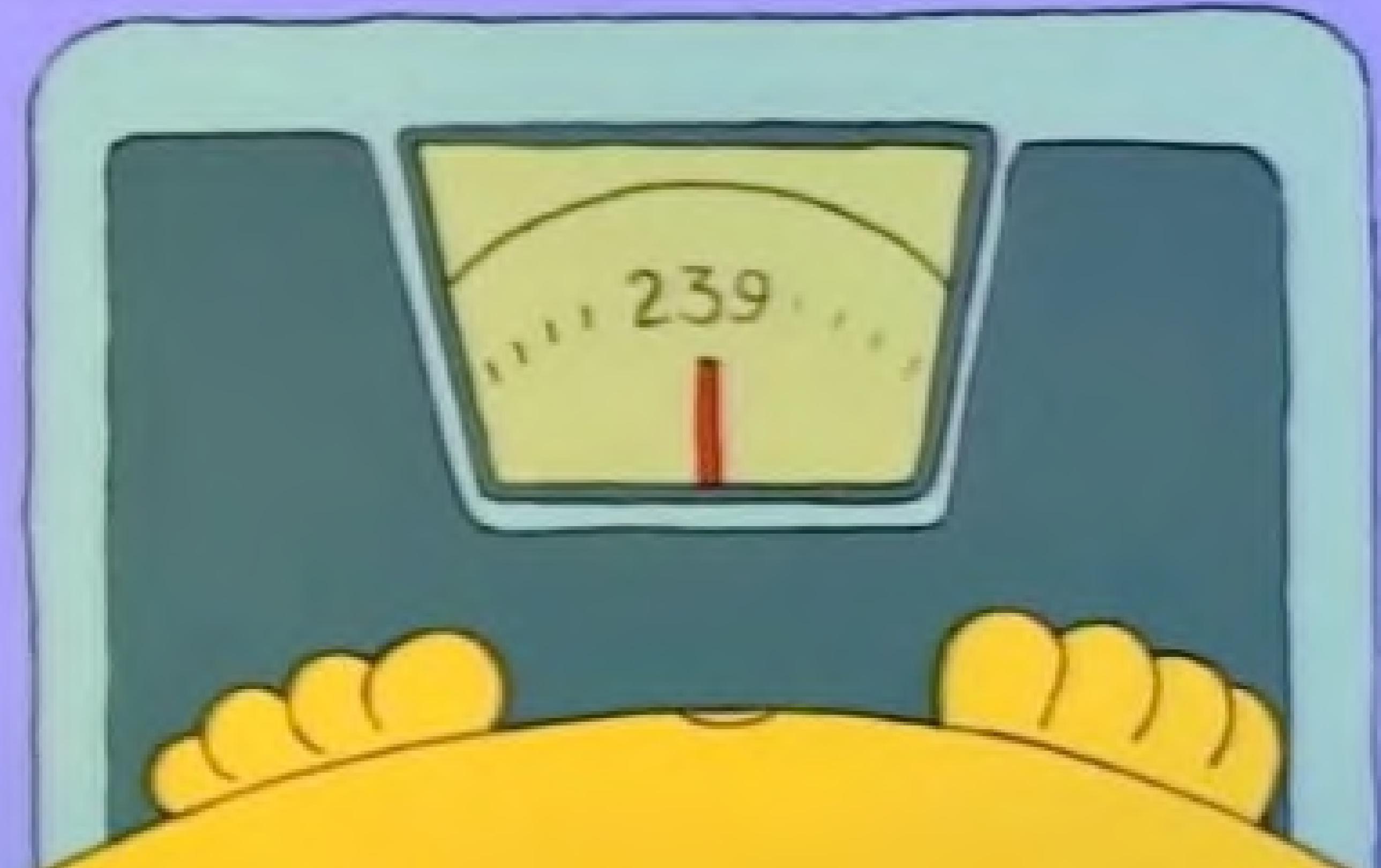
System Fonts
Summary / Details
Dialog / Modal Feature
Formular Validierung
System Fonts

... you get the point!

Drei Fünf Säulen von Website Performance



Reduce

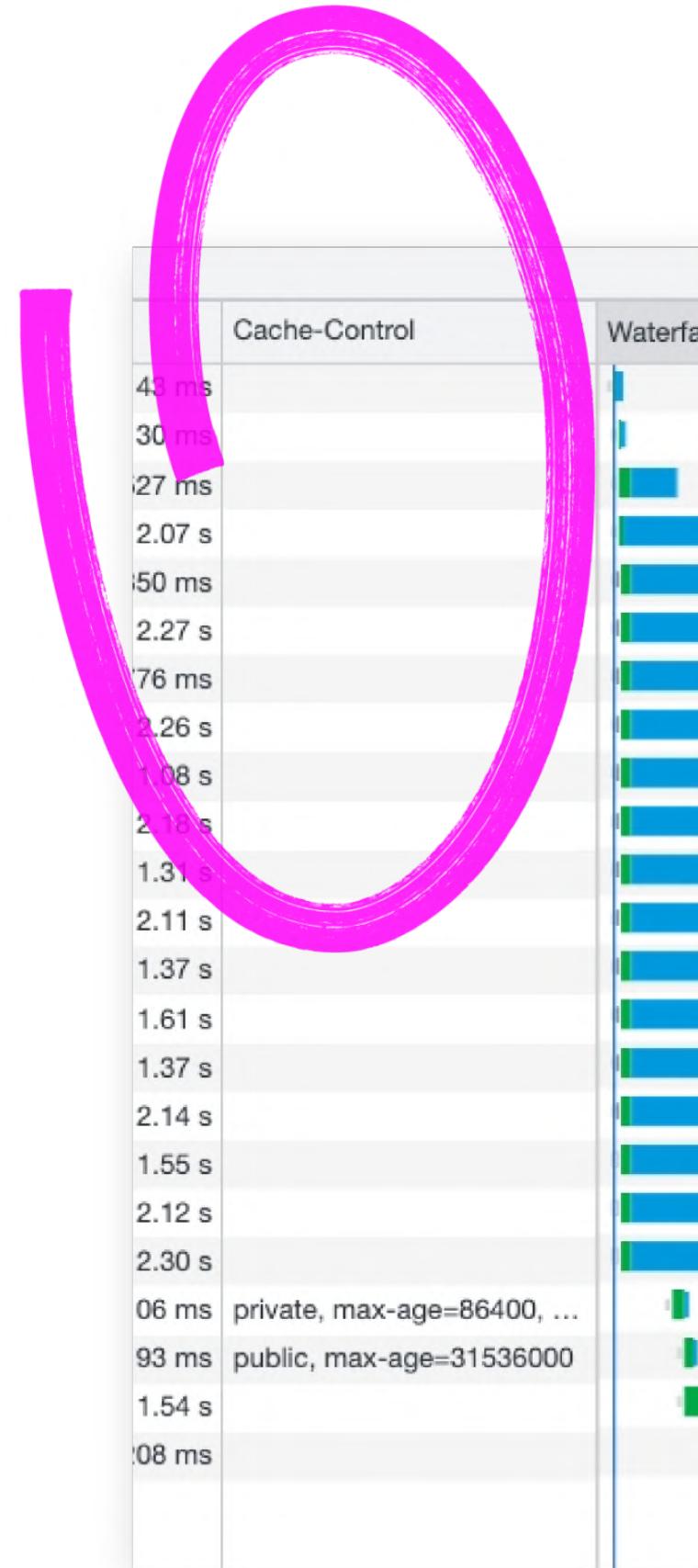


Reduce

Caching

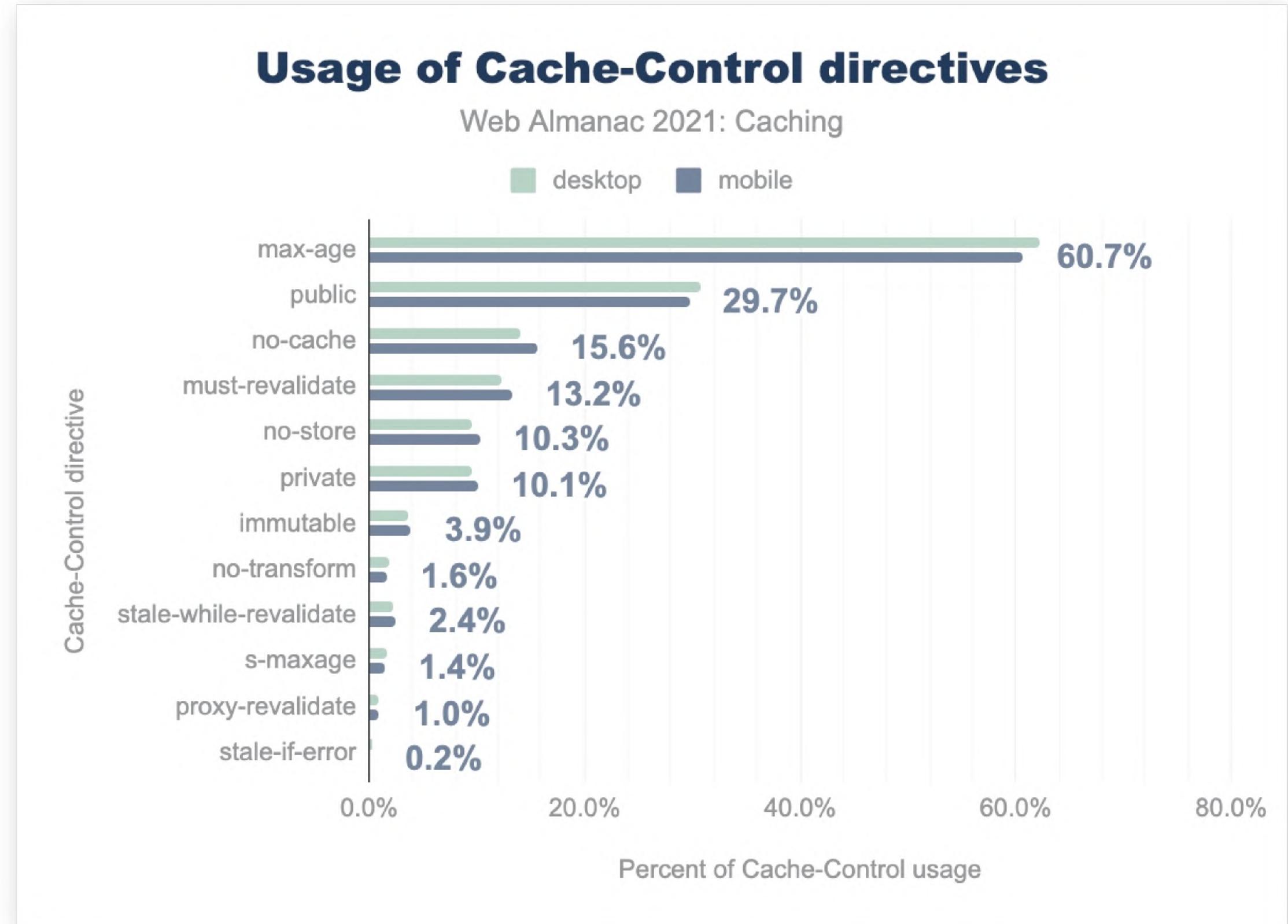
Caching und CDN / Proxy Cache

- deutliches Alarmsignal
- wird dir von jedem Testing Tool um die Ohren gehauen
- kurze Cache-Zeiten sollten gut begründet sein
- `immutable` nutzen!



Caching und CDN / Proxy Cache

- deutliches Alarmsignal
- wird dir von jedem Testing Tool um die Ohren gehauen
- kurze Cache-Zeiten sollten gut begründet sein
- `immutable` nutzen!



