

PWA

PWA Fundamentals

websites with superpowers

Labas rytas!



Rowdy Rabouw

Rowdy Rabouw

Born and raised in Gouda, The Netherlands

Freelance web and app developer

Senior engineer at Nationale-Nederlanden

@rowdyrabouw

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❤️ superhero movies

PWA

Progressive

Web

App

Reliable

Always load and never show the downasaur

Fast

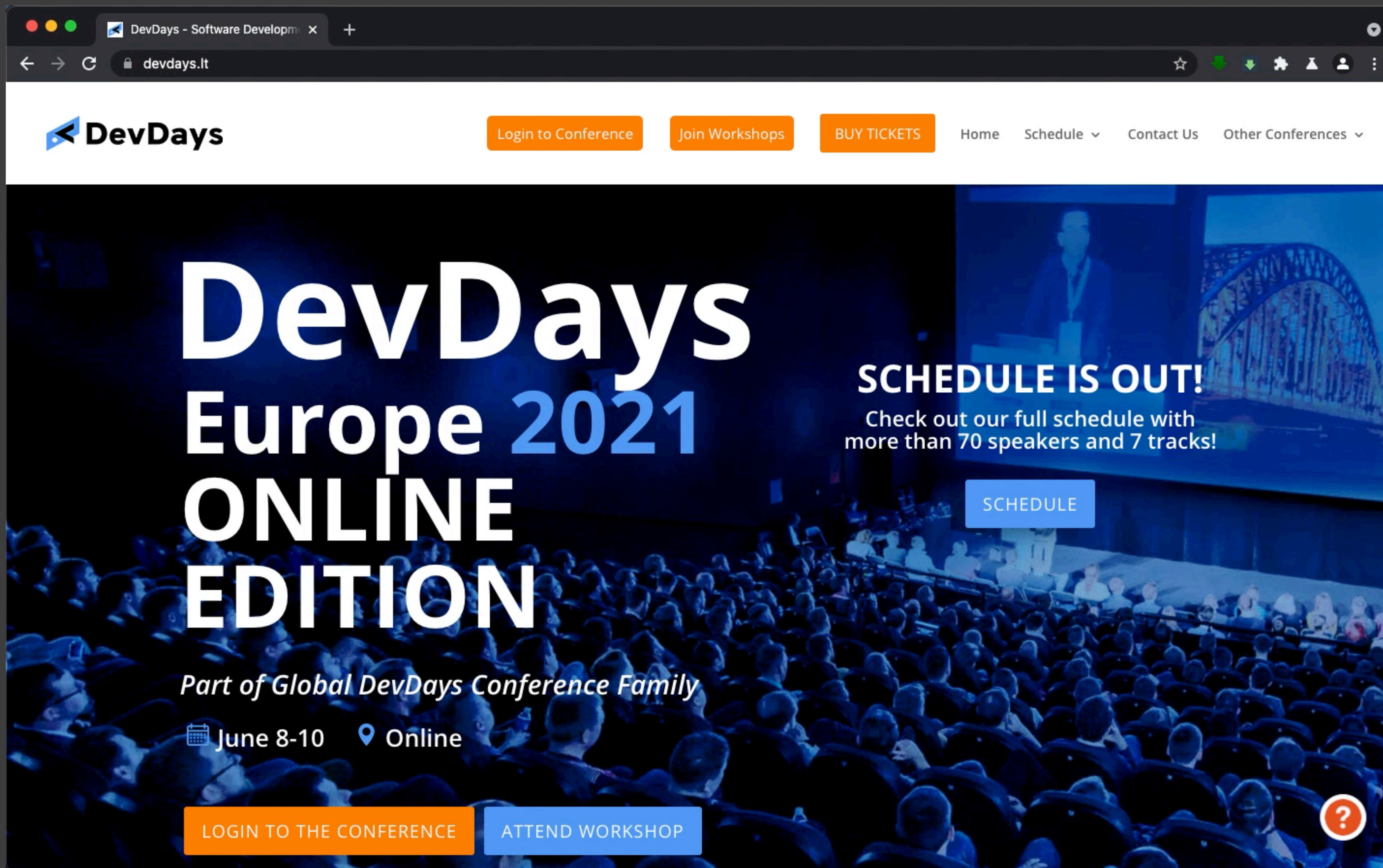
Respond quickly to user interactions

Engaging

Feel like a native app on the device

Key Features

- **Linkable** (*URL's*)
- **Safe** (*https*)
- **Discoverable** (*search engines*)
- **Responsive** (*works on every screen resolution*)
- **Feel like a native app** (*fast loading, look-and-feel*)
- **Always up-to-date** (*fresh from the web; no updates from app store*)
- **Installable** (*home screen, cache data*)
- **Re-engageable** (*home screen, push notifications*)
- **Connectivity-independent** (*can work offline*)



Progressive Web Apps

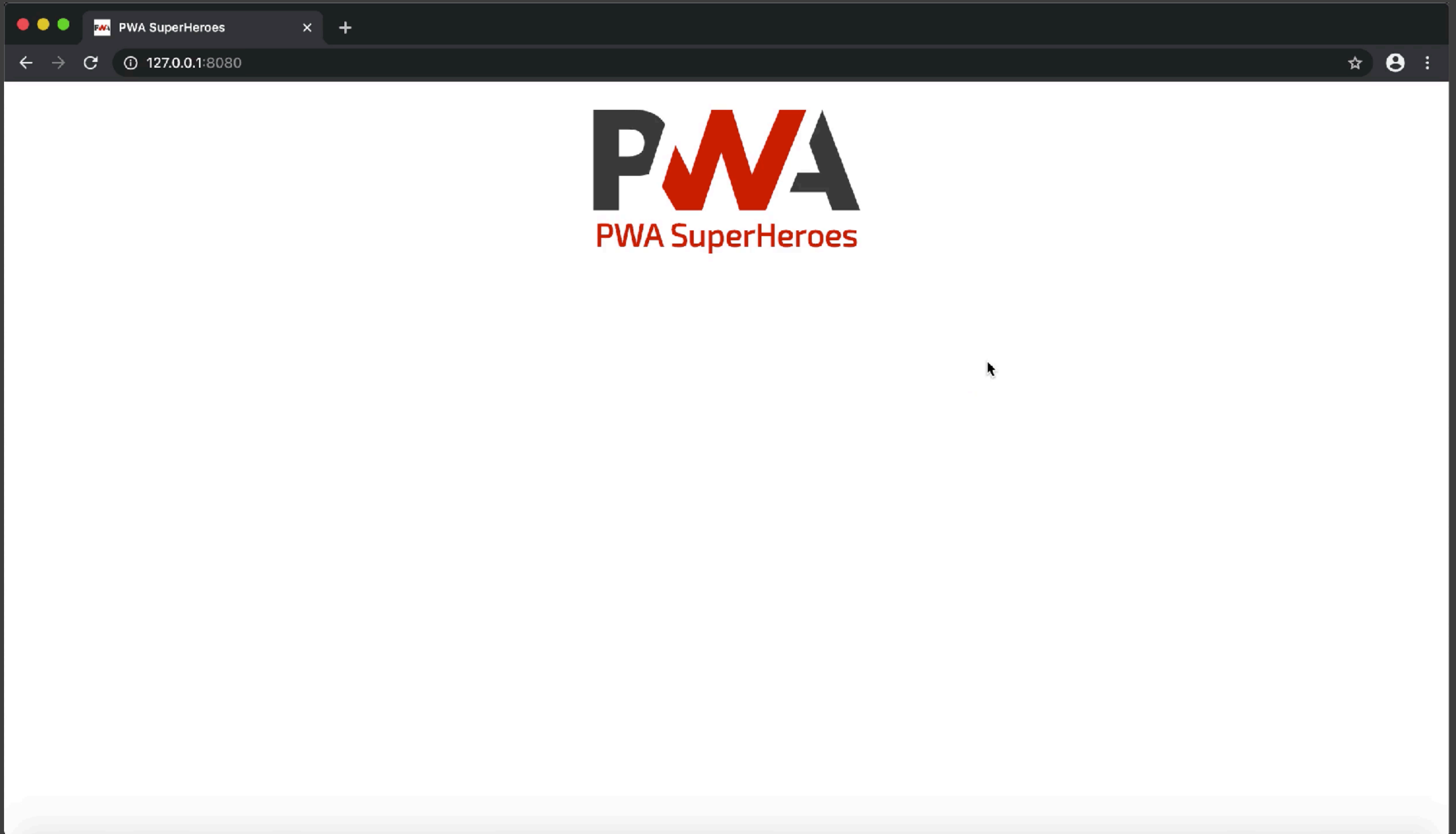
Progressive
Modern Browsers



Starter Code


```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <meta http-equiv="X-UA-Compatible" content="ie=edge" />
    <title>PWA SuperHeroes</title>
    <link rel="icon" type="image/png" href="favicon.png" />
    <link rel="stylesheet" href="css/app.css" />
  </head>
  <body>
    <header>
      
      <h1>PWA SuperHeroes</h1>
    </header>
  </body>
</html>
```

```
@font-face {  
  font-family: "Exo 2";  
  font-display: swap;  
  font-style: normal;  
  font-weight: 400;  
  src: url("../fonts/exo2.woff2") format("woff2");  
}  
  
body {  
  padding: 20px;  
}  
  
header img {  
  max-height: 100px;  
}  
  
h1 {  
  color: #df2305;  
  font-family: "Exo 2", sans-serif;  
  margin: 0;  
  text-align: center;  
}
```





