Web Performance Optimization (WPO) done for OXID shop

Daniel Ruf // 12.10.2019

Daniel Ruf

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situation

- Ubuntu 16 with 4.4.0 kernel
- PHP 7.1(.19) as CGI/FPM
- 256M memory_limit
- MySQL 5.7.21
- HTTP2 (TLS + LetsEncrypt)
- Apache 2.4
- managed Hosting (All-Inkl Premium)
- OXID 6.1.0 (composer-project)
- no CDN

target

- under 1s
- under 1MB
- very good scores

21 requests | 2.5 MB transferred | Finish: 5.19 s | DOMContentLoaded: 1.35 s | Load: 5.15 s

cached

21 requests | 10.1 KB transferred | Finish: 708 ms | DOMContentLoaded: 789 ms | Load: 864 ms

images

7 / 21 requests | 2.2 MB / 2.5 MB transferred | Finish: 5.19 s | DOMContentLoaded: 1.35 s | Load: 5.15 s

93	58	57	87	100
Performance	Progressive Web App	Accessibility	Best Practices	SEO

Score scale: ● 0-49 ● 50-89 ● 90-100

Performance

⏱ Metrics

93

First Contentful Paint	1.0 s ✓	First Meaningful Paint	1.3 s ✓
Speed Index	4.4 s ⓘ	First CPU Idle	1.4 s ✓
Time to Interactive	1.4 s ✓	Estimated Input Latency	20 ms ✓

https://oxid-demo.daniel-ruf.de/

Sep 22, 2018, 9:28 PM GMT+2

Emulated Nexus 5X, Simulated Fast 3G network
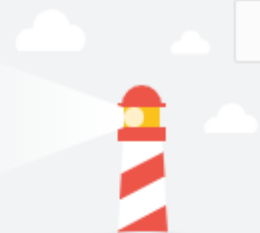
54	**58**	**57**	**80**	**100**
Performance	Progressive Web App	Accessibility	Best Practices	SEO

Score scale: ⬤ 0-44   ⬤ 45-74   ⬤ 75-100

Performance

54

⏱ **Metrics**

First Contentful Paint	2.3 s ✅	First Meaningful Paint	2.3 s ✅
Speed Index	7.3 s ⚠️	First CPU Idle	3.9 s ℹ️
Time to Interactive	9.4 s ⚠️	Estimated Input Latency	10 ms ✅

Web Page Performance Test for

https://oxid-demo.daniel-ruf.de/

From: Frankfurt, Germany - EC2 - Chrome - Cable
22.9.2018, 22:23:22

A	A	A	F	F	X
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN
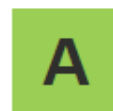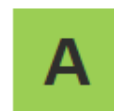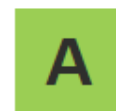
Summary **Details** **Performance Review** **Content Breakdown** **Domains** **Processing Breakdown** **Screen Shot** **Image Analysis** ⧉ **Request Map** ⧉

Tester: i-06ca5cddd891c5edc
First View only
Test runs: 3

Export HTTP Archive (.har)
Custom Metrics

	Load Time	First Byte	Start Render	Visually Complete	Speed Index	First Interactive (beta)	Result (error code)	Document Complete			Fully Loaded		
								Time	Requests	Bytes In	Time	Requests	Bytes In
First View (Run 1)	4.906s	0.334s	0.700s	5.500s	4023	0.840s	0	4.906s	20	2,582 KB	5.526s	31	2,652 KB

First Interactive (beta)	Colordepth	RUM First Paint	domInteractive	domContentLoaded	loadEvent
0.840s	24	0.731s	0.820s	0.820s - 0.840s (0.020s)	4.906s - 4.939s (0.033s)

images

- responsive images (picture-Tags + picturefill)
- lazyloading
- compression (+ WebP)
- progressive

Picture element 📄 - LS

A responsive images method to control which image resource a user agent presents to a user, based on resolution, media query and/or support for a particular image format

% of all users
Global   88.08%

Current aligned | Usage relative | Date relative | Show all | ?

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Blackberry Browser	Opera Mobile *	Chrome for Android
			49								
			63								
			67			10.3					
		61	68	11.1	54	11.2		4.4			
11	17	62	69	12	55	11.4	all	67	10	46	69
	18	63	70	TP		12					
		64	71								
			72								

caniuse.com/#feat=picture

RESPONSIVE BREAKPOINTS

Responsive Image
Breakpoints Generator *v2.0*

www.responsivebreakpoints.com

compression

- Photoshop
- imageoptim
- PNGGauntlet
- Caesium
- imagemin
- sharp
- …

WebP image format ▤ - UNOFF

Image format that supports lossy and lossless compression, as well as animation and alpha transparency.