Reduce

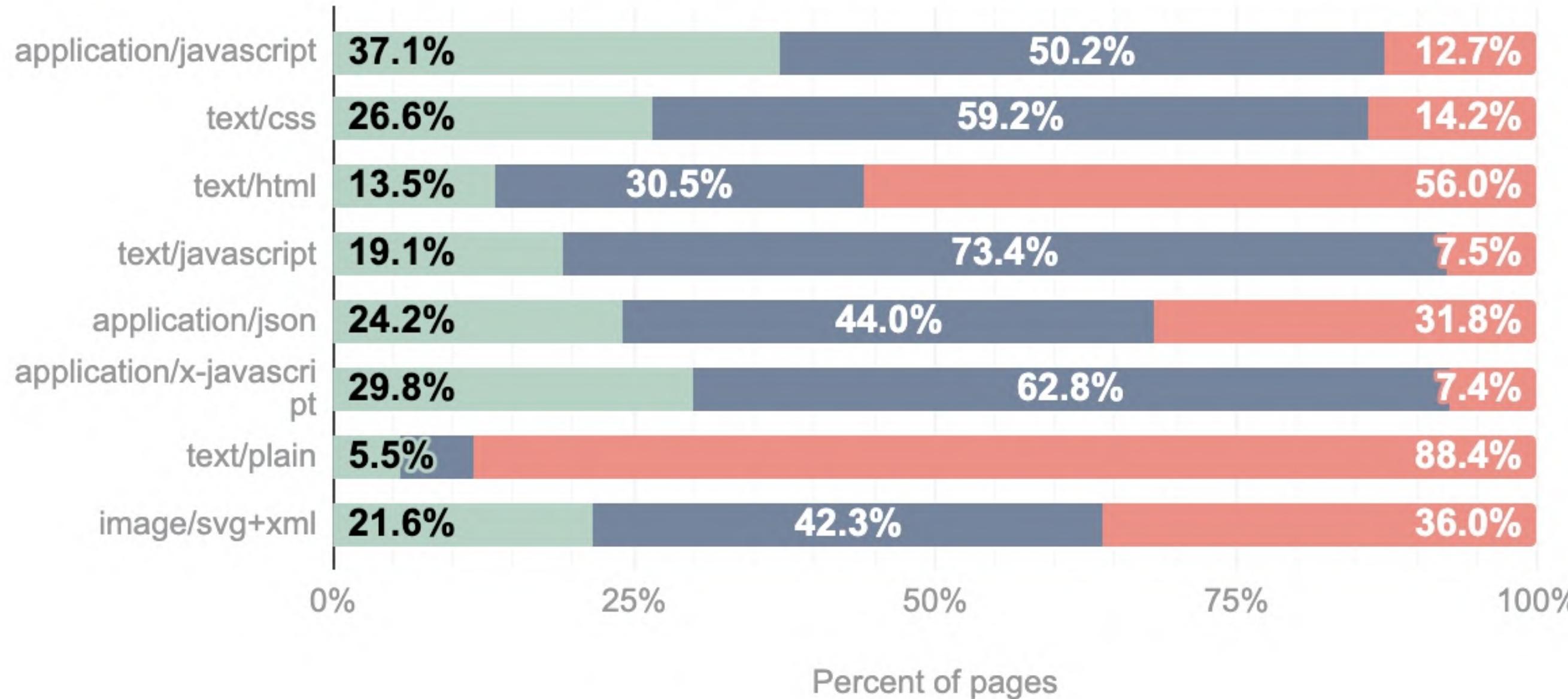
Caching

Komprimierung

Compression methods for different content types

Web Almanac 2021: Compression

Brotli Gzip No text compression

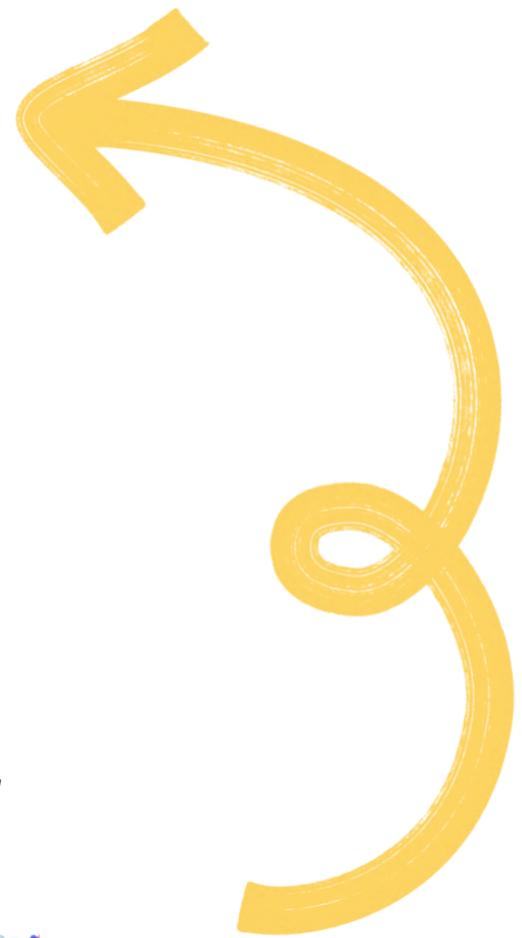


Komprimierung: gzip, brotli

- Gzip als default, drop-in-Lösung
- brotli komprimiert 15–30% besser, aber
 - geringerer Browser-Support (93%)
 - dynamische Komprimierung dauert länger
 - Tweaking der 9 gzip und 11 brotli Stufen

Komprimierung: gzip, brotli

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 - dynamische Komprimierung dauert länger
 - Tweaking der 9 gzip und 11 brotli Stufen 😱



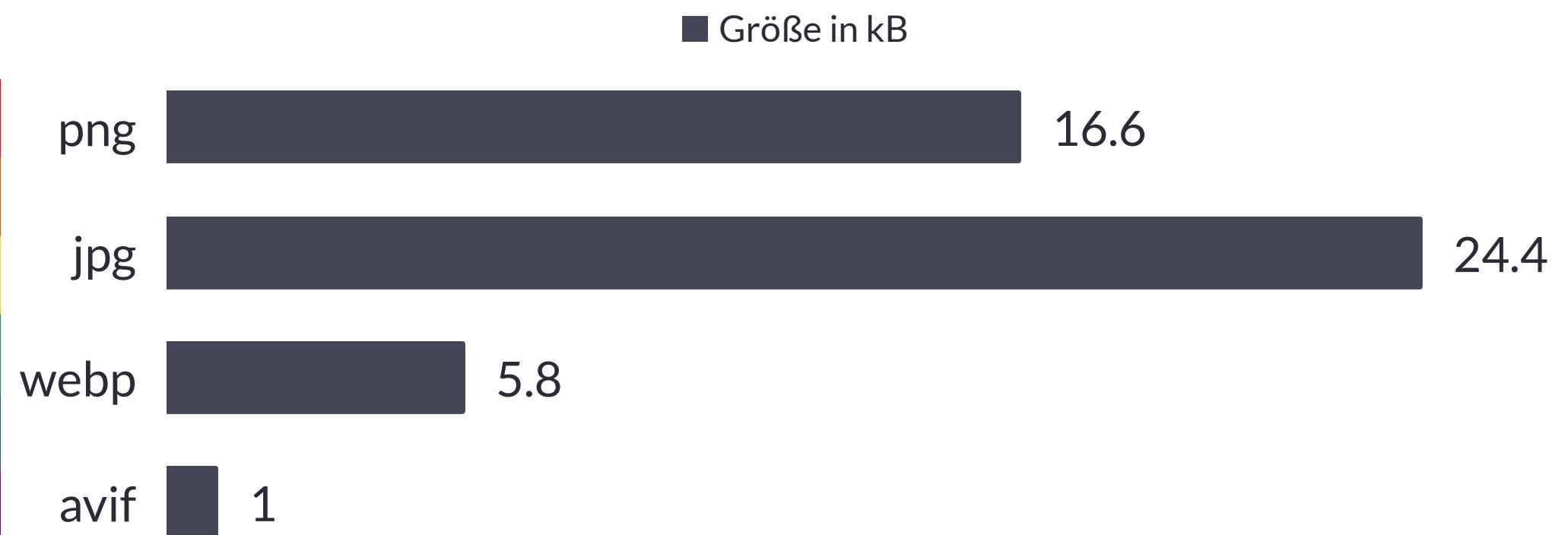
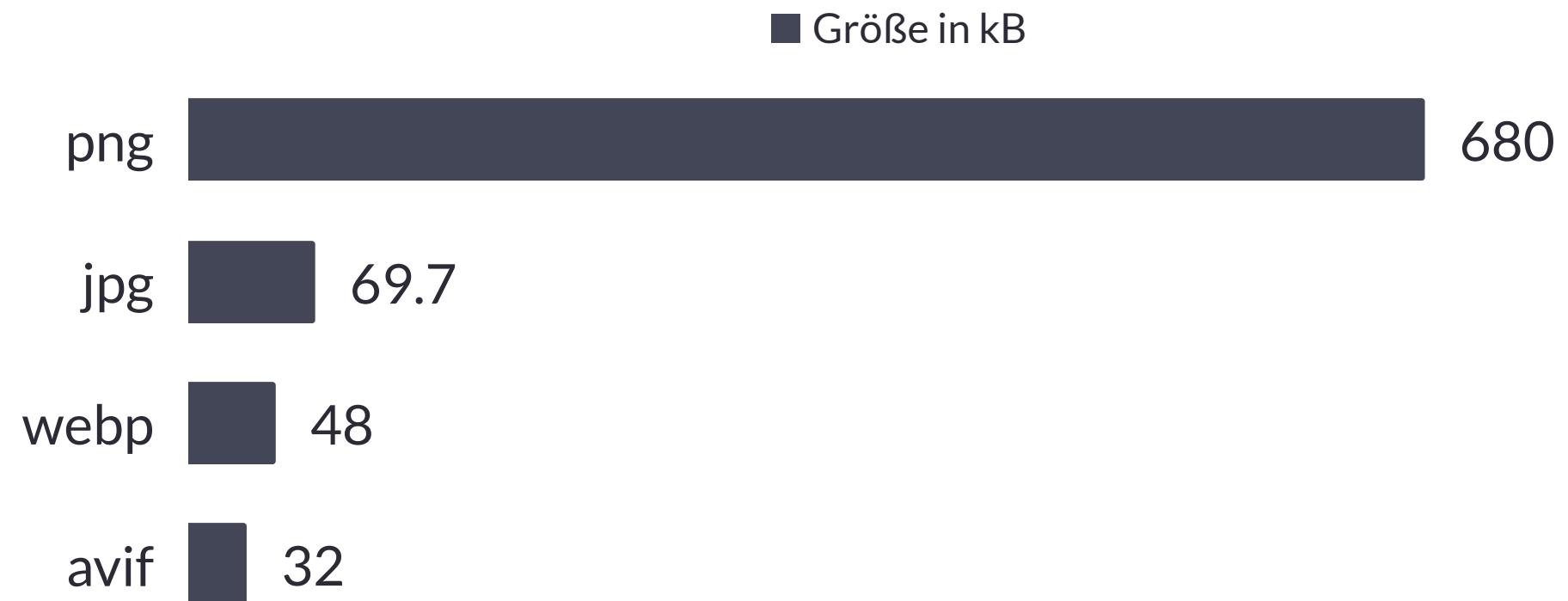
Reduce

Caching

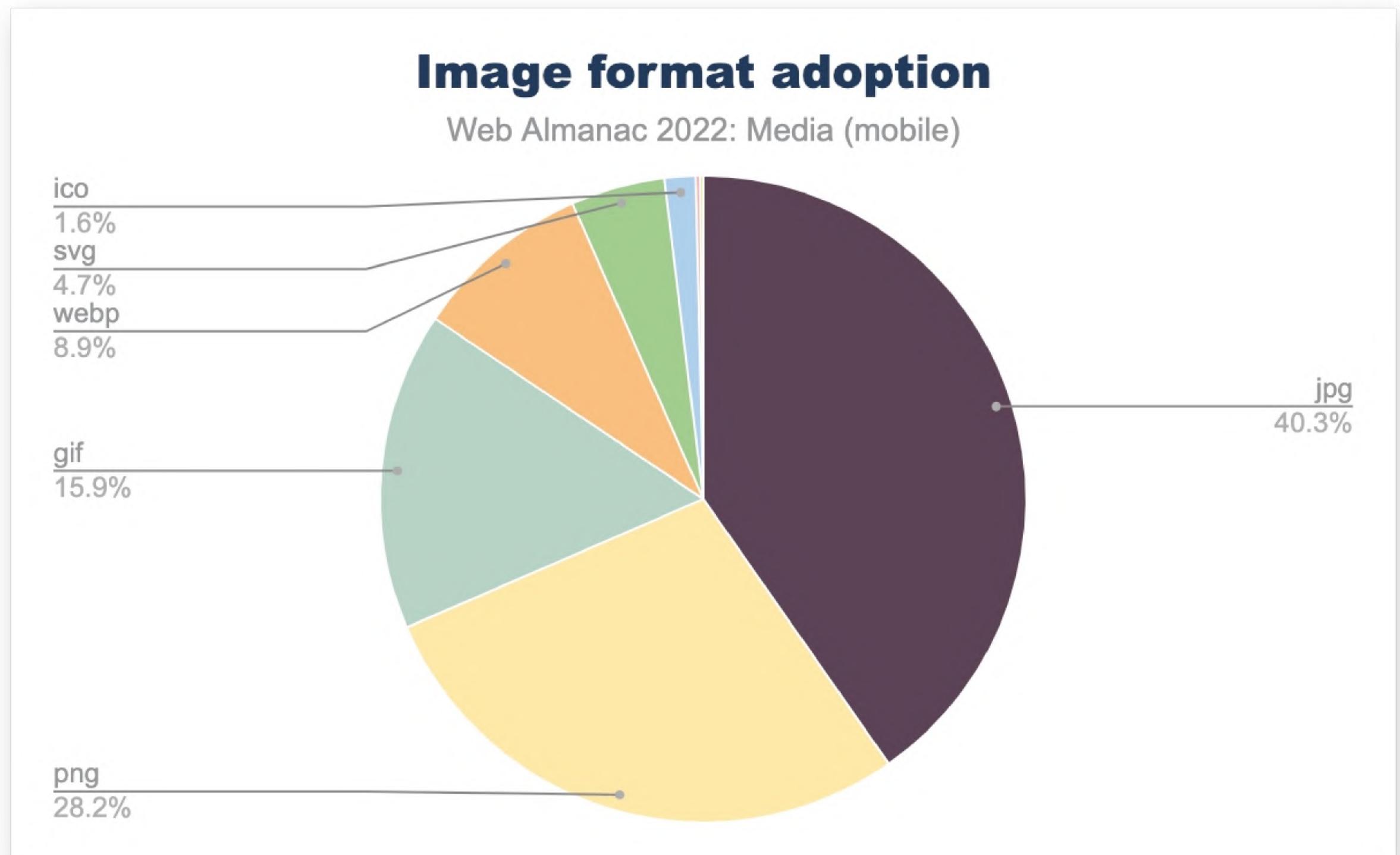
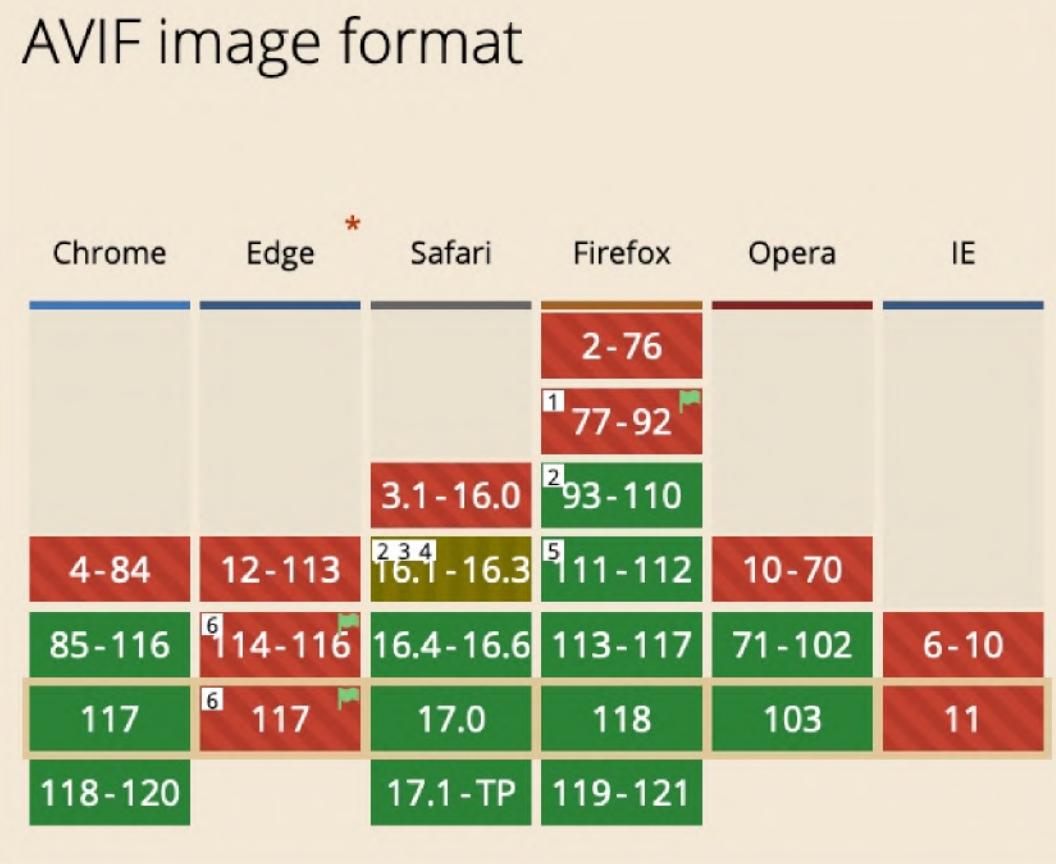
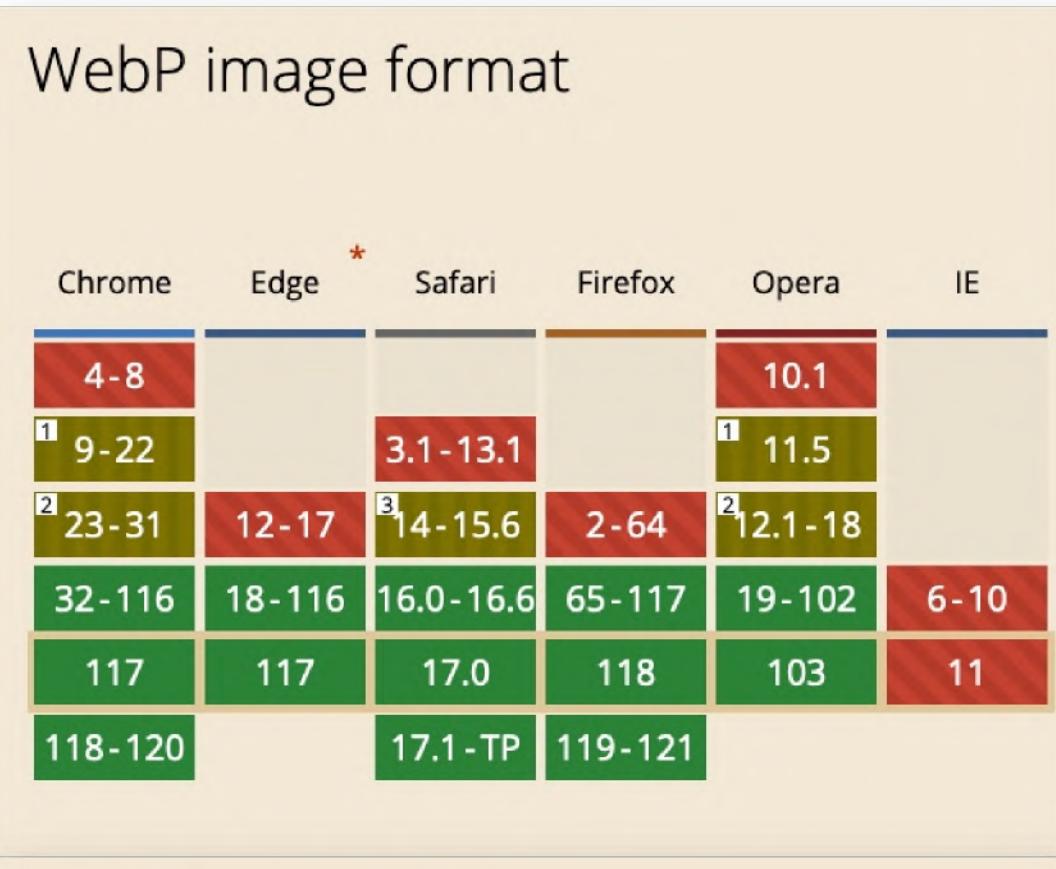
Komprimierung

