

PWA

PWA Fundamentals

websites with superpowers



Good morning!



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Rowdy Rabouw

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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*)

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June 28th - July 1st, 2021 | ONLINE
9 AM CEST - EUROPE | 3 AM EDT | 0 AM PDT

THE WORLD'S FLAGSHIP DEVELOPER CONFERENCE

The WeAreDevelopers World Congress is the world's largest annual gathering of software developers, engineers, software architects and tech decision-makers.

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FAQ





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

- index.html
- manifest.json
- package.json

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

package.json

```
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 3:41pm | 1 author (You)

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 ▲ 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"
    }
  ]
}
```

Browser window showing the Application tab for a PWA named "PWA SuperHeroes". The page displays the PWA logo and the Application Manifest details.



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

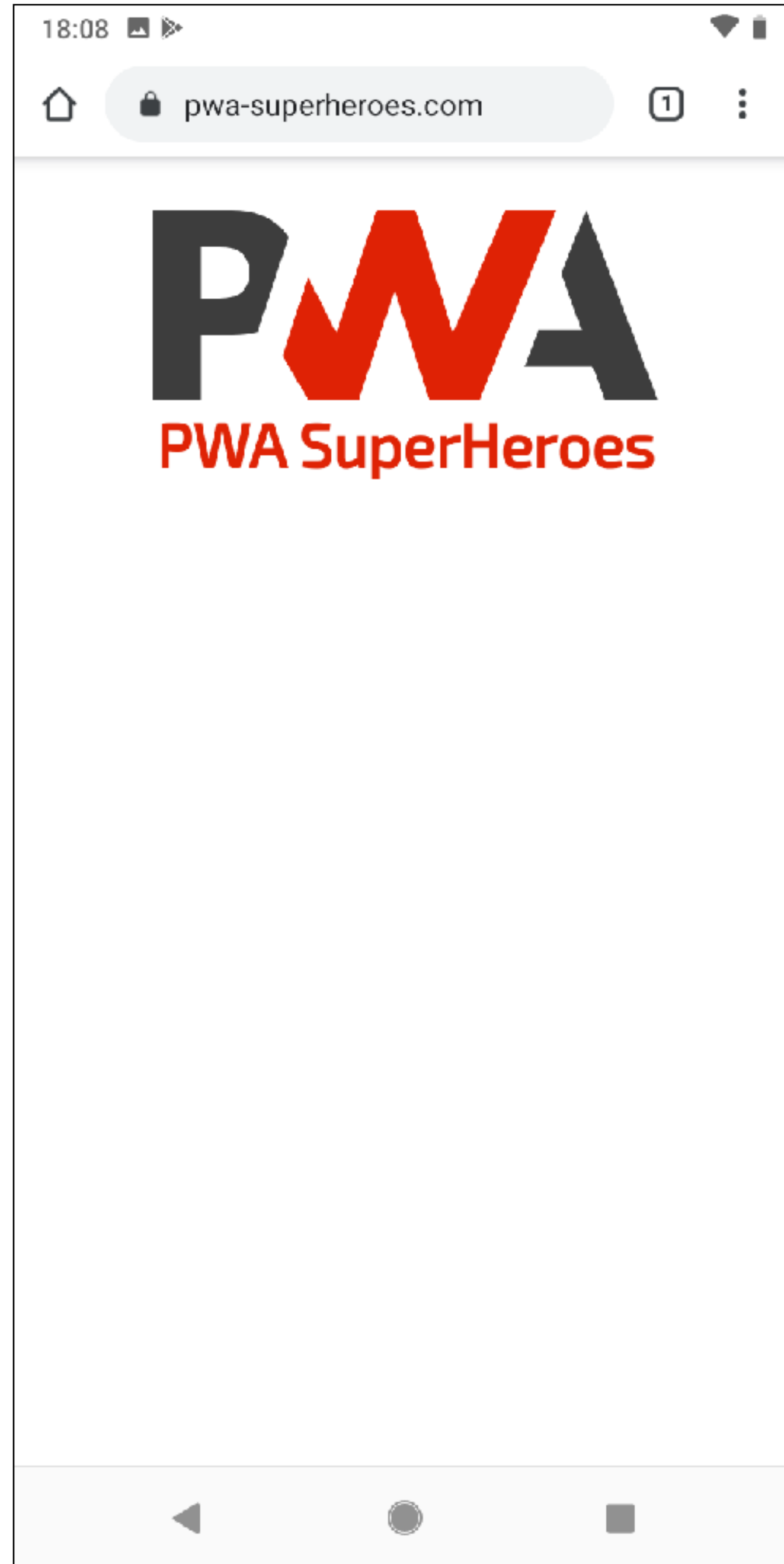
192x192
image/png



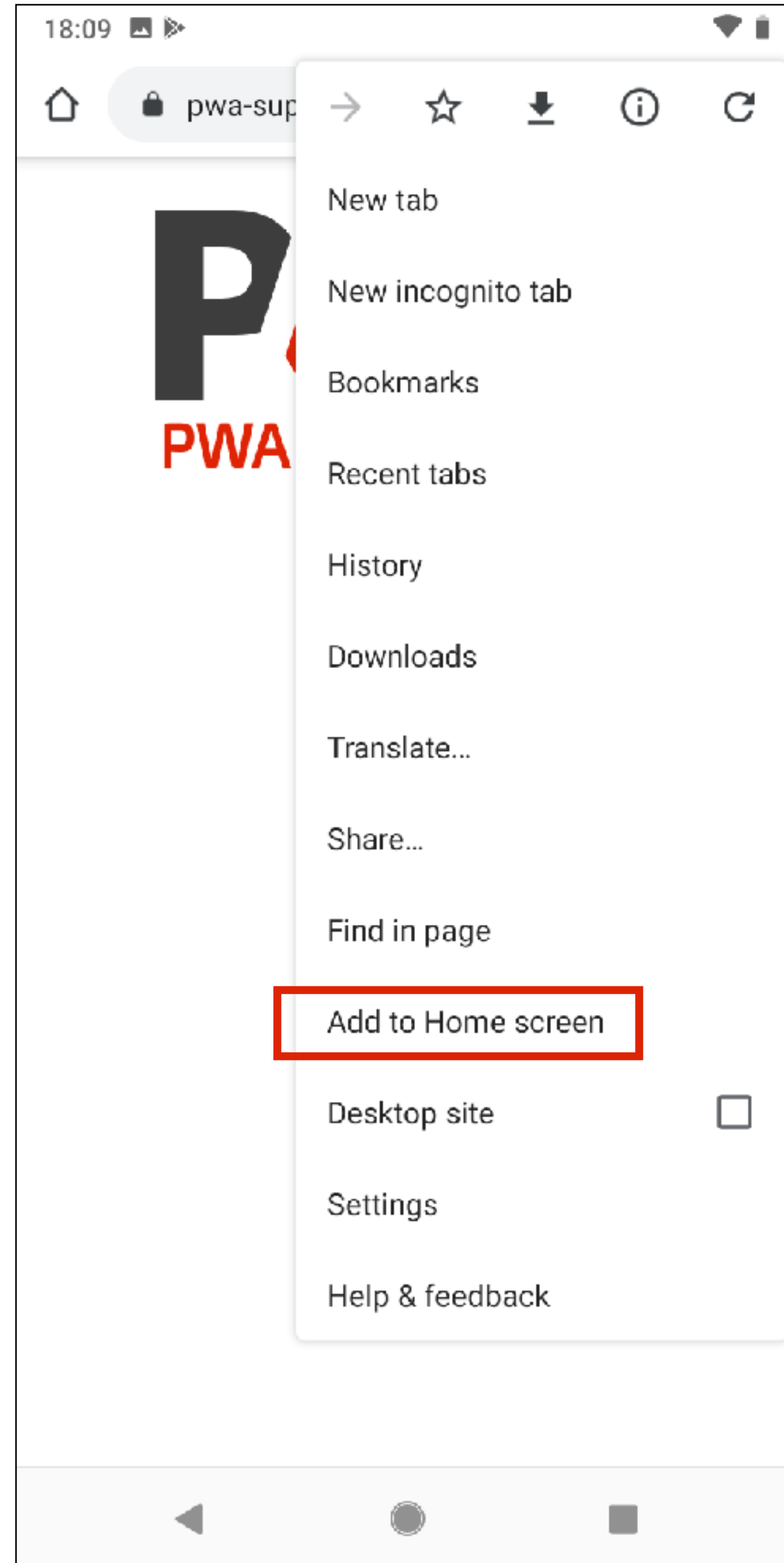
A2HS

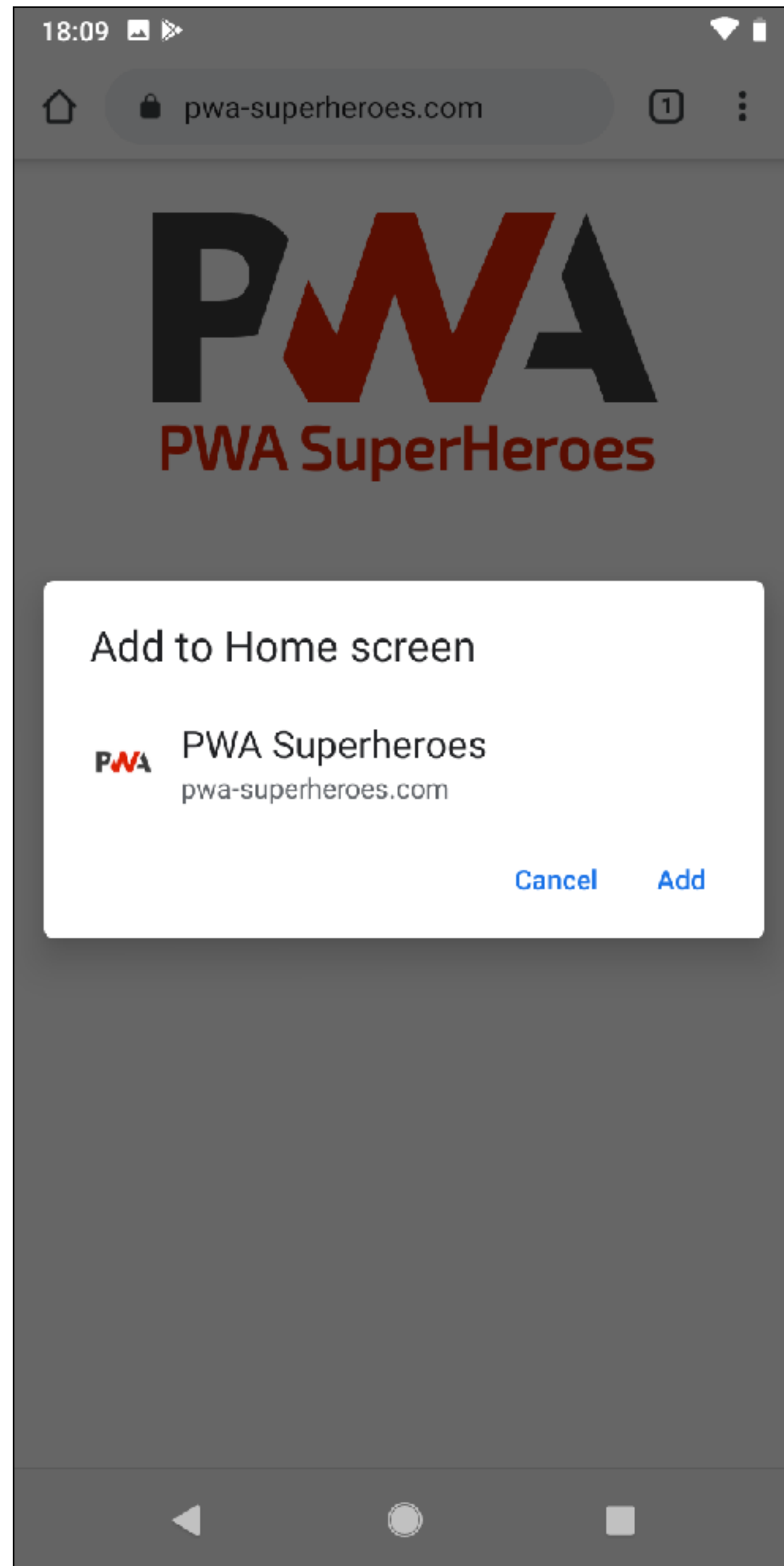
AZHS Criteria

- 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*

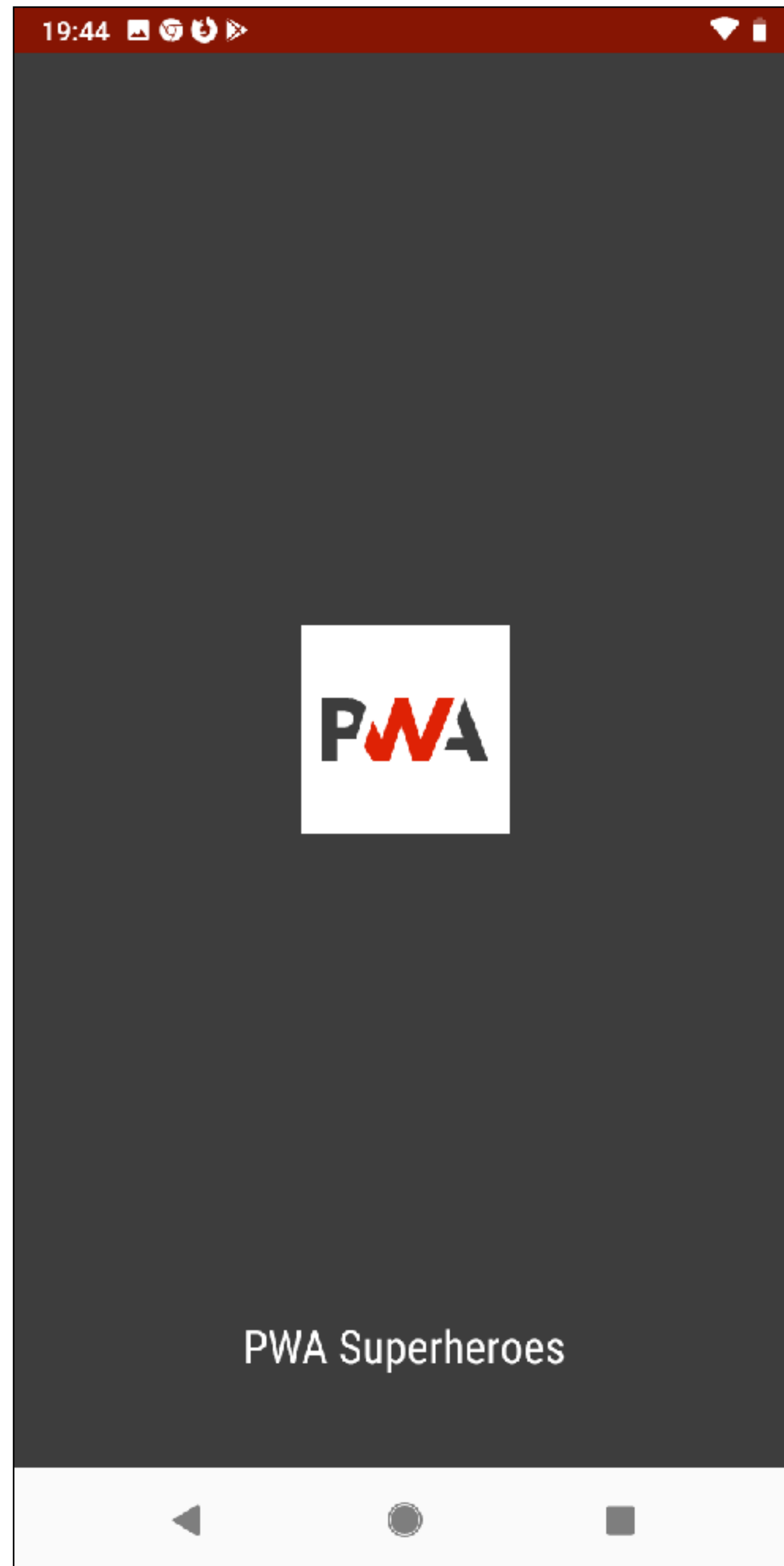


@rowdyrabouw

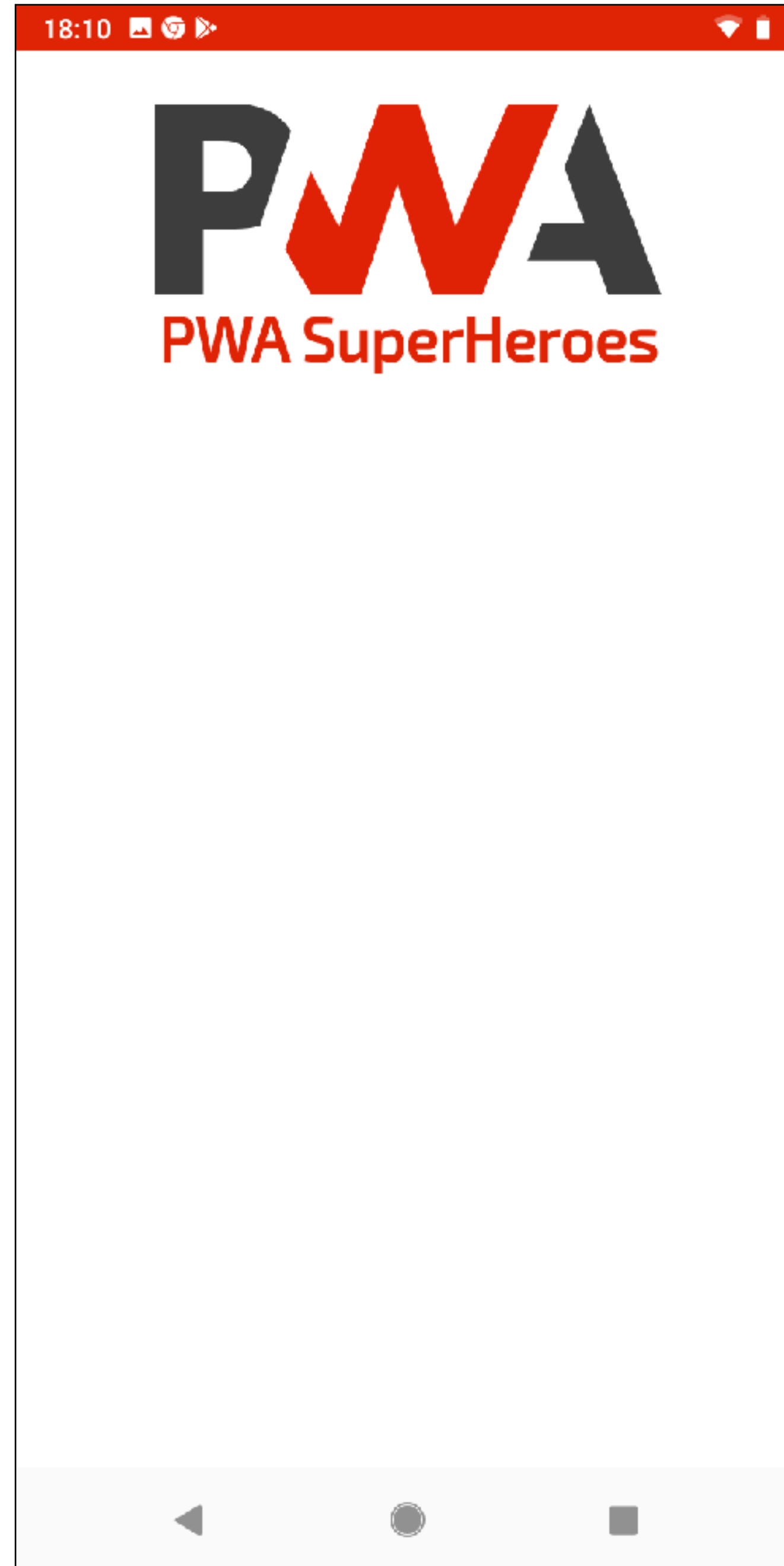




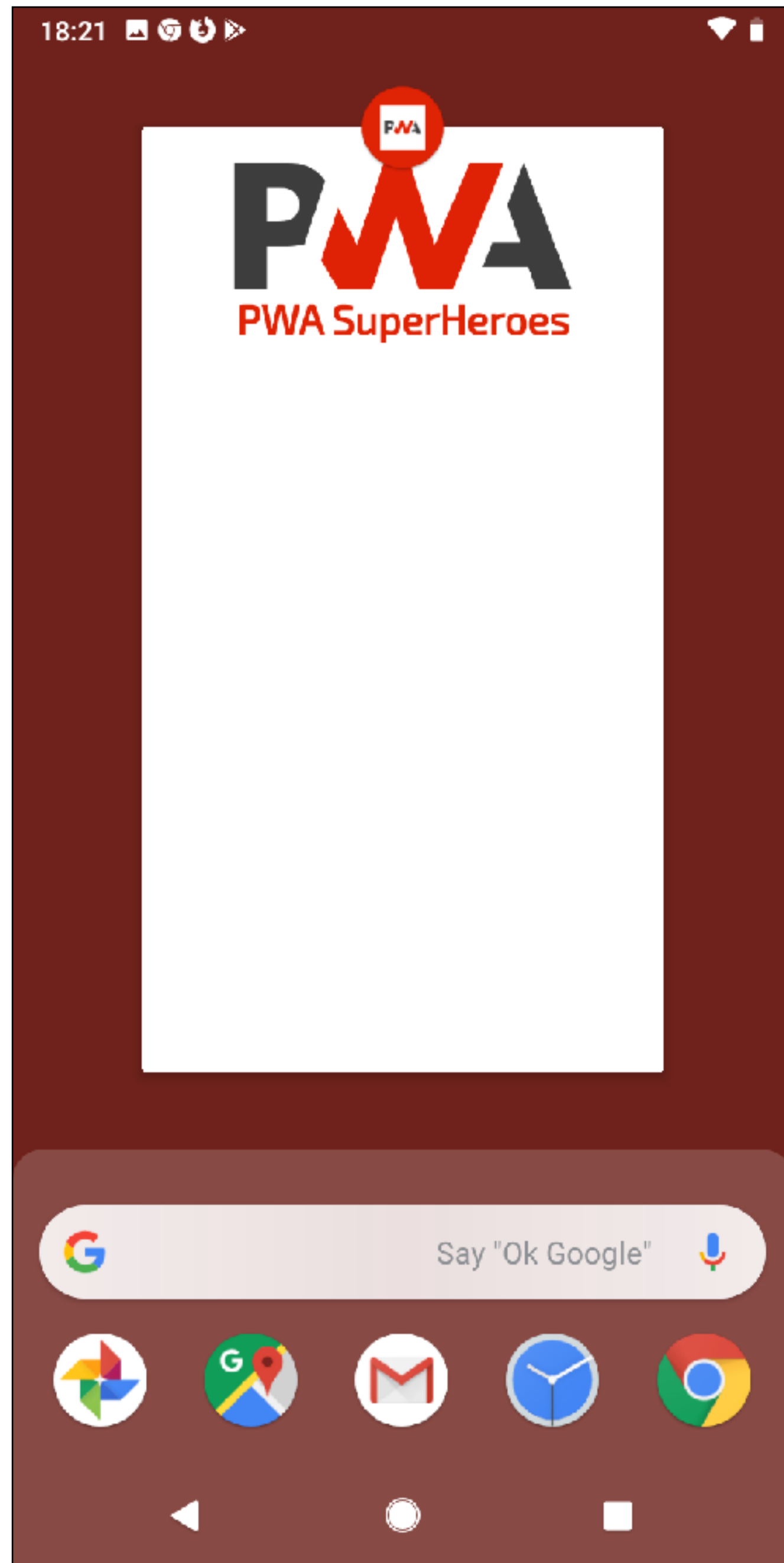




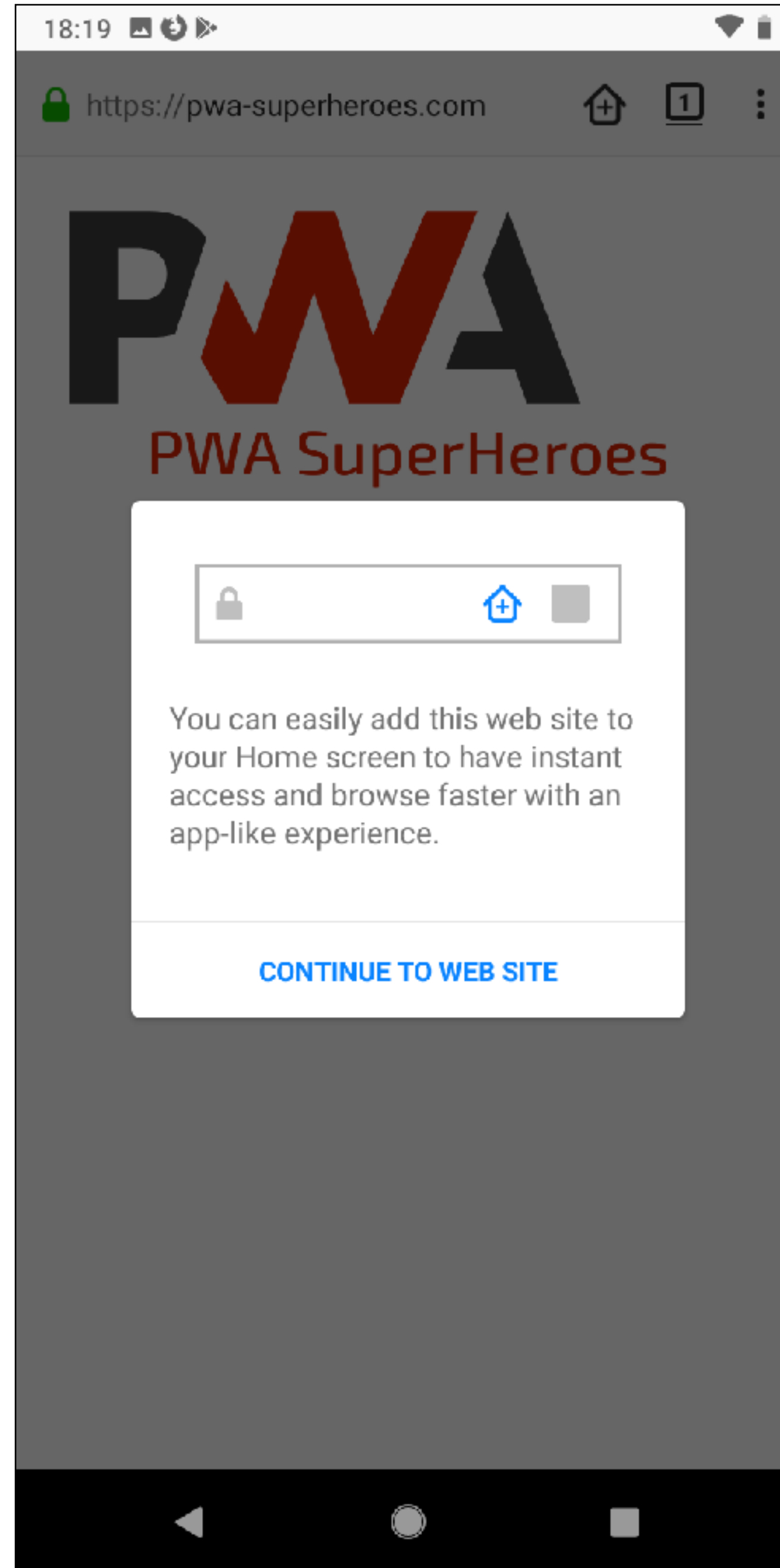
@rowdyrabouw

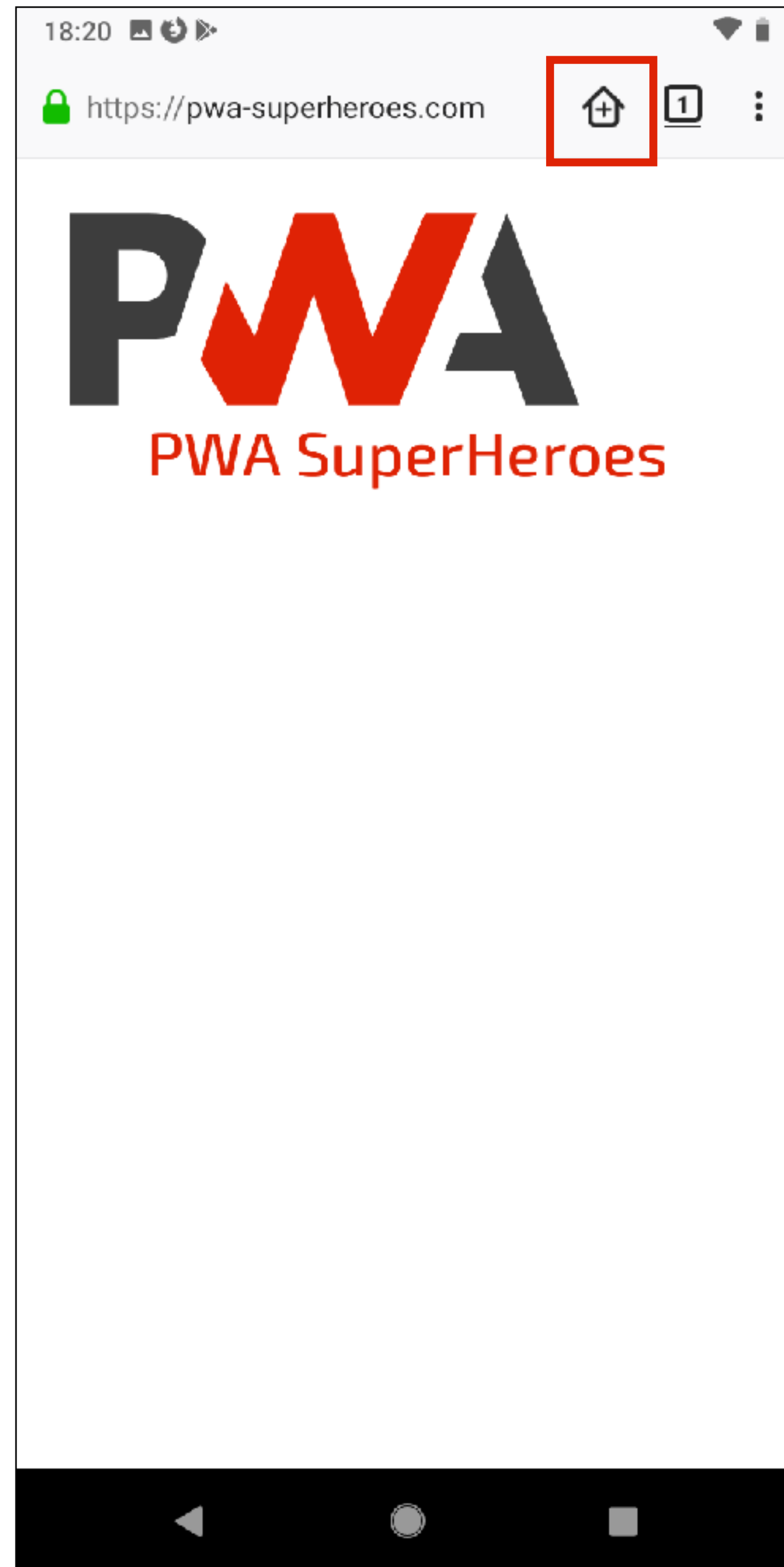


@rowdyrabouw

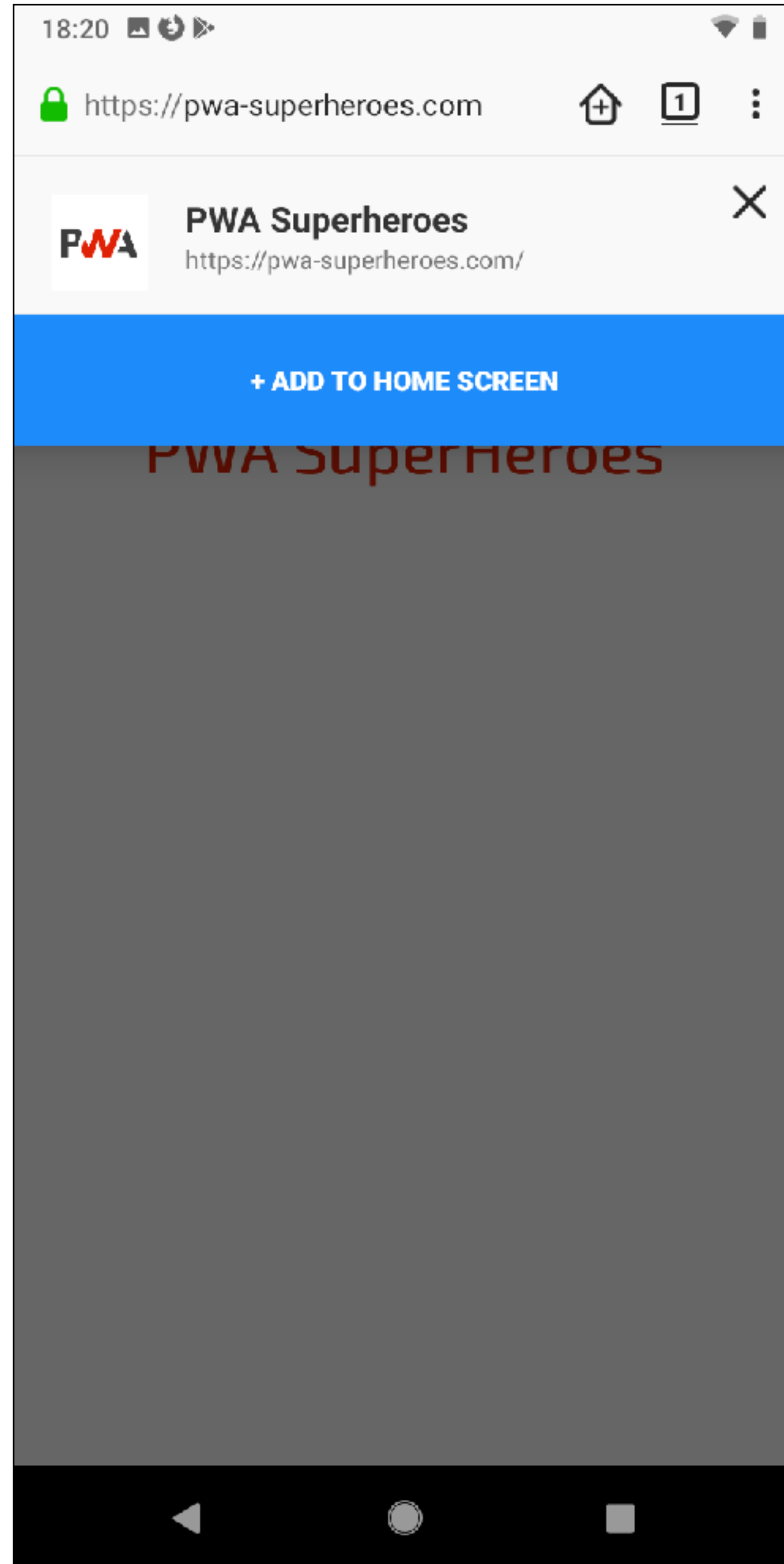


@rowdyrabouw





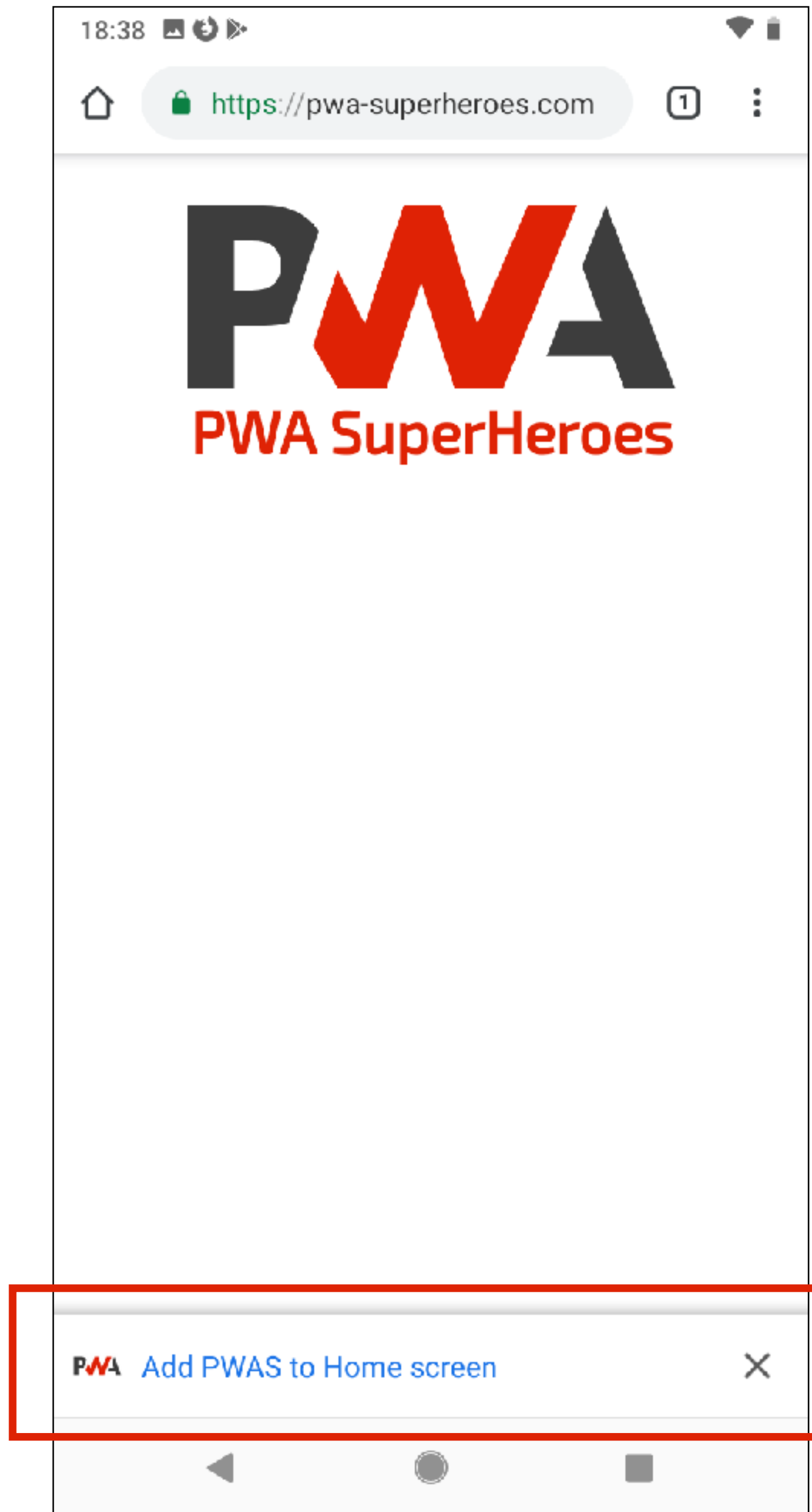