Manifest File

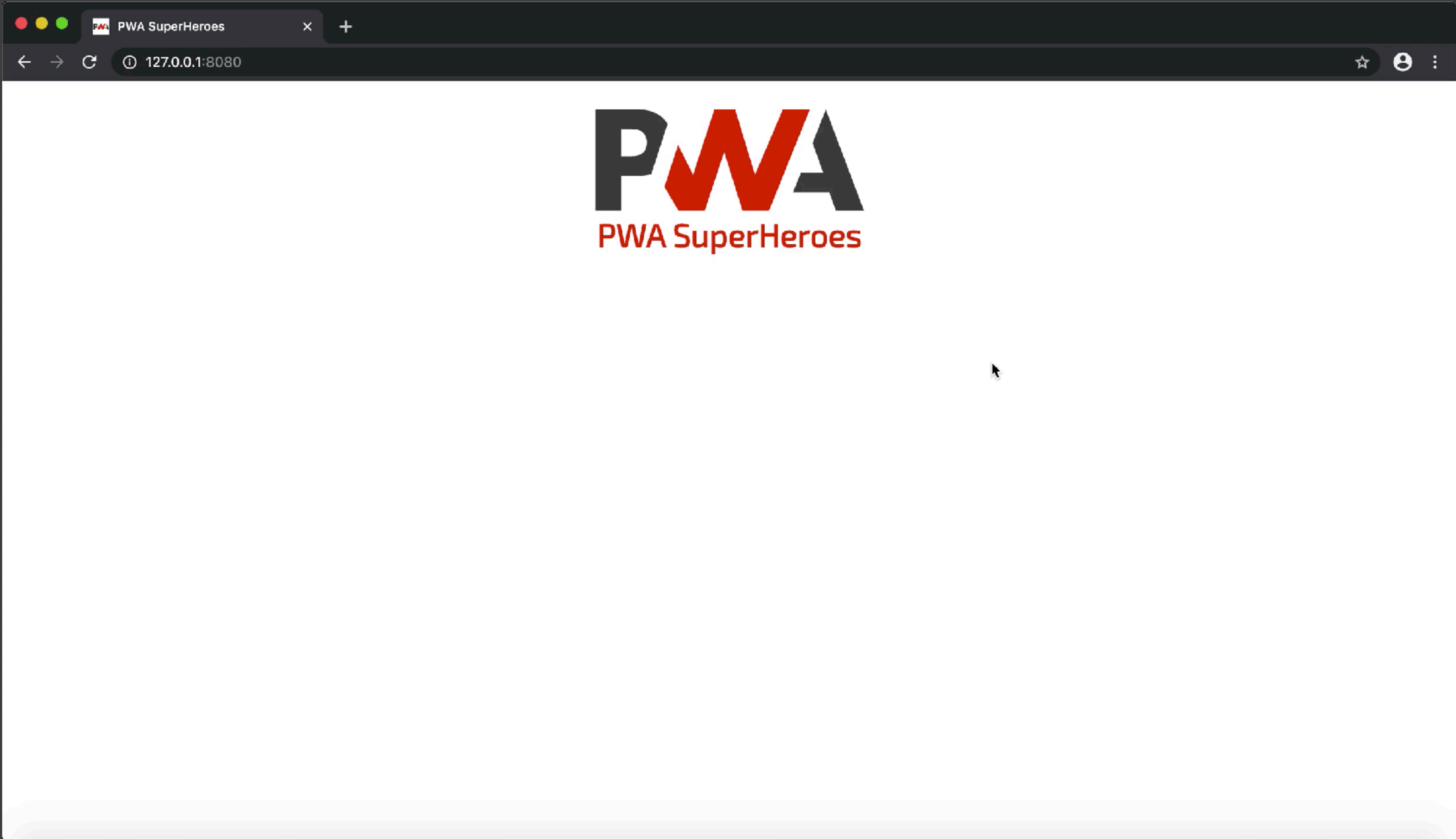
Manifest File

- simple JSON file
- informs the browser about your web application
- tells it how it should behave when “installed”



```
{  
  "name": "PWA Superheroes",  
  "short_name": "PWAS",  
  "lang": "en-GB",  
  "start_url": "/",  
  "scope": ".",  
  "display": "standalone",  
  "orientation": "portrait",  
  "background_color": "#3D3D3D",  
  "theme_color": "#DF2305",  
  "icons": []  
}
```

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <meta http-equiv="X-UA-Compatible" content="ie=edge" />
    <title>PWA SuperHeroes</title>
    <link rel="icon" type="image/png" href="favicon.png" />
    <link rel="stylesheet" href="css/app.css" />
    <link rel="manifest" href="manifest.json" />
  </head>
  <body>
    <header>
      
      <h1>PWA SuperHeroes</h1>
    </header>
  </body>
</html>
```



onderceylan / pwa-asset-generator

Sponsor

Notifications

Star

1.5k

Fork

75

Code

Issues 12

Pull requests 12

Discussions

Actions

Projects

Security

Insights

master

12 branches

39 tags

Go to file

Code

dependabot-preview build(deps): [security] bump ws from... 2aac89f 7 days ago 676 commits

.github	feat(main): add funding	5 months ago
bin	fix(puppets): updated scraper for latest specs and improv...	10 months ago
src	fix(cli): do not throw when args are missing	5 months ago
static	feat(main): add BLM branding #blacklifematters	12 months ago
.editorconfig	chore(format): extend formatting rules	5 months ago
.eslintrc	refactor(test): refactored tests and added new visual regr...	2 years ago
.gitattributes	chore(format): extend formatting rules	5 months ago

About

Automates PWA asset generation and image declaration. Automatically generates icon and splash screen images, favicons and mstile images. Updates manifest.json and index.html files with the generated images according to Web App Manifest specs and Apple Human Interface guidelines.

android

manifest

ios

pwa

package.json — pwa-superheroes.com

EXPLORER

OPEN EDITORS

index.html dist
manifest.json dist
package.json

PWA-SUPERHEROES.COM

.vscode

settings.json

dist

css

fonts

img

js

favicon.png

index.html

manifest.json

node_modules

.gitignore

package-lock.json

package.json

OUTLINE

NPM SCRIPTS

index.html

manifest.json

package.json X

package.json > ...

You, October 7th, 2019 3:41pm | 1 author (You)

```
1 {  
2   "name": "pwa-superheroes.com",  
3   "version": "1.0.0",  
4   "description": "",  
5   "main": "index.js",  
6   "scripts": {  
7     "serve": "cd dist && http-server",  
8     "generate": "cd dist && pwa-asset-generator ./img/pwa.svg -i ./index.html -m ./manifest.json"  
9   },  
10  "author": "",  
11  "license": "ISC",  
12  "dependencies": {  
13    "http-server": "^0.11.1",  
14    "pwa-asset-generator": "^1.3.1"  
15  }  
16 }
```

You, October 7th, 2019 3:03pm • Initial commit

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

2: bash

Skynet-2:pwa-superheroes.com rowdy\$

01-initial-state-with-manifest

0 ↓ 1 ↑

0 0

You, October 7th, 2019 3:03pm

Ln 16, Col 2

Spaces: 2

UTF-8

LF

JSON

Prettier: ✓

Formatting: ✓

4