Bildformate

WebP / Avif : Vorteile



WebP / Avif : Nutzung



WebP / Avif : Einsatz



Squoosh

npm



Natural Preference for Minification

Cloudinary

```
● ● ●  
<picture>  
  <source srcset="img/photo.avif" type="image/avif">  
  <source srcset="img/photo.webp" type="image/webp">  
    
</picture>
```

Reduce

Bildkomprimierung:
Testing-Tools

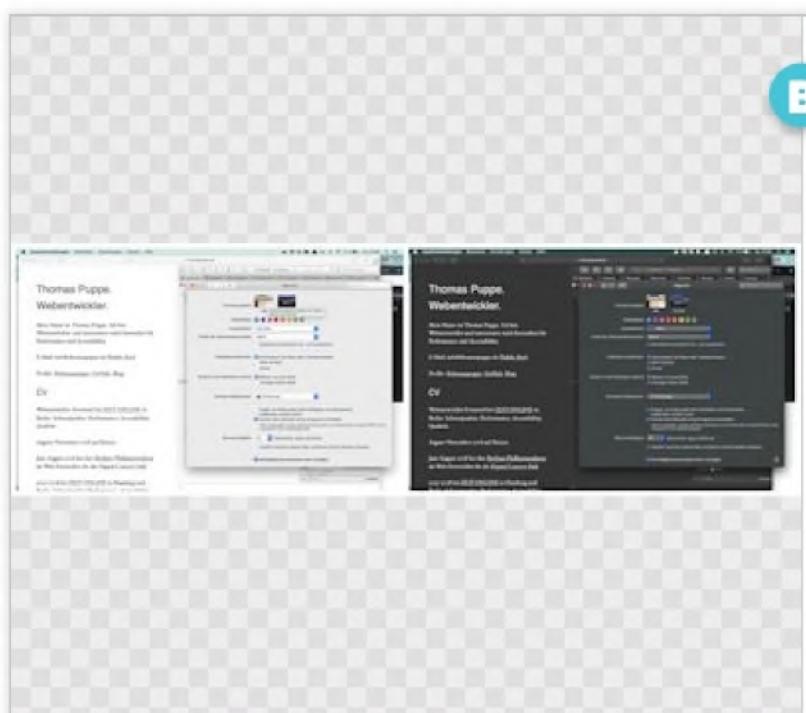
lokal:
Lighthouse im Browser

online:
webspeedtest.cloudinary.com

■ Serve images in next-gen formats 0.52s ^

Image formats like WebP and AVIF often provide better compression than PNG or JPEG, which means faster downloads and less data consumption. [Learn more about modern image formats.](#)

URL	Resource Size	Potential Savings
thomaspuppe.de 1st Party	2,178.9 KiB	1,514.9 KiB
 ...png/event-funeral.png (lama.thomaspuppe.de)	302.3 KiB	232.4 KiB

 B blog-both.jpg

JPEG 66.8 KB Current

Potential Smart Compression

 **35.2%**
Reduction in image weight
1200x384 → 1200x384

SEE DETAILS ▾

Image format options with file size and % compared to current		
JPEG	58.3 KB	(-12.7%)
WEBP	50.9 KB	(-23.8%)
AVIF	43.2 KB	(-35.2%)
PNG	138.3 KB	(+107.1%)

Bildformate rostock.de

4 KB

https://www.rostock.de

D UNIVERSITÄTSSTADT
ROSTOCK

hafen, Kaufmannshäuser, Handel und
sen und junge Leute: All das zeichnet
d Universitätsstadt aus und bietet ein
besonderes Lebensgefühl.

Stadt erleben



SEEBAD WARNEMÜNDE

Selten sind Ruhe & Erholung und Action & Abenteuer so nah
beieinander wie im Seebad Warnemünde.

► Warnemünde fühlen



B rostock-kaufmannshaeuser-neuer-markt-76dd2a1b.jpg

JPEG 158.2 KB Current

Potential Smart Compression

78.2%
Reduction in image weight
800x400 → 656x328

[SEE DETAILS](#)

Image format options with file size and % compared to current

Format	File Size	Change (%)
JPEG	158.2 KB	-
WEBP	40.2 KB	(-74.6%)
AVIF	34.4 KB	(-78.2%)
PNG	134.3 KB	(-15.1%)

B wa_10_strand_von_warnemuende_tmv-suess-ec85db01.jpg

JPEG 102.3 KB Current

Potential Smart Compression

83.8%
Reduction in image weight
800x400 → 656x328

[SEE DETAILS](#)

Image format options with file size and % compared to current

Format	File Size	Change (%)
JPEG	102.3 KB	-
WEBP	21.3 KB	(-79.2%)
JPEG2000	23.9 KB	(-76.7%)
AVIF	16.6 KB	(-83.8%)
JPEG-XR	22.0 KB	(-78.5%)
PNG	89.0 KB	(-12.9%)