@rowdyrabouw



@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

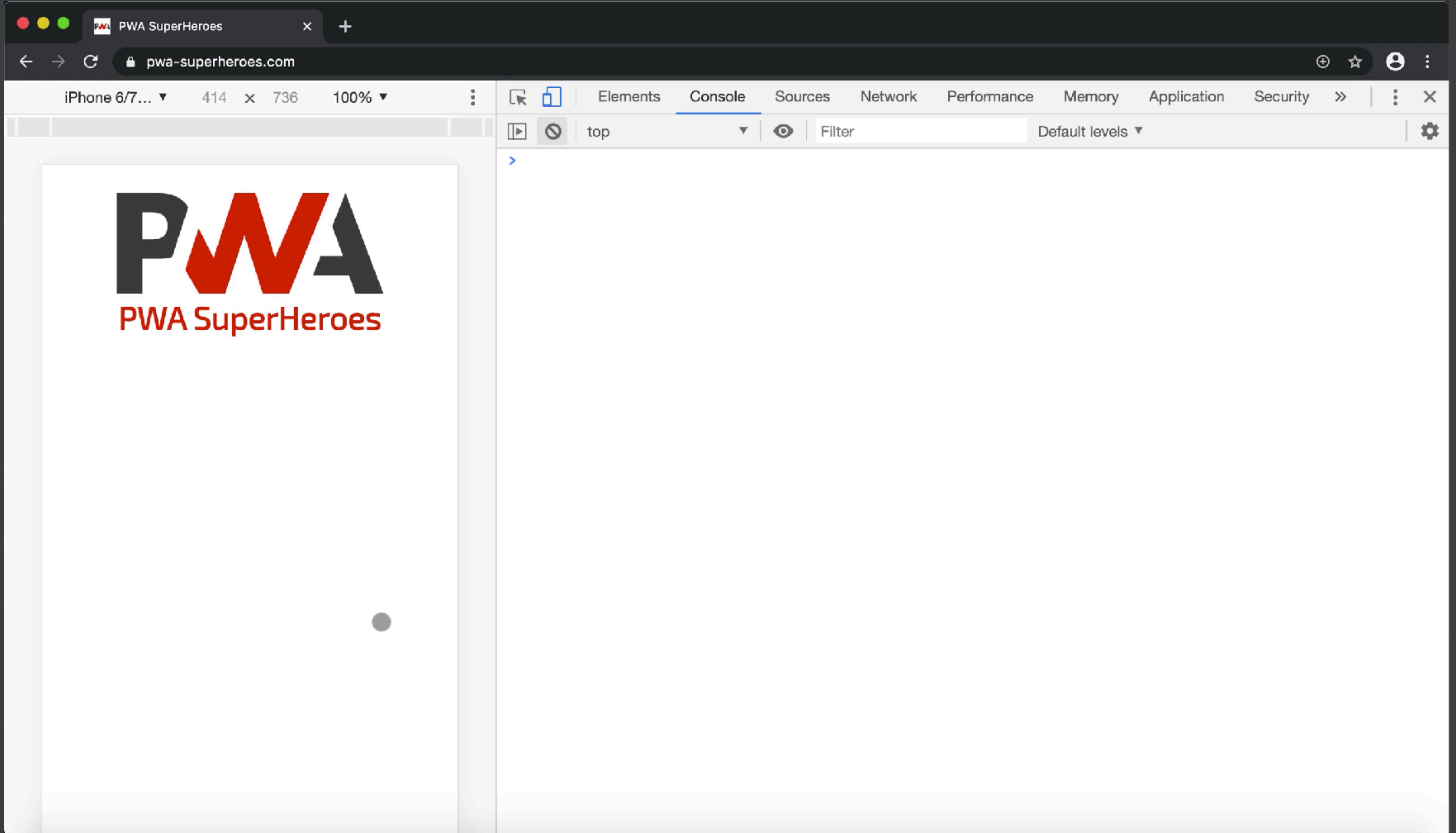
let deferredPrompt;
const btnInstall = document.getElementById("btnInstall");

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>
```

Browser window showing the Application tab for a Progressive Web App (PWA) named "PWA SuperHeroes".


Page Information: iPhone 6/7..., 414 x 736, 100% zoom.

Application Tab:

- App Manifest:** [manifest.json](#)
- Installability:** ⚠️ No matching service worker detected. You may need to reload the page, or check that the service worker is registered.
- Identity:**
 - Name: PWA Superheroes
 - Short name: PWAS
- Presentation:**
 - Start URL: /
 - Theme color: #DF2305
 - Background color: #3D3D3D
 - Orientation: portrait
 - Display: standalone
- Icons:**
 - 192x192
 - image/png

Left Panel (Application Management):

- 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





Cache API

Browser window: PWA SuperHeroes, 127.0.0.1:8080

Device: iPhone 6/7... 414 x 736 87%

Network tab: Recording network activity... Perform a request or hit ⌘ R to record the reload. [Learn more](#)

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		