Current aligned | Usage relative | Date relative   **Apply filters** | Show all   **?**

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Blackberry Browser	Opera Mobile *	Chrome for Android
			49								
			70								
	17	64	71			11.4					
11	18	65	72	12	57	12.1	all	67	10	46	71
		66	73	TP							
		67	74								
			75								

caniuse.com/#feat=webp

developers.google.com/speed/webp/download
developers.google.com/speed/webp/docs/precompiled

```
cwebp -q 80 -o output_file.webp input_file
```

libjpeg
libjpeg-turbo.org/Documentation/OfficialBinaries

```
jpegtran -copy none -optimize -progressive -outfile $outfile $infile
```

```html
<picture>
  <source type="image/webp" sizes="(max-width: 1170px) 100vw, 1170px" src
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d

  <source sizes="(max-width: 1170px) 100vw, 1170px" srcset="
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d
    https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_d

  <img src="https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__
</picture>
```

image services

- WURFL (Wireless Universal Resource FiLe)
- Cloudinary
- imgix
- Sirv
- piio
- Thumbor
- flyimg

Brotli for assets (css, js, svg)

Brotli Accept-Encoding/Content-Encoding 📄 - OTHER

Usage
Global

% of all users
84.37%

More effective lossless compression algorithm than gzip and deflate.

Current aligned | Usage relative | Date relative | Show all | ?

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Blackberry Browser	Opera Mobile *	Chrome for Android
			[1] 49 🚩								
			63								
			67			10.3					
		61	68	[3] 11.1	54	11.2		4.4			
11	17	62	69	[3] 12	55	11.4	all	[2] 67	10	46	69
	18	63	70	[3] TP		12					
		64	71								
			72								

caniuse.com/#feat=brotli

Agreed, executables for Windows (32/64 bit) would be a great start.

eustas (Eugene Kliuchnikov) on 14 Sep 2017 <>   Contributor   +😃   •••

After #596 windows binaries will be accessible as build artifacts.

eustas (Eugene Kliuchnikov) on 19 Sep 2017 <>   Contributor   +😃   •••

Latest build could be taken from here: bintray.com/eustas/brotli/bin/snapshot/view/files?
sort=name&order=asc#files
Next release will contain those artifacts as well.

👍 1 🧑

🚫 🏊 **eustas** (Eugene Kliuchnikov) closed this on 19 Sep 2017

github.com/google/brotli
bintray.com/eustas/brotli/bin/snapshot/view/files?
sort=name&order=asc#files

```
brotli -5 index.html
brotli -5 -o index.html.br index.html
```

```
<IfModule mod_headers.c>

  RewriteCond %{HTTP:Accept-Encoding} br
  RewriteCond %{REQUEST_FILENAME}\.br -f
  RewriteRule \.(css|ics|js|json|html|svg)$ %{REQUEST_URI}.br [L]

  # Prevent mod_deflate double gzip
  RewriteRule \.br$ - [E=no-gzip:1]

  <FilesMatch "\.br$">

    <IfModule mod_mime.c>
      # Serve correct content types
      AddType text/css css.br
      AddType text/calendar ics.br
      AddType text/javascript js.br
      AddType application/json json.br
      AddType text/html html.br
```

github.com/powturbo/TurboBench
sites.google.com/site/powturbo/compression-benchmark

caching

HTML5 Boilerplate .htaccess

caching (excerpt)

```
<IfModule mod_expires.c>

  ExpiresActive on
  ExpiresDefault "access plus 1 month"

  # CSS

  ExpiresByType text/css "access plus 1 year"

  # HTML

  ExpiresByType text/html "access plus 0 seconds"

  # JavaScript

  ExpiresByType application/javascript "access plus 1 year"
  ExpiresByType application/x-javascript "access plus 1 year"
  ExpiresByType text/javascript "access plus 1 year"
```

fonts

self hosted!

google-webfonts-helper.herokuapp.com/fonts
github.com/majodev/google-webfonts-helper
www.npmjs.com/package/google-webfonts-downloader

3. Copy CSS: (default is `Best Support`)

Best Support   **Modern Browsers**

Choose `Modern Browsers` if supporting old browsers is not relevant. Formats in this snippet: `[woff,woff2]`

```css
/* roboto-regular - latin */
@font-face {
  font-family: 'Roboto';
  font-style: normal;
  font-weight: 400;
  src: local('Roboto'), local('Roboto-Regular'),
       url('../fonts/roboto-v18-latin-regular.woff2') format('woff2'), /* Chrome 26+, Ope
       url('../fonts/roboto-v18-latin-regular.woff') format('woff'); /* Chrome 6+, Firefo
}
```

Customize folder prefix (optional): `../fonts/`

Click on code to select all statements, then copy/paste it into your own CSS file.

