
AMP &
FURIOUS
17 APRILE
Turin web
performance
TOOLBOX

web performance Turin

- Turin Web Performance Group su Meetup.com: http://bit.ly/29T4pQt
- Gruppo Web Performance Italia su Facebook: http://bit.ly/29MRgHA
- Web Performance TRN su Twitter: @trnwebperf
- trnwebperf@gmail.com

Sponsor

TOOLBOX

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Web Performance Lead

@pecus

Modo

@madebymodo

https://modo.md/


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START
LIGHTS
FANS
DONUTS
MOTEC

What is AMP?

AMP


AMP

AMP is HTML

AMP is a Web Component Format

+

JavaScript Library

AMP is strictly validated

What is AMP Recap

- Accelerated Mobile Pages are HTML pages designed to be rendered fast

- AMP is a web component format + JS library, strictly validated

- AMP does not require any server side technology* and works in any browser


Lamborghini
DRIVER ED

AMP 101

```
<!doctype html>
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https://www.ampproject.org/

AMP Do's and Don'ts

Simplified HTML

Simplified HTML

No external resources

img

video

audio

iframe

Simplified HTML

No external resources

~~img~~

~~video~~

~~audio~~

~~iframe~~

Simplified HTML

No external resources

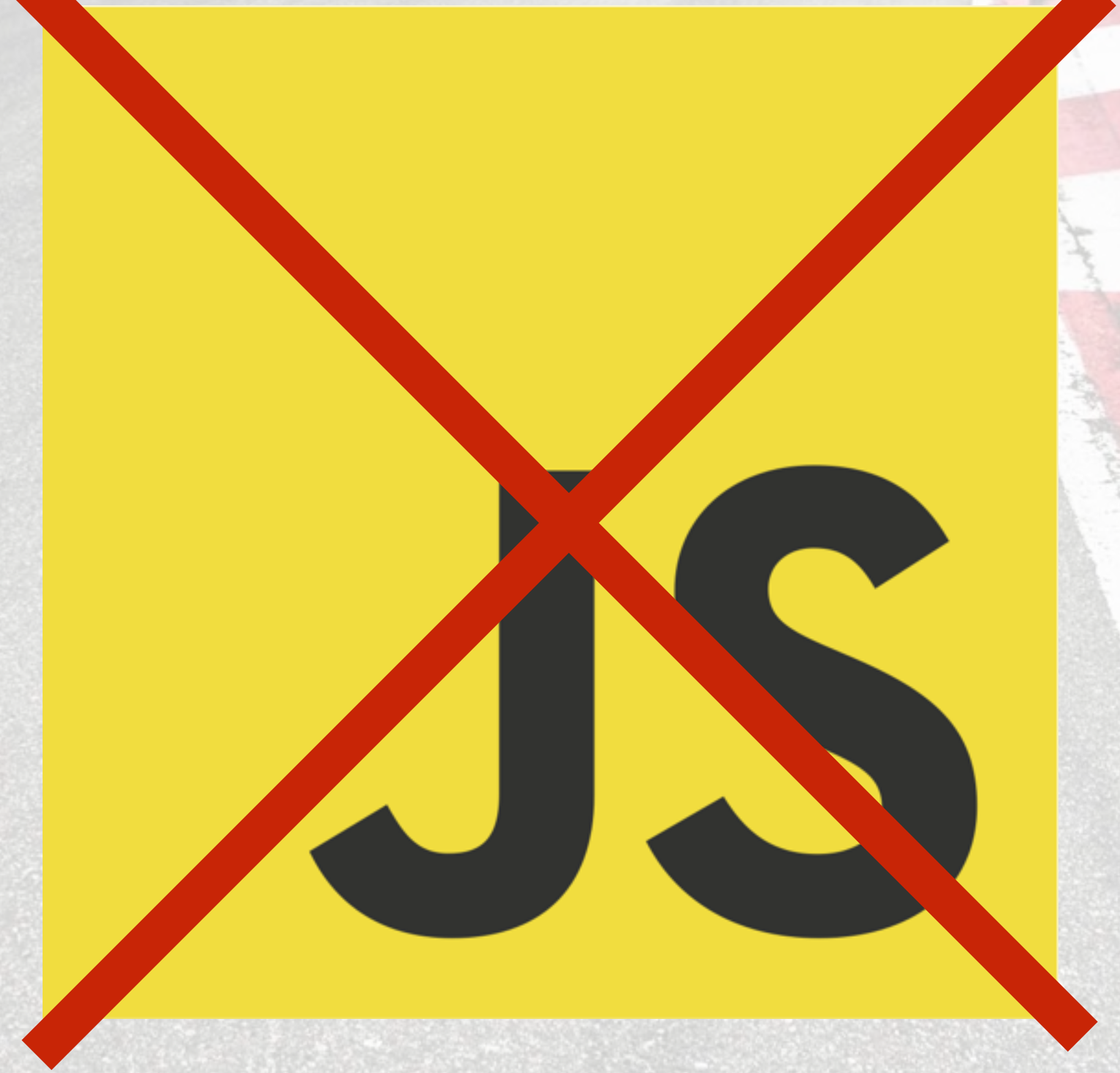
~~img~~ → `<amp-img>`

~~video~~ → `<amp-video>`

~~audio~~ → `<amp-audio>`

~~iframe~~ → `<amp-iframe>`

No JavaScript



CSS

CSS

- 50Kb single file CSS
- no inline styles
- no `!important`
- no `filter:`
- only GPU–accelerated CSS animations

SEO

SEO

- Self Canonicalize or use an alternate page
- Use `<link rel="amphtml">` in alternate page
- Ensure Content Parity
- Validate iteratively + fix errors

Validation

How to validate AMP

- With your browser (append `"#development=1"` to URL)
- Web Interface: `https://validator.ampproject.org/`
- Browser Extension
- NPM Packages for CI
- Command Line Tool

Development lifecycle issues

- Validator via node
- Complex test environments vs. validation / iteration
- A/B testing
- Enforce user input / UGC

AMP 101 Recap

- Subset of HTML + boilerplate
- No JS (iFrames / AMP Components)
- Light CSS (50Kb + fonts)