```
{
  "name": "PWA Superheroes",
  "short_name": "PWAS",
  "lang": "en-GB",
  "start_url": "/",
  "scope": ".",
  "display": "standalone",
  "orientation": "portrait",
  "background_color": "#3D3D3D",
  "theme_color": "#DF2305",
  "icons": [
    {
      "src": "manifest-icon-192.png",
      "sizes": "192x192",
      "type": "image/png"
    },
    {
      "src": "manifest-icon-512.png",
      "sizes": "512x512",
      "type": "image/png"
    }
  ]
}
```

PWA SuperHeroes

x

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127.0.0.1:8080

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👤

⋮

iPhone 6/7... ▾

414 x 736

100% ▾

⋮

🔍

📄

Elements

Console

Sources

Network

Performance

Memory

Application

Security

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✕

Application

📄 Manifest

⚙️ Service Workers

🗑️ Clear storage

Storage

▶️ 🗄️ Local Storage

▶️ 🗄️ Session Storage

🗄️ IndexedDB

🗄️ Web SQL

▶️ 🍪 Cookies

Cache

🗄️ Cache Storage

🗄️ Application Cache

Background Services

⬆️⬆️ Background Fetch

🔄 Background Sync

🔔 Notifications

💰 Payment Handler

☁️ Push Messaging

Frames

▶️ 🖼️ top

App Manifest