```
// sw.js

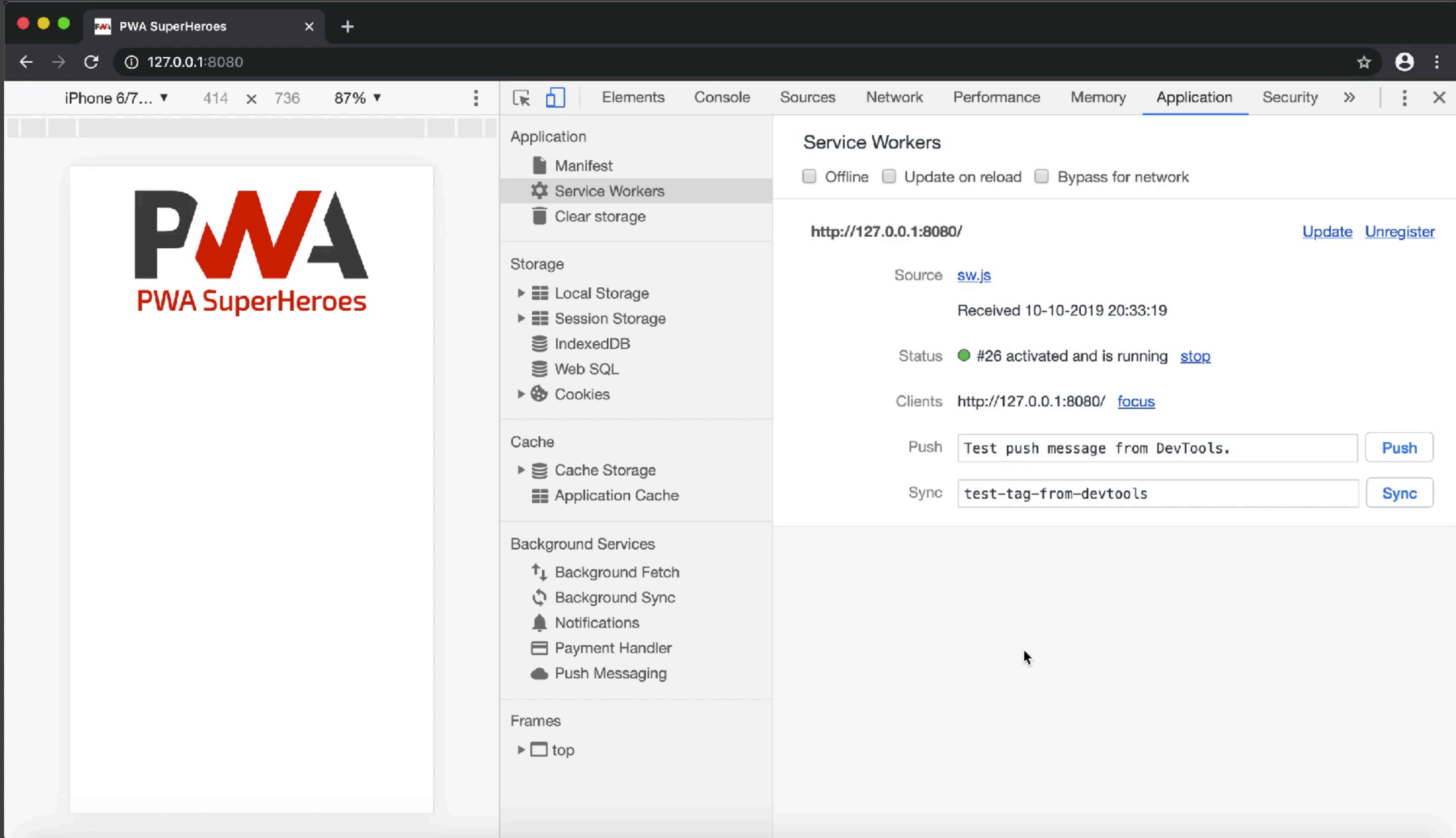
self.addEventListener("install", event => {
  // without waiting the SW will continue without caching
  event.waitUntil(
    // opens the existing `static` cache or creates it
    caches.open("static").then(cache => {
      console.log("[Service Worker] Precaching Files");
      cache.add("/");
      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);  
    })  
  );  
});
```

Browser window showing the PWA SuperHeroes application running on a simulated iPhone 6/7 device. The address bar shows the URL 127.0.0.1:8080. The Application panel is open, displaying the Service Workers section. The Service Workers list shows a worker for http://127.0.0.1:8080/ with source sw.js, received on 10-10-2019 20:33:19, and status #26 activated and is running. The worker is currently running on the client http://127.0.0.1:8080/. The panel also includes controls for Offline, Update on reload, and Bypass for network. There are input fields for sending a push message ("Test push message from DevTools.") and a sync tag ("test-tag-from-devtools").



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

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](#)

Browser window showing the PWA SuperHeroes application running on a simulated iPhone 6/7 device. The address bar shows the URL 127.0.0.1:8080. The Application panel is open, displaying the Service Workers section. The Service Workers list shows two workers: #26 (activated and running) and #27 (waiting to activate). The interface includes a sidebar with navigation options (Manifest, Service Workers, Clear storage, Storage, Cache, Background Services, Frames) and a main content area with a logo and DevTools controls (Push, Sync).

PWA SuperHeroes

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](#)

● #27 waiting to activate [skipWaiting](#)

Received 10-10-2019 20:34:50

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

Push [Push](#)

Sync [Sync](#)



Fetch API

Chromium browser window showing a PWA SuperHeroes application at 127.0.0.1:8080. The page displays the PWA SuperHeroes logo. The Network tab is active, showing a message: "Recording network activity... Perform a request or hit ⌘ R to record the reload. [Learn more](#)".



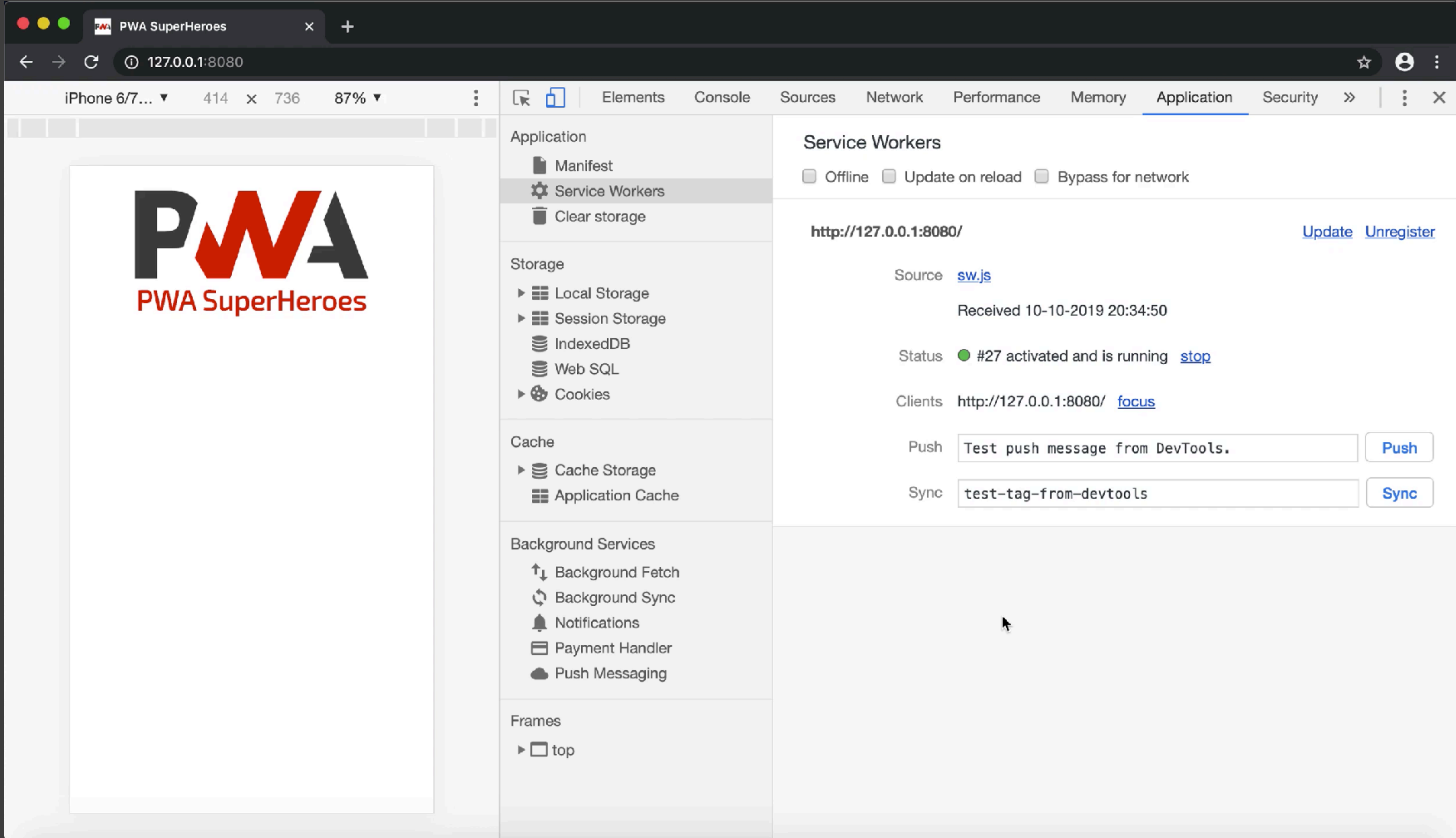
Recording network activity...
Perform a request or hit ⌘ R to record the reload.

[Learn more](#)

