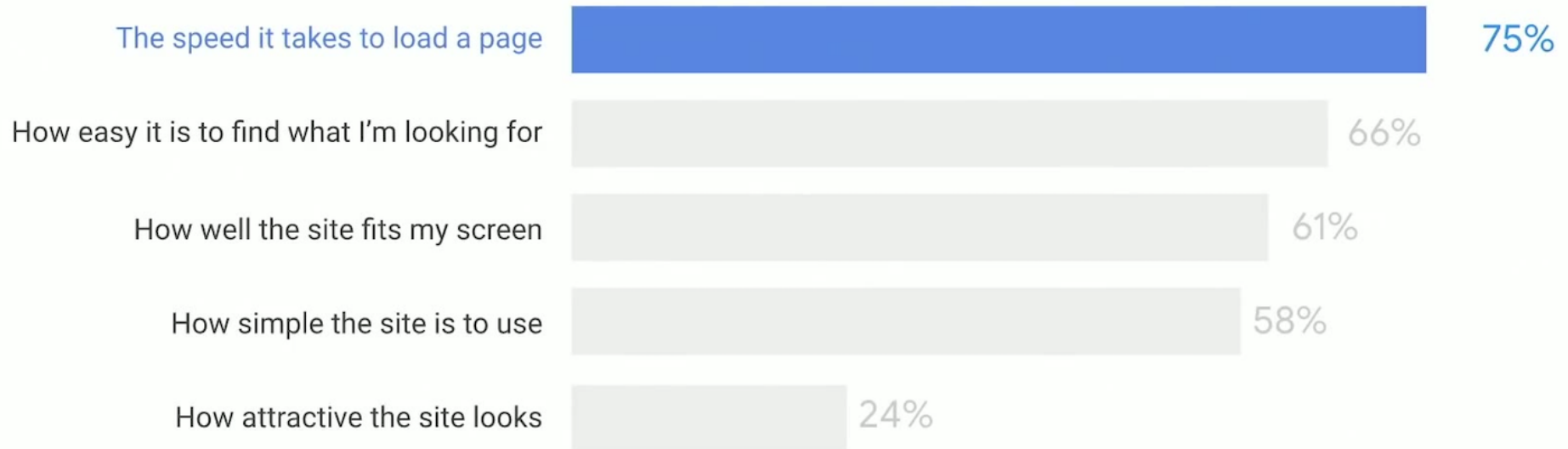




53%

of mobile users abandon
sites that take over 3
seconds to load

The impact on user experience



<https://www.youtube.com/embed/gSNaR6FRuO0?enablejsapi=1>

<https://www.youtube.com/embed/wVsY9PVIKsQ?enablejsapi=1>

Finding web performance issues you didn't know you had

José M. Pérez

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A collection of old, rusty tools including wrenches, pliers, and a screwdriver on a wooden surface. The tools are arranged in a pile, with some overlapping. The wood surface is dark and textured. The text "The Tools" is overlaid in the center in a large, white, serif font.

The Tools

The Tools (Synthetic)

- One Off
 - Lighthouse (browser, cli or web)
 - WebPageTest
- Monitoring Periodically
 - Calibre
 - CrUX Dashboard
 - Firebase
 - New Relic
 - Pingdom
 - Sitespeed
 - SpeedCurve

The Tools (RUM)

- Akamai's mPulse
- CrUX Dashboard
- Firebase
- New Relic
- Pingdom
- Sitespeed
- SpeedCurve

Tools are important, but...

- Web Performance is a moving target
- What's the dev effort to fix a certain issue
- What's the impact