[:8080/manifest.json](#)

Installability

⚠️ No matching service worker detected. You may need to reload the page, or check that the service worker

Identity

Name

PWA Superheroes

Short name

PWAS

Presentation

Start URL

/

Theme color

■ #DF2305

Background color

■ #3D3D3D

Orientation

portrait

Display

standalone

Icons

192x192

image/png

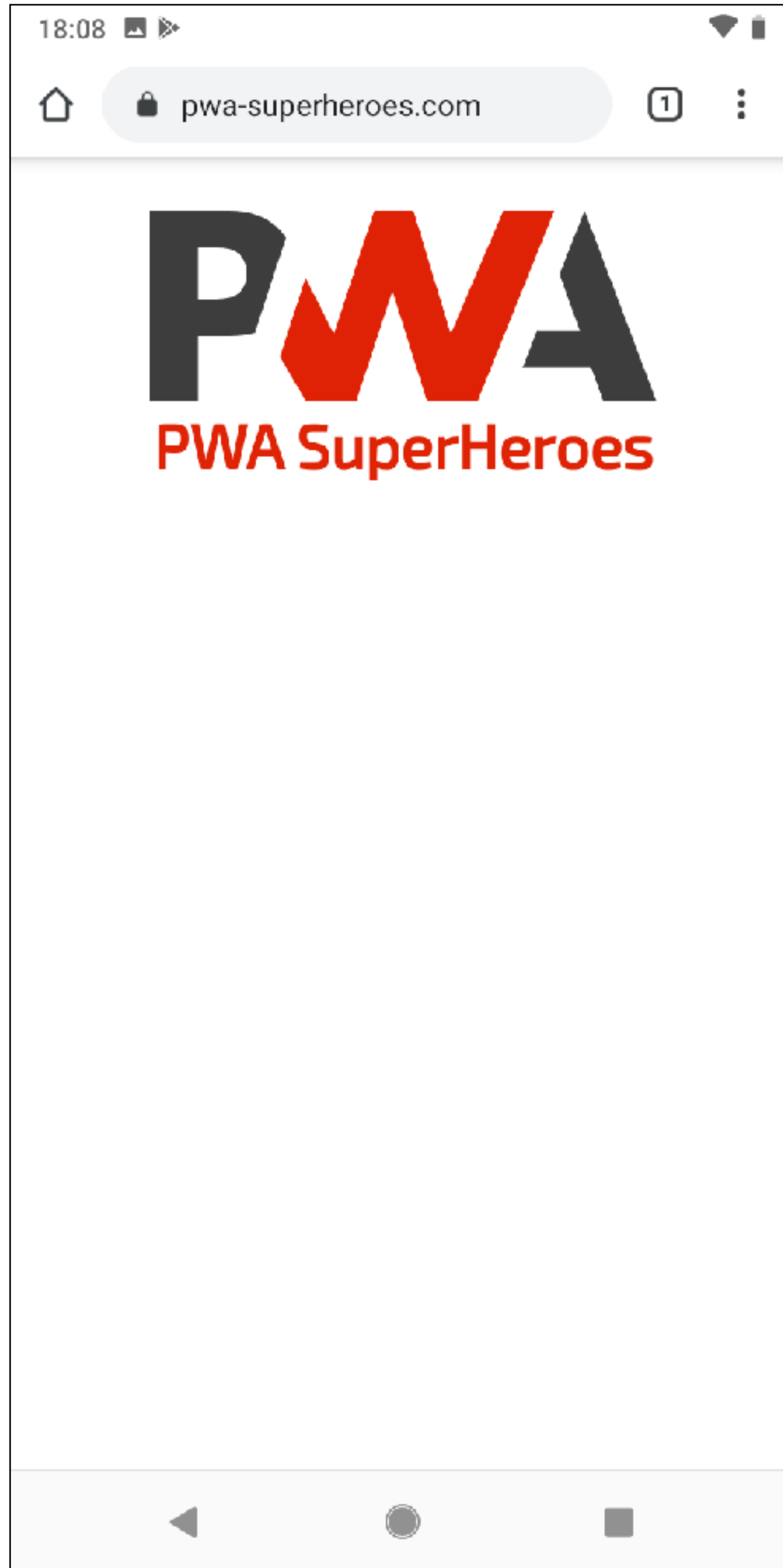


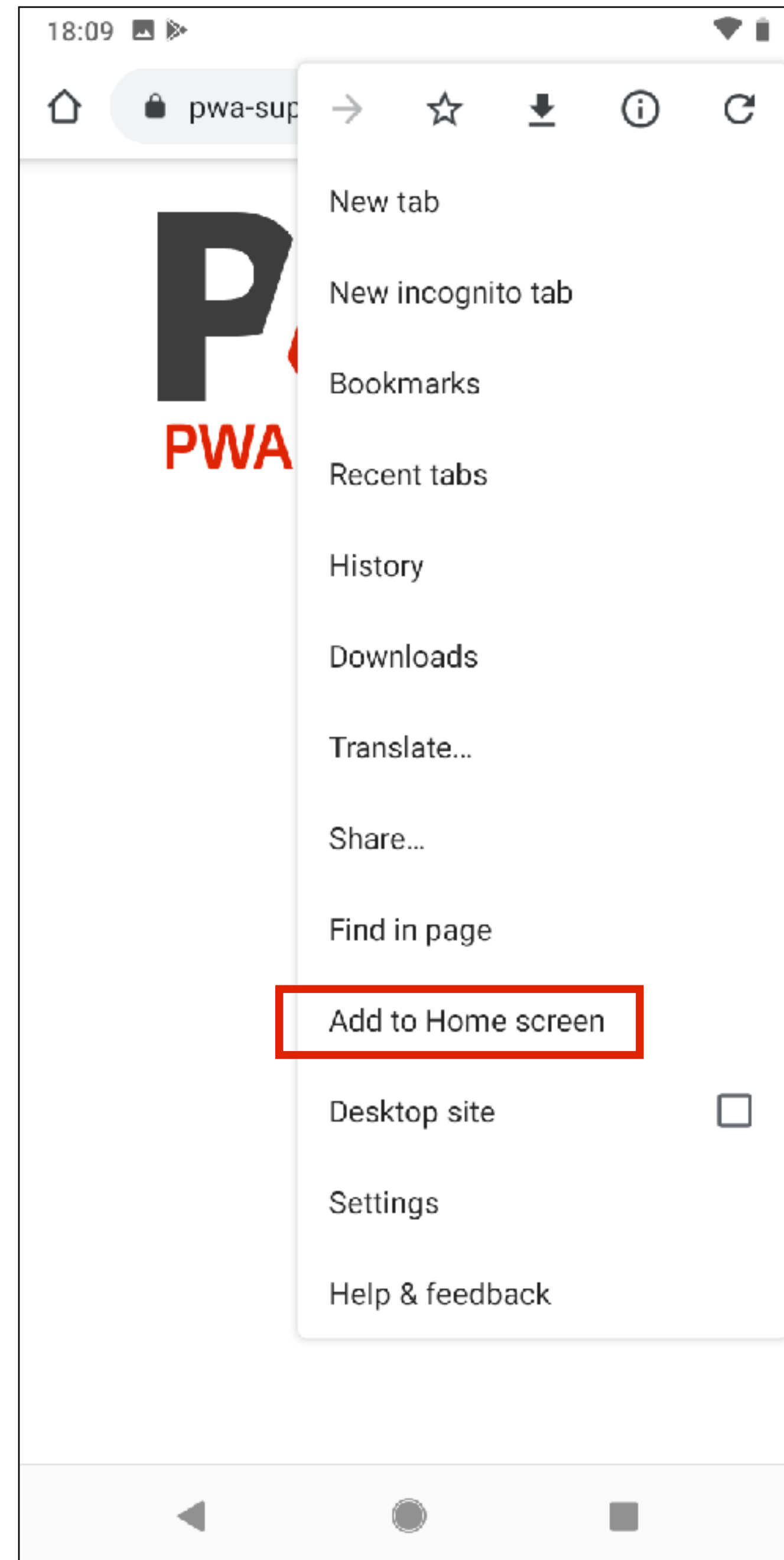


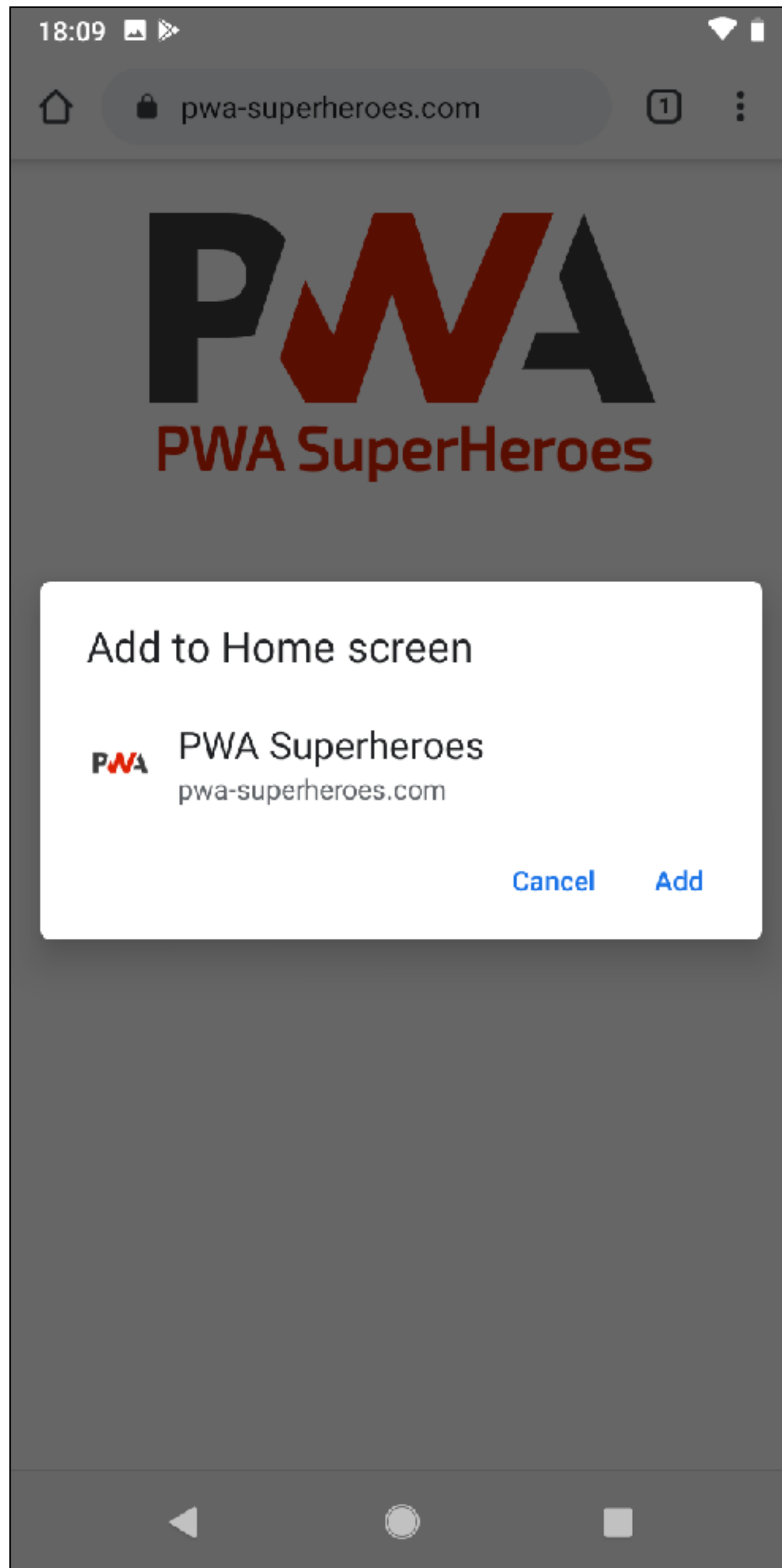
A2HS

A2HS Criteria

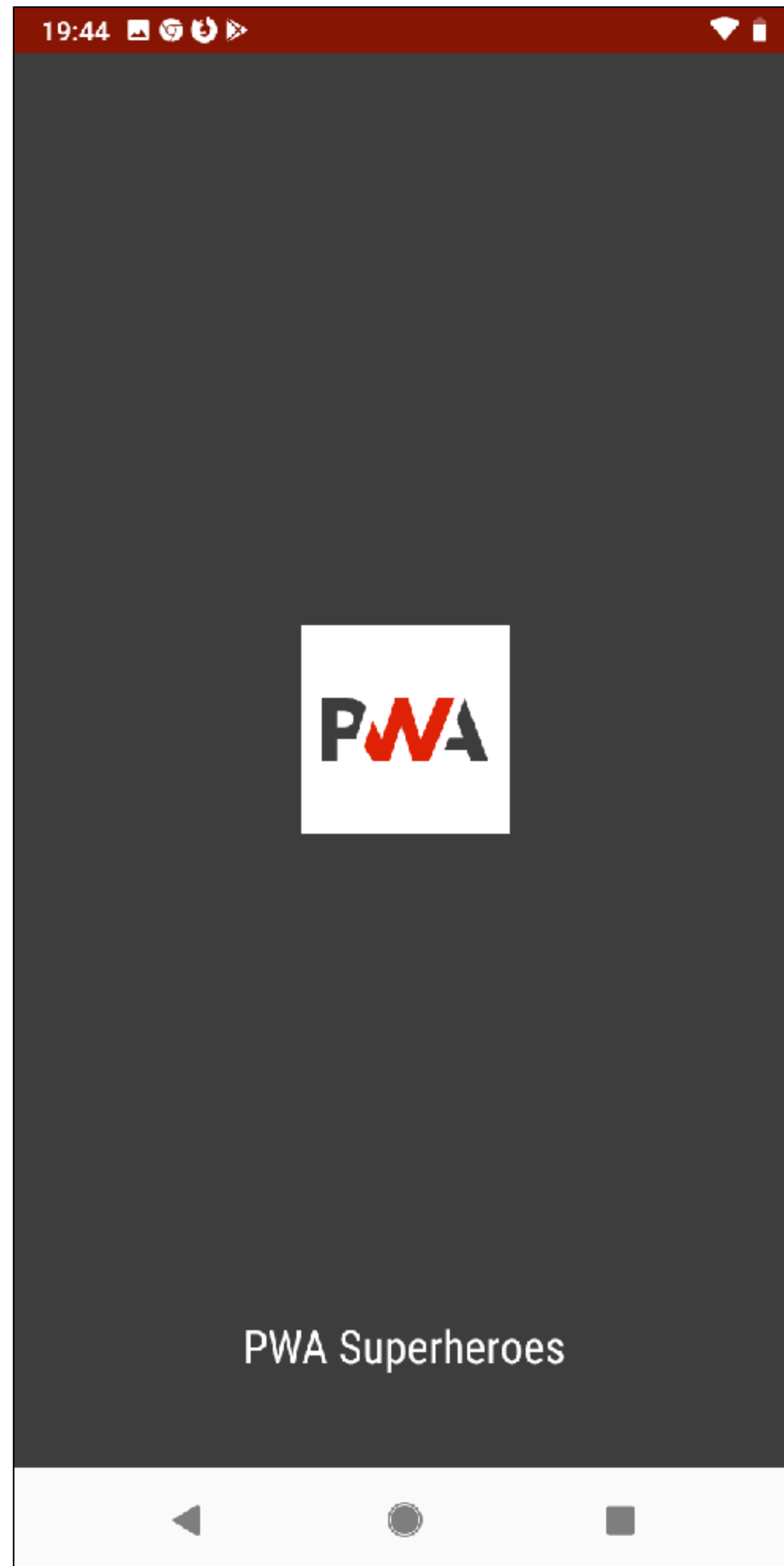
- the web app is not already installed
- served over HTTPS
- manifest file
 - short_name or name
 - start_url
 - display must be one of: fullscreen, standalone, or minimal-ui
 - icons must include a 192px and a 512px sized icons
- *registered service worker with a fetch event handler*





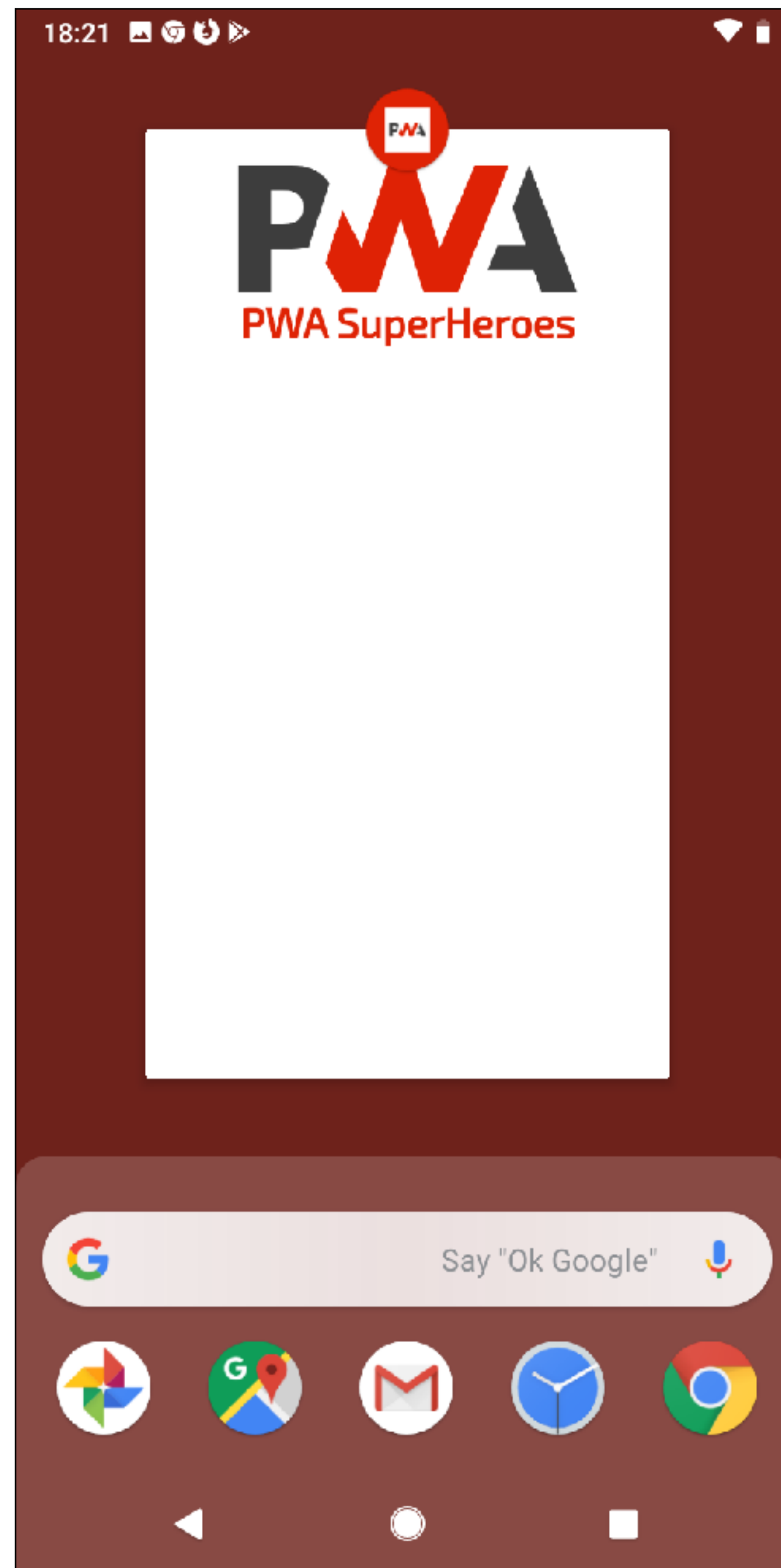




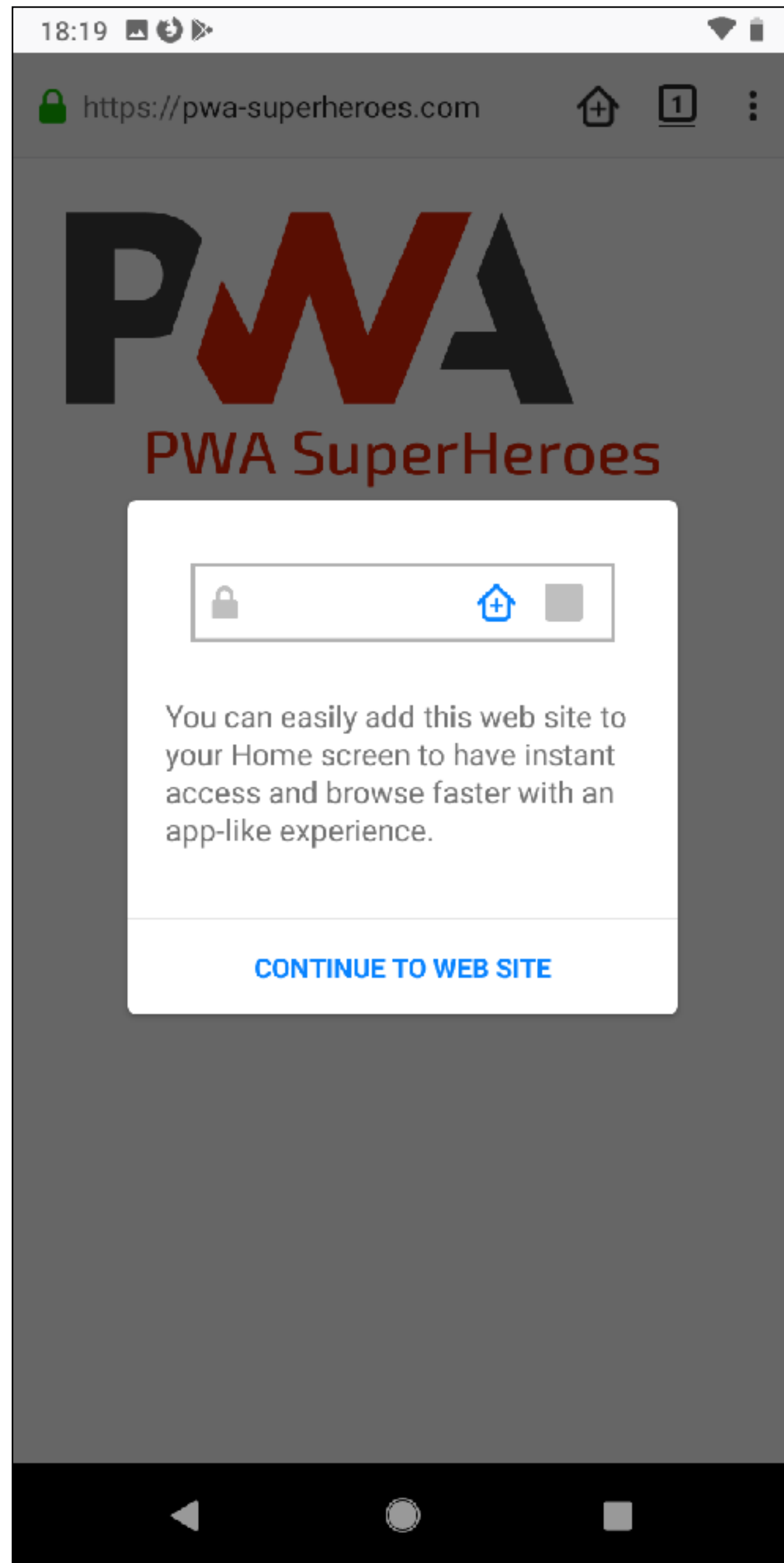


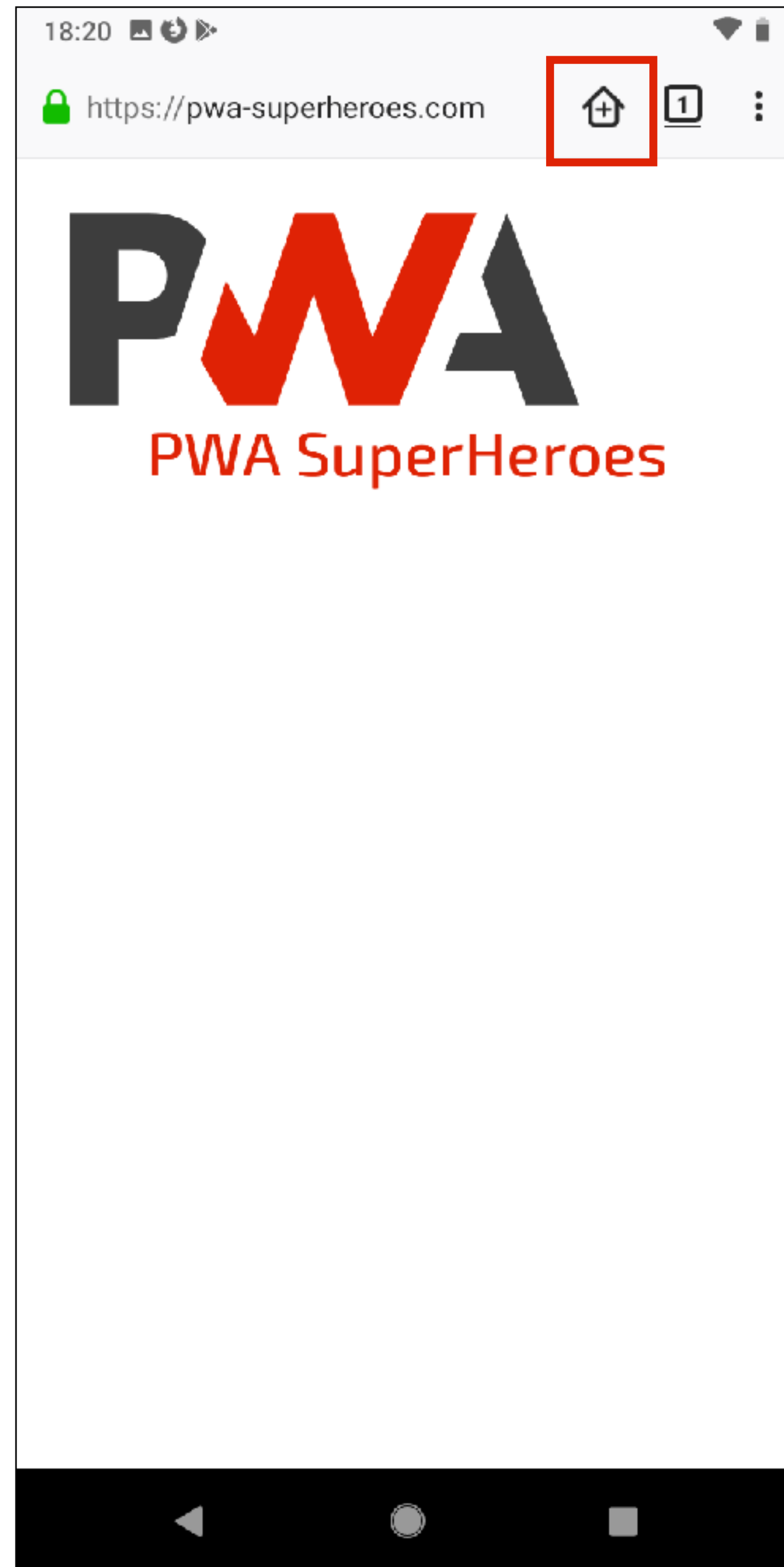
@rowdyrabouw



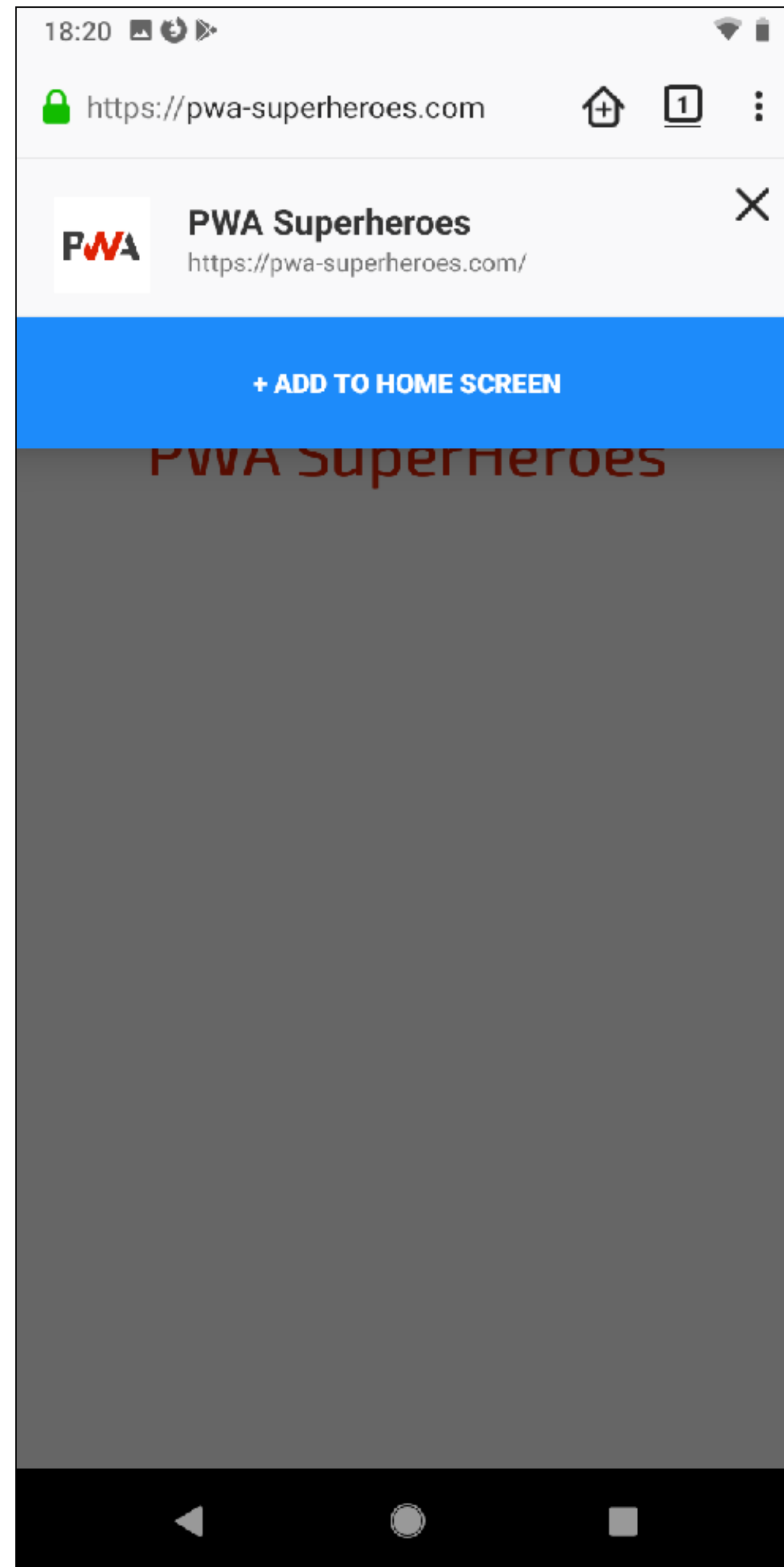


@rowdyrabouw





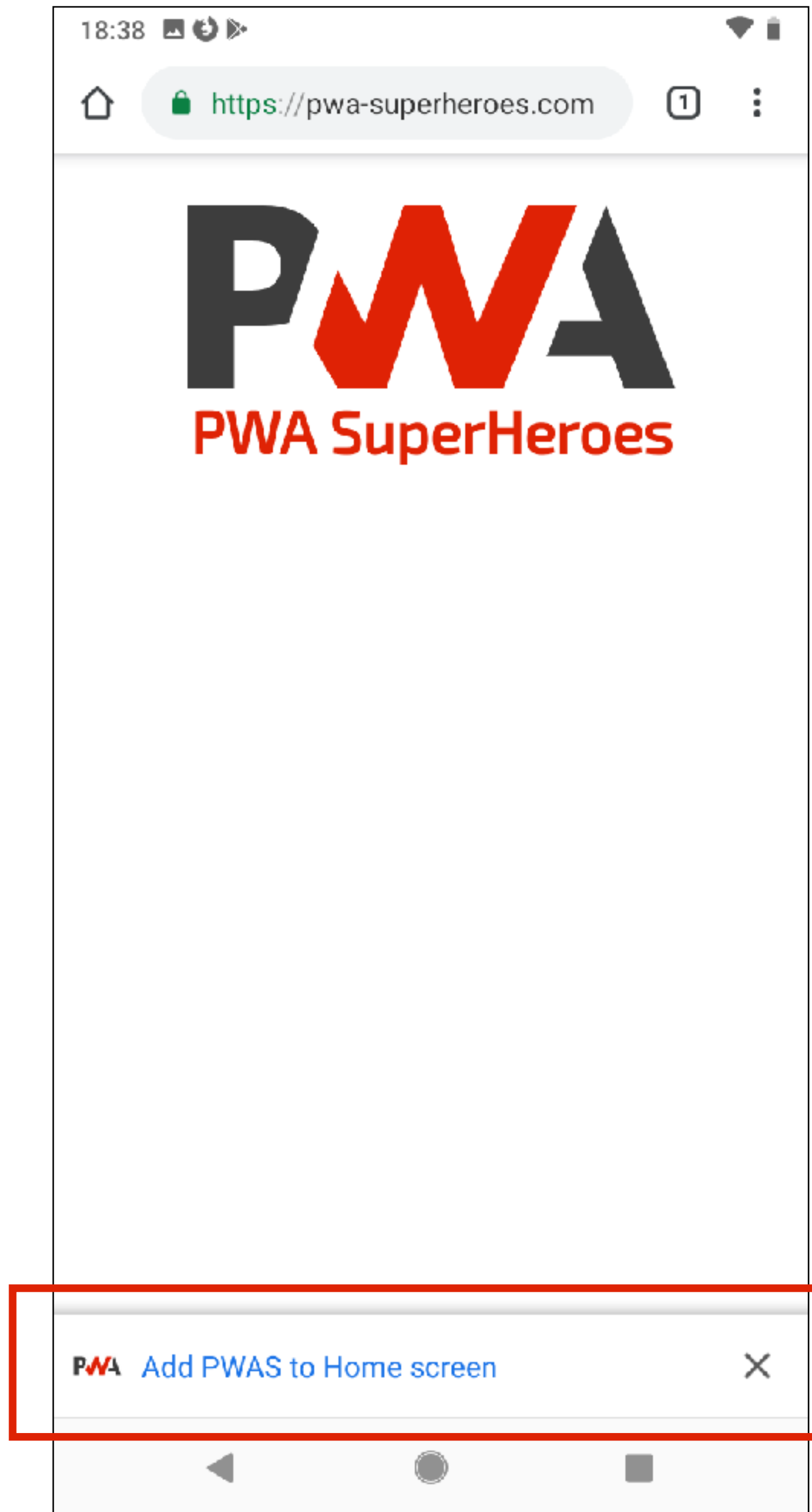
@rowdyrabouw



@rowdyrabouw



beforeinstallprompt