- modern browsers
- no local rule
- only needed charsets

offline first (PWA)

PWA BUILDER

Generate your Progressive Web App

PWA.tools takes data from your site and uses that to generate cross-platform Progressive Web Apps

1 Generate Manifest   2 Build Service Worker   3 Publish PWA

Provide a URL

Provide your URL and we'll help fill in the gaps if there are any.

URL

Enter a URL

Service Workers 🗎 - WD

Method that enables applications to take advantage of persistent background processing, including hooks to enable bootstrapping of web applications while offline.

Current aligned | Usage relative | Date relative | Show all | ?

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Blackberry Browser	Opera Mobile *	Chrome for Android
			49								
			63								
			67			10.3					
		61	68	11.1	54	11.2		4.4			
11	17	62	69	12	55	11.4	all	67	10	46	69
	18	63	70	TP		12					
		64	71								
			72								

caniuse.com/#feat=serviceworkers

Web App Manifest 📄 - WD

The web app manifest provides information about an application (such as name, author, icon, and description) in a JSON file, which browsers can use to give richer offline experiences.

| Current aligned | Usage relative | Date relative | | Apply filters | Show all | ? |

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Blackberry Browser	Opera Mobile *	Chrome for Android
			[1] 49								
			[2] 70								
	[3] 17	64	[2] 71			[1] 11.4					
11	[3] 18	65	[2] 72	12	57	[1] 12.1	all	67	10	[1] 46	71
		66	[2] 73	TP							
		67	[2] 74								
			[2] 75								

caniuse.com/#feat=web-app-manifest

result

- under 1s (0,8s - 1,2s desktop, 1,0s - 2,2s mobile)
- under 1MB (~800KB)
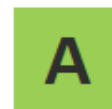- very good scores
- offline first

Web Page Performance Test for

https://oxid.daniel-ruf.de/

From: Frankfurt, Germany - EC2 - Chrome - Cable
22.9.2018, 22:20:58
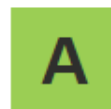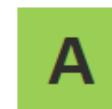
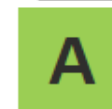| A	A	A	A	A	X
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN

Summary   **Details**   **Performance Review**   **Content Breakdown**   **Domains**   **Processing Breakdown**   **Screen Shot**   **Image Analysis** ⬀   **Request Map** ⬀

Tester: i-0ce70bced9116eef7
First View only
Test runs: 3

Export HTTP Archive (.har)
Custom Metrics

								Document Complete			Fully Loaded		
	Load Time	First Byte	Start Render	Visually Complete	Speed Index	First Interactive (beta)	Result (error code)	Time	Requests	Bytes In	Time	Requests	Bytes In
First View (Run 1)	1.454s	0.394s	0.600s	2.100s	1406	> 0.663s	0	1.454s	23	578 KB	2.352s	38	679 KB

First Interactive (beta)	Colordepth	RUM First Paint	domInteractive	domContentLoaded	loadEvent
> 0.663s	24	0.664s	0.827s	0.827s - 0.849s (0.022s)	1.455s - 1.481s (0.026s)

Visual Progress (%)

Legend: oxid-demo.daniel-ruf.de/ (blue), oxid.daniel-ruf.de/ (red)

