

TIKAL

FULLSTACK TECH

RADAR DAY

FULL DAY OF FULLSTACK.

PWA

#PWALogo

Progressive Web Apps

Shavit Cohen
Hagai Reuveni

Our Story

```
$ git clone  
...github.com/hagai-reuveni/pwa-workshop.git
```

What will I learn today?

- 1. What are Progressive Web Apps?**
- 2. What characterize a PWA ?**
- 3. Why should I care ?**
- 4. How do I get it up and running ?**

What will we do today ?

tday.surge.sh



18:35

TIKAL

SPEAKERS



Michael
BURDELL
SVP, CMO

Full Cycle Digital Marketing



JEFF
MEYERSON
SOFTWARE ENTREPRENEUR

You Are Not A Commodity

What are PWAs ?

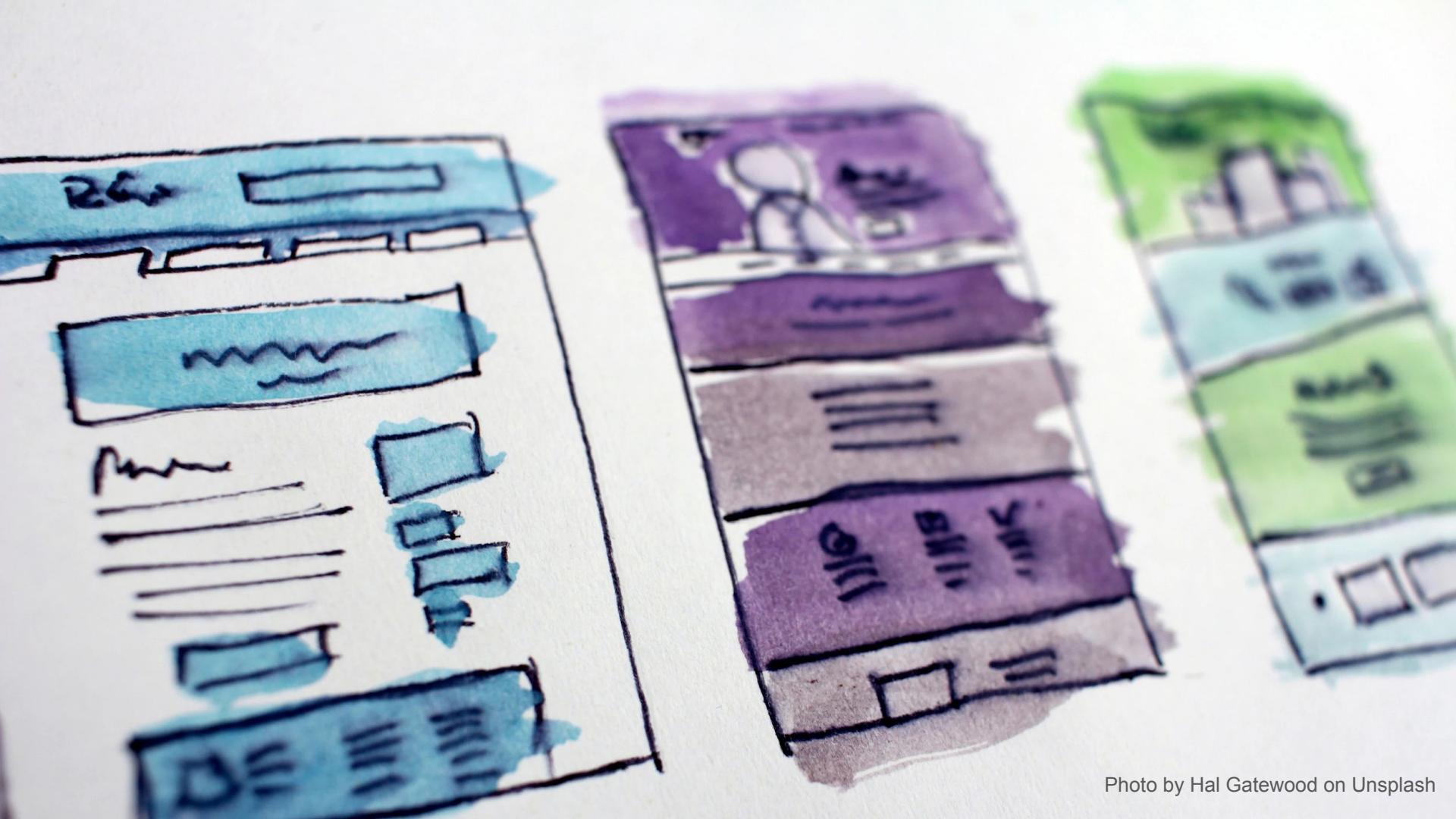


Photo by Hal Gatewood on Unsplash

PWAs are

Web Applications

PWAs uses

Modern Web APIs

PWAs are meant to

deliver an

app-like user experience

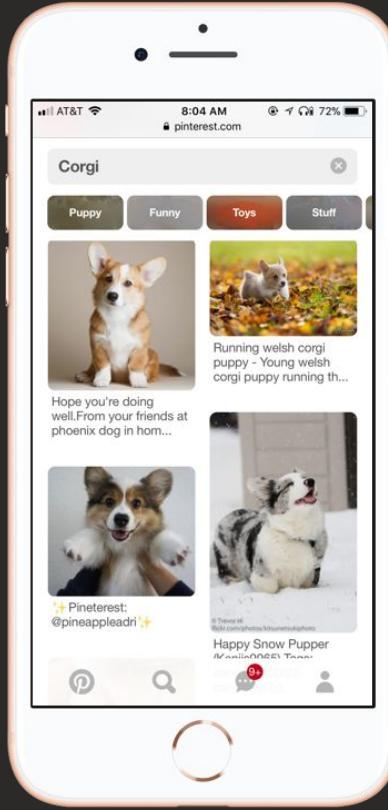
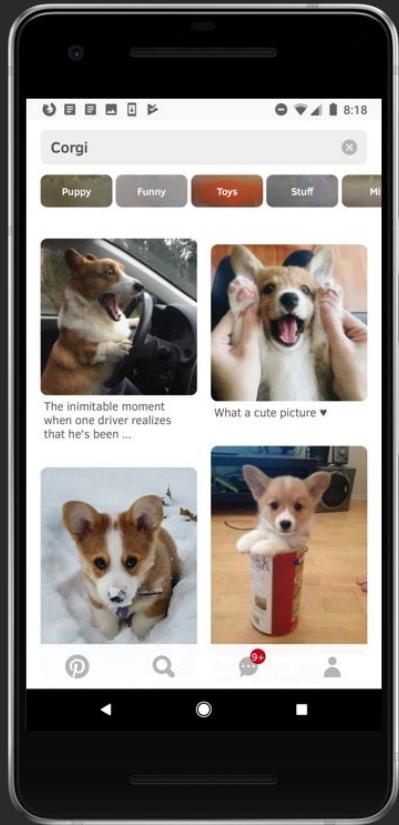


Google

san f

san francisco weather
san francisco
san francisco giants
san fernando valley
san francisco state university
san francisco hotels
san francisco 49ers
san fernando
san fernando mission