```
<!DOCTYPE html>
<html lang="en">
  <head>
    ...
    <script defer src="js/a2hs.js"></script>
  </head>
  <body>
    <header>
      
      <h1>PWA SuperHeroes</h1>
    </header>
    <main>
      <button id="btnInstall" class="hide">Add to Home screen</button>
    </main>
  </body>
</html>
```

```
main {  
    margin-top: 10px;  
    text-align: center;  
}  
  
#btnInstall {  
    color: #ffffff;  
    background-color: #3d3d3d;  
    border-radius: 10px;  
    display: none;  
    padding: 10px 20px;  
}  
  
.show {  
    display: inline-block !important;  
}
```



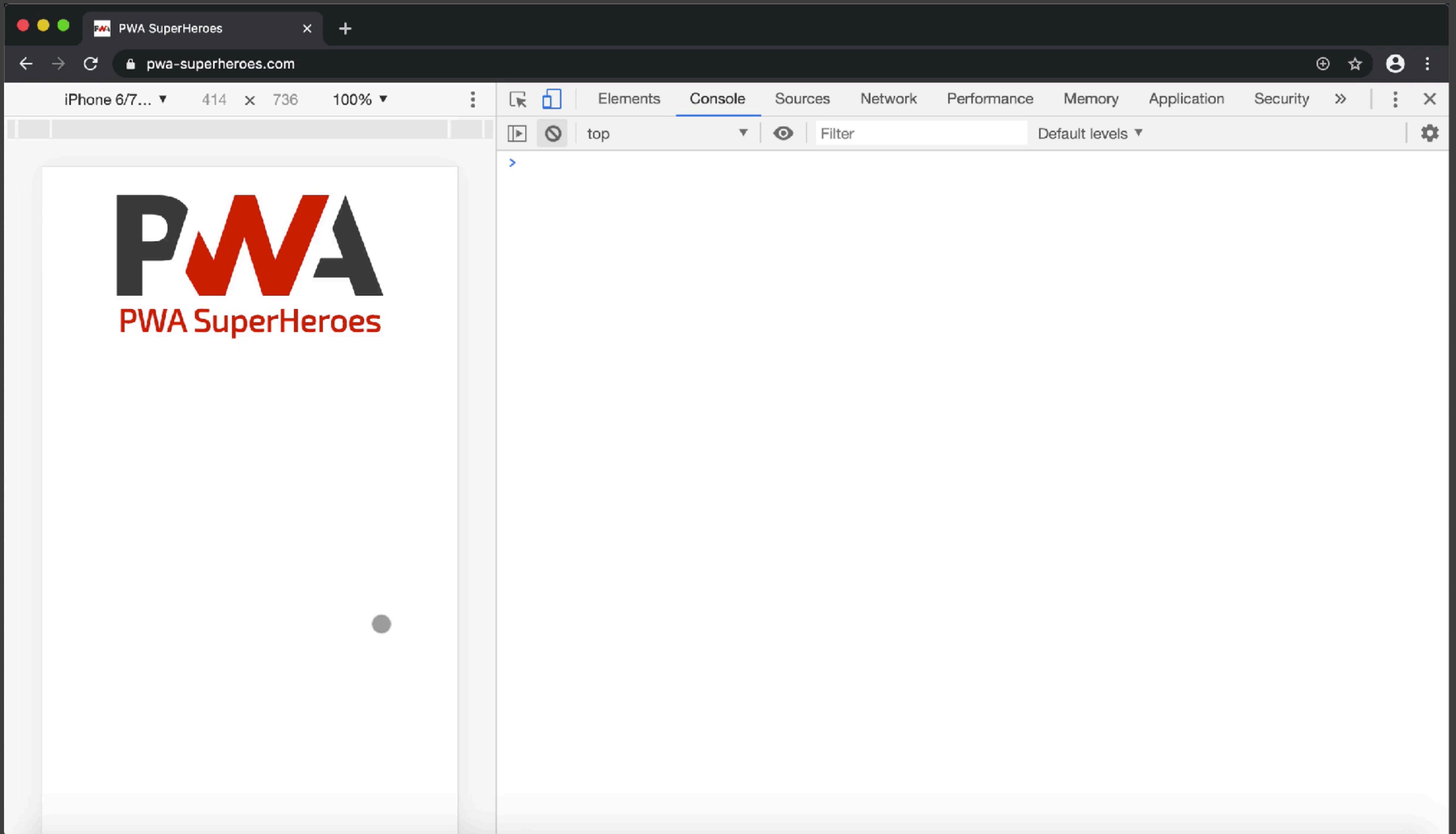

```
// a2hs.js

let deferredPrompt;
const btnInstall = document.getElementById("btnInstall");

window.addEventListener("beforeinstallprompt", event => {
  console.log("beforeinstallprompt fired");
  // prevent showing dialog
  event.preventDefault();
  deferredPrompt = event;
  // show button to install PWA
  btnInstall.classList.add("show");
  return false;
});
```

// a2hs.js