- Must validate (with browser, toolchain or process)

Ready to race?

AMP Pros

- Fast / Lightweight
- Progressively Enhanced
- Open Source / somewhat standardised
- Publisher advantage (reach, higher CT rates, lower bounces)

Common misconceptions

- Does AMP replaces websites? Are we back to the m-site nightmare of pre-responsive web?

Common misconceptions

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- Will AMP sites look all the same? 50Kb of CSS is tiny!

PurifyCSS

Common misconceptions

- Does AMP replaces websites? Are we back to the m-site nightmare of pre-responsive web?
- Will AMP sites look all the same? 50Kb of CSS is tiny!
- Is AMP a static site? no fancy JS stuff (no JS!)?

Great, right?

Enter Google News Carousel

Carrier 12:12 PM

Search or enter website name

Apple Bing Google Yahoo

Great, right?

So, then, AMP...

AMP Cons

- Proprietary (despite OSS)
- “Breaks” the web
  - breaks URLs, scrolling issues, introduces 3rd party hosting
- Competitive advantage in News Carousel
- Associated cost (development, testing, maintenance)

How Can AMP Be So Fast?

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- Critical path is clear of blocking obstacles
  - CSS (inline)
  - JS (ampified + async)

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1 SINGLE HTTP REQUEST TO DISPLAY CONTENT

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How can AMP be so fast?

- Critical path is clear of blocking obstacles
  - CSS (inline)
  - JS (ampified + async)
- Static layouting (elements have known sizes)
- Early font loading
- Minimized relayouting
- Prioritised resource loading (ATF)

Then just add NOS...

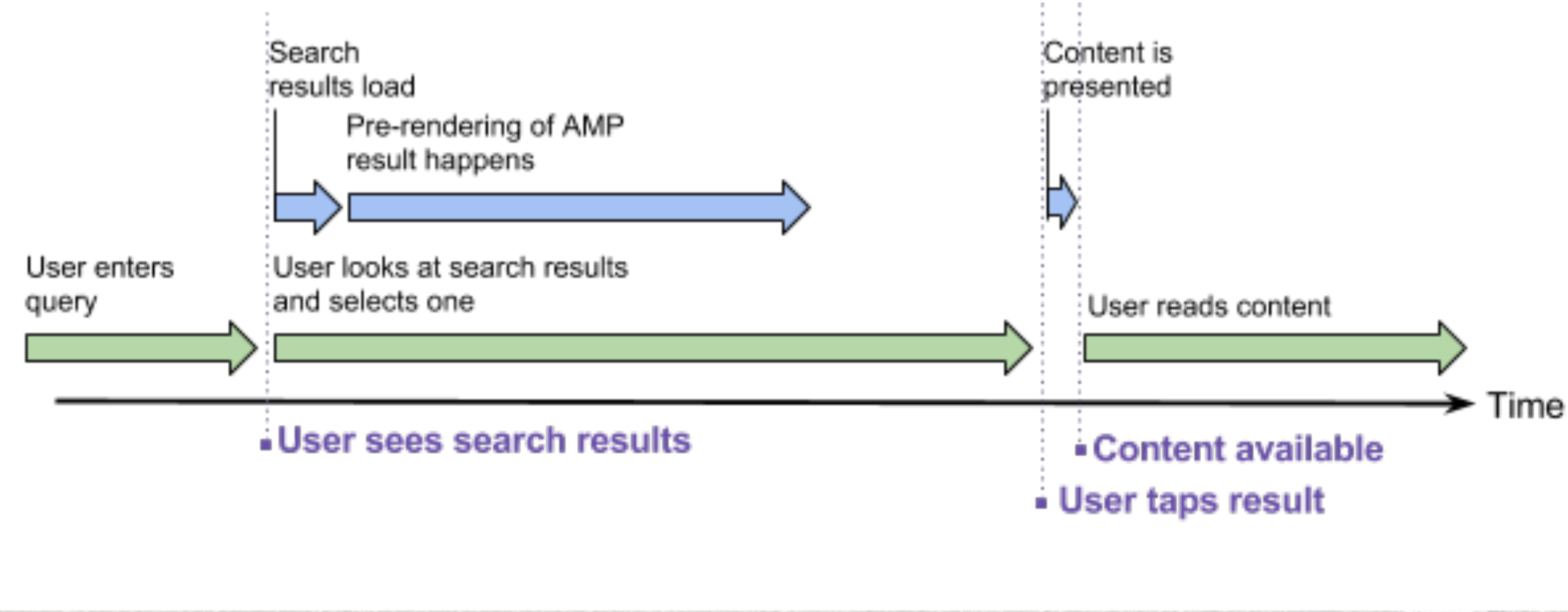
NOS: AMP Caches

- Caches play a fundamental role in AMP
  - Ensure the document is valid (thus, *fast*)
  - Allow embedding
  - Allow image optimisation, source reordering, AMP post–processing
  - Allow pre–rendering (partial, prioritised)

NOS: AMP Caches

- Ensure no Cross Scripting Issues when preloading
- Modify JS URLs for better caching
- Provide a privacy shield when content is pre-rendered