san francisco zip code

Google Search I'm Feeling Lucky



Source: https://medium.com/@Pinterest_Engineering/a-one-year-pwa-retrospective-f4a2f4129e05

What do we mean when we say “PWA” ?

Linkable

App Like

Installable

Discoverable

Always
Up to date

Work offline

Responsive

Secured

Re-engageable

Source: <https://infrequently.org/2015/06/progressive-apps-escaping-tabs-without-losing-our-soul/>

Cool, But do I really need it ?

Small Changes

**Huge
Impact**

Small changes - huge impact

- Secured
- Save loading time by caching
- Update only what is needed
- A more ‘native’ feel
- Notifications

... And ...

- One App to rule them all (almost..)
- No App Store rules
- Discrete updates
- JS based.... :)
- Google and Microsoft are ‘all in’

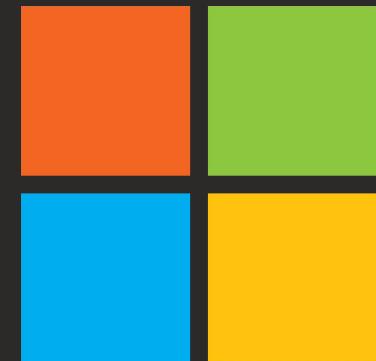
That sound really good, but....

What are the cons ?

- Can't do everything a 'Native' app can do (whatwebcando.today)
- Limited support by IOS (medium: [bit.ly/2UG4vF5](https://medium.com/@bitly/2UG4vF5))

Why it's the right time for PWA ?