Quick & easy
performance fixes



80

20

Too much effort for
little gain

Quick Fixes

- Enable compression
- Preconnect
- Lazy Loading
- Font-display

Quick Fixes

Compression

36%

of potential files are **not** compressed

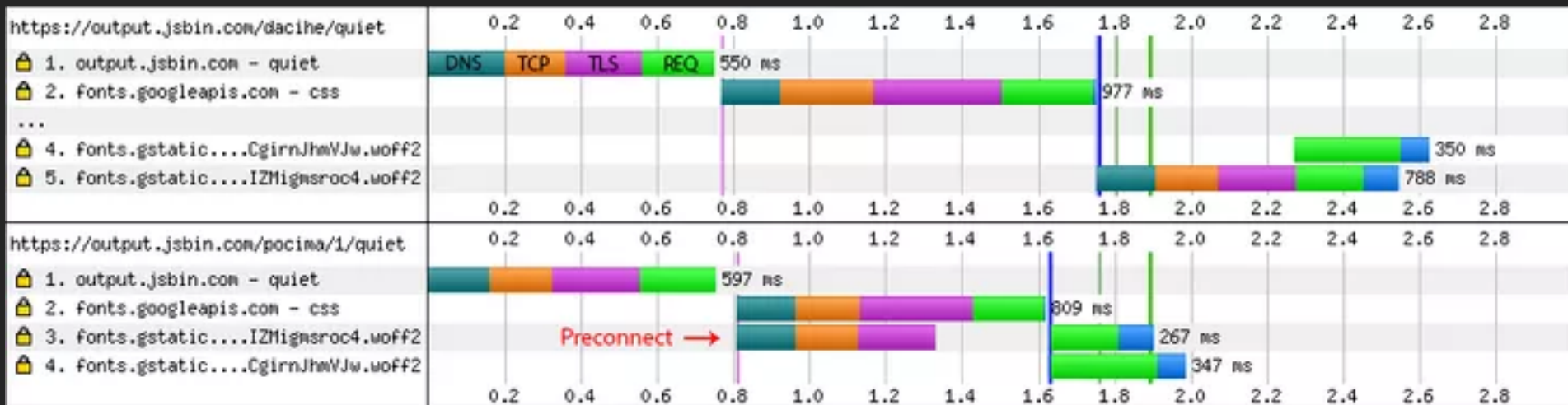
Source: HTTP Archive

Quick Fixes

Preconnect

```
1 <link rel="preconnect"  
2 href="https://fonts.gstatic.com/"  
3 crossorigin>
```