```
// 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);
        }
      })
  );
});
```

Browser window showing the PWA SuperHeroes application running on a simulated iPhone 6/7 device. The URL is 127.0.0.1:8080. The Application panel is open, displaying the Service Workers section. A service worker is active for the URL http://127.0.0.1:8080/, with source sw.js and received on 10-10-2019 20:34:50. The status is #27 activated and is running. The panel also shows options to Update or Unregister the service worker, and buttons to Push or Sync messages.



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

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](#)

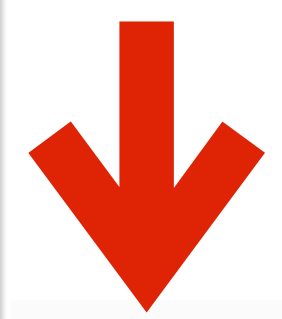
SPEED !!!

Browser window showing PWA SuperHeroes at 127.0.0.1:8080. The page displays the PWA SuperHeroes logo. The Network tab is open, showing a list of requests and a waterfall chart. A red arrow points to the 'Load: 145 ms' metric in the bottom status bar.




Network tab interface showing a list of requests and a waterfall chart. The waterfall chart shows the timing of each request, with a red arrow pointing to the 'Load: 145 ms' metric in the bottom status bar.

Name	Status	Type	Initiator	Size	Time	Waterfall
127.0.0.1	200	document	Other	870 B	30 ms	
app.css	200	stylesheet	(index)	650 B	62 ms	
app.js	200	script	(index)	525 B	38 ms	
pwa.svg	200	svg+xml	(index)	1.8 KB	38 ms	
manifest.json	200	manifest	Other	747 B	7 ms	
favicon.png	200	png	Other	20.7 KB	13 ms	
manifest-icon-192.png	200	png	Other	4.4 KB	9 ms	



7 requests | 29.6 KB transferred | 27.6 KB resources | Finish: 175 ms | DOMContentLoaded: 140 ms | Load: 145 ms

Browser window showing a PWA SuperHeroes application. The page displays the PWA logo and the text "PWA SuperHeroes". The Network tab is open, showing a list of requests. A red arrow points to the "Load: 59 ms" metric in the bottom status bar.



Name	Status	Type	Initiator	Size	Time	Waterfall
127.0.0.1	200	document	Other	(ServiceWorker)	22 ms	
app.css	200	stylesheet	(index)	(ServiceWorker)	25 ms	
app.js	200	script	(index)	(ServiceWorker)	25 ms	
pwa.svg	200	svg+xml	(index)	(ServiceWorker)	25 ms	
manifest.json	200	manifest	Other	(ServiceWorker)	8 ms	
favicon.png	200	png	Other	(ServiceWorker)	10 ms	
manifest-icon-192.png	200	png	Other	(ServiceWorker)	3 ms	

7 requests | 0 B transferred | 27.6 KB resources | Finish: 87 ms | DOMContentLoaded: 55 ms | Load: 59 ms



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"];
```

Browser window showing the PWA SuperHeroes application. The page displays the PWA logo and the text "PWA SuperHeroes". The developer tools are open, showing the Application tab with the following sections:

- 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

The Cache Storage section is expanded, showing the text "Cache Storage".

```
// 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();
});
```

Browser window showing the PWA SuperHeroes website. The page displays the PWA logo and the text "PWA SuperHeroes" with an "about" link. The Network tab is open, showing a list of requests and their details.



PWA
PWA SuperHeroes
[about](#)

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



Offline Fallback

Browser window showing the PWA SuperHeroes website. The page displays the PWA logo and the text "PWA SuperHeroes" with an "about" link. The browser's developer tools are open, showing the Application tab. The Service Workers section is active, displaying a service worker for https://pwa-superheroes.com/ with status #60 activated and is running. The interface includes options for Offline, Update on reload, and Bypass for network. There are also fields for Push (Test push message from DevTools) and Sync (test-tag-from-devtools) messages, along with buttons for Push and Sync. The left sidebar of the developer tools lists various application features like 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), and Frames (top).

PWA
PWA SuperHeroes
[about](#)

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


```
// 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");
      }
    });
  });
...

```

Browser window showing the PWA SuperHeroes website on an iPhone 6/7 simulator. The URL is pwa-superheroes.com. The page displays the PWA SuperHeroes logo and an [about](#) link.

The DevTools Application panel is open, showing the Service Workers section. The active service worker is `https://pwa-superheroes.com/`, which is #60 activated and is running. The source is `sw.js` (18 instances). The status is `#60 activated and is running`. The clients are `https://pwa-superheroes.com/` (focus).

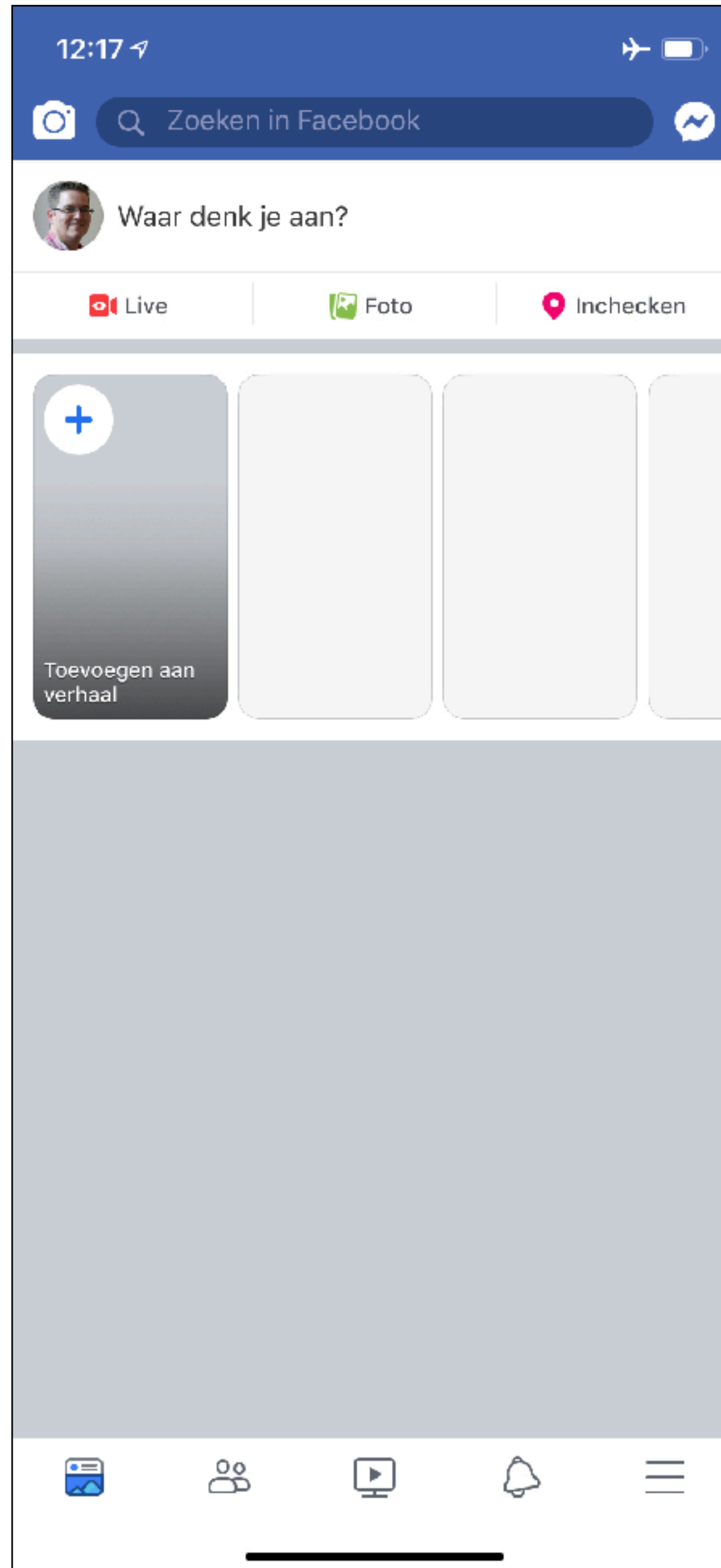
The Service Workers panel includes controls for Offline, Update on reload, and Bypass for network. It also features input fields for testing push messages and sync tags, with buttons for `Push` and `Sync`.