```
btnInstall.addEventListener("click", () => {  
  if (deferredPrompt) {  
    // show native dialog  
    deferredPrompt.prompt();  
    // act on user choice  
    deferredPrompt.userChoice.then(choiceResult => {  
      if (choiceResult.outcome === "dismissed") {  
        console.log("User cancelled installation");  
      } else {  
        console.log("User added to home screen");  
        // hide button to install PWA  
        btnInstall.classList.remove("show");  
        deferredPrompt = null;  
      }  
    });  
  }  
});
```







Service Workers

Service Workers

- JavaScript file
- runs in the background in a separate thread; non-blocking
- scoped to a website
- can't modify page; no access to DOM
- asynchronous; promises or async/await
- event driven

Man-in-the-middle



Marvel-in-the-middle



```
// sw.js

self.addEventListener("install", event => {
  console.log("[Service Worker] Installing Service Worker ...", event);
});

self.addEventListener("activate", event => {
  console.log("[Service Worker] Activating Service Worker ...", event);
  // ensure that the Service Worker is activated correctly (fail-safe)
  return self.clients.claim();
});
```

```
// app.js

// check for modern browser
if ("serviceWorker" in navigator) {
  navigator.serviceWorker
    .register("/sw.js")
    .then(() => {
      console.log("Service Worker registered!");
    })
    .catch(err => {
      console.log(err);
    });
}
```



```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="UTF-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
    <meta http-equiv="X-UA-Compatible" content="ie=edge" />
    <title>PWA SuperHeroes</title>
    <link rel="icon" type="image/png" href="favicon.png" />
    <link rel="stylesheet" href="css/app.css" />
    <link rel="manifest" href="manifest.json" />
    <script src="js/app.js"></script>
  </head>
  <body>
    <header>
      
      <h1>PWA SuperHeroes</h1>
    </header>
  </body>
</html>
```



PWA SuperHeroes

x

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←

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↺

127.0.0.1:8080

☆

👤

Updaten

⋮

iPhone 6/7...414 x 736100%

🔍📄

Elements

Console

Sources

Network

Performance

Memory

Application

Security

»

⋮

✕

Application

📄 Manifest

⚙️ Service Workers

🗑️ Clear storage

Storage

▶️ 🗄️ Local Storage

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↕️ Background Fetch

🔄 Background Sync

🔔 Notifications

💰 Payment Handler

☁️ Push Messaging

Frames

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App Manifest

[manifest.json](#)

Installability

⚠️ No matching service worker detected. You may need to reload the page, or check that the service worker

Identity

NamePWA Superheroes

Short namePWAS

Presentation

Start URL/

Theme color■ #DF2305

Background color■ #3D3D3D

Orientationportrait

Displaystandalone

Icons

192x192

image/png



Cache API

PWA SuperHeroes

×

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←

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127.0.0.1:8080

☆

👤

Updaten

⋮

iPhone 6/7...

▼

414 × 736

87%

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⋮

🖱️

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✕

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🔍

🔍

☐ Preserve log

☒ Disable cache

Online

▼

⬆️

⬇️

⚙️

Filter

☐ Hide data URLs

All

XHR

JS

CSS

Img

Media

Font

Doc

WS

Manifest

Other

10 ms

20 ms

30 ms

40 ms

50 ms

60 ms

70 ms

80 ms

90 ms

100 ms

110 ms

Recording network activity...

Perform a request or hit ⌘ R to record the reload.

[Learn more](#)



```
// sw.js

self.addEventListener("install", event => {
  // without waiting the SW will continue without caching
  event.waitUntil(
    // opens the existing `static` cache or creates it
    caches.open("static").then(cache => {
      console.log("[Service Worker] Precaching Files");
      cache.add("/");
      cache.add("index.html");
      cache.add("css/app.css");
      cache.add("fonts/exo2.woff2");
      cache.add("js/app.js");
      cache.add("img/pwa.svg");
      cache.add("favicon.png");
      cache.add("manifest.json");
      cache.add("manifest-icon-192.png");
    })
  );
});
```


// sw.js

```
const STATIC_CACHE = "static-v1";  
const STATIC_FILES = ["/", "index.html", "css/app.css",  
    "fonts/exo2.woff2", "js/app.js",  
    "img/pwa.svg", "favicon.png",  
    "manifest.json", "manifest-icon-192.png"];
```

```
self.addEventListener("install", event => {  
    event.waitUntil(  
        caches.open(STATIC_CACHE).then(cache => {  
            cache.addAll(STATIC_FILES);  
        })  
    );  
});
```

PWA SuperHeroes

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127.0.0.1:8080

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iPhone 6/7... ▾

414 × 736

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Service Workers

☐ Offline ☐ Update on reload ☐ Bypass for network

http://127.0.0.1:8080/

[Update](#) [Unregister](#)

Source [sw.js](#)

Received 10-10-2019 20:33:19

Status ● #26 activated and is running [stop](#)

Clients [http://127.0.0.1:8080/](#) [focus](#)

Push [Push](#)

Sync [Sync](#)







Fetch API




```
// sw.js

self.addEventListener("fetch", event => {
  event.respondWith(
    // look at all caches for a match on the key (= request)
    caches
      .match(event.request)
      // you will always get a response; null if not found
      .then(response => {
        if (response) {
          // if found: return from cache
          return response;
        } else {
          // fetch it from the server
          return fetch(event.request);
        }
      })
  );
});
```

PWA SuperHeroes

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127.0.0.1:8080

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iPhone 6/7... ▾

414 × 736

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Cache

▶️ 🗄️ Cache Storage

🗄️ Application Cache

Background Services

↕️ Background Fetch

🔄 Background Sync

🔔 Notifications

💳 Payment Handler

☁️ Push Messaging

Frames

▶️ 🖼️ top

Service Workers

☐ Offline ☐ Update on reload ☐ Bypass for network

http://127.0.0.1:8080/

[Update](#) [Unregister](#)

Source

[sw.js](#)

Received

10-10-2019 20:34:50

Status

● #27 activated and is running [stop](#)

Clients

http://127.0.0.1:8080/ [focus](#)

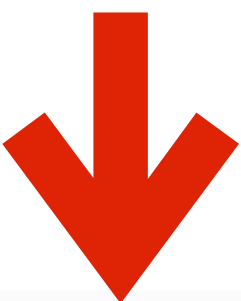
Push

[Push](#)

Sync

[Sync](#)

SPEED !!!







Cache Cleanup

...

```
<main>
```

```
  <button id="btnInstall" class="hide">Add to Home screen</button>
```

```
  <a href="about.html">about</a>
```

```
</main>
```

...

```
// about.html
```

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
  <head>
```

```
    ...
```

```
  </head>
```

```
  <body>
```

```
    <header>
```

```
      ...
```

```
    </header>
```

```
    <main>
```

```
      <p>This is a demo website for a Progressive Web App  
      talk by Rowdy Rabouw.</p>
```

```
      <a href="https://rowdy.codes" target="_blank">more info</a>
```

```
    </main>
```

```
  </body>
```

```
</html>
```




```
a, p {  
  color: #3d3d3d;  
  font-family: "Exo 2", sans-serif;  
  font-size: 20px;  
  text-decoration-color: #df2305;  
}
```

// sw.js

```
const STATIC_CACHE = "static-v2";  
const STATIC_FILES = ["/", "index.html", "css/app.css",  
  "fonts/exo2.woff2", "js/app.js",  
  "img/pwa.svg", "favicon.png",  
  "manifest.json", "manifest-icon-192.png"];
```






```
// sw.js

self.addEventListener("activate", event => {
  event.waitUntil(
    // will return an array of cache names
    caches.keys().then(keys => {
      return Promise.all(
        // go over all available keys
        keys.map(key => {
          if (key !== STATIC_CACHE) {
            return caches.delete(key);
          }
        })
      );
    })
  );
  return self.clients.claim();
});
```



Dynamic Caching


```
// sw.js
```

```
const DYNAMIC_CACHE = "dynamic-v1";  
const STATIC_CACHE = "static-v3";  
const STATIC_FILES = ["/", "index.html", "css/app.css",  
    "fonts/exo2.woff2", "js/app.js",  
    "js/a2hs.js", "img/pwa.svg",  
    "favicon.png", "manifest.json",  
    "manifest-icon-192.png"];
```

```
// sw.js
```

```
self.addEventListener("fetch", event => {  
  event.respondWith(  
    caches.match(event.request).then(response => {  
      if (response) { return response; }  
      else {  
        return fetch(event.request);  
      }  
    })  
  );  
});
```


// sw.js

```
self.addEventListener("fetch", event => {  
  event.respondWith(  
    caches.match(event.request).then(response => {  
      if (response) { return response; }  
      else {  
        return (  
          fetch(event.request).then(res => {  
            return caches.open(DYNAMIC_CACHE).then(cache => {  
              cache.put(event.request.url, res.clone());  
              return res;  
            });  
          });  
        );  
      }  
    })  
  );  
});
```

// sw.js

```
self.addEventListener("activate", event => {  
  event.waitUntil(  
    caches.keys().then(keys => {  
      return Promise.all(  
        keys.map(key => {  
          if (key !== STATIC_CACHE) {  
            return caches.delete(key);  
          }  
        })  
      );  
    })  
  );  
  return self.clients.claim();  
});
```

// sw.js

```
self.addEventListener("activate", event => {
  event.waitUntil(
    caches.keys().then(keys => {
      return Promise.all(
        keys.map(key => {
          if (key !== STATIC_CACHE && key !== CACHE_DYNAMIC_NAME) {
            return caches.delete(key);
          }
        })
      );
    })
  );
  return self.clients.claim();
});
```


PWA SuperHeroes

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←

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🔒 pwa-superheroes.com

🔗

☆

👤

⋮

iPhone 6/7... 414 x 736 100% ⌵

🖼️ 📄

Elements

Console

Sources

Network

Performance

Memory

Application

Security

⋮

✕

🔴

🚫

🔍

🔍

⏻ Preserve log

✅ Disable cache

Online ⌵

⬆️

⬇️

⚙️

Filter

⏻ Hide data URLs

All

XHR

JS

CSS

Img

Media

Font

Doc

WS

Manifest

Other

20 ms

40 ms

60 ms

80 ms

100 ms

120 ms

1

Name	Status	Type	Initiator	Size	Time	Waterfall
📄 pwa-superheroes.com	200	document	Other	(ServiceWorker)	9 ms	
📄 app.css	200	stylesheet	(index)	(ServiceWorker)	26 ms	
📄 app.js	200	script	(index)	(ServiceWorker)	25 ms	
📄 a2hs.js	200	script	(index)	(ServiceWorker)	68 ms	
📄 pwa.svg	200	svg+xml	(index)	(ServiceWorker)	25 ms	
⚙️ a2hs.js	200	fetch	sw.js:30	516 B	33 ms	
📄 manifest.json	200	manifest	Other	(ServiceWorker)	5 ms	
📄 favicon.png	200	png	Other	(ServiceWorker)	5 ms	
📄 manifest-icon-192.png	200	png	Other	(ServiceWorker)	7 ms	

9 requests

516 B transferred

29.0 KB resources

Finish: 115 ms

DOMContentLoaded: 94 ms

Load: 93 ms

PWA

PWA SuperHeroes

[about](#)



Offline Fallback

PWA SuperHeroes

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Elements

Console

Sources

Network

Performance

Memory

Application

Security

»

⋮

✕

Application

📄 Manifest

⚙️ Service Workers

🗑️ Clear storage

Storage

▶ 🗄️ Local Storage

▶ 🗄️ Session Storage

🗄️ IndexedDB

🗄️ Web SQL

▶ 🍪 Cookies

Cache

▼ 🗄️ Cache Storage

🗄️ static-v3 - https://pwa-superheroes.com/

🗄️ Application Cache

Background Services

↕️ Background Fetch

🔄 Background Sync

🔔 Notifications

💳 Payment Handler

☁️ Push Messaging

Frames

▶ 🖼️ top

Service Workers

☐ Offline ☐ Update on reload ☐ Bypass for network

https://pwa-superheroes.com/

[Update](#) [Unregister](#)