Reduce

Caching

Komprimierung

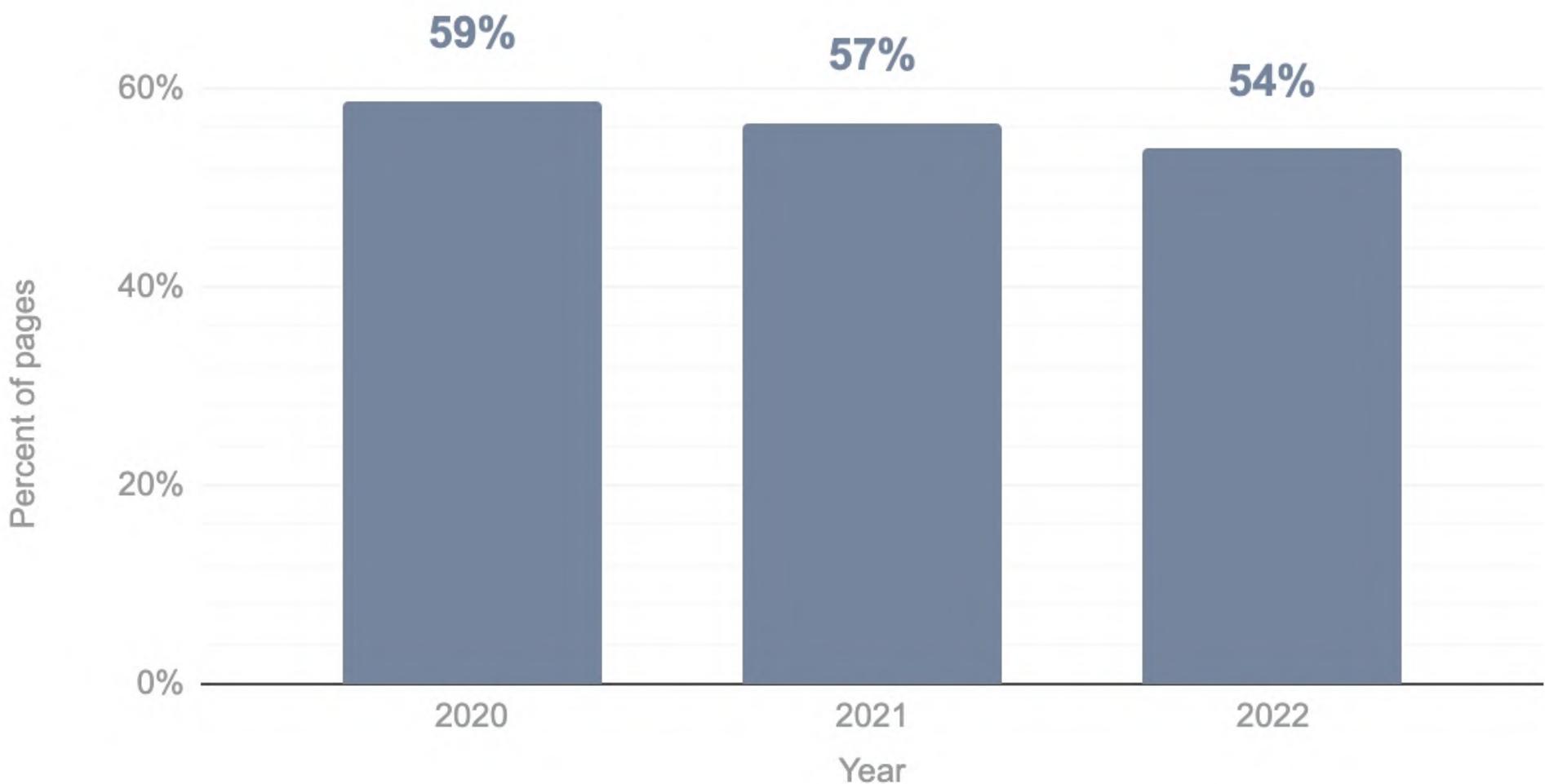
Bildformate

Responsive Images

Responsive Images

Properly sized images

Web Almanac 2022: Mobile Web

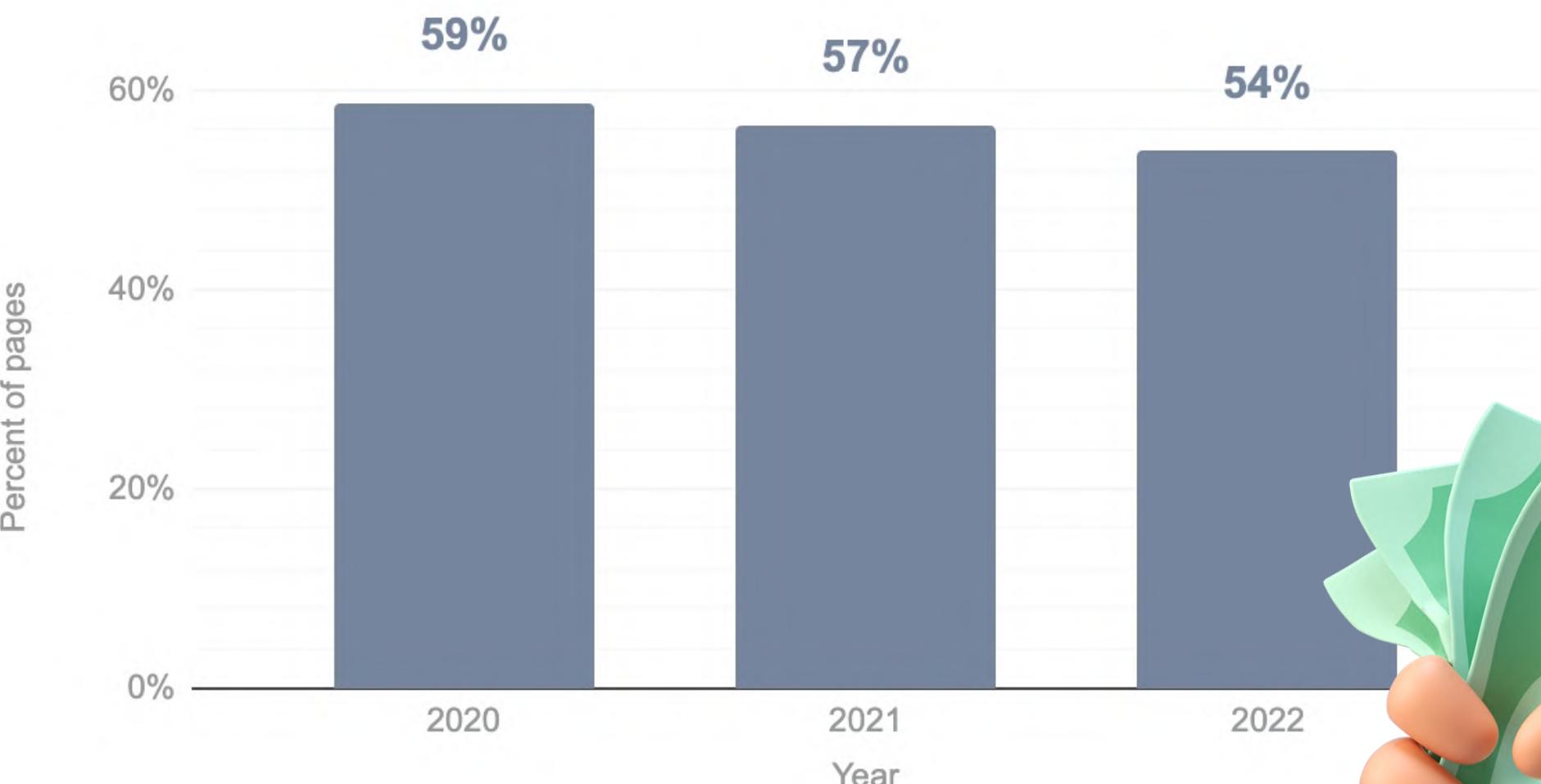


Credit: <httparchive.org>

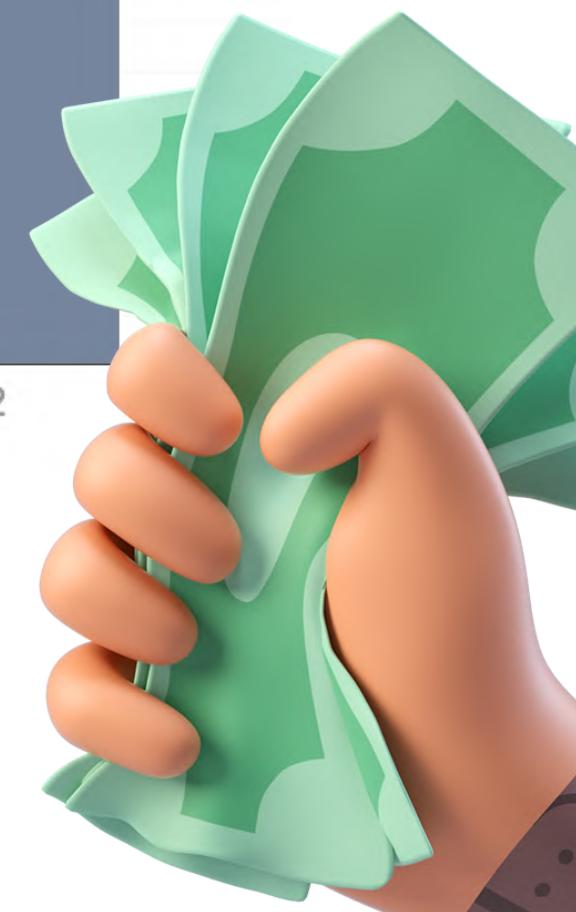
Responsive Images

Properly sized images

Web Almanac 2022: Mobile Web



Credit: <httparchive.org>



Responsive Images



Credit: <httparchive.org>

Responsive Images



22



Responsive Images checken:

DevTools



Responsive Images checken:

Lighthouse

▲ Properly size images 4.62s ^

Serve images that are appropriately-sized to save cellular data and improve load time. [Learn how to size images.](#)

URL	Resource Size	Potential Savings
thomaspuppe.de 1st Party	13,874.8 KiB	5,878.4 KiB
 <small>i m g</small> ...png/avatar8.png (lama.thomaspuppe.de)	1,495.6 KiB	1,459.1 KiB

Reduce

Responsive Images Checker

[https://toolsaday.com/seo/
responsive-image-checker](https://toolsaday.com/seo/responsive-image-checker)

SEO TOOLS

- Open Graph Checker
- HTTP Status Checker
- Redirect Checker
- Gzip Checker
- Web Page Size Checker
- Canonical URL Checker

https://lama.thomaspuppe.de/before.html Check

Check if all of your page's images are appropriately sized for your user's viewport.

Responsive Image ! Serve images larger than the user's viewport

Preview	Display Size	Natural Size
	397x224	1000x566

Reduce

Caching

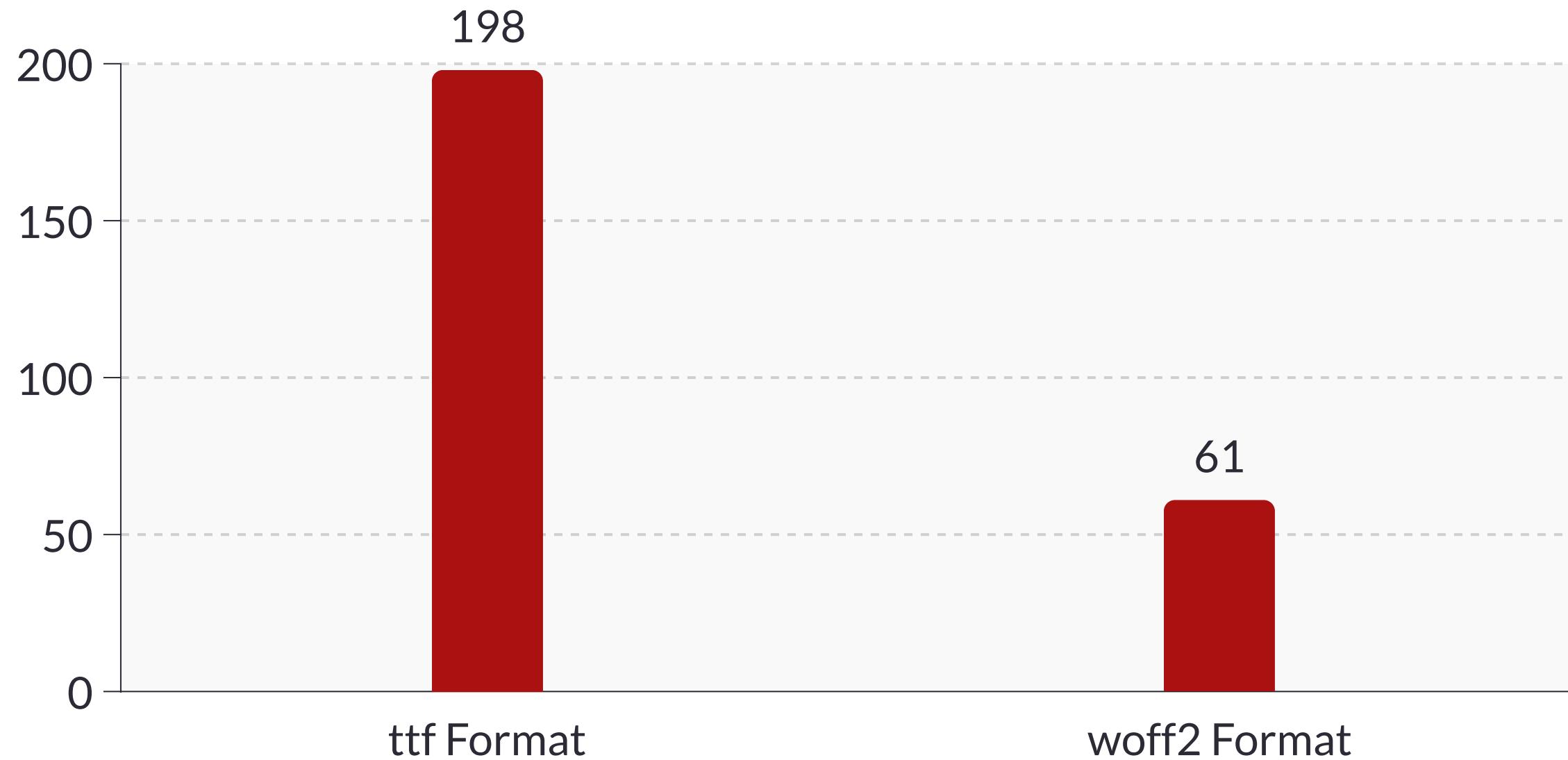
Komprimierung

Bildformate

Responsive Images

Schriften: woff2 Format

Schriften: Woff 2 Format



- Vergesst andere Formate!
- Browser-Support
- Kompatibilität mit alten Browsern wollen wir nicht.

Reduce

Caching

Komprimierung

Bildformate

Responsive Images

Schriften: woff2 Format

Schriften: Subsetting

Reduce

Schriften: Subsetting

- <https://wakamaifondue.com>
für Schriften-Eigenschaften

Montserrat Regular

This is a **TrueType** font with **969 characters**. It has **24 layout features**

Reduce

Schriften: Subsetting

- <https://wakamaifondue.com> für Schriften-Eigenschaften
- <https://everythingfonts.com/subsetter> als Subsetting-GUI
- <https://transfonter.org/>

Montserrat Regular

This is a **TrueType** font with **969 characters**. It has **24 layout features**.

Characters	969	Glyphs	1909	Layout features	24	Languages	50
Filename	Montserrat-Regular.woff2			Size	60 KB	Format	WOFF2
Designed by	Julieta Ulanovsky			Manufactured by	Julieta Ulanovsky		
Copyright	Copyright 2011 The Montserrat Project Authors (https://github.com/JulietaUla/Montserrat)			Version	Version 8.000		

License

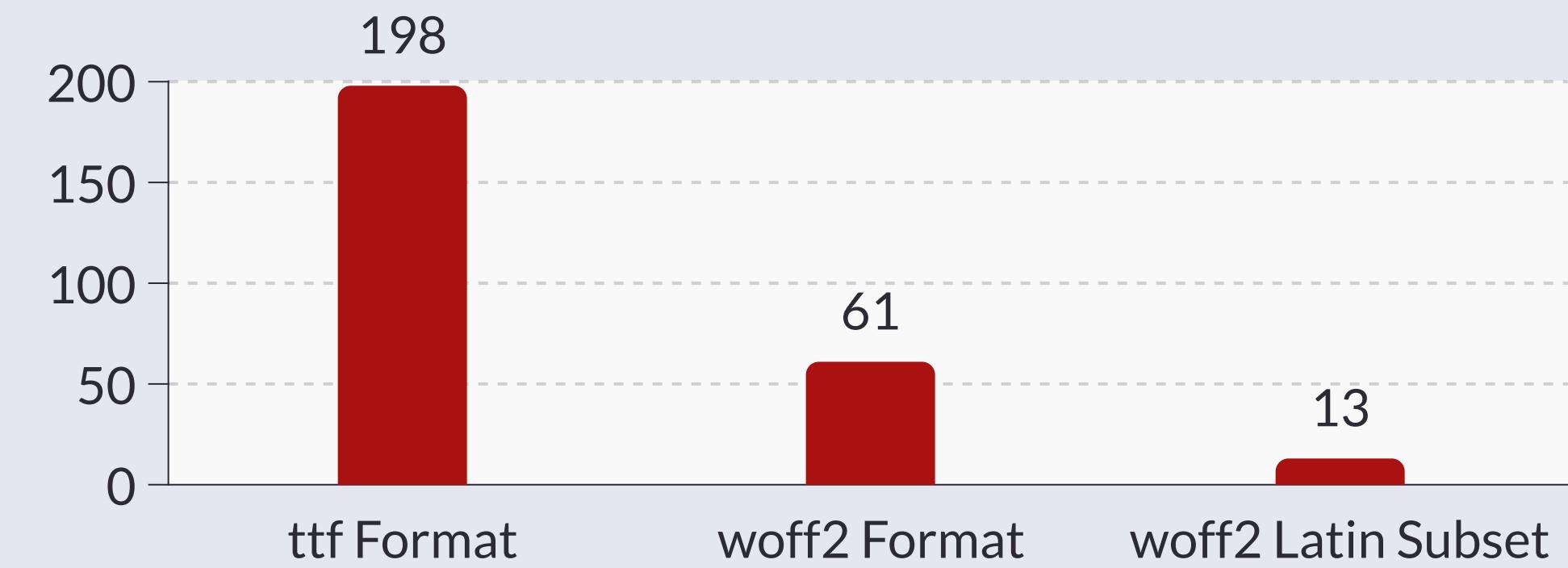
This Font S

Language s

50 languages
Estonian, Fa
Macedonian
Swedish, To
Wakamai Fo

Layout feat

aalt c2sc
tnum kern



Reduce

Caching

Komprimierung

Bildformate

Responsive Images

Schriften: woff2 Format

Schriften: Subsetting

Fünf Säulen von Website Performance

A R O M A

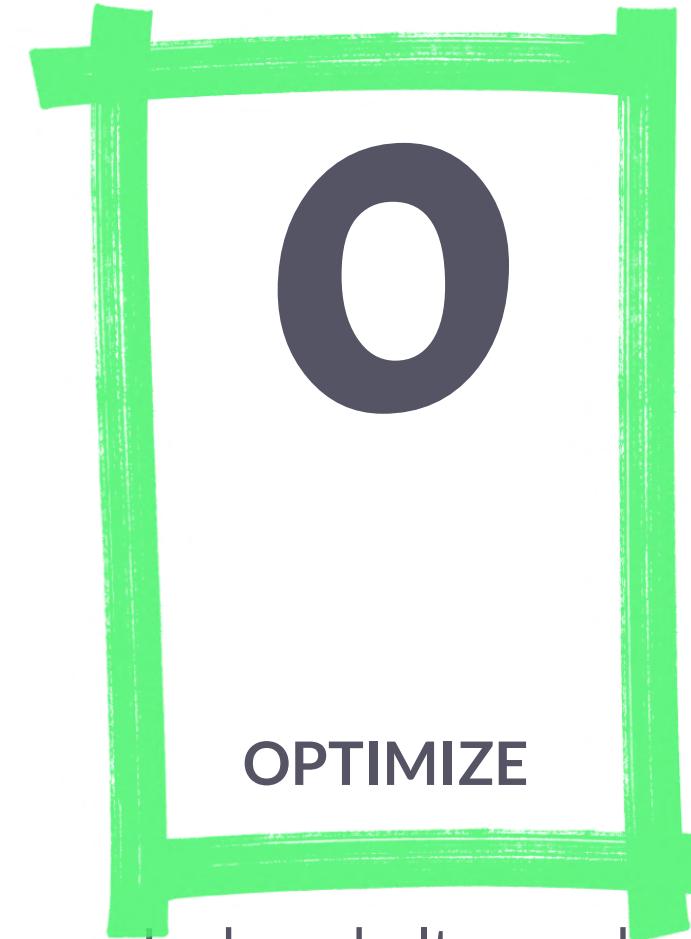
AVOID

Benutzen wir alles?