Without Preconnect

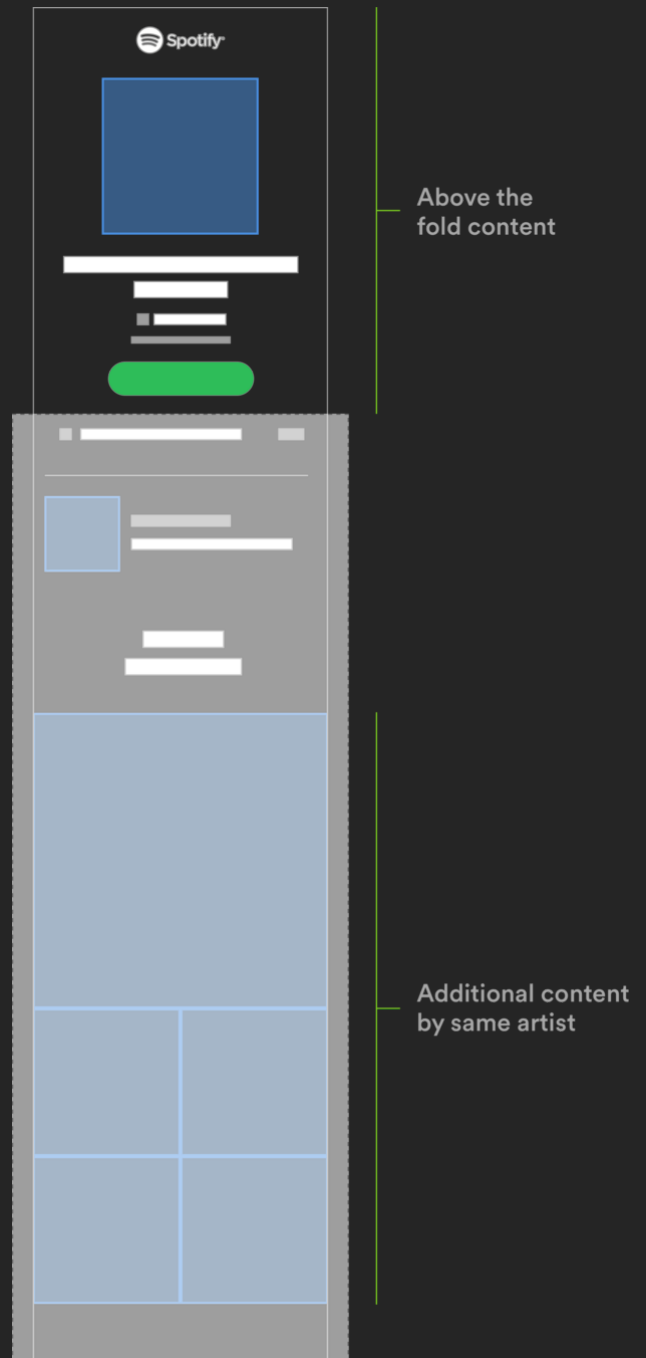


With Preconnect

Quick Fixes

Lazy-Loading

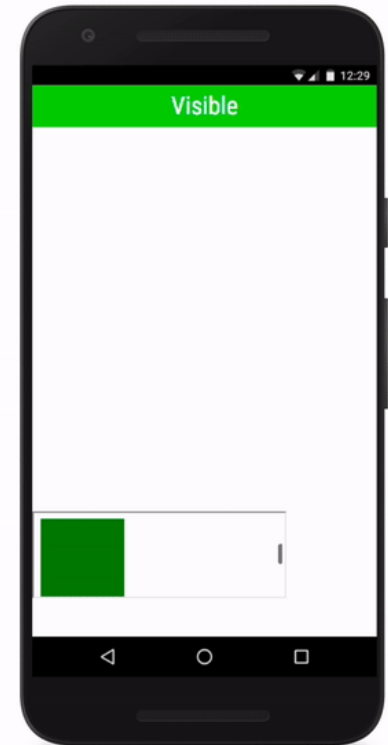
`` above the fold
&
Lazy below the fold



Quick Fixes

Lazy-Loading

Intersection Observer



Quick Fixes

Lazy-Loading

```
// load image when it's within 100px of the viewport

const options = {
  rootMargin: '100px'
}

const callback = entries => {
  entries.forEach(entry => {
    if (entry.intersectionRatio > 0) {
      // load image
    }
  });
};

const observer = new IntersectionObserver(callback, options);
observer.observe(document.querySelector('.lazy-img'));
```

Quick Fixes

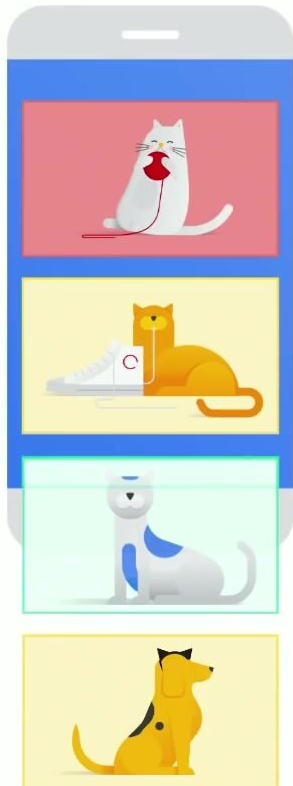
Lazy-Loading



Eager Loading

``

2MB



Lazy Loading

``

1MB



Introducing
native image
lazy-loading!

``

<chrome://flags/#enable-lazy-image-loading>

Quick Fixes

Lazy-Loading



Eager Loading

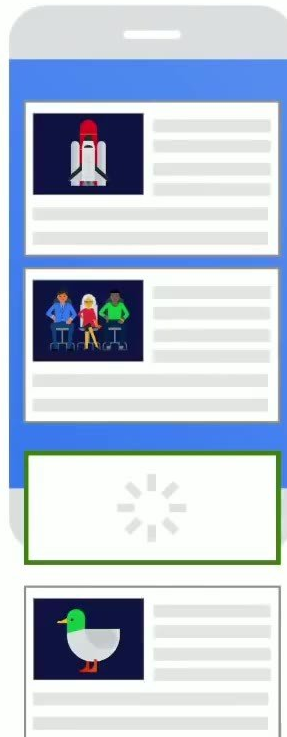
`<iframe loading=eager>`



Lazy Loading

`<iframe loading=lazy>`

0MB
iframe



Introducing native iframe lazy-loading!