Source [sw.js](#) 15

Received 4-11-2019 14:29:59

Status ● #60 activated and is running [stop](#)

Clients [https://pwa-superheroes.com/](#) [focus](#)

Push [Push](#)

Sync [Sync](#)

▶ Service workers from other origins

PWA

PWA SuperHeroes

[about](#)

```
// offline.html

<!DOCTYPE html>
<html lang="en">
  <head>
    ...
  </head>
  <body>
    <header>
      ...
    </header>
    <main>
      <p><b>We're sorry, this page hasn't been cached yet :-( </b></p>
      <p>But why don't you try one of our <a href="/">other pages</a>?</p>
    </main>
  </body>
</html>
```

```
// sw.js
```

```
const DYNAMIC_CACHE = "dynamic-v1";  
const STATIC_CACHE = "static-v4";  
const STATIC_FILES = ["/", "index.html", "offline.html",  
  "css/app.css", "fonts/exo2.woff2",  
  "js/app.js", "js/a2hs.js", "img/pwa.svg",  
  "favicon.png", "manifest.json",  
  "manifest-icon-192.png"];
```



```
// sw.js
```

```
self.addEventListener("fetch", event => {  
  event.respondWith(  
    caches.match(event.request).then(response => {  
      if (response) { return response; }  
      else {  
        return (  
          fetch(event.request).then(res => {  
            return caches.open(DYNAMIC_CACHE).then(cache => {  
              cache.put(event.request.url, res.clone());  
              return res;  
            });  
          });  
        );  
      }  
    })  
  );  
});
```

```
// sw.js

...
return fetch(event.request)
  .then(res => {
    ...
  })
  .catch(err => {
    return caches.open(STATIC_CACHE).then(cache => {
      return cache.match("/offline.html");
    });
  });
...

```



```
// sw.js

...
return fetch(event.request)
  .then(res => {
    ...
  })
  .catch(err => {
    return caches.open(STATIC_CACHE).then(cache => {
      if (event.request.headers.get("accept").includes("text/html")) {
        return cache.match("/offline.html");
      }
    });
  });
...

```

PWA SuperHeroes

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🔗

☆

👤

⋮

iPhone 6/7... ▾414 x 736100% ▾⋮

Application

Manifest

⚙️ Service Workers

🗑️ Clear storage

Storage

▶️ 🗄️ Local Storage

▶️ 🗄️ Session Storage

🗄️ IndexedDB

🗄️ Web SQL

▶️ 🍪 Cookies

Cache

▼ 🗄️ Cache Storage

🗄️ static-v3 - https://pwa-superheroes.com/

🗄️ Application Cache

Background Services

↕️ Background Fetch

🔄 Background Sync

🔔 Notifications

💳 Payment Handler

☁️ Push Messaging

Frames

▶️ 🖼️ top

Service Workers

☐ Offline☐ Update on reload☐ Bypass for network

https://pwa-superheroes.com/

UpdateUnregister

Source

sw.js 18

Received

4-11-2019 14:29:59

Status

🟢 #60 activated and is running

stop

Clients

https://pwa-superheroes.com/

focus

Push

Test push message from DevTools.

Push

Sync

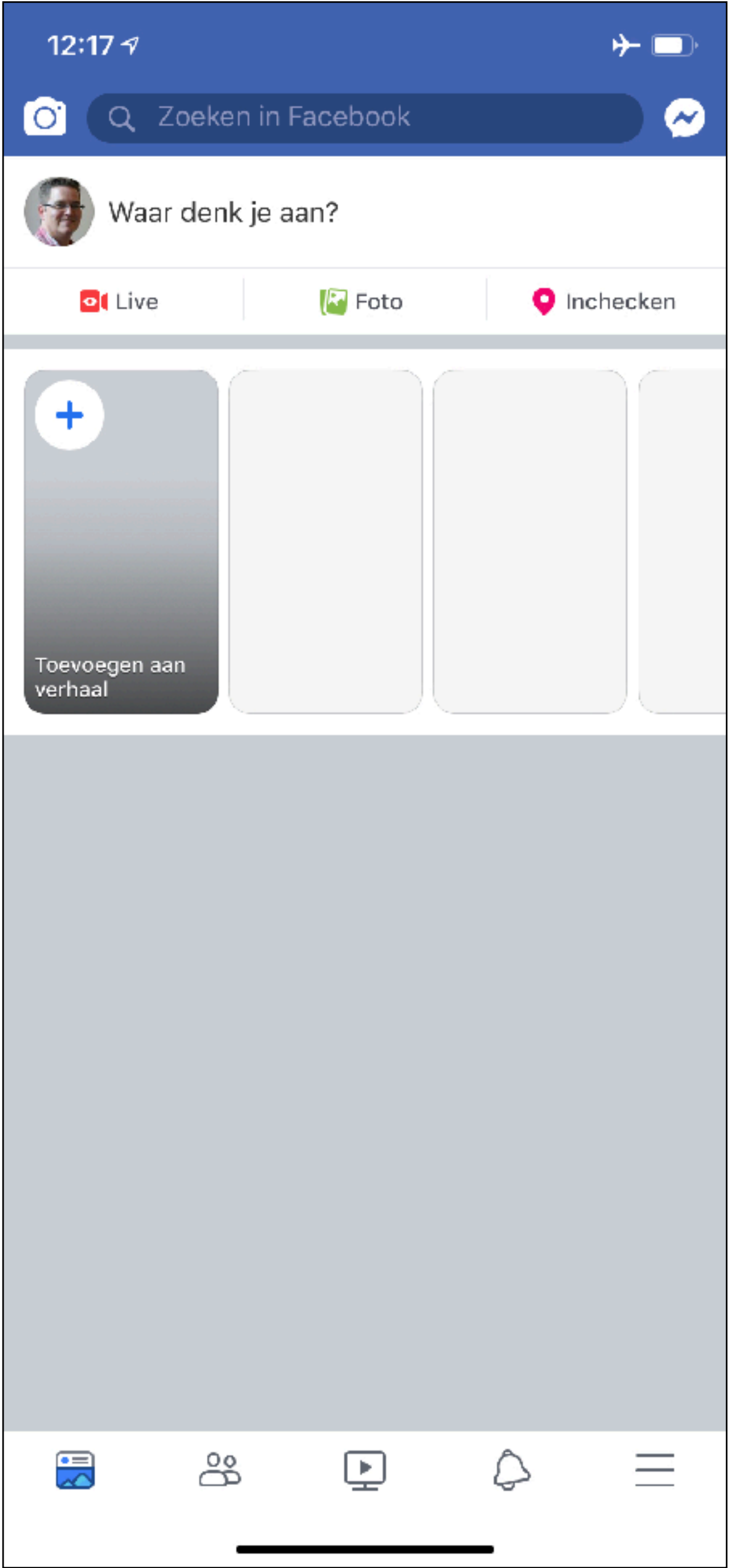
test-tag-from-devtools

Sync

▶️ Service workers from other origins



Application Shell



```
...
<main>
  <button id="btnInstall" class="hide">Add to Home screen</button>
  <a href="about.html">about</a>
  <div class="container">
    <div class="placeholder">
      <h2 id="name">&nbsp;</h2>
    </div>
    <div class="placeholder">
      <p id="details">&nbsp;<br />&nbsp;</p>
    </div>
    <div class="placeholder img-placeholder" id="image"></div>
  </div>
</main>
...
```



```
h2 {  
  font-family: "Exo 2", sans-serif;  
  margin-bottom: 0;  
}  
  
.container {  
  width: 240px;  
  margin: auto;  
}  
  
.placeholder {  
  background-color: #f3f3f3;  
  margin-bottom: 10px;  
  animation: colorchange 2.5s cubic-bezier(0.36, 0.07, 0.19, 0.97) both;  
  animation-iteration-count: infinite;  
}
```

```
.img-placeholder {  
  height: 320px;  
}  
  
img {  
  max-width: 100%;  
  border-top-left-radius: 70px;  
  border-bottom-right-radius: 70px;  
}  
  
@keyframes colorchange {  
  0% { background: #f3f3f3; }  
  50% { background: #d1d1d1; }  
  100% { background: #f3f3f3; }  
}
```

```
// sw.js
```

```
const STATIC_CACHE = "static-v5";
```






Dynamic Data

```
// api.js
```

```
const url = "https://www.superheroapi.com/api.php/3251184438288441/213";
```

```
fetch(url)
  .then(res => {
    return res.json();
  })
  .then(data => {
    console.log("Retrieved from web", data);
    updateUI("web", data);
  });
```



```
// api.js
```

```
function updateUI(updateBy, data) {  
  console.log(`Update UI by ${updateBy}`);  
  document.getElementById("name").innerHTML = data.name;  
  const details = `${data.biography["full-name"]}, ${data.biography["place-  
of-birth"]}<br/>${data.appearance.height[1]} / ${data.appearance.weight[1]}  
`;  
  document.getElementById("details").innerHTML = details;  
  document.getElementById("image").innerHTML = ``;  
  const all = document.getElementsByClassName("placeholder");  
  for (let i = 0; i < all.length; i++) {  
    all[i].style.backgroundColor = "transparent";  
    all[i].style.animation = "none";  
  }  
}
```

```
<!DOCTYPE html>
<html lang="en">
  <head>
    ...
    <script defer src="js/api.js"></script>
  </head>
  <body>
    ...
  </body>
</html>
```

```
// sw.js
```

```
const STATIC_CACHE = "static-v6";  
const STATIC_FILES = ["/", "index.html", "offline.html", "css/app.css",  
  "fonts/exo2.woff2", "js/app.js", "js/a2hs.js",  
  "js/api.js", "img/pwa.svg", "favicon.png",  
  "manifest.json", "manifest-icon-192.png"];
```






IndexedDB

IndexedDB

An asynchronous transactional key-value database in the browser for data that changes frequently and is typically in JSON format.

Transactional means that if one of the actions within an operation fails, none of those actions are applied to keep database integrity.



jakearchibald / idb

Notifications

Star

3.8k

Fork

286

Code

Issues 6

Pull requests

Actions

Projects

Wiki

Security

Insights

main

2 branches

32 tags

Go to file

Code



jakearchibald 6.1.2

303fa24 12 days ago 158 commits



.github/ISSUE_TEMPLATE

Update issue templates

8 months ago



build

Changing KnownKeys to be compatible with more TS versions. Fixes ...

12 days ago



lib

Updating dependencies and formatting

21 days ago



src

Changing KnownKeys to be compatible with more TS versions. Fixes ...

12 days ago



test

Updating dependencies and formatting

21 days ago



.gitignore

Better build system & updated dependencies

17 months ago



.prettierrc.json

Prettier

2 years ago



LICENSE

Update license to be inline with package.json

5 years ago



README.md

Updating documentation for methods that are now supported by Edg...

