WEB PERFORMANCE OPTIMIERUNG (WPO)
AM BEISPIEL EINES OXID-SHOPS

AUSGANGSLAGE

- Ubuntu 16 mit 4.4.0 Kernel
- PHP 7.1(.19) als 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)
- kein CDN

ZIEL

- unter 1s
- unter 1MB
- sehr gute Scores

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

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

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

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

Sep 22, 2018, 10:18 PM GMT+2

No emulation, No throttling applied

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 ✓

54	**58**	**57**	**80**	**100**
Performance	Progressive Web App	Accessibility	Best Practices	SEO

Score scale: ● 0-44 ● 45-74 ● 75-100

Performance

⏱ **Metrics**

54

First Contentful Paint	2.3 s ✓	First Meaningful Paint	2.3 s ✓
Speed Index	7.3 s ⚠	First CPU Idle	3.9 s ℹ
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
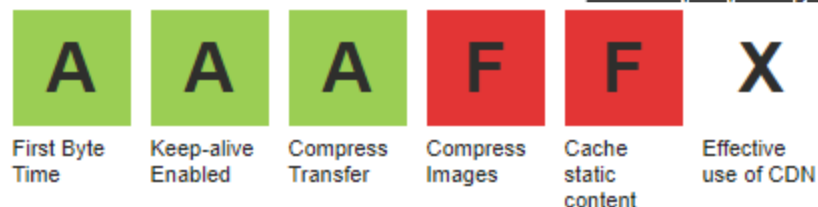
A	A	A	F	F	X
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN

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)

BILDER

- responsive Bilder (picture-Tags + picturefill)
- lazyloading
- Kompression (+ webp)
- progressive

https://caniuse.com/#feat=picture

https://www.responsivebreakpoints.com/

KOMPRESSION

- 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.

Usage
Global

% of all users

72.69% + 0.26% = 72.95%

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								
		61	68	11.1		11.2		4.4.4			
11	17	62	69	12	55	11.4	all	67	10	46	69
	18	63	70	TP		12					
		64	71								
			72								

https://caniuse.com/#feat=webp

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

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

libjpeg
https://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" srcset=
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_

    <source sizes="(max-width: 1170px) 100vw, 1170px" srcset="
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
            https://oxid.daniel-ruf.de/out/pictures/promo/surfer_wave_1__promo_
```

IMAGE SERVICES

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

Brotli für weitere Dateien (css, js, svg)

Brotli Accept-Encoding/Content-Encoding ▤ - OTHER

More effective lossless compression algorithm than gzip and deflate.

Usage % of all users
Global 84.37%

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								

https://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

https://github.com/google/brotli

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

```
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
```

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

CACHING

HTML5 Boilerplate .htaccess

CACHING (AUSZUG)

```
<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
```

SCHRIFTEN

self hosted!

https://google-webfonts-helper.herokuapp.com/fonts
https://github.com/majodev/google-webfonts-helper
https://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]`

```
/* 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/`

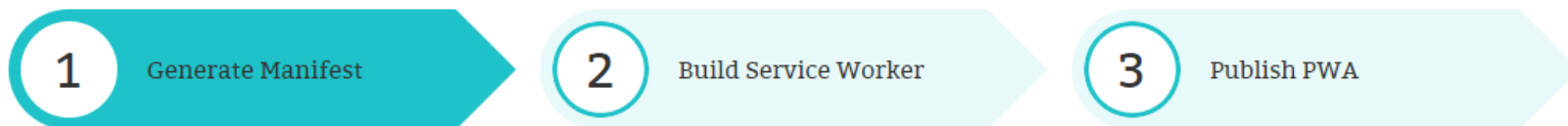Click on code to select all statements, then copy/paste it into your own CSS file.

- modern browsers
- local raus
- nur benötigte Charsets

offline first (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.

Usage
Global

% of all users

84.43% + 0.2% = 84.63%

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								

https://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.

Usage
Global

% of all users

49.95% + 27.8% = 77.75%

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								

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

ERGEBNIS

- unter 1s (0,8s - 1,2s Desktop, 1,0s - 2,2s Mobile)
- unter 1MB (~800KB)
- sehr gute Scores
- offline first
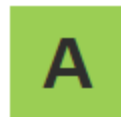
Web Page Performance Test for

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

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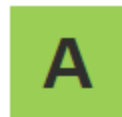22.9.2018, 22:20:58
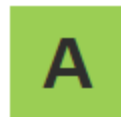
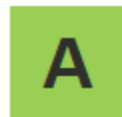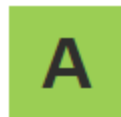| A	A	A	A	A	X
First Byte Time	Keep-alive Enabled	Compress Transfer	Compress Images	Cache static content	Effective use of CDN