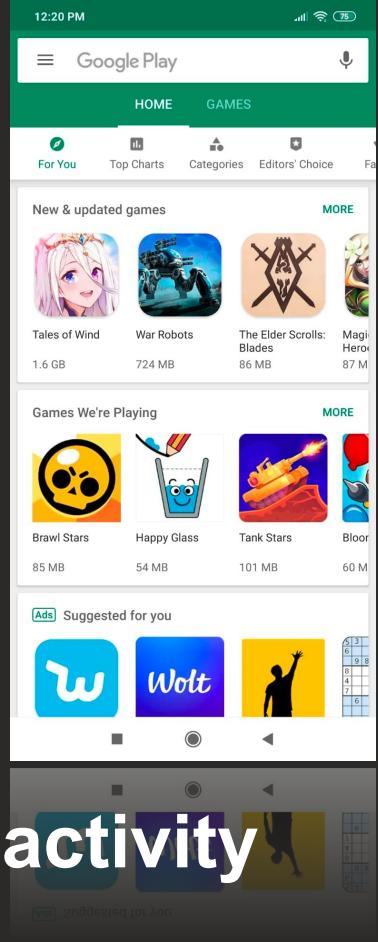
Google



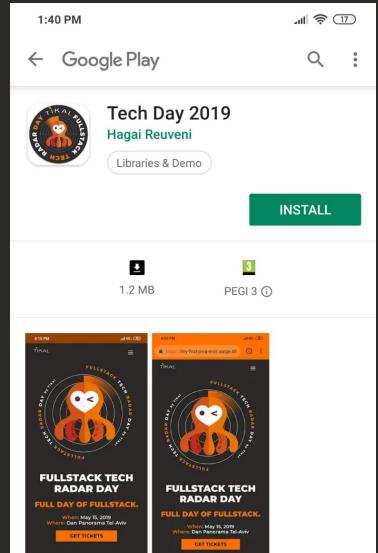
And then there is...



FULLSTACK TECH RADAR DAY



TWA - Trusted web activity



This is a demo app for the Tech day 2019

[READ MORE](#)

Ratings and reviews

No reviews yet

Let's sum up

Linkable

App Like

Installable

Discoverable

Always
Up to date

Work offline

Responsive

Secured

Re-engageable

Source: <https://infrequently.org/2015/06/progressive-apps-escaping-tabs-without-losing-our-soul/>

Installable

Work offline

Secured

Re-engageable



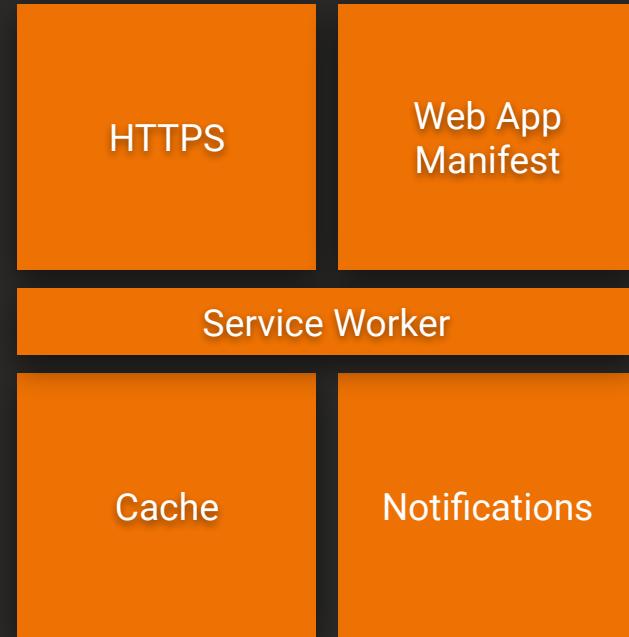
FULLSTACK TECH RADAR DAY

Secured

Installable

Work offline

Re-engageable



And now... we build



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[CODING]