`<iframe loading=lazy>`

<chrome://flags/#enable-lazy-frame-loading>

Quick Fixes

Font-display



Source: @zachleat

Quick Fixes

Font-display

```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic.woff2') format('woff2'),  
       url('tgothic.woff') format('woff');  
}  
  
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic-italic.woff2') format('woff2'),  
       url('tgothic-italic.woff') format('woff');  
  font-style: italic;  
}
```

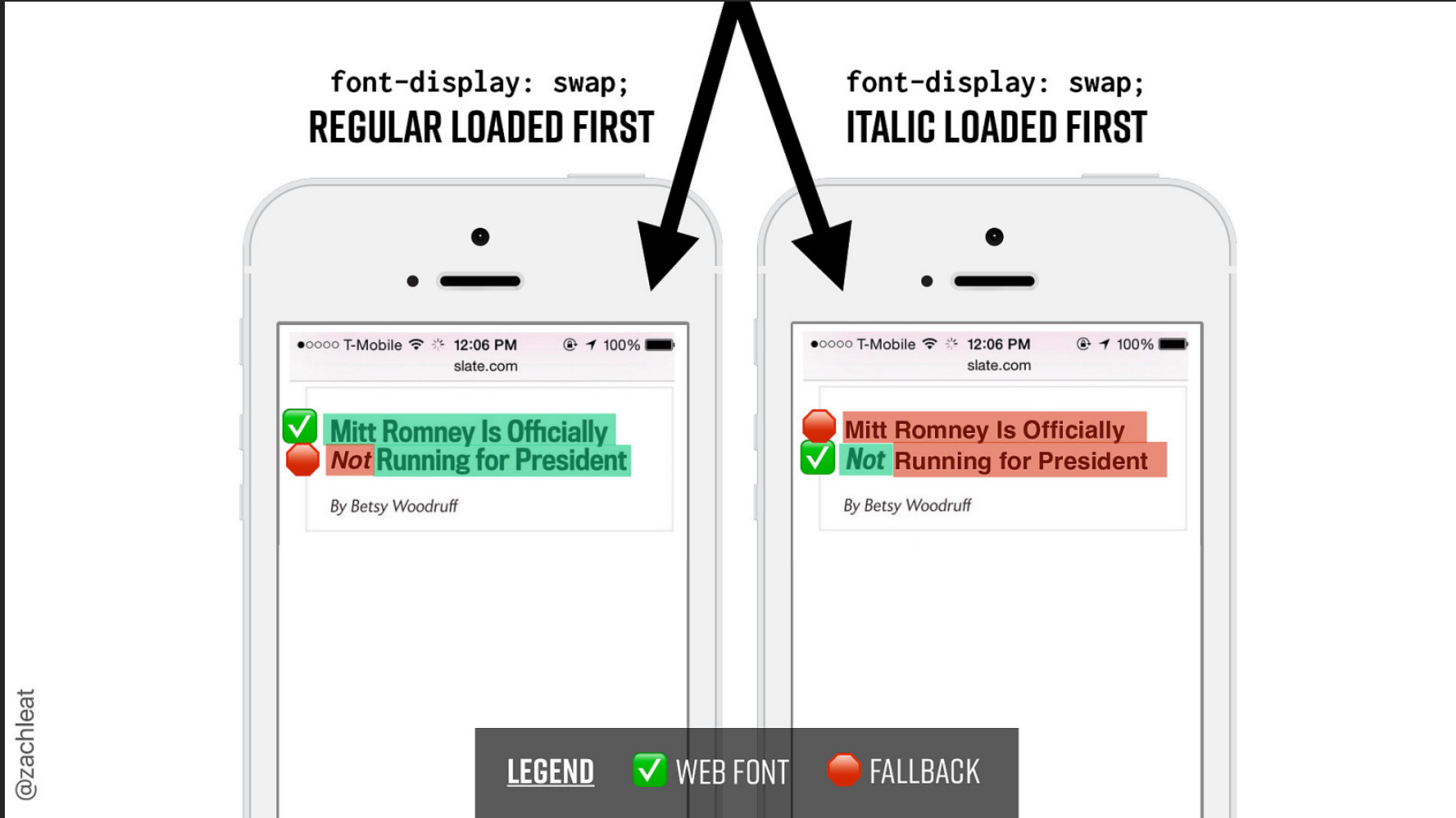
Quick Fixes

Font-display

```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic.woff2') format('woff2'),  
       url('tgothic.woff') format('woff');  
  font-display: swap;  
}  
  
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic-italic.woff2') format('woff2'),  
       url('tgothic-italic.woff') format('woff');  
  font-style: italic;  
  font-display: swap;  
}
```