Brauchen wir alles?

REDUCE

Cachen,
Komprimieren,
Minimieren.



MEASURE

Tooling und
Monitoring

ATTITUDE

Performance
Culture

Optimize



Optimize

Lazy Loading

Lazy Loading

The screenshot shows the npm search interface. At the top, there's a navigation bar with links for 'Newly Purchased Memories', 'Pro', 'Teams', 'Pricing', and 'Documentation'. Below that is the npm logo and a search bar containing the query 'lazy load'. To the right of the search bar are 'Search', 'Sign Up', and 'Sign In' buttons. The main content area displays the results: '1464 packages found' with a page navigation bar showing pages 1 through 74.

Unpacked Size	Total Files
219 kB	12
Issues	Pull Requests
7	3
Last publish	
7 months ago	

Unpacked Size	Total Files
14.3 kB	5
Issues	Pull Requests
71	38
Last publish	
4 years ago	

Unpacked Size	Total Files
336 kB	80
Issues	Pull Requests
165	34
Last publish	
2 years ago	

Lazy Loading via JavaScript



```

```

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Lazy Loading via JavaScript



A screenshot of a browser window. At the top, there are three colored dots (red, yellow, green). Below them, the page content starts with an tag. The code for the tag is shown in green: . A red box highlights the 'img' tag. Below the code, an error message is displayed in a red box: 'Error Element img is missing required attribute src'. Underneath the error message, it says 'From line 72, column 17; to line 72, column 69'. A yellow box highlights the 'data-src' attribute in the original code.

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Lazy Loading via JavaScript

The screenshot shows a browser developer tools console with the following content:

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Error Element `img` is missing required attribute `src`.
From line 72, column 17; to line 72, column 69

```

```

auf JavaScript angewiesen

The screenshot shows a browser developer tools console with the following content:

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Lazy Loading via JavaScript

The screenshot shows a browser's developer tools console with the following output:

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Error Element `img` is missing required attribute `src`.
From line 72, column 17; to line 72, column 69

```

```

auf JavaScript angewiesen

responsive Bilder und Retina?

The screenshot shows a browser's developer tools console with the following working code for lazy loading:

```
const images = document.querySelectorAll('img[data-src]');
const options = { rootMargin: '0px', threshold: 0.5 };
const observer = new IntersectionObserver(entries, observer) => {
  entries.forEach(entry => {
    if (entry.isIntersecting) {
      const image = entry.target;
      const src = image.getAttribute('data-src');
      image.setAttribute('src', src);
      image.removeAttribute('data-src');
      observer.unobserve(image);
    }
  });
}, options);
images.forEach(image => {
  observer.observe(image);
});
```

Lazy Loading nativ

Natives Lazyloading im Browser:



```

```

Lazy Loading nativ

Natives Lazyloading im Browser:



```

```



```
<iframe src="datawrapper.html" loading="lazy" >
```



Optimize

Lazy Loading
Fassaden

Fassaden

QUIZ

Wissenstest des Tages

Von ZEIT ONLINE
12. Oktober 2023

SPIELEN

5/8

3 Punkte

Dieser Satz fiel nach der Landtagswahl in Bayern: "Ich würde der CSU empfehlen, jetzt nicht so mädchenhaft aufzutreten." Wer sagte ihn?

AfD-Politiker Martin Böhm

Freie-Wähler-Chef Hubert Aiwanger

Bayerns ehemaliger Ministerpräsident Horst Seehofer

☰

Quiz suchen

» Quiz spielen

📝 Quiz erstellen

⭐ Die besten Spieler

Die besten Quizautoren

Impressum

Fassaden



Bombenanschlag in Ankara

PKK soll sich zu Anschlag in Ankara bekannt haben

Recep Tayyip Erdogan bezeichnet die Explosion in Ankara als "letztes Zucken des Terrors". Einem Bericht zufolge soll die PKK für den Anschlag verantwortlich sein.

The image shows two overlapping web pages. On the left, a teal-colored page for the game "Wortiger" features a cartoon tiger, the letters "W O R T" in boxes, and a "STARTEN" button. Below it, a black bar contains the word "Gesellschaft" and other navigation links. On the right, a white page for "Wissenstest des Tages" by ZEIT ONLINE from October 1, 2023, features a green border and a "SPIELEN" button. A large green brushstroke effect overlaps both pages.

Gesellschaft Letzte Generation · Rechtsextremismus · Extremwerte >

Australien

Behörden ordnen wegen Buschbränden Evakuierungen an

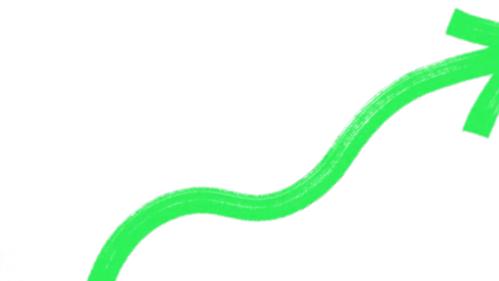
Fassaden



Bombenanschlag in Ankara

PKK soll sich zu Anschlag in Ankara bekannt haben

Recep Tayyip Erdogan bezeichnet die Explosion in Ankara als "letztes Zucken des Terrors". Einem Bericht zufolge soll die PKK für den Anschlag verantwortlich sein.



Host	Datei	Typ	Übertra...	Größe
quiz.z...	daily?embedded=true&fix=4	html	1,15 kB	846 B
quiz.z...	teaser.6aa74084.css	css	6,98 kB	39,34 kB

The interface for the 'Wortiger' word puzzle game. It features a teal header with a yellow tiger logo and the word 'WORT'. Below the header, the text 'Wortiger' is displayed in bold. A subtext reads: 'Das beliebte Worträtsel jetzt auch auf ZEIT ONLINE: Finden Sie in 6 Versuchen das richtige Wort.' A large 'STARTEN' button is at the bottom. To the right of the teal box is a white sidebar for the quiz.

The quiz interface titled 'Wissenstest des Tages' by ZEIT ONLINE, dated 01. Oktober 2023. It features a large 'SPIELEN' button. The entire sidebar area is highlighted with a thick green border, matching the one on the adjacent teal box.

Gesellschaft Letzte Generation · Rechtsextremismus · Extremwerte

Australien

Behörden ordnen wegen Buschbränden Evakuierungen an



Fassaden



Bombenanschlag in Ankara
PKK soll sich zu Anschlag in Ankara
bekannt haben

Recep Tayyip Erdogan bezeichnet die Explosion in Ankara als "letztes Zucken des Terrors". Einem Bericht zufolge soll die PKK für den Anschlag verantwortlich sein.

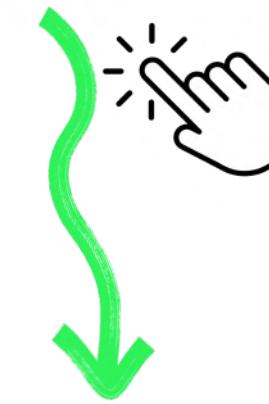
The screenshot shows a teal-colored quiz interface. At the top, there's a cartoon tiger holding four white cubes with the letters 'W', 'O', 'R', and 'T'. Below the tiger, the word 'Wortiger' is written in a bold, sans-serif font. Underneath, it says: 'Das beliebte Worträtsel jetzt auch auf ZEIT ONLINE: Finden Sie in 6 Versuchen das richtige Wort.' A large dark button labeled 'STARTEN' is centered below this text. At the bottom of the teal section, there's a black bar with the word 'Gesellschaft' and some small text about the last generation, right-wing extremism, and far-right movements.

The screenshot shows a news article from Zeit Online. At the top left is a photo of a police officer. The main headline reads: 'PKK soll sich zu Anschlag in Ankara bekannt haben'. Below the headline is a paragraph of text. On the right side of the article, there's a sidebar with three options: 'AfD-Politiker Martin Böhm', 'Freie-Wähler-Chef Hubert Aiwanger', and 'Bayerns ehemaliger Ministerpräsident Horst Seehofer'. A green arrow points upwards from the bottom of the teal 'Wortiger' box towards the top of this news article.

The screenshot shows a news article from Zeit Online. The headline reads: 'Behörden ordnen wegen Buschbränden Evakuierungen an'. Below the headline is a photo of a forest fire.

Host	Datei	Typ	Übertra...	Größe
quiz.z...	daily?embedded=true&fix=4	html	1,15 kB	846 B
quiz.z...	teaser.6aa74084.css	css	6,98 kB	39,34 kB

Host	Datei	Typ	Übertra...	Größe
quiz.z...	daily?embedded=true&fix=4	html	1,15 kB	846 B
quiz.z...	teaser.6aa74084.css	css	6,98 kB	39,34 kB
quiz.z...	/	html	1,69 kB	1,73 kB
quiz.z...	quiz.d16f76ce.css	css	24,40 kB	131,03 kB
quiz.z...	modernizr.c2ed6eb5.js	js	3,08 kB	4,98 kB
quiz.z...	quiz.d0c7b3f4.js	js	146,76 kB	447,48 kB
respo...	981949533494636?url=https:	js	7,60 kB	26,53 kB
quiz.z...	/-/	json	590 B	356 B
quiz.z...	daily	json	4,98 kB	4,74 kB
quiz.z...	rad-grad.ded4378d.png	png	35,39 kB	34,63 kB
audev....	wt?p=453,redaktion.homepage.gif	gif	782 B	43 B



Fassaden



Bombenanschlag in Ankara

PKK soll sich zu Anschlag in Ankara bekannt haben

Recep Tayyip Erdogan bezeichnet die Explosion in Ankara als "letztes Zucken des Terrors". Einem Bericht zufolge soll die PKK für den Anschlag verantwortlich sein.

The image contains two screenshots of mobile interfaces. The left screenshot shows a game called 'Wortiger' with a yellow tiger logo and a 'STARTEN' button. The right screenshot shows a quiz titled 'Wissenstest des Tages' from 'ZEIT ONLINE' dated 01. Oktober 2023, with a 'SPIELEN' button. A green brushstroke graphic overlays both screens, connecting them.

- Videos (youtube/vimeo-lite)
- Social Media Widgets
- Chats, Support-Messenger
- Spiele, Interaktives
- Dashboards in Apps
- Formular-Logik



Australien

**Behörden ordnen wegen Buschbränden
Evakuierungen an**

Optimize

Lazy Loading
Fassaden

Rel=preload

Hero-Image

This site is part of a Website Performance Workshop. [Source code](#) and [presentation slides](#) are available on GitHub.

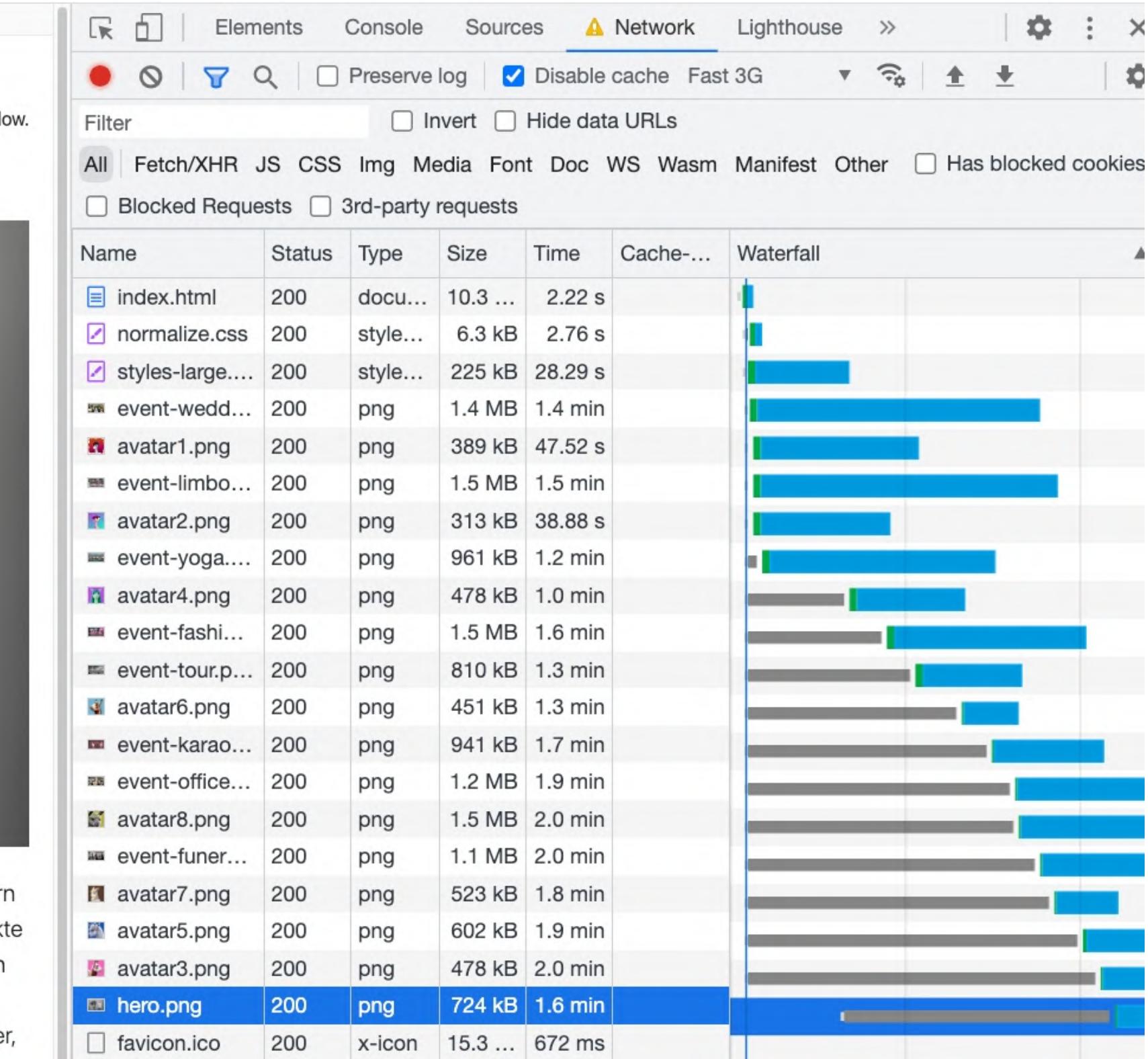
Rent a Llama

Even a static website can be slow.