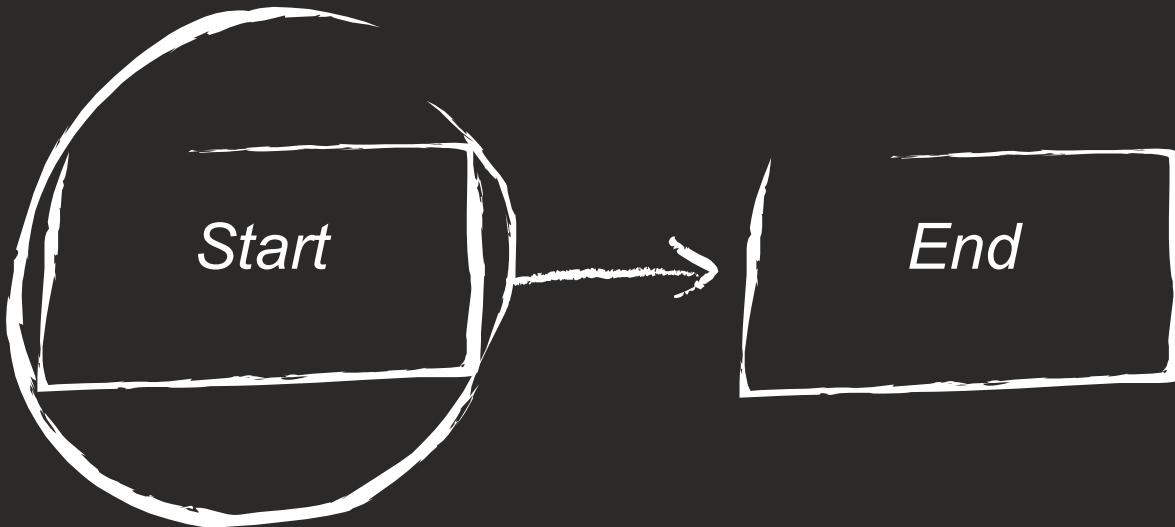
github.com/hagai-reuveni/pwa-workshop

\$ git clone

...github.com/hagai-reuveni/pwa-workshop.git

cd to project directory

\$ git checkout step-1-https

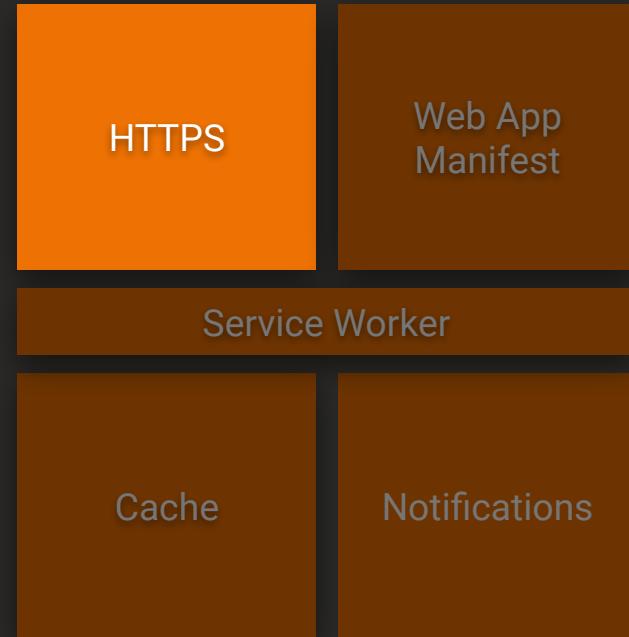


```
$ cd start ...
```

```
$ npm i
```



```
$ npm start
```





```
# cd src
```

```
# open CNAME file
```

```
# define domain:
```

<https://your-name.surge.sh>

(keep the 'https...')

```
$ npm run deploy
```

*# Define user and pass
(Only for the first time)*

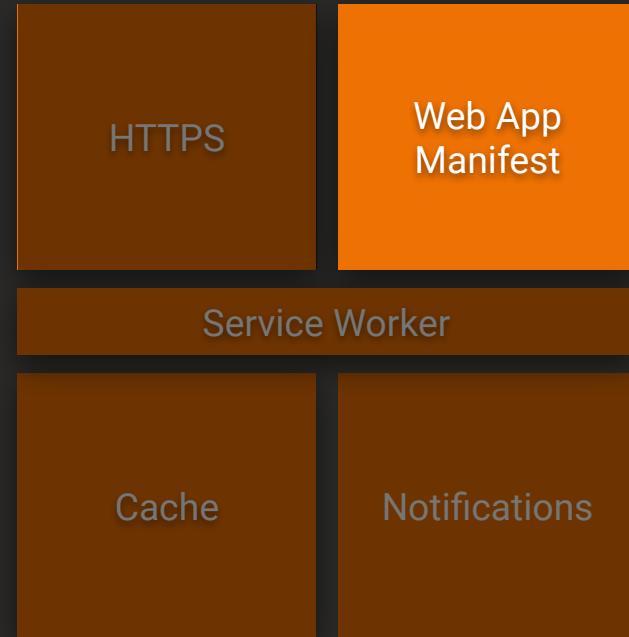
```
project: /Users/rhagai/pwa-workshop/start/dist
domain: https://hreuveni.surge.sh
upload: [=====] 100% eta: 0.0s (121 files, 7892675 bytes)
CDN: [=====] 100%
```

IP: 45.55.110.124

Success! – Published to hreuveni.surge.sh



Image Source: sky.com



Checkout : step-2-manifest

The Web App Manifest

- A simple JSON file that identifies your application
- Metadata associated with a web app
- Provide info to the host OS.