The left sidebar of the DevTools panel shows the following sections:

- 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



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";
```

Browser window showing the PWA SuperHeroes application. The page displays the PWA logo and the text "PWA SuperHeroes" with a link to "about". The browser's developer tools are open, showing the Application panel with the Service Workers section selected. The Service Workers panel shows a single worker for https://pwa-superheroes.com/ with status #64 activated and is running. The worker source is sw.js, received on 5-11-2019 19:33:56. The panel includes controls for Offline, Update on reload, and Bypass for network. There are also input fields for testing push messages and sync tags, and a section for service workers from other origins.

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 5-11-2019 19:33:56

Status ● #64 activated and is running [stop](#)

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

Push [Push](#)

Sync [Sync](#)

▶ Service workers from other origins



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]} / ${data.appearance.weight[1]}
`;
  document.getElementById("details").innerHTML = details;
  document.getElementById("image").innerHTML = `![${data.name}]($
{data.image.url})
```

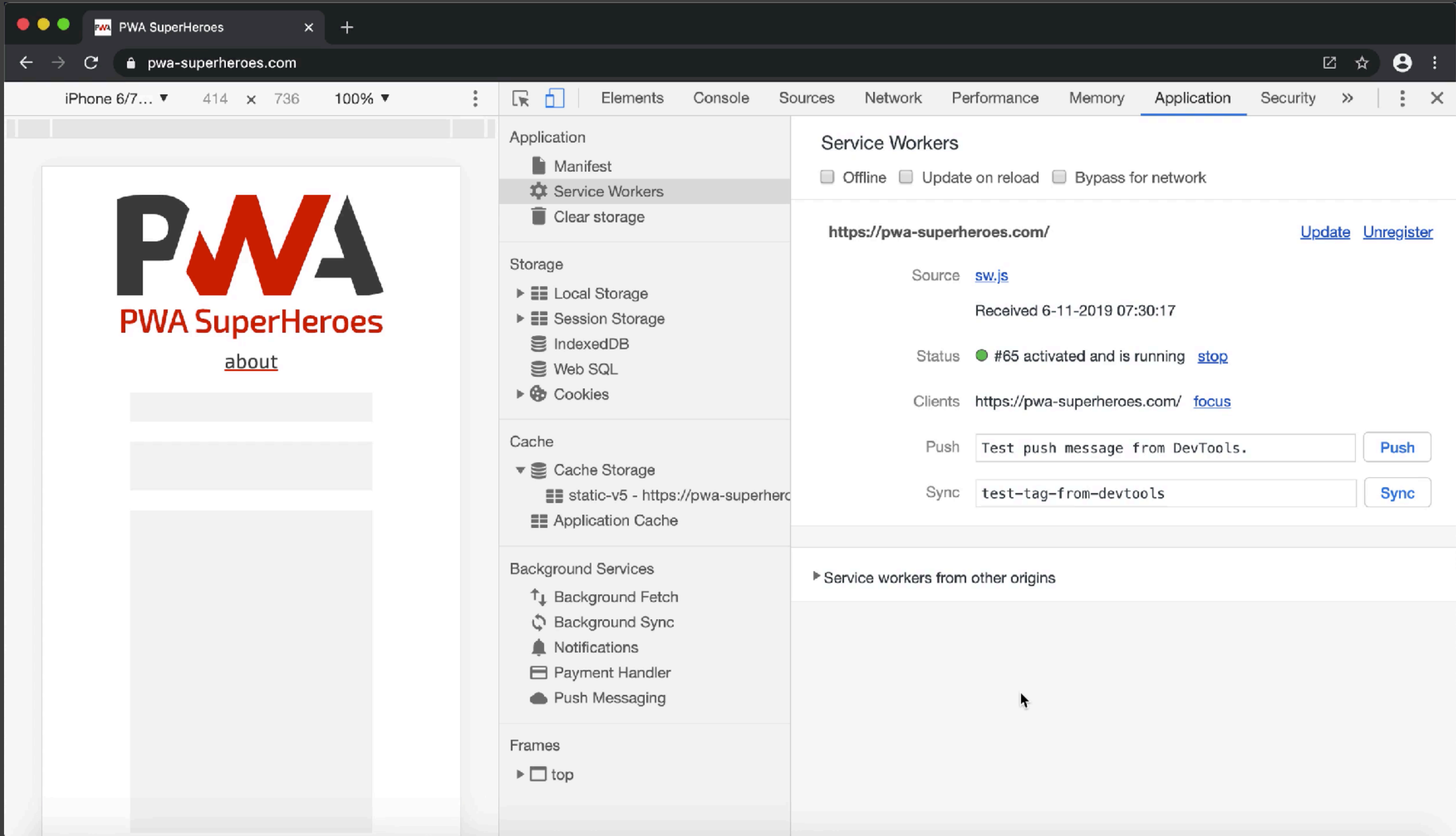


```
<!DOCTYPE html>
<html lang="en">
  <head>
    ...
    <script defer src="js/api.js"></script>
  </head>
  <body>
    ...
  </body>
</html>
```

```
// 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"];
```

Browser window showing the PWA SuperHeroes website on an iPhone 6/7 simulator. The page displays the PWA logo and the text "PWA SuperHeroes" with an "about" link. The DevTools Application panel is open, showing the Service Workers section. The active service worker is for the origin https://pwa-superheroes.com/ and is running. The panel includes controls for Offline mode, Update on reload, and Bypass for network. It also shows the source file sw.js, the registration date (6-11-2019 07:30:17), and the status (#65 activated and is running). There are buttons for Update and Unregister. Below this, there are input fields for testing push messages and sync tags, with corresponding Push and Sync buttons. The bottom section of the panel shows "Service workers from other origins".



Application

- Manifest
- Service Workers**
- Clear storage

Storage

- Local Storage
- Session Storage
- IndexedDB
- Web SQL
- Cookies

Cache

- Cache Storage
 - static-v5 - 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](#)

Received 6-11-2019 07:30:17

Status ● #65 activated and is running [stop](#)

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

Push [Push](#)

Sync [Sync](#)

▶ Service workers from other origins



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

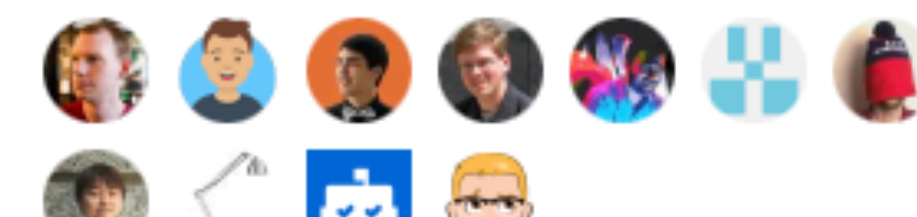
Packages

No packages published

Used by 148k



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]);
    }
  }
});
```

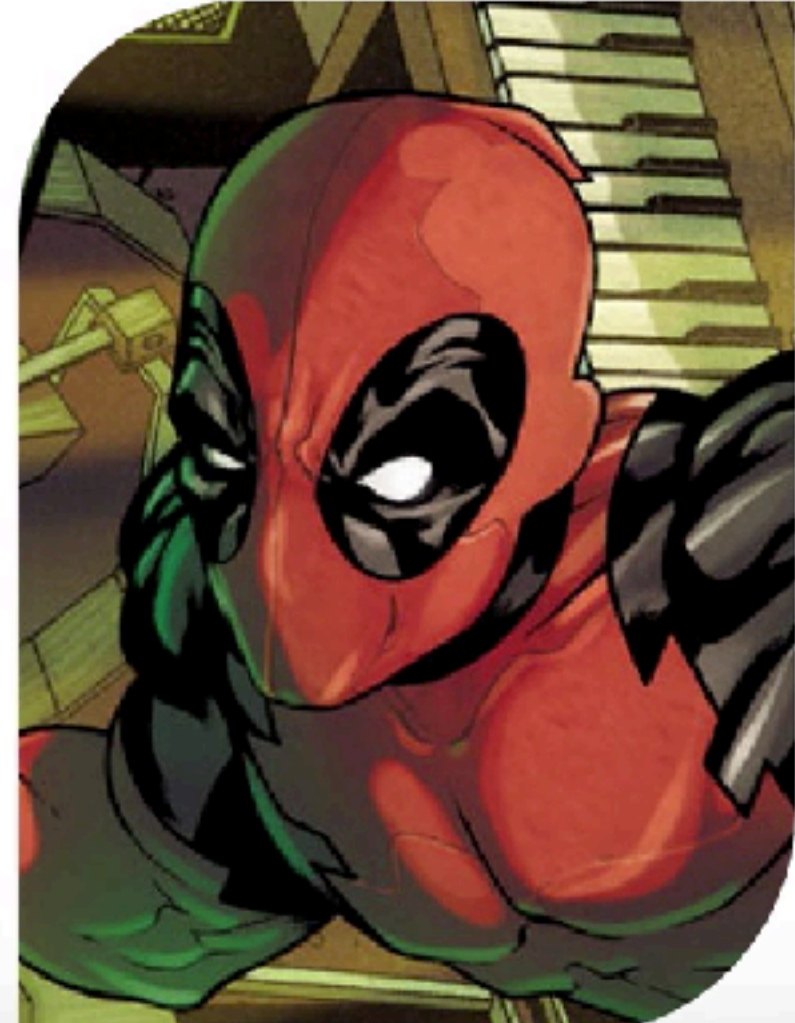

PWA

PWA SuperHeroes

[about](#)

Deadpool

Wade Wilson, Canada
188 cm / 95 kg



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 07:41:22

Status ● #147 activated and is running [stop](#)

● #148 waiting to activate [skipWaiting](#)
Received 8-11-2019 07:45:42

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

Push [Push](#)

Sync [Sync](#)

▶ Service workers from other origins





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

PWA SuperHeroes

[about](#)

Deadpool

Wade Wilson, Canada
188 cm / 95 kg



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 [Push](#)

Sync [Sync](#)

▶ Service workers from other origins





Workbox

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

<https://rowdy.codes/wadwc>

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