Quick Fixes

Font-display



Quick Fixes

Font-display



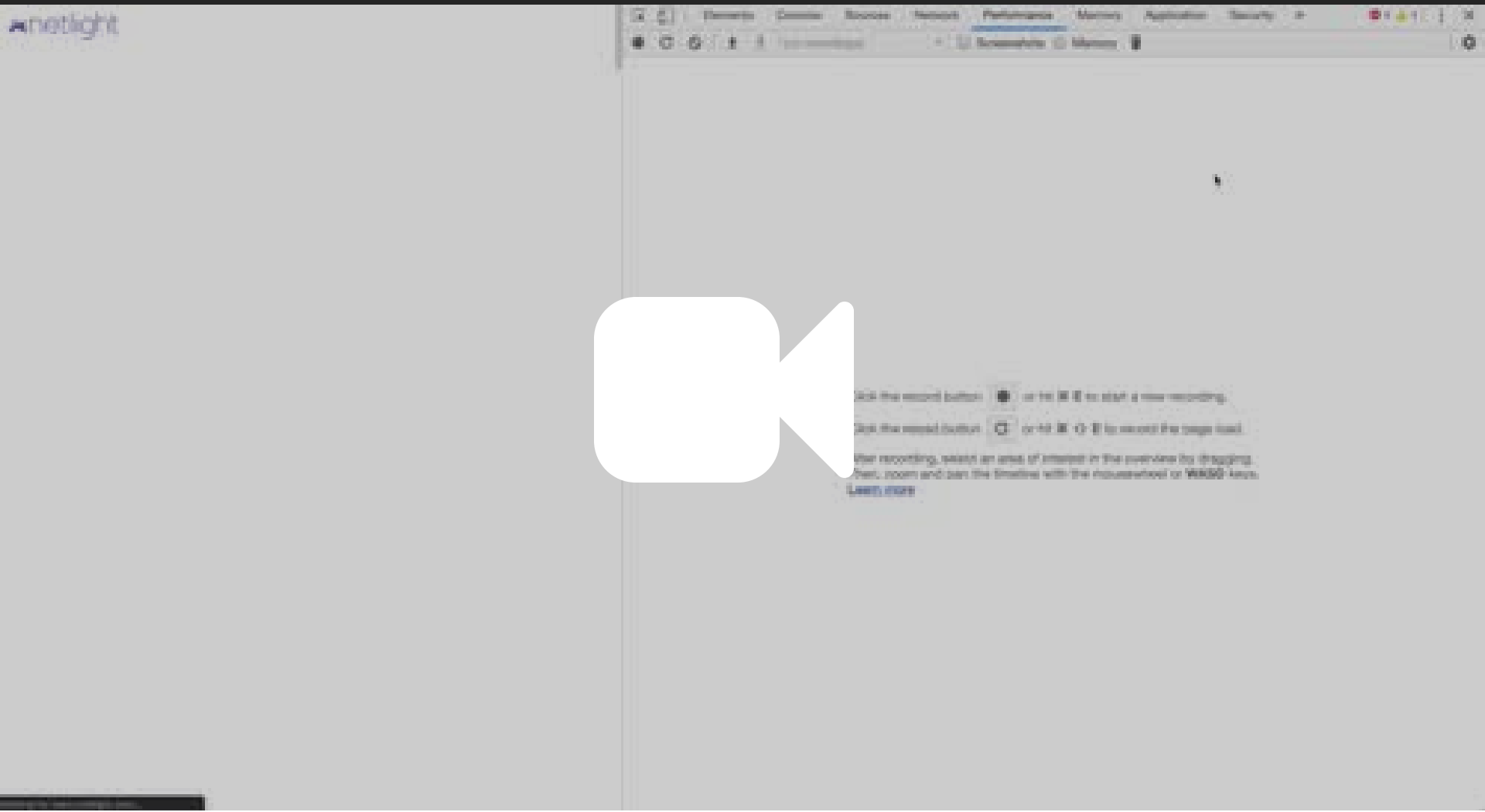
`fonts.googleapis.com/css?family=Lobster
&font-display=swap`