**Willkommen beim
professionellen Lamaverleih**

Ob für Firmenevents, Hochzeiten, Geburtstagsfeiern oder Naturausflüge - unsere Lamas sind die perfekte Ergänzung und garantieren Ihnen und Ihren Gästen ein besonderes Erlebnis. Unsere Lamas sind gut ausgebildet und bestens gepflegt. Wir stellen sicher,



Preload



```
<head>

  <link rel="preload" as="image" href="/images_optimized/png/hero.png">

  {... CSS usw usf ...}

</head>

<body>

  ...


```

Mit Preload-Links können wir im Head einer HTML-Seite dem Browser schon Hinweise geben auf Ressourcen, die während dem Rendern gebraucht werden.
Unterstützt: Bilder, Videos, CSS, JS. Schriften!

Hero-Image mit rel=preload

This site is part of a Website Performance Workshop. [Source code](#) and [presentation slides](#) are available on GitHub.

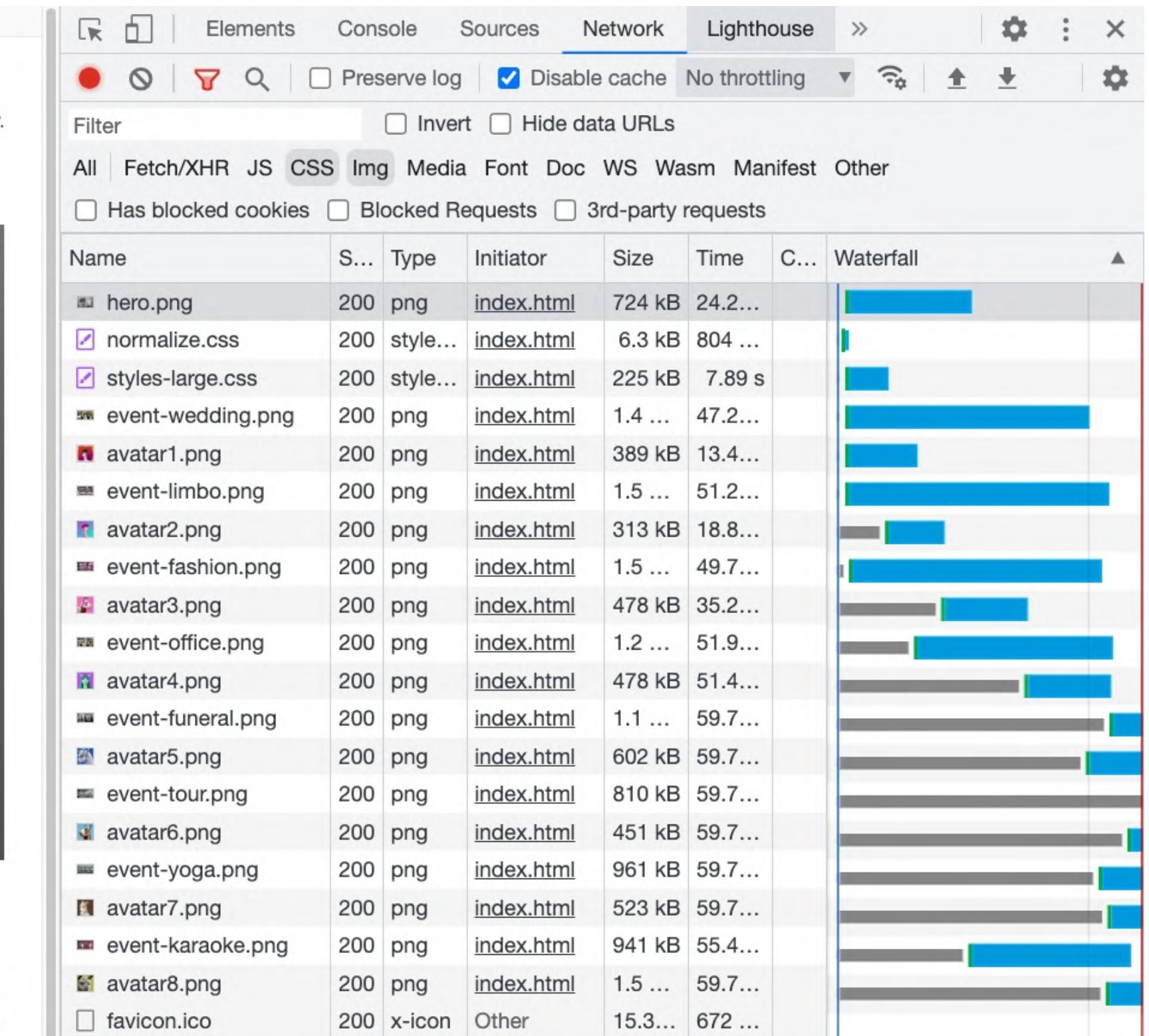
Rent a llama

Even a static website can be slow.

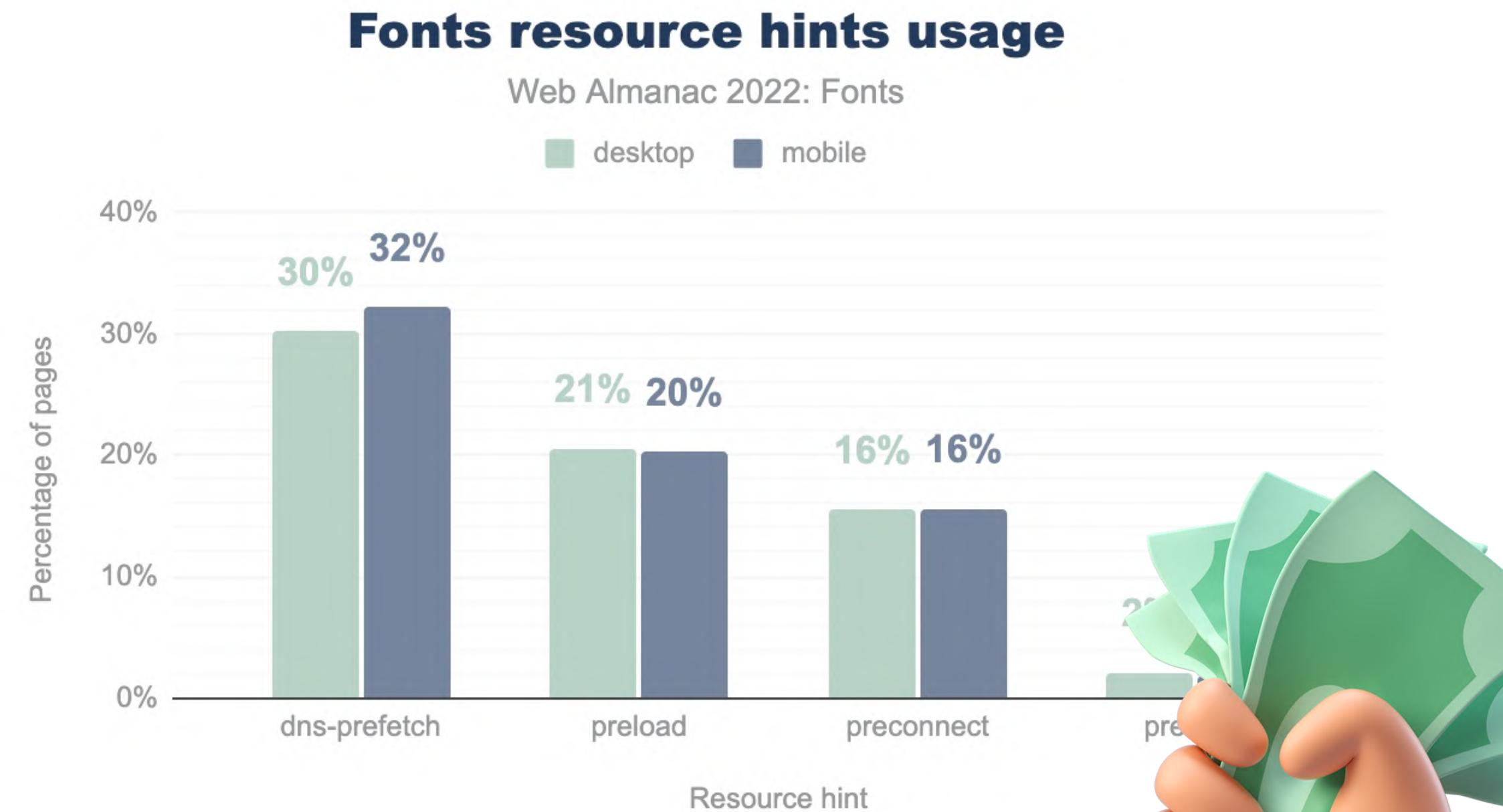


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professionellen Lamaverleih**

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Geburtstagsfeiern oder Naturausflüge -
unsere Lamas sind die perfekte Ergänzung
und garantieren Ihnen und Ihren Gästen ein



Preload Browsersupport und Verbreitung



Optimize

Lazy Loading

Fassaden

Rel=Preload

Layout Shift

Cumulative Layout Shift

Der Cumulative Layout Shift (CLS) ist eine Maßeinheit für unerwartetes Verschieben des Layouts einer Website.

CLS ist einer der Core Web Vitals von Google und fließt mit in das Google-Ranking ein!

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**Willkommen beim
professionellen Lamaverleih**

Cumulative Layout Shift

Performance studies related to “core web vitals”



Carpe improved Largest Contentful Paint by 52% and Cumulative Layout Shift by 41% and saw a 10% increase in traffic, a 5% increase in online store conversion rate, and a 15% increase in revenue.

[PERMALINK](#) [SHARE ON TWITTER](#)

#bounce rate #conversion rate #traffic #revenue #2023 #core web vitals

Cumulative Layout Shift

Performance studies related to “core web vitals”



Carpe improved Largest Contentful Paint by 52% and Cumulative Layout Shift by 41% and saw a 10% increase in traffic, a 5% increase in online store conversion rate, and a 15% increase in revenue.

[PERMALINK](#) [SHARE ON TWITTER](#)

#bounce rate #conversion rate #traffic #revenue #2023 #core web

Credit: <https://wpostats.com/>



Optimize

Layout Shift

- Chrome DevTools:
 - → Console Drawer
 - → Rendering
 - → Layout Shift
 - → Core Web Vitals
- Chrome Plugins
- [https://defaced.dev/tools/
layout-shift-gif-generator/](https://defaced.dev/tools/layout-shift-gif-generator/)
- npm install -g layout-shift-gif
- JS Performance Observer
API → Tracking



Platz freihalten gegen Layout-Shift

aspect-ratio definiert für Box-Elemente automatisch die Höhe anhand der Breite.

Der Wert ist eine Dezimalzahl, die man aber auch durch einen Bruch angeben kann.

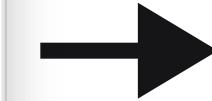


```
.img {  
    aspect-ratio: 1.777;  
    aspect-ratio: 16/9;  
}
```

This site is part of a Website Performance Workshop. [Source code](#) and [presentation slides](#) are available online.

Rent a llama

Even a static website can be slow.



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Rent a llama

Even a static website can be slow.



**Willkommen beim
professionellen Lamaverleih**

**Willkommen beim
professionellen Lamaverleih**



Optimize

Lazy Loading

Fassaden

Rel=Preload

Layout Shift

Fünf Säulen von Website Performance

A R O T M A

AVOID

Benutzen wir alles?

Brauchen wir alles?

REDUCE

Cachen,
Komprimieren,
Minimieren.

OPTIMIZE

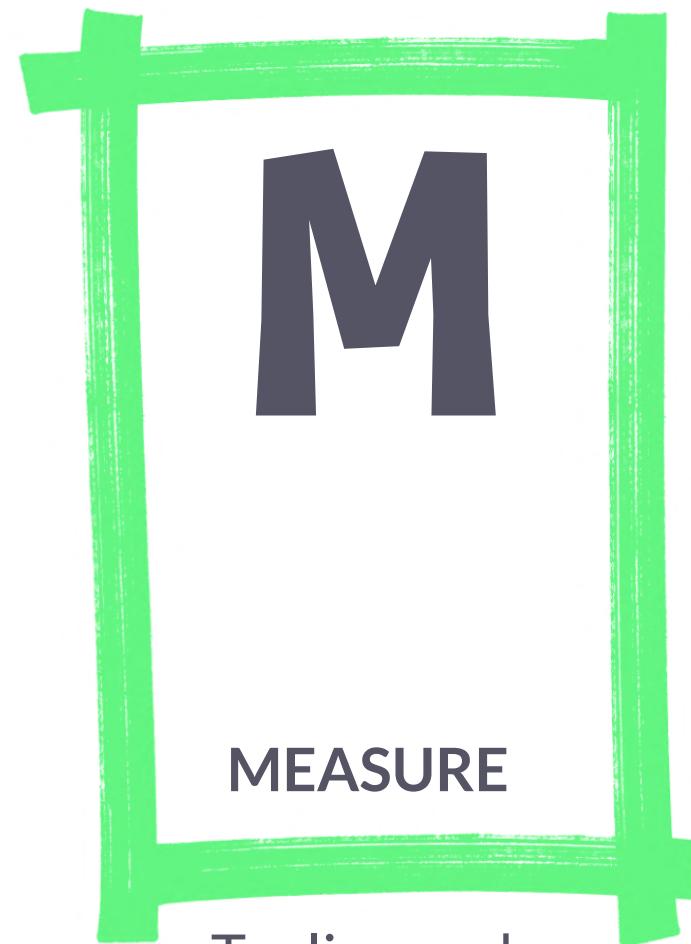
Ladeverhalten und
Priorisierung

MEASURE

Tooling und
Monitoring

ATTITUDE

Performance
Culture



A woman with short, wavy hair, wearing a bright red dress, stands outdoors near a body of water. She is looking down at a large, dark reel of film held in her hands. The reel has a circular metal plate attached to it. The background shows trees and a bright sky.