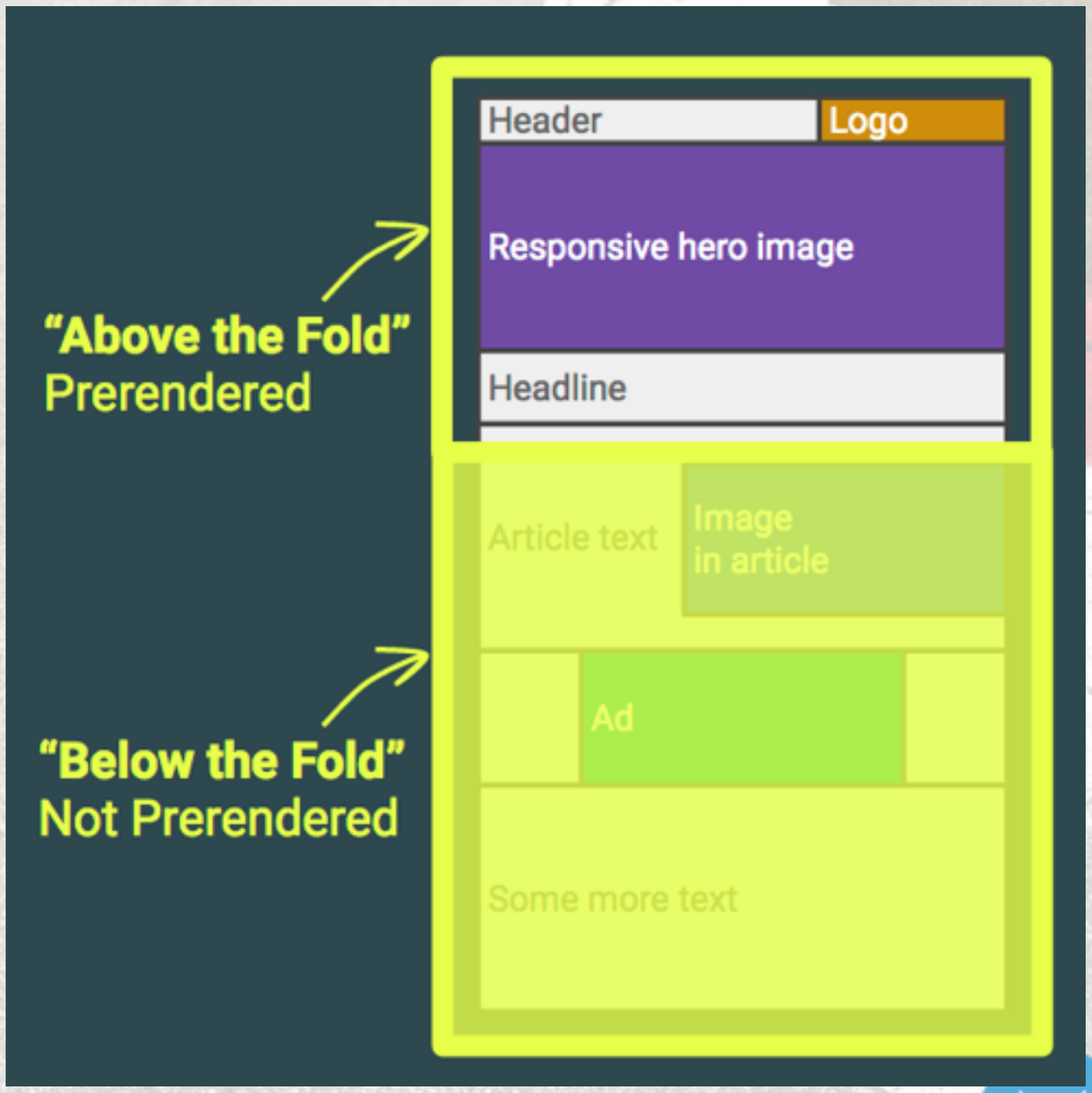
NOS: Preloading



https://medium.com/@pbakaus/why-amp-caches-exist-cd7938da2456

NOS: Preloading

- Prerenders only ATF
- No downloads of BTF elements
- Does not execute 3rd party JavaScript
- on average 75% off in pre-rendering



https://www.youtube.com/watch?v=hVRkG1CQScA

Recap

- **AMP Pros**
  - Fast / Lightweight
  - Progressively Enhanced
  - Open Source / somewhat standardised
  - Preloading (News Carousel)
- **AMP Cons**
  - Privately led OSS
  - Not a W3C standard
  - Less control over content
  - Improper advantage on SERP

Comparison

Comparison

- AMP vs. separate canonical page
- AMP pages are significantly lighter (905 KB vs. 2,762 KB) and load significantly fewer assets (61 vs. 318 requests)
- There are significant extremes across the spectrum (heavily bloated pages, slow pages)

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

AMP page speeds

Metric	Min	Max	Median	90th Percentile
Start Render	1,765ms	8,130ms	4,617ms	5,788ms
Visually Complete	4,604ms	35,096ms	7,475ms	21,432ms