Non obvious issues

- After-rendering performance (eg repaints, junky scroll)
- Duplicated combined assets
- Third-party scripts

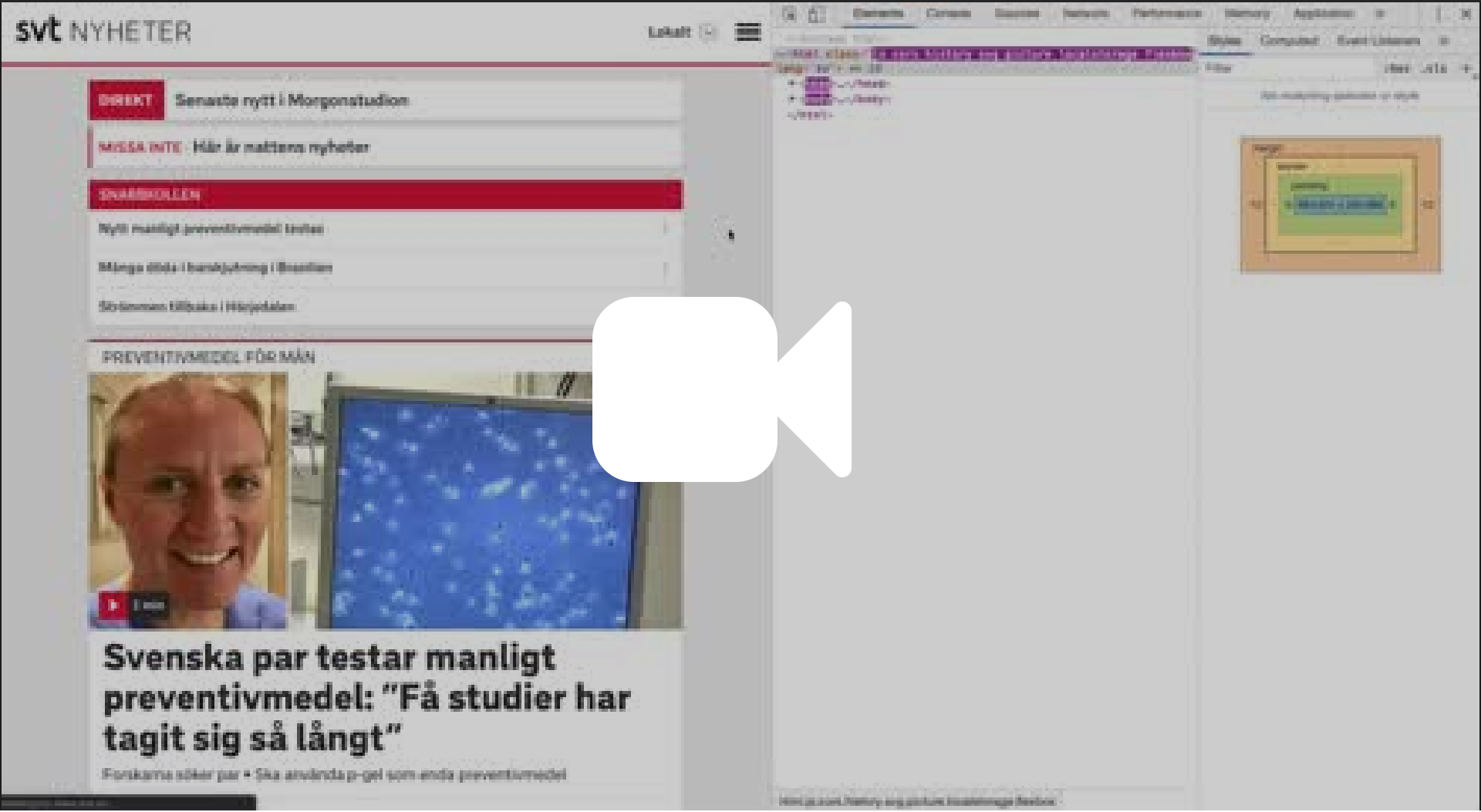
Advanced Fixes

Long frames



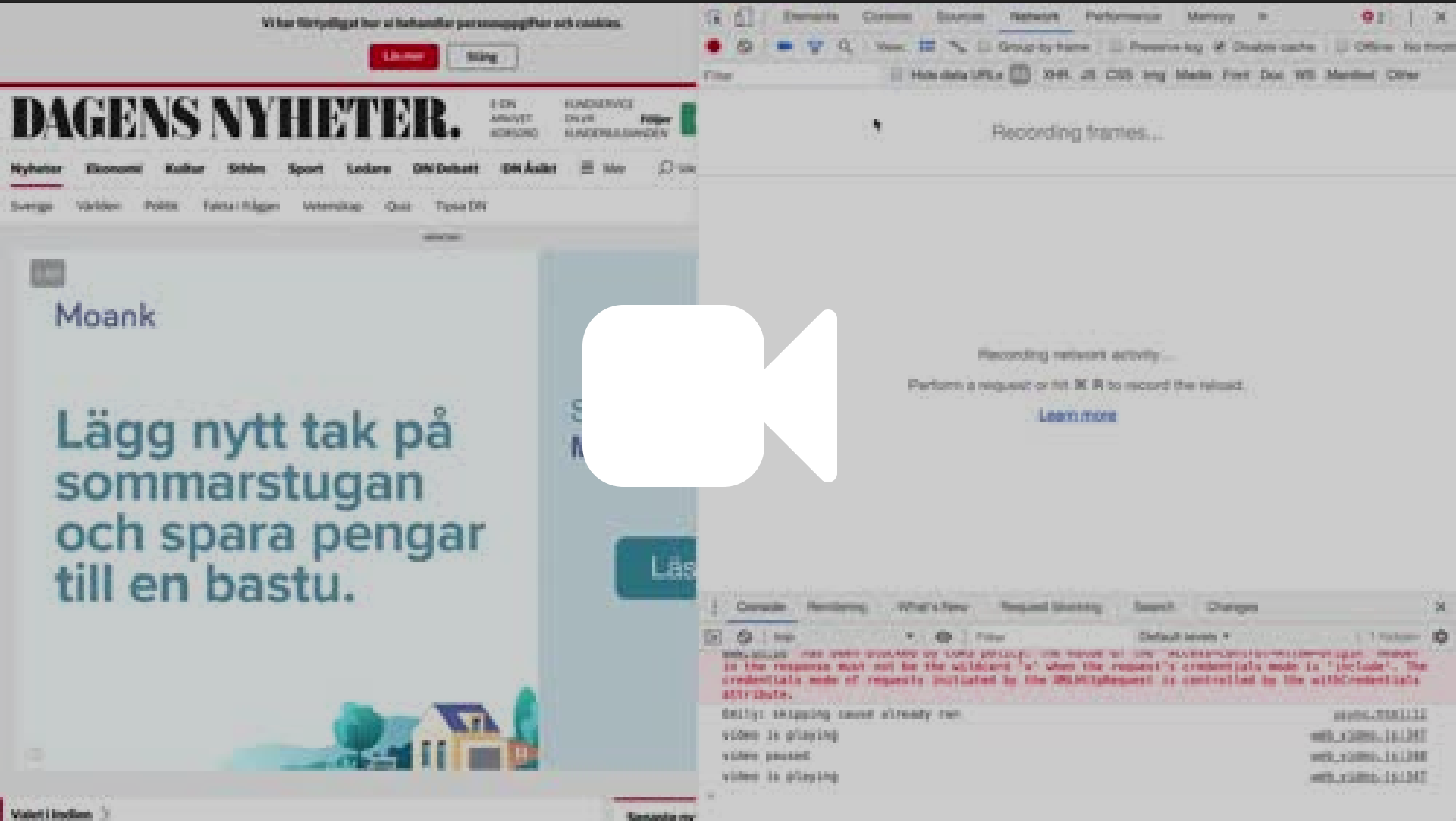
Advanced Fixes

Unnecessary repaints



Advanced Fixes

Duplicated resources



Advanced Fixes

3rd party scripts impact

3rd party scripts



The diagram consists of two large circles. The left circle is teal and contains the word 'Tech'. The right circle is purple and contains the word 'Marketing'. Both circles are positioned below the main title '3rd party scripts'.