Measure

hulu Disney+

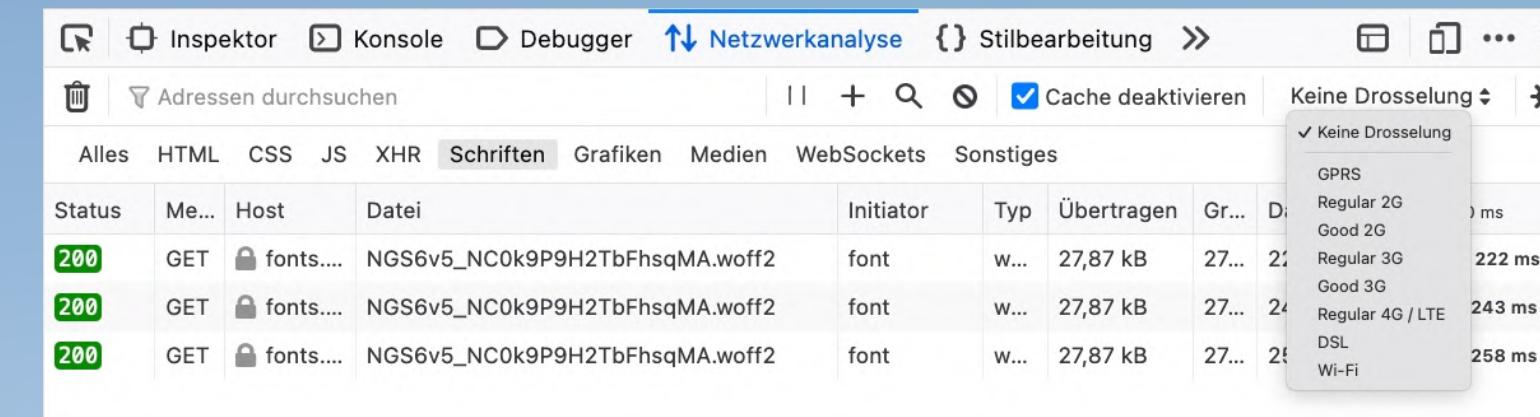
Measure

DevTools

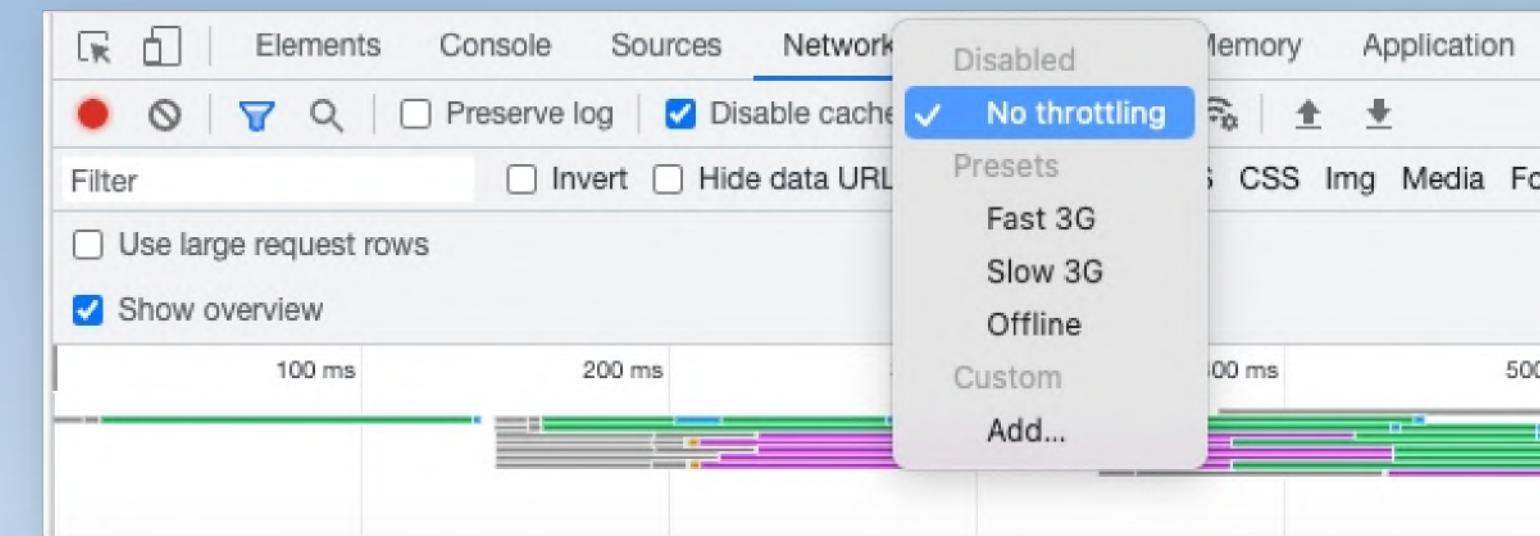
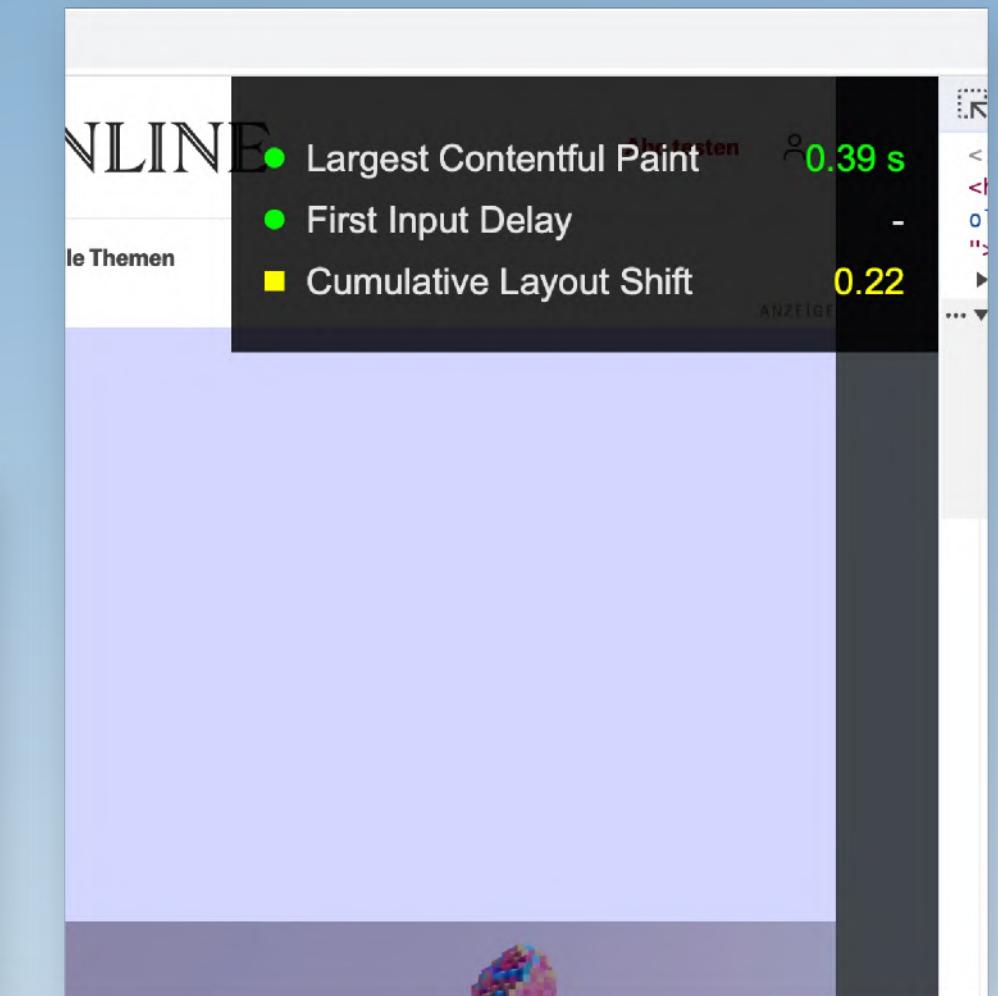
Measure

DevTools

- Throttling
 - Local Source Overrides
 - Web Vitals Score
 - Layout Shift
 - Unused CSS/JS
-
- **JavaScript:** Memory, Frame Rate, CPU Flame Graphs



The screenshot shows the Network tab in the Chrome DevTools. It lists three GET requests for font files: 'NGS6v5_NC0k9P9H2TbFhsqMA.woff2' (status 200). The table includes columns for Status, Method, Host, Datei, Initiator, Typ, Übertragen, Gr., D., and Drosselung. A dropdown menu is open next to the 'Drosselung' column, showing options like 'Keine Drosselung', 'GPRS', 'Regular 2G', etc.



The screenshot shows the Network tab in the Chrome DevTools with the 'Throttling' dropdown open. The 'No throttling' option is selected. Other options include 'Fast 3G', 'Slow 3G', 'Offline', 'Custom', and 'Add...'. Below the dropdown, there's a timeline visualization showing request times.

Name	Status	Type	Size	Time	Priority	Waterfall
after.html	304	document	80 B	70 ms	Highest	
Montserrat-Regular.woff2	200	font	(disk cache)	16 ms	High	
normalize.css	200	stylesheet	(disk cache)	15 ms	Highest	
styles-optimized.css	200	stylesheet	(disk cache)	8 ms	Highest	
hero.webp	200	webp	(disk cache)	12 ms	Low	

URL	Type	Total Bytes	Unused Bytes	Usage Visualization
https://consent-cdn.zeit.de/wrapperMessagingWithoutDetection.js	JS (per function)	204 217	95 490 46.8%	
https://interactive.zeit.de/wiegehtesi... /app.c0381a78a97b00cf65db.cached.js	JS (per function)	156 095	75 866 48.6%	
https://interactive.zeit.de/g/2022/energiekostenmonitor/.../index.75ca3a4e.css	CSS	99 104	72 859 73.5%	
https://interactive.zeit.de/g/2022/energiekostenmonitor/.../react.8d1c6deb.mjs	JS (per function)	142 733	67 107 47%	
https://static.zeit.de/p.../centerpage.92c7290fe3f64752971581ffeb39d5b6.css	CSS	97 335	62 054 63.8%	
https://static.zeit.de/p/zeit.... /base.4ac770b16c740c03c50e84fb93f1dd9.css	CSS	49 036	38 825 79.2%	
https://static.zeit.de/static/js/webtrekk/webtrekk_v4.5.3.min-3.js	JS (per function)	75 896	30 541 40.2%	

devtoolstips.org

Measure

DevTools

Lighthouse

Measure

Lighthouse

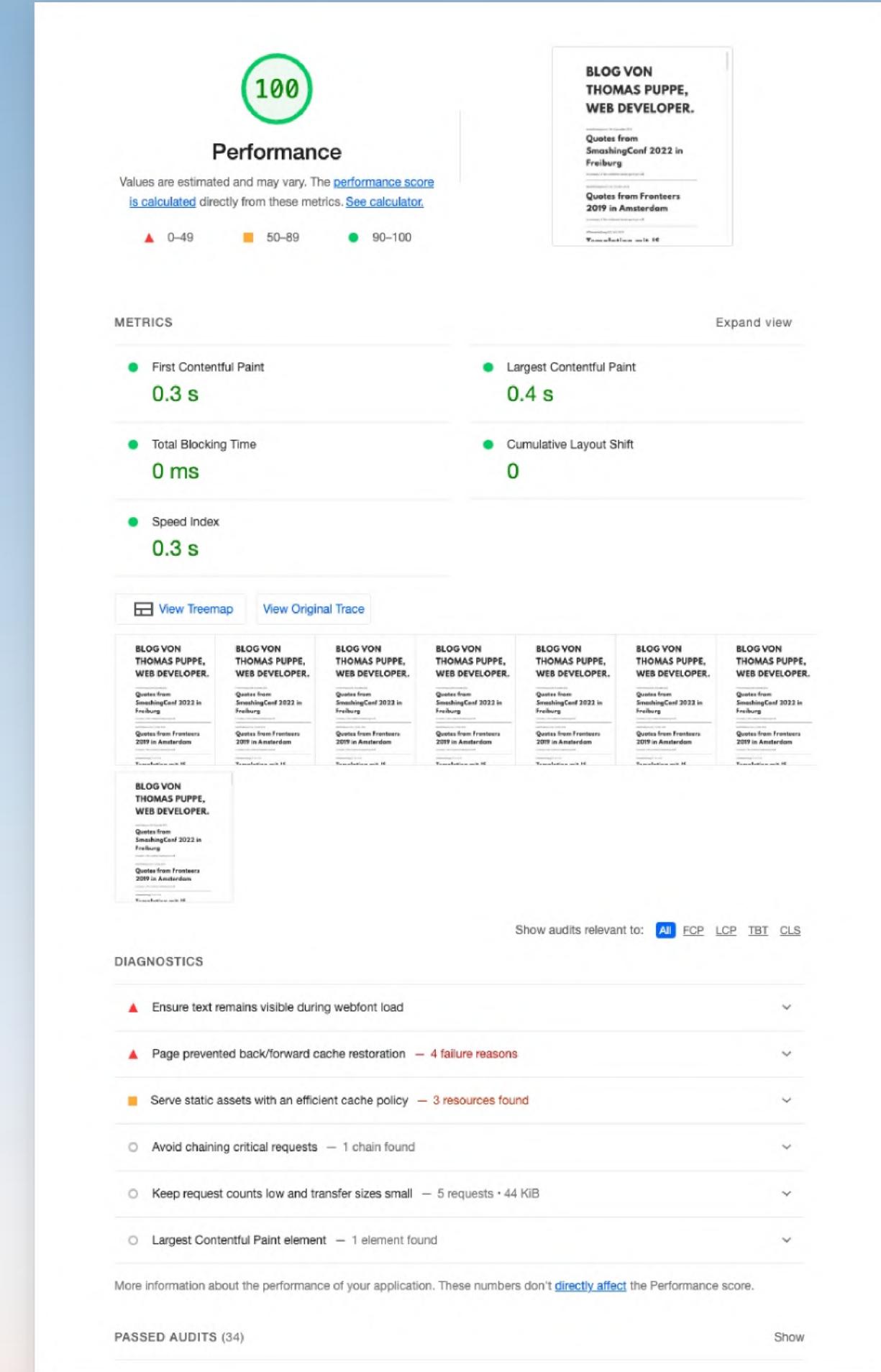
- Web Vital Scores
- konkrete Todos zur Verbesserung

- DevTools

- CLI

`npm install -g lighthouse`

- npx lightouse



Measure

Pagespeed Insights

- Lighthouse,
aber online

pagespeed.web.dev

PageSpeed Insights

Link kopieren Dokumentation

Mobil Computer

98 Leistung

Die Werte sind geschätzt und können variieren. Die Leistungsbewertung wird direkt aus diesen Messwerten berechnet. Siehe Rechner.