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 (%)

oxid-demo.daniel-ruf.de/

oxid.daniel-ruf.de/

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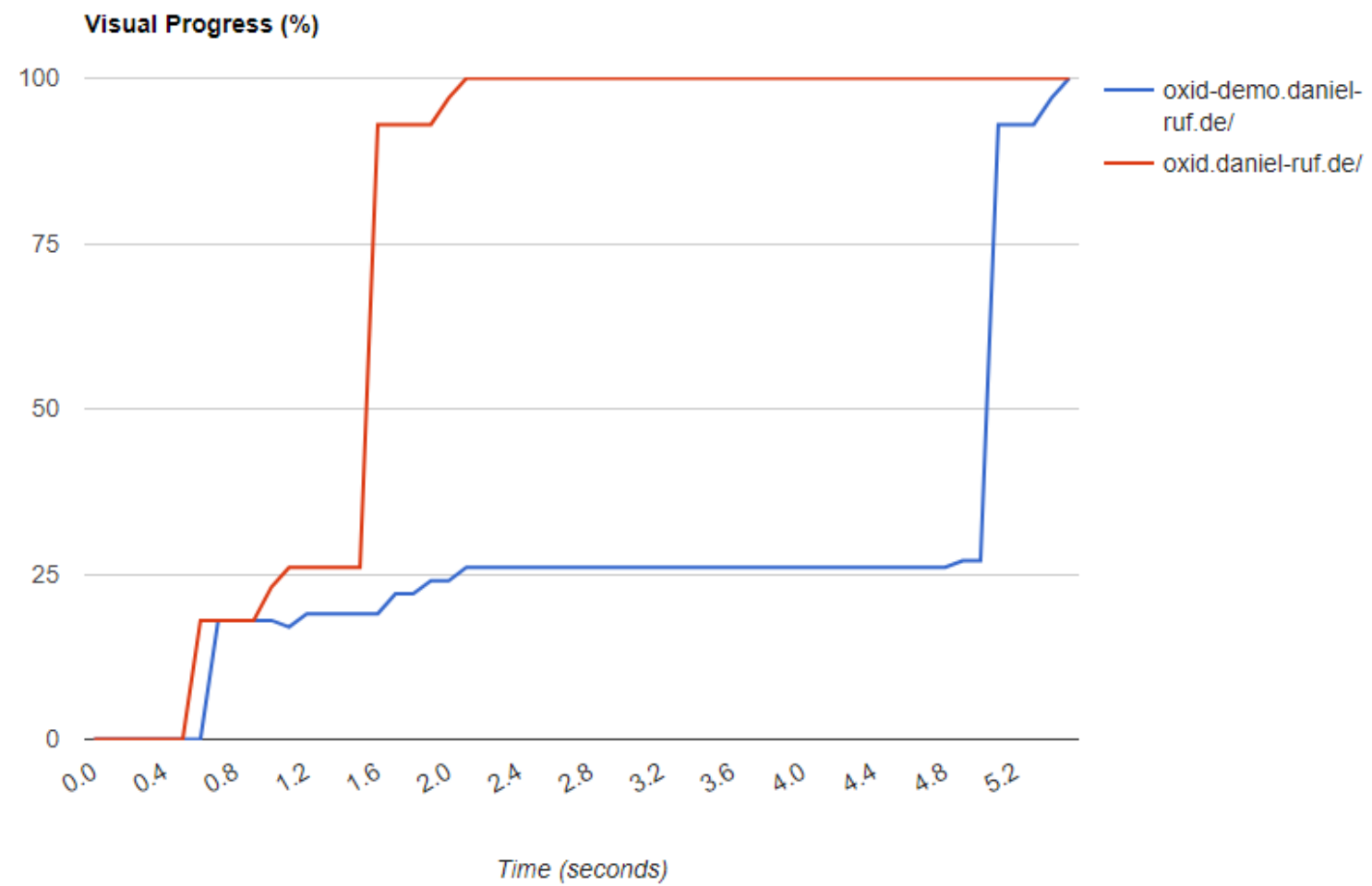
31 requests | 895 KB transferred | Finish: 6.96 s | DOMContentLoaded: 2.19 s | Load: 4.57 s

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

🕐 **Metrics**

100

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 ✓

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

Sep 22, 2018, 9:51 PM GMT+2

Emulated Nexus 5X, Simulated Fast 3G network

96	100	57	80	100
Performance	Progressive Web App	Accessibility	Best Practices	SEO

Score scale: ● 0-44 ● 45-74 ● 75-100

Performance

96

🕐 **Metrics**

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 LÖSUNGEN

- Magento PWA Studio
- Deity
- Vue Storefront
- Shopware Experiments
- …

VERBESSERUNGSVORSCHLÄGE

- alte Code raus (IE 8 / 9 / 10)
- picture-Tags generieren / unterstützen
- weniger Abhängigkeiten (Fontawesome, jQuery UI, jQuery)
- user-scalable=no raus (a11y verbessern)
- gute Defaults (Caching etc)
- schlankere Slider (Swiper)

LINKS

https://github.com/DanielRuf/my-slides/
https://lighthouse-ci.appspot.com/try
https://images.guide/
https://developers.google.com/web/fundamentals/performance/why-performance-matters/
https://www.smashingmagazine.com/2016/10/next-generation-server-compression-with-brotli/
https://github.com/thedaviddias/Front-End-Performance-Checklist/blob/master/README.md

UEBERBIT

Vielen Dank für Ihre Aufmerksamkeit.

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