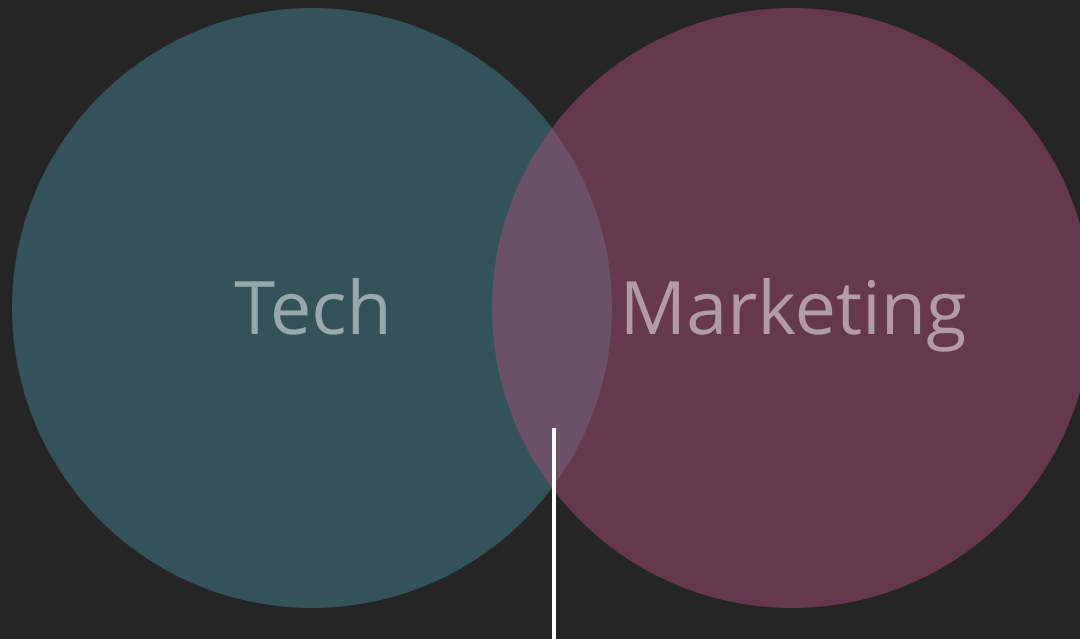
Tech

Marketing

Advanced Fixes

3rd party scripts impact

3rd party scripts



Where the magic happens

Advanced Fixes

3rd party scripts impact

The screenshot displays the Wireshark network protocol analyzer interface. The top menu bar includes File, Edit, Capture, Settings, Network, Performance, Memory, Application, and Help. The toolbar contains icons for opening files, saving, capturing, and other functions. The main display area is divided into three panes: Packet List, Packet Details, and Packet Bytes. The Packet List pane shows a list of captured packets, with the selected packet being a file transfer. The Packet Details pane shows the structure of the selected packet, including the file's metadata. The Packet Bytes pane shows the raw data of the file transfer. A large white arrow points to the selected packet in the Packet List pane.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
2	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
3	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
4	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
5	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
6	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
7	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
8	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
9	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
10	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
11	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
12	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
13	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
14	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
15	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
16	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
17	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
18	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
19	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
20	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
21	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
22	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
23	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
24	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
25	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
26	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
27	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
28	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
29	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
30	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
31	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
32	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
33	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
34	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
35	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
36	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
37	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
38	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
39	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
40	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
41	0.000000	192.168.1.1	192.168.1.2	FTP	1024	FTP [REDACTED]
42	0.000000					

Pro-Tip

Measure the **impact**
of your
performance improvements

Pro-Tip

Monitor your performance
to avoid **regressions**

Wrapping up

- Web Performance matters
- Quick fixes have a great impact
- Data wins arguments



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