The Web App Manifest - Browser support



Adding a Manifest

```
<link rel="manifest" href="manifest.json">
```

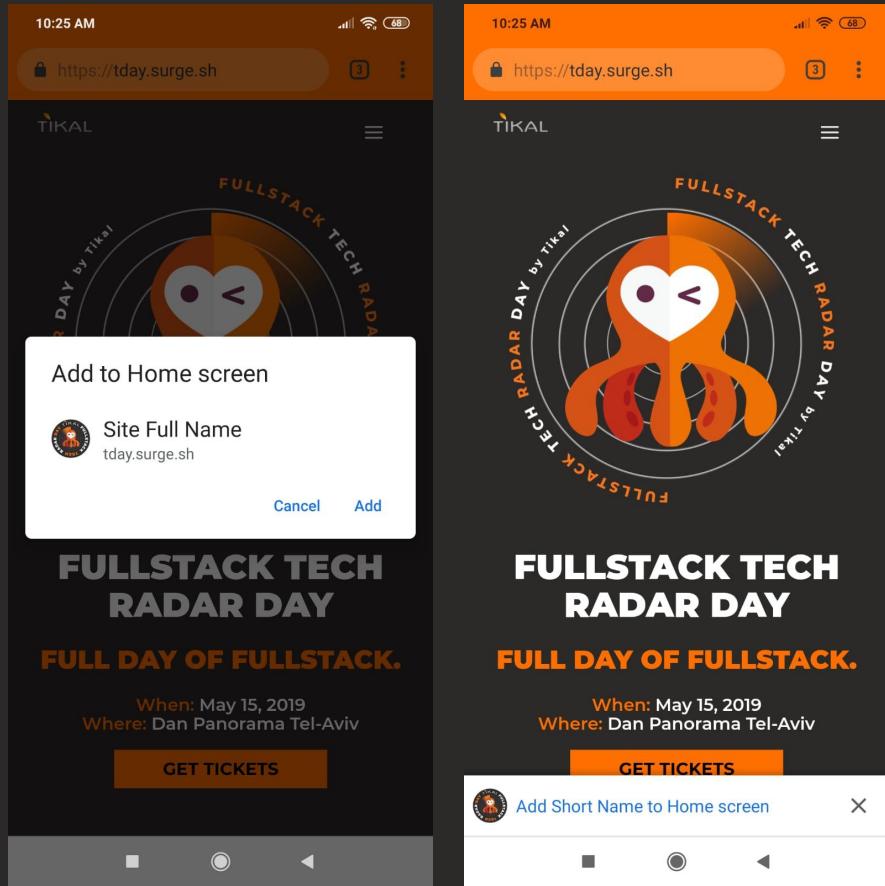
Content-Type: application/manifest+json

Manifest props (Identity)

```
{  
  "name": "Site Full Name",  
  "short_name": "Short Name"  
}
```

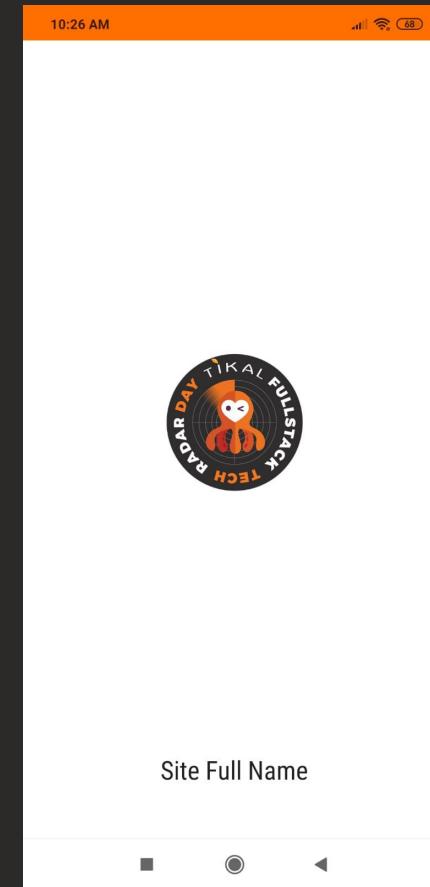
Manifest props (Identity)

```
{  
  "name": "Site Full Name",  
  "short_name": "Short Name"  
}
```