Speed Index	3729	16230	6171	10144
Weight	273kb	10,385kb	905kb	1,553kb
Requests	14	308	61	151

(served from origin)

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

Enter the Cache

- Google AMP Cache
  - CDN
    - caches AMP documents
    - applies a series of optimizations
    - provides a validation system

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

AMP page speeds

Metric	Min	Max	Median	90th Percentile
Start Render	1,427ms	4,828ms	1,933ms	2,291ms
Visually Complete	2,036ms	36,001ms	4,924ms	19,626ms
Speed Index	1966	18677	3277	9004
Weight	177kb	10,749kb	775kb	2,079kb
Requests	13	305	53	218

(served from Google AMP cache)

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

Google AMP Cache Delta

Metric	Min	Max	Median	90th Percentile
Start Render (ms)	-338 (119,15%)	-3.302 (140,61%)	-2.684 (158,13%)	-3.497 (160,41%)
Visually Complete (ms)	-2.568 (155,77%)	905 (97,42%)	-2.551 (134,12%)	-1.806 (108,42%)
Speed Index	-1763 (147,27%)	2.447 (84,92%)	-2.894 (146,89%)	-1.140 (111,23%)
Weight (kb)	-96 (135,16%)	364 (96,49%)	-130 (114,36%)	526 (66,13%)