Time (seconds)
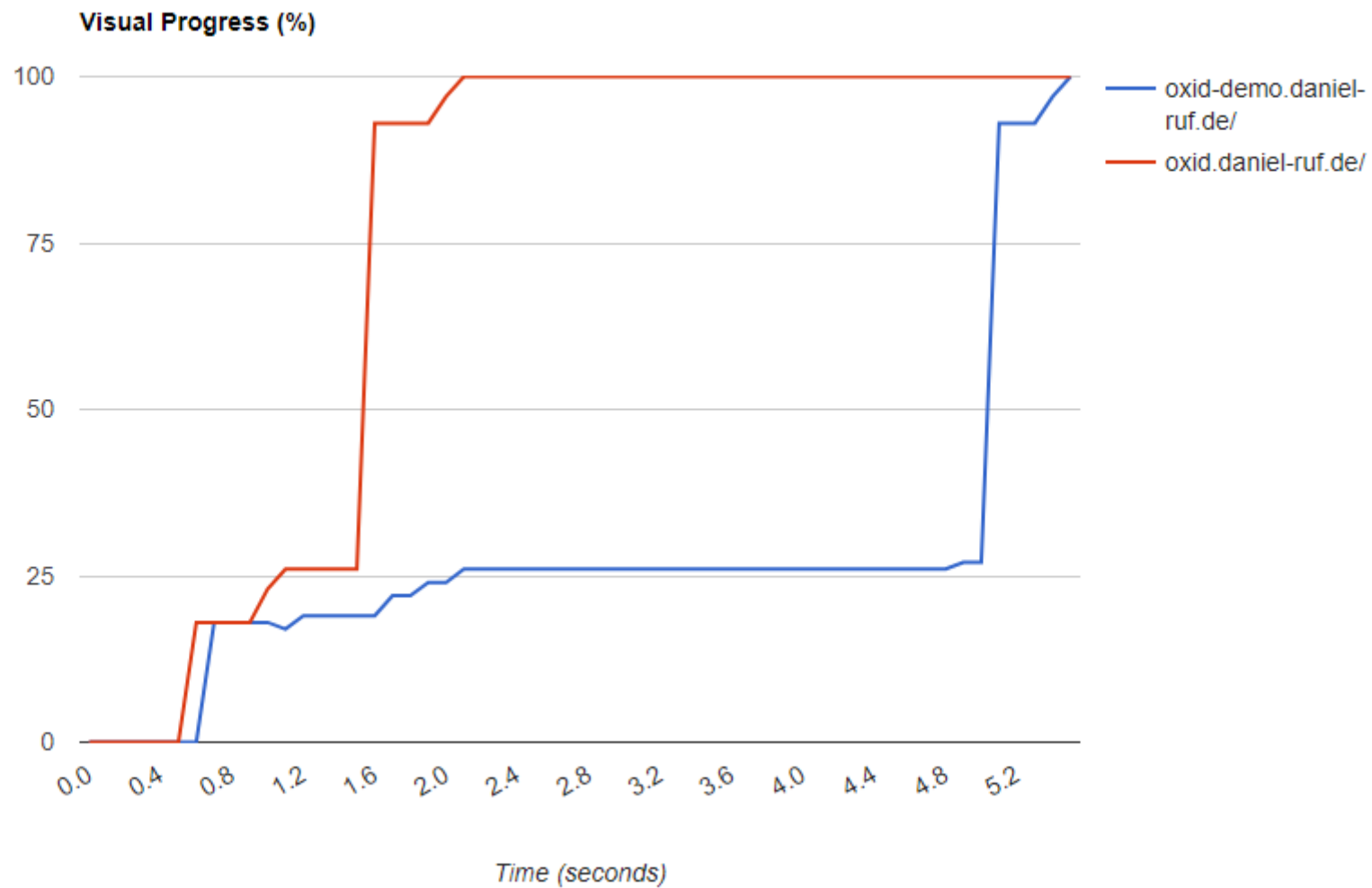
31 requests | 895 KB transferred | Finish: 6.96 s | DOMContentLoaded: 2.19 s | Load: 4.57 s

30 requests | 128 B transferred | Finish: 1.66 s | DOMContentLoaded: 607 ms | Load: 655 ms

https://oxid.daniel-ruf.de/

Sep 22, 2018, 10:15 PM GMT+2

No emulation, No throttling applied

100	**100**	**57**	**87**	**100**
Performance	Progressive Web App	Accessibility	Best Practices	SEO

Score scale: ● 0-49 ● 50-89 ● 90-100

Performance

100

⏱ **Metrics**

First Contentful Paint	0.8 s ✓	First Meaningful Paint	1.2 s ✓
Speed Index	1.5 s ✓	First CPU Idle	1.3 s ✓
Time to Interactive	1.3 s ✓	Estimated Input Latency	20 ms ✓

96 Performance

100 Progressive Web App

57 Accessibility

80 Best Practices

100 SEO
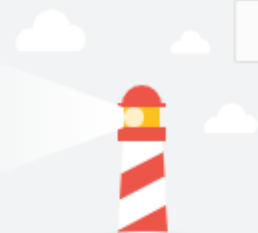
Score scale: ● 0-44 ● 45-74 ● 75-100

Performance

Metrics

96

First Contentful Paint	1.0 s ✓	First Meaningful Paint	2.2 s ✓
Speed Index	3.1 s ✓	First CPU Idle	2.2 s ✓
Time to Interactive	2.9 s ✓	Estimated Input Latency	10 ms ✓

headless eCommerce solutions

- Magento PWA Studio
- Deity
- Vue Storefront
- …

further improvements

- remove old code (IE 8 / 9 / 10)
- generate / support picture tags
- less dependencies (Fontawesome, jQuery UI, jQuery)
- remove user-scalable=no and user-select (improve a11y)
- use good default (caching etc)
- better slider (Swiper)

links

lighthouse-ci.appspot.com/try
developers.google.com/speed/pagespeed/insights
web.dev/measure

links

images.guide
developers.google.com/web/fundamentals/performance/why-performance-matters
www.smashingmagazine.com/2016/10/next-generation-server-compression-with-brotli
github.com/thedaviddias/Front-End-Performance-Checklist/blob/master/README.md

thanks for your attention!