▲ 0–49 ■ 50–89 ■ 90–100

MESSWERTE

First Contentful Paint: 1,1 s
Largest Contentful Paint: 2,2 s
Total Blocking Time: 0 ms
Cumulative Layout Shift: 0,021
Speed Index: 1,1 s

Captured at 15. Okt. 2023, 21:01 MESZ Emulation eines Moto G Power with Lighthouse 11.0.0 Einzelner Seitenaufbau
Erster Seitenaufbau Langsame 4G-Drosselung Using HeadlessChromium
117.0.5938.149 with lr

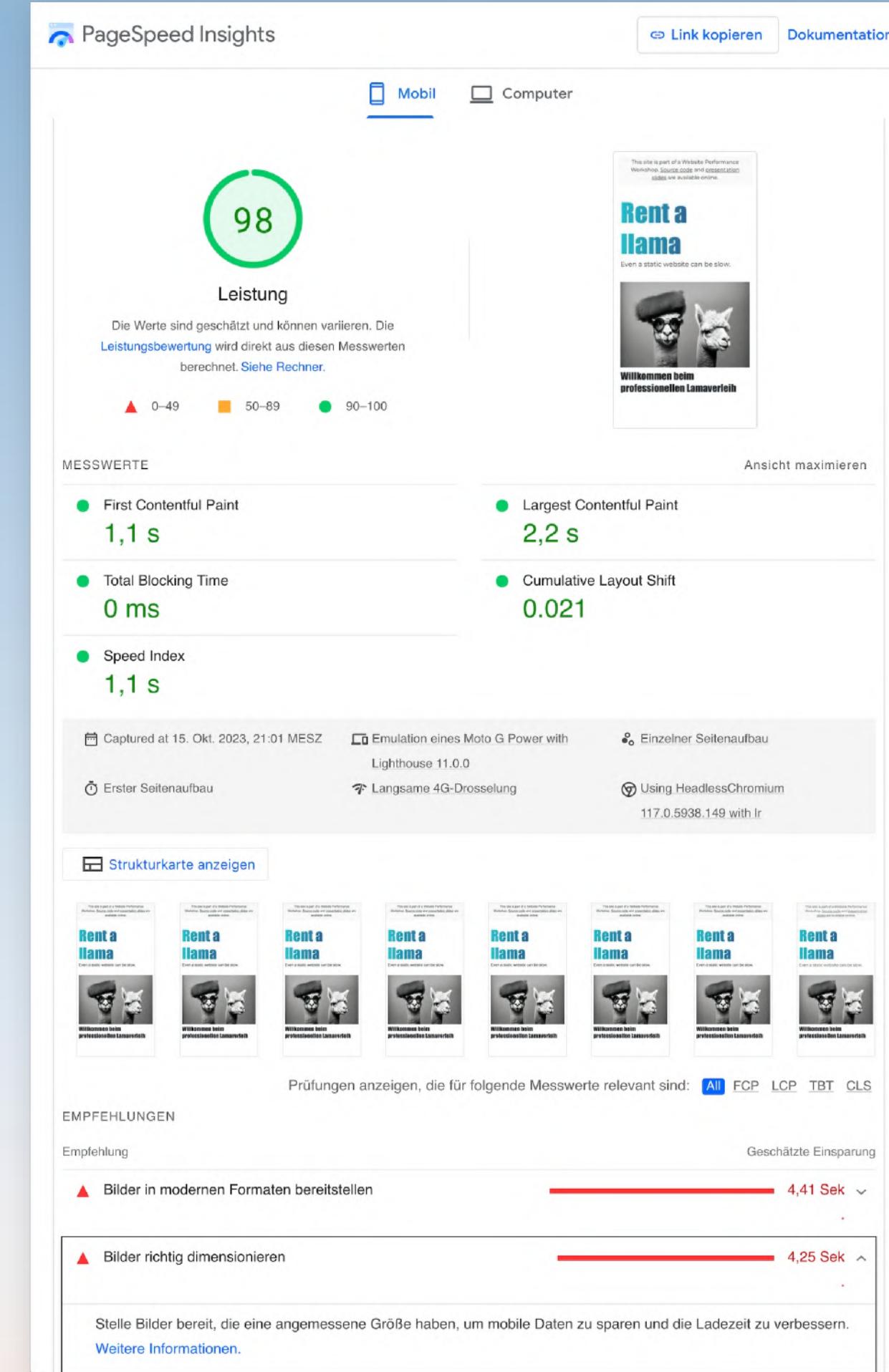
Strukturkarte anzeigen

Prüfungen anzeigen, die für folgende Messwerte relevant sind: All FCP LCP TBT CLS

EMPFEHLUNGEN

Empfehlung Geschätzte Einsparung
Bilder in modernen Formaten bereitstellen 4,41 Sek ▾
Bilder richtig dimensionieren 4,25 Sek ▾

Stelle Bilder bereit, die eine angemessene Größe haben, um mobile Daten zu sparen und die Ladezeit zu verbessern.
[Weitere Informationen](#)



Measure

DevTools

Lighthouse

Page Speed Insights

Webpagetest

Measure

Webpagetest

- genauere Analysen und Empfehlungen
- instant-Experimente

webpagetest.org

Platform > WebPageTest

URL: <https://javascript-days.de/berlin/>
DATE: 15.10.2023, 21:18:58

WebPageTest Pro Experiment

Experiment SETTINGS: DESKTOP v118 Cable Frankfurt, Germany

More Share

View: Experiment Results & Filmstrip

Tools: Export

Experiment Results

EXPERIMENTS APPLIED: Defer Render-Blocking Scripts ▾ Async Render-Blocking Scripts ▾ Inline Render-Blocking Scripts ▾ Add loading="lazy" to images ▾

LINKS: Experiment Results Experiment Control Original

Experiment Impact

(Notable changes between experiment and control)

Start Render	First Contentful Paint	Speed Index	Total Blocking Time	Page Weight
0.2s FASTER Experiment: 1.8s Control: 2s	0.15s FASTER Experiment: 1.78s Control: 1.93s	0.48s SLOWER Experiment: 14.8s Control: 14.33s	0.16s FASTER Experiment: 0.72s Control: 0.88s	69 KB HEAVIER Experiment: 8863 KB Control: 8794 KB

Measure

DevTools

Lighthouse

Page Speed Insights

Webpagetest

Speedcurve

Measure

Speedcurve

- kontinuierliches Monitoring
- Benchmark mit Konkurrenz

speedcurve.com

VITALS

Your site's current performance in key areas of user experience.

Loading (LCP)	Interactivity (FID)	Visual Stability (CLS)
1.35s	32ms	0

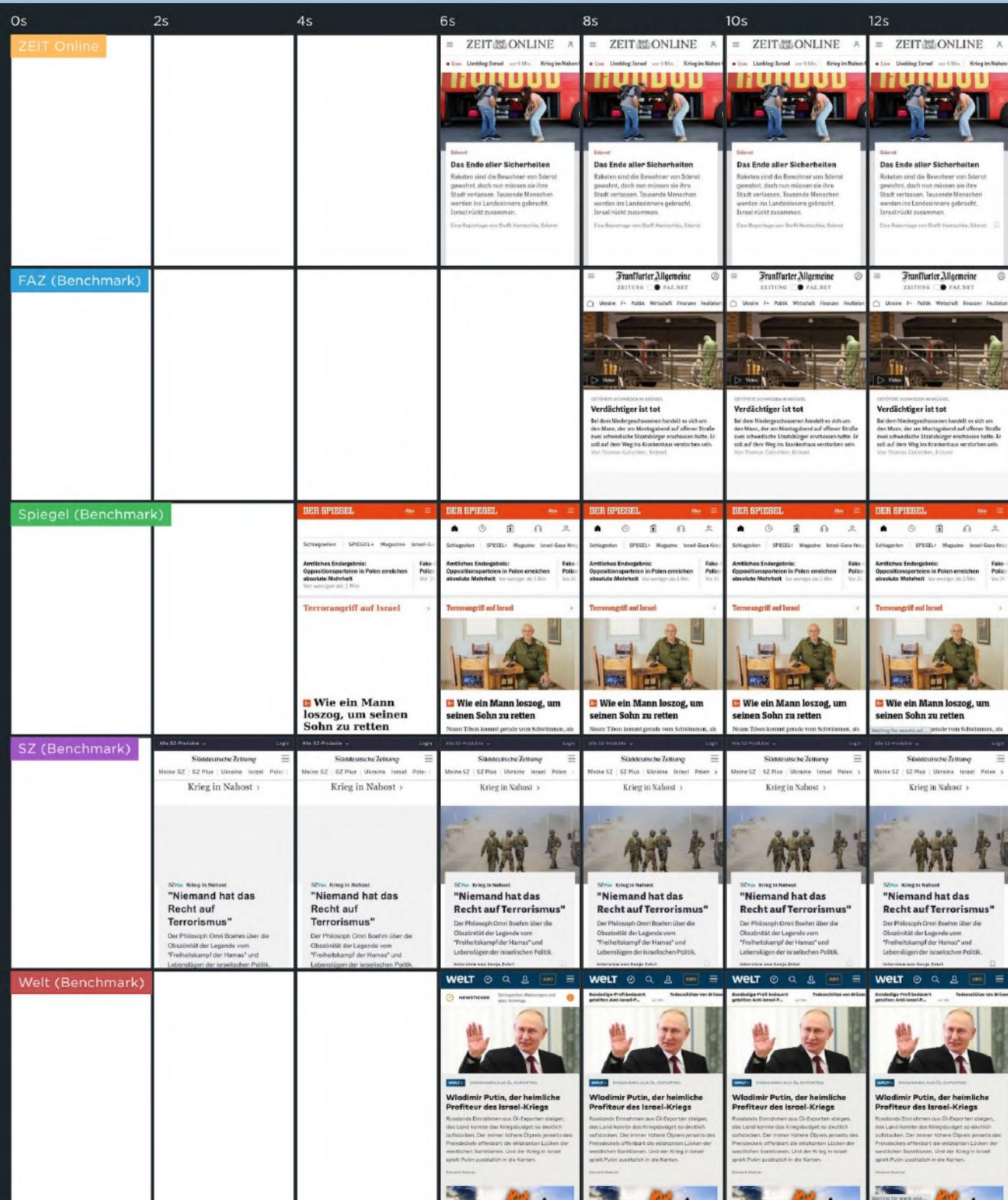
Explore your Web Vitals

USER HAPPINESS

How real users experience the way your site loads.

Happy	Okay	Unhappy
24%	62%	14%

Learn about your visitors



RECOMMENDATIONS

Recommendation	Synthetic Impact
Page prevented back/forward cache restoration	100%
Image elements do not have explicit `width` and `height` <small>CLS</small>	100%
Does not use passive listeners to improve scrolling performance	100%
Some third-party resources can be lazy loaded with a facade <small>TBT</small>	100%
Reduce the impact of third-party code <small>TBT</small>	100%
Ensure text remains visible during webfont load <small>LCP</small>	100%
Avoid an excessive DOM size <small>TBT</small>	100%
Serve static assets with an efficient cache policy	100%

Fünf Säulen von Website Performance

A R O M A

AVOID

Benutzen wir alles?

Brauchen wir alles?

REDUCE

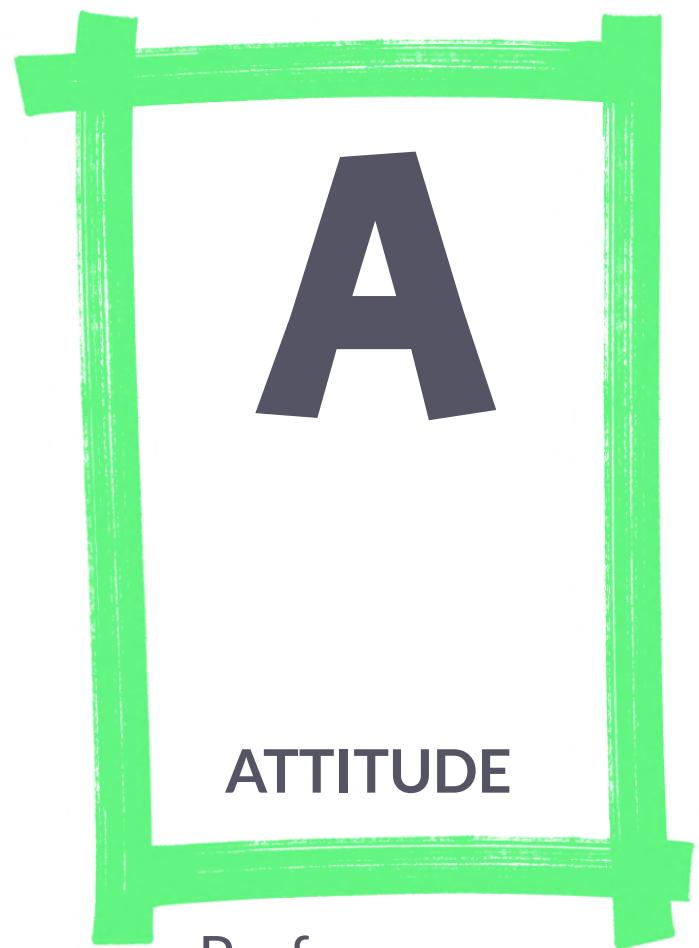
Cachen,
Komprimieren,
Minimieren.

OPTIMIZE

Ladeverhalten und
Priorisierung

MEASURE

Tooling und
Monitoring



ATTITUDE

Performance
Culture

Table Captain

13:15 – 14:00 Uhr

- How to Start, actually?
- Performance Culture: Wie baue ich Performance in unsere Prozesse ein?
- Wie bleibe ich schnell?
- Best-Practice von ZEIT Online.

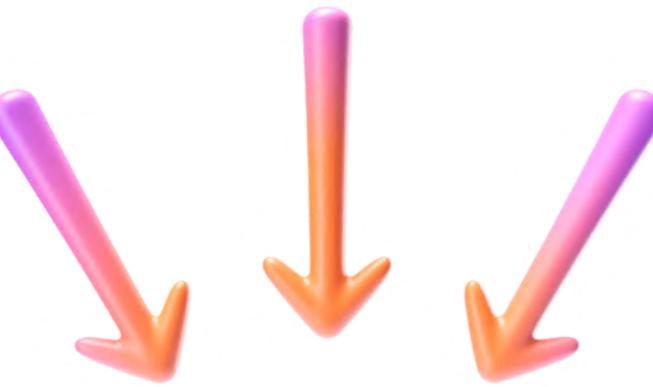


Up-to-date bleiben

- web.dev/fast
- github.com/davidsonfellipe/awesome-wpo
- www.smashingmagazine.com/category/performance/
- perfplanet.com

- calibreapp.com/blog
- speedcurve.com/blog
- debugbear.com/blog

- simonhearne.com/posts
- csswizardry.com/archive
- timkadlec.com/remembers



thomaspuppe.de/talks/nconf-2023

Slides und Links



Dankeschön ❤



Dankeschön ❤

Thomas is hiring @ ZEIT Online: dev.zeit.de



Dankeschön ❤

Thomas is hiring @ ZEIT Online: dev.zeit.de

www.thomaspuppe.de

<https://webperf.social/@thomaspuppe>