Requests	-1 (107,14%)	-3 (100,97%)	-8 (113,11%)	67 (55,62%)

(Google AMP cache vs. origin, abs. differences, for % origin is 100%)

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

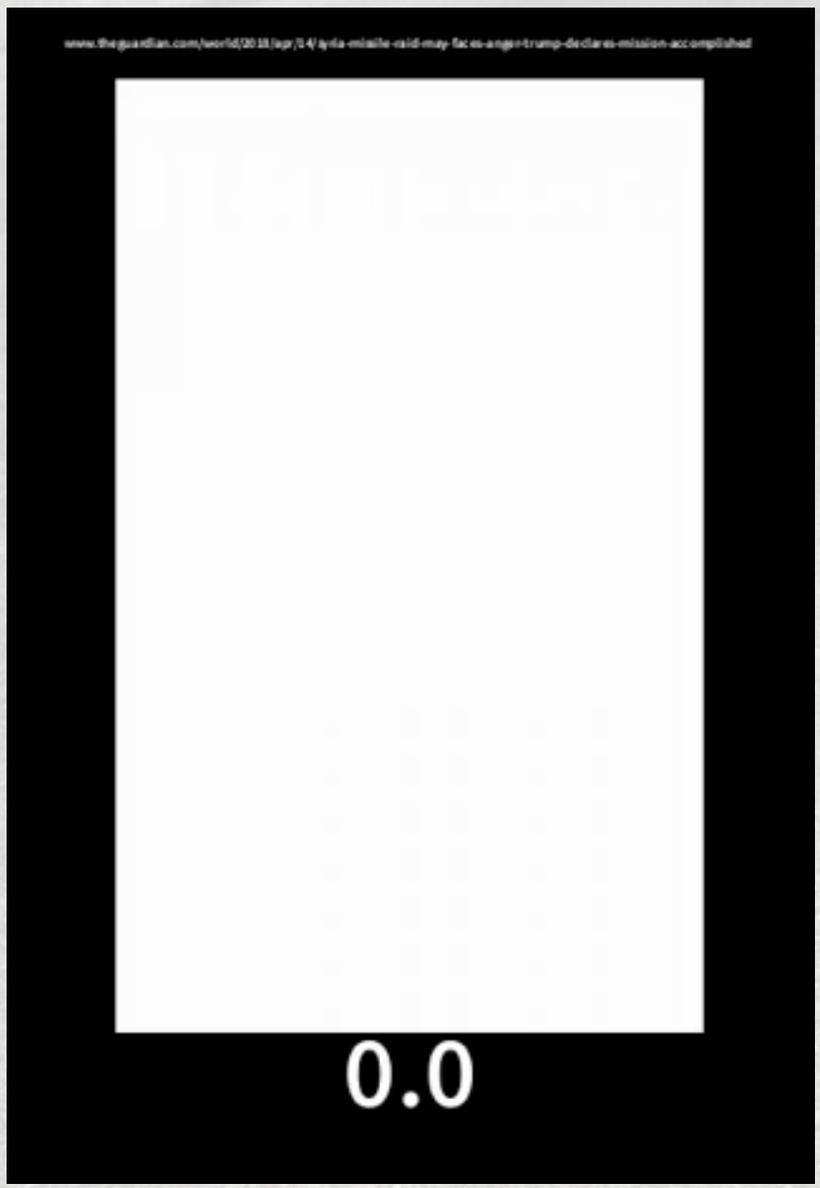
Canonical page speeds

Metric	Min	Max	Median	90th Percentile
Start Render	1,763ms	7,469ms	4,227ms	6,298ms
Visually Complete	4,231ms	108,006ms	20,418ms	54,546ms
Speed Index	3332	45362	8152	21495
Weight	251kb	11,013kb	2,762kb	5,229kb
Requests	24	1743	318	647

(HTML canonical pages)

https://timkadlec.com/remembers/2018-03-19-how-fast-is-amp-really/

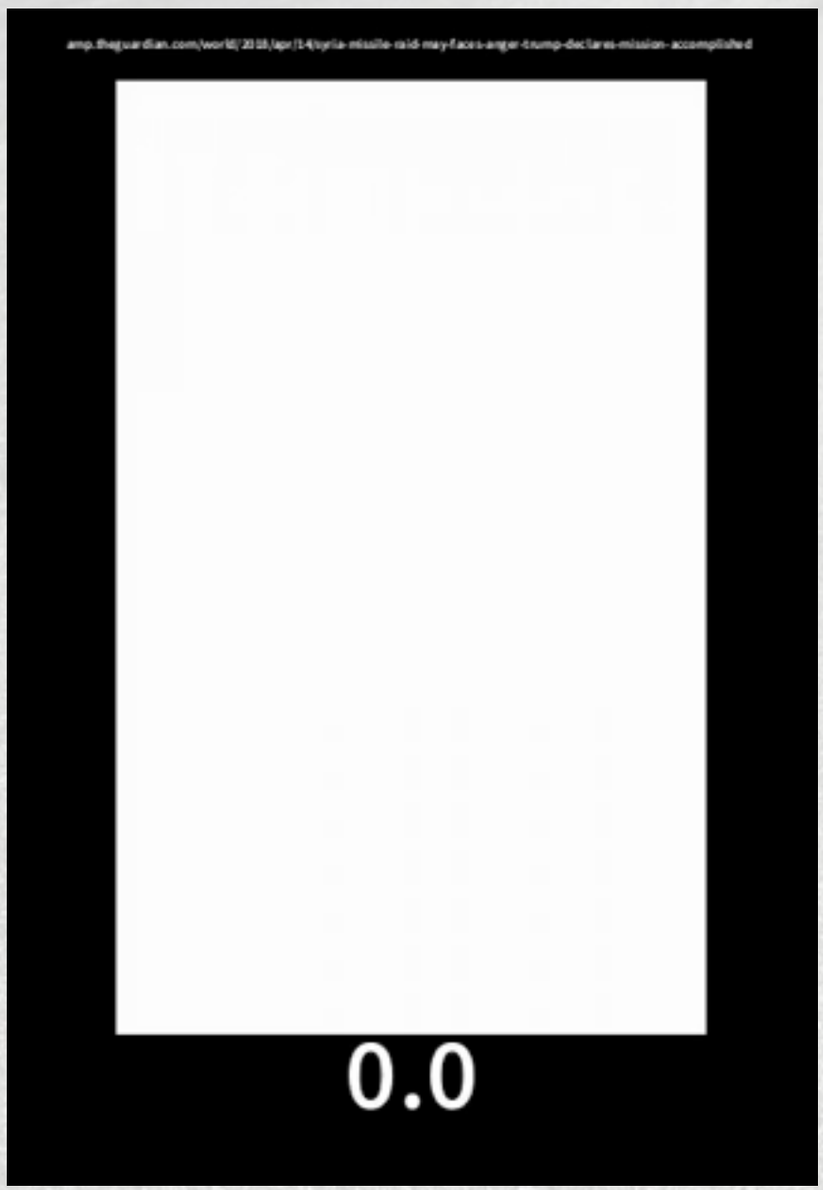
Canonical



SpeedIndex: 5337

Start Render: 3600ms

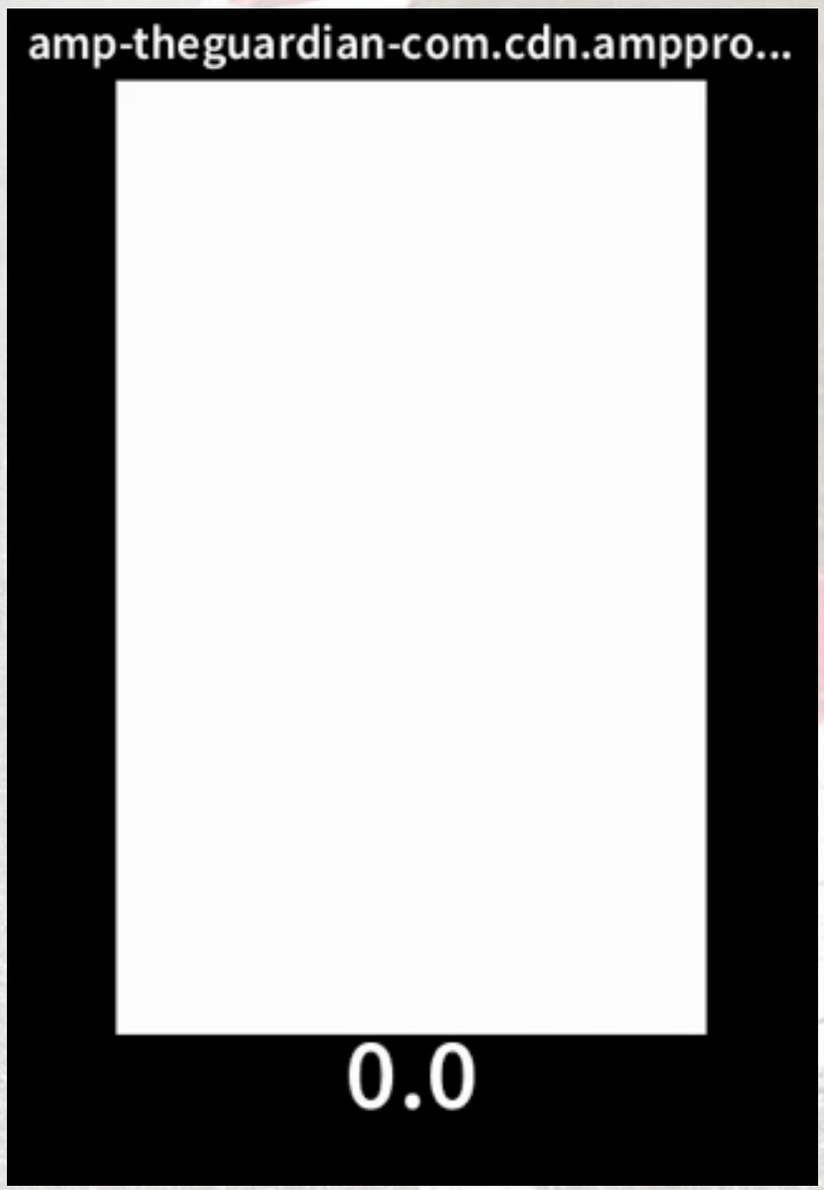
AMP



SpeedIndex: 4506

Start Render: 4033ms

AMP Cache



SpeedIndex: 3546

Start Render: 2850ms

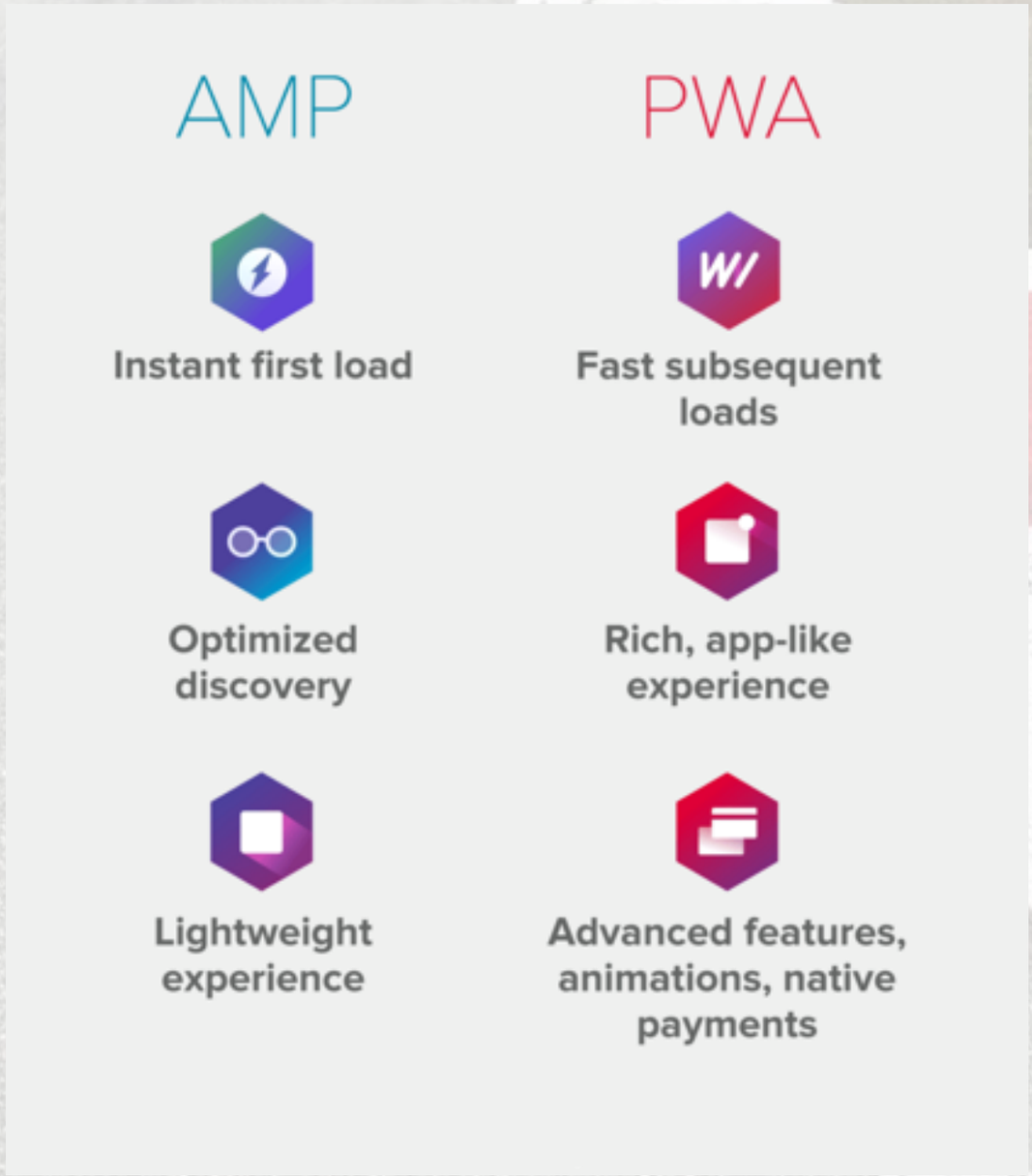
Advanced AMP

PWA + AMP

2 (and 1/2) Strategies

1. **AMP Up:** use AMP as landing, then install SW and handoff to PWA

2. **AMP Down:** use AMP as a SSoT for content (vs. Json)



PWA + AMP

AMP Up: AMP to Warm-up PWA

AMP loads instantly, and silently installs Service Worker to "warm up" PWA

<amp-install-serviceworker>

Site loads instantly once warmed up.

AMP

PWA + AMP

AMP Down: Embed AMP as data in a PWA

PWA shell embeds AMP pages into your PWA

beta.mic.com is a PWA with AMP embedded.

Article page loads AMP in PWA shell

AMP

AMP future

- **Standardization:** Feature Policy, Web Packaging, iframe promotion, Performance Timeline, and Paint Timing.
- **Web Packaging** format for providing privacy preserving pre-loading, no 3rd party caches
- **Custom JavaScript** (Web Workers + Virtual DOM)
- **Origin URLs**
- See: https://github.com/ampproject/amphtml/blob/master/contributing/web-standards-related-to-amp.md

AMP Resources

- http://ampbyexample.com
- http://ampproject.org
- The AMP Channel (YouTube)
- Malte Ubl @cramforce
- Paul Baukaus @pbakaus
- https://amphtml.wordpress.com

AMP & FURIOUS

Driver: Matteo Fogli @pecus

Production: TorinoWebPerf

P.R. Agency: #webperformanceitalia

Twitvertising: @trnwebperf

Camera: Oleg Belousov