15 days ago



changes.md

Rebuild

5 months ago



generic-tsconfig.json

Better errors from shortcut methods (#181)

13 months ago



package-lock.json

6.1.2

12 days ago



package.json

6.1.2

12 days ago



rollup.config.js

Keep iife small

5 months ago



tsconfig.json

Better errors from shortcut methods (#181)

13 months ago

About

IndexedDB, but with promises

www.npmjs.com/package/idb

Readme

ISC License

Releases

32 tags

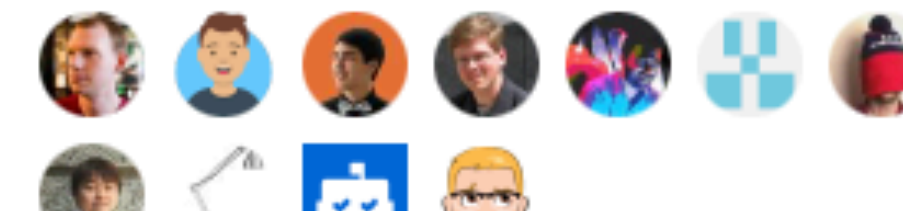
Packages

No packages published

Used by 148k

147,575

Contributors 24





```
<!DOCTYPE html>
<html lang="en">
  <head>
    ...
    <script src="idb.js"></script>
    <script src="utils.js"></script>
  </head>
  <body>
    ...
  </body>
</html>
```

```
// sw.js
```

```
importScripts("idb.js");  
importScripts("utils.js");
```

```
const DYNAMIC_CACHE = "dynamic-v1";  
const STATIC_CACHE = "static-v7";  
const STATIC_FILES = ["/", "index.html", "offline.html", "css/app.css",  
    "idb.js", "utils.js", "fonts/exo2.woff2", "js/app.js",  
    "js/a2hs.js", "js/api.js", "img/pwa.svg",  
    "favicon.png", "manifest.json", "manifest-icon-192.png"];
```


// utils.js

```
const DYNAMIC_DB = "dynamic";
const DYNAMIC_DB_VERSION = 1;
const DYNAMIC_DB_STORE = "heroes";
const API_URL = "https://www.superheroapi.com/api.php/3251184438288441/213";

// open database and get a callback after it is opened
const IDB = idb.open(DYNAMIC_DB, DYNAMIC_DB_VERSION, db => {
  // create a store if it doesn't exist already
  if (!db.objectStoreNames.contains(DYNAMIC_DB_STORE)) {
    // name the store and set the primary key
    db.createObjectStore(DYNAMIC_DB_STORE, { keyPath: "id" });
  }
});
```

```
// utils.js
```

```
function writeData(storeName, data) {  
  console.log("Write data to cache", data);  
  return IDB.then(db => {  
    const tx = db.transaction(storeName, "readwrite");  
    const store = tx.objectStore(storeName);  
    store.put(data);  
    return tx.complete;  
  });  
}
```

```
// utils.js
```

```
function clearAllData(storeName) {  
  return IDB.then(db => {  
    const tx = db.transaction(storeName, "readwrite");  
    const store = tx.objectStore(storeName);  
    store.clear();  
    return tx.complete;  
  });  
}
```



```
// utils.js
```

```
function readAllData(storeName) {  
  return IDB.then(db => {  
    const tx = db.transaction(storeName, "readonly");  
    const store = tx.objectStore(storeName);  
    return store.getAll();  
  });  
}
```

```
// sw.js
```

```
self.addEventListener("fetch", event => {  
  if (event.request.url.indexOf(API_URL) > -1) {  
    event.respondWith(  
      fetch(event.request).then(res => {  
        const clonedRes = res.clone();  
        clearAllData(DYNAMIC_DB_STORE)  
          .then(() => {  
            return clonedRes.json();  
          })  
          .then(data => {  
            writeData(DYNAMIC_DB_STORE, data);  
          });  
        return res;  
      })  
    );  
  }  
});
```

```
// sw.js
```

```
self.addEventListener("fetch", event => {  
  if (event.request.url.indexOf(API_URL) > -1) {  
    ...  
  } else {  
    event.respondWith(  
      caches.match(event.request).then(response => {  
        ...  
      })  
    );  
  }  
});
```



```
// api.js
```

```
const url = "https://www.superheroapi.com/api.php/3251184438288441/213";  
let networkDataReceived = false;
```

```
fetch(API_URL)  
  .then(res => {  
    return res.json();  
  })  
  .then(data => {  
    networkDataReceived = true;  
    console.log("Retrieved from web", data);  
    updateUI("web", data);  
  });
```

```
// api.js
```

```
readAllData(DYNAMIC_DB_STORE).then(data => {  
  if (!networkDataReceived) {  
    console.log("Retrieved from cache", data[0]);  
    if (typeof data[0] !== "undefined") {  
      updateUI("cache", data[0]);  
    }  
  }  
});
```





New version available!

```
<div id="snackbar">A new version of this app is available.  
Click here to update.</div>
```

```
#snackbar {  
  visibility: hidden;  
  background-color: #e02205;  
  color: #ffffff;  
  text-align: center;  
  padding: 16px;  
  position: fixed;  
  z-index: 1;  
  left: 0;  
  top: 0;  
  font-family: "Exo 2", sans-serif;  
  font-size: 20px;  
  border: 3px solid #000000;  
}
```

```
#snackbar.show {  
  visibility: visible;  
}
```




```
// sw.js
```

```
const STATIC_CACHE = "static-v8";
```

```
self.addEventListener("message", event => {  
  if (event.data.action === "skipWaiting") {  
    self.skipWaiting();  
  }  
});
```

// app.js

```
let newWorker;
```

```
function showUpdateBar() {  
  let snackbar = document.getElementById("snackbar");  
  snackbar.className = "show";  
}
```

```
document.getElementById("snackbar").addEventListener("click", () => {  
  newWorker.postMessage({ action: "skipWaiting" });  
});
```

// app.js

```
navigator.serviceWorker
  .register("/sw.js")
  .then(reg => {
    reg.addEventListener("updatefound", () => {
      newWorker = reg.installing;
      newWorker.addEventListener("statechange", () => {
        switch (newWorker.state) {
          case "installed":
            if (navigator.serviceWorker.controller) {
              showUpdateBar();
            }
            break;
        }
      });
    });
  });
```




```
// app.js
```

```
navigator.serviceWorker.addEventListener("controllerchange", () => {  
  window.location.reload();  
});
```

PWA SuperHeroes

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⋮

iPhone 6/7... 414 x 736 100% ⋮

Application

Manifest

Service Workers

Clear storage

Storage

Local Storage

Session Storage

IndexedDB

Web SQL

Cookies

Cache

Cache Storage

Application Cache

Background Services

Background Fetch

Background Sync

Notifications

Payment Handler

Push Messaging

Frames

top

Service Workers

☐ Offline

☐ Update on reload

☐ Bypass for network

https://pwa-superheroes.com/

Update

Unregister

Source

sw.js

Received

8-11-2019 23:33:53

Status

●

#177 activated and is running

stop

Clients

https://pwa-superheroes.com/

focus

Push

Test push message from DevTools.

Push

Sync

test-tag-from-devtools

Sync

▶ Service workers from other origins

PWA

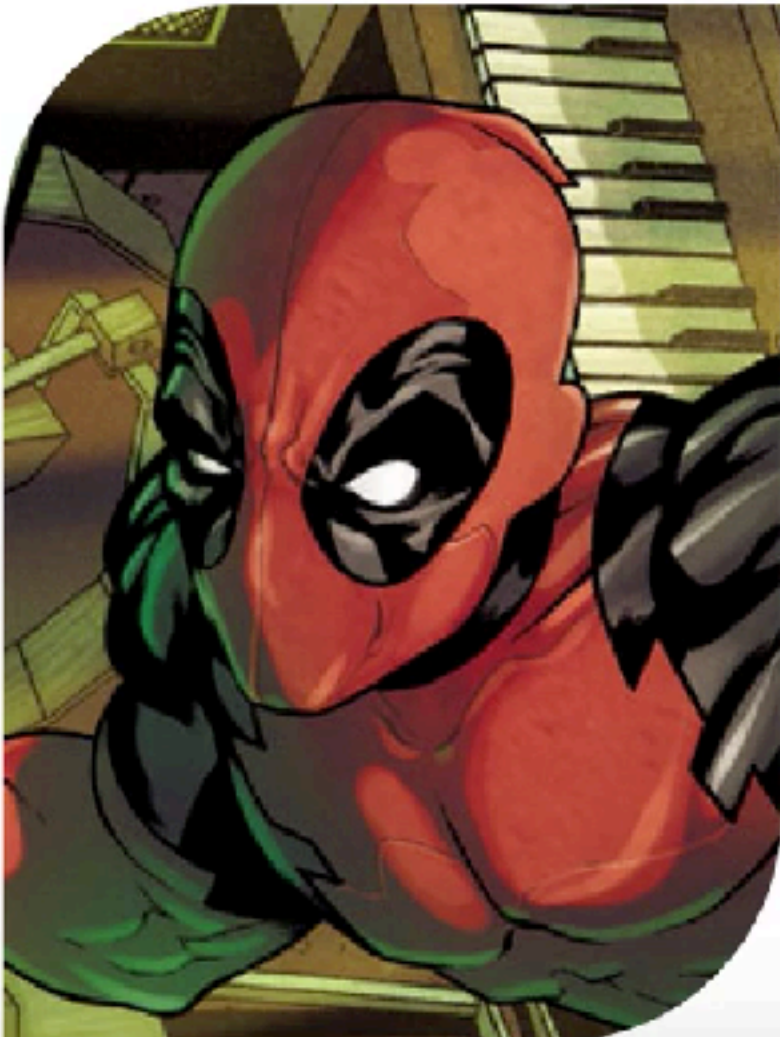
PWA SuperHeroes

about

Deadpool

Wade Wilson, Canada

188 cm / 95 kg





<https://developers.google.com/web/tools/workbox>

<https://rowdy.codes/devdays>

<https://github.com/rowdyraboutw/pwa-superheroes.com>



Background Sync API

- defer actions until the user has stable connectivity
- ensure that whatever the user wants to send is sent when they regain connectivity
- behaves similar to the outbox on an email client
- messages are queued up in the outbox (indexedDB) and as soon as there's a connection, they're sent
- make sure to notify the user

Can I use

? ⚙ Settings

x Feature: Background Sync API

#

Background Sync API - UNOFFUsage % of all users  ?
Global 73.09%

Provides one-off and periodic synchronization for Service Workers with an onsync event.

Current aligned

Usage relative

Date relative

Apply filters

Show all

?

IE	Edge *	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Opera Mobile *	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	QQ Browser	Baid Browser
			4-48		10-35								4		
6-10	12-17	2-69	49-77	3.1-12.1	36-63	3.2-12.4		2.1-4.4.4	12-12.1				5-9.2		
11	18	70	78	13	64	13.2	all	76	46	78	68	12.12	10.1	1.2	7.1
	76	71-72	79-81	TP											

Notes

Known issues (0)

Resources (7)

Feedback

MS Edge status: In Development

Firefox status: in-development

Periodic Sync API

- sync data on a regular basis; update the PWA
- while the user is sleeping for instance!
- PeriodicSync API will take into account the battery level and network state of the device it's running on
- powerState: 'auto' or 'avoid-draining'
- networkState: 'avoid-cellular'

Periodic Sync API

- sync data on a regular basis; update the PWA
- while the user is sleeping for instance!
- PeriodicSync API will take into account the battery level and network state of the device it's running on
- powerState: 'auto' or 'avoid-draining'
- networkState: 'avoid-cellular'

EXPERIMENTAL FEATURE

Can I use

?

Settings

x

Feature: (MDN feature)

#

ServiceWorkerRegistration API: periodicSync

Usage % of

all users

?

Global

0%

Current aligned

Usage relative

Date relative

Apply filters

Show all

?

IE	Edge	Firefox	Chrome	Safari	Opera	iOS Safari	Opera Mini	Android Browser	Opera Mobile	Chrome for Android	Firefox for Android	UC Browser for Android	Samsung Internet	QQ Browser	Baid Browser
6-10	12-17	2-69	4-77	3.1-12.1	10-63	3.2-12.4		2.1-4.4.4	12-12.1				4-9.2		
11	18	70	78	13	64	13.2	all	76	46	78	68	12.12	10.1	1.2	7.1
	76	71-72	79-81	TP											

Notes

Feedback

This feature is non-standard and **should not be used** without careful consideration.

See full reference on [MDN Web Docs](#).

Support data for this feature provided by:

MDN browser-compat-data