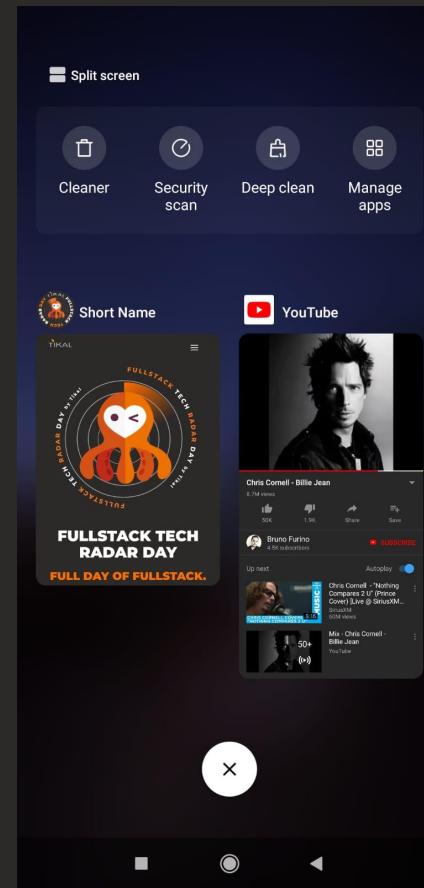
Manifest props (Identity)

```
{  
  "name": "Site Full Name",  
  "short_name": "Short Name"  
}
```



Manifest props (Identity)

```
{  
  "name": "Site Full Name",  
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}
```

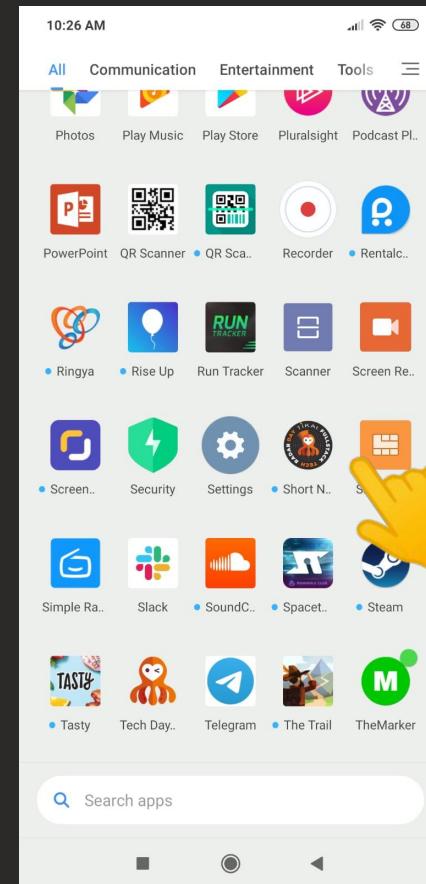


Manifest props (presentation)

```
{  
  "start_url": "/",  
  "theme_color": "#ff6f00",  
  "background_color": "#ffffff",  
  "display": "standalone",  
  "orientation": "any",  
  "scope": "/",  
}
```

Manifest props (presentation)

```
{  
  "start_url": "/",  
  "theme_color": "#ff6f00",  
  "background_color": "#ffffff",  
  "display": "standalone",  
  "orientation": "any",  
  "scope": "/",  
}
```



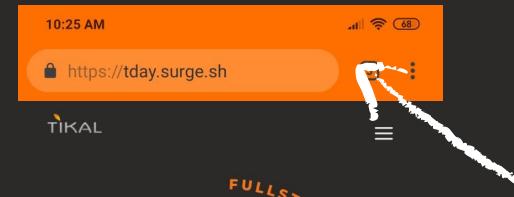
Manifest props (presentation)

```
{  
  "start_url": "/",  
  "theme_color": "#ff6f00",  
  "background_color": "#ffffff",  
  "display": "standalone",  
  "orientation": "any",  
  "scope": "/",  
}
```



Manifest props (presentation)

```
{  
  "start_url": "/",  
  "theme_color": "#ff6f00",  
  "background_color": "#ffffff",  
  "display": "standalone",  
  "orientation": "any",  
  "scope": "/",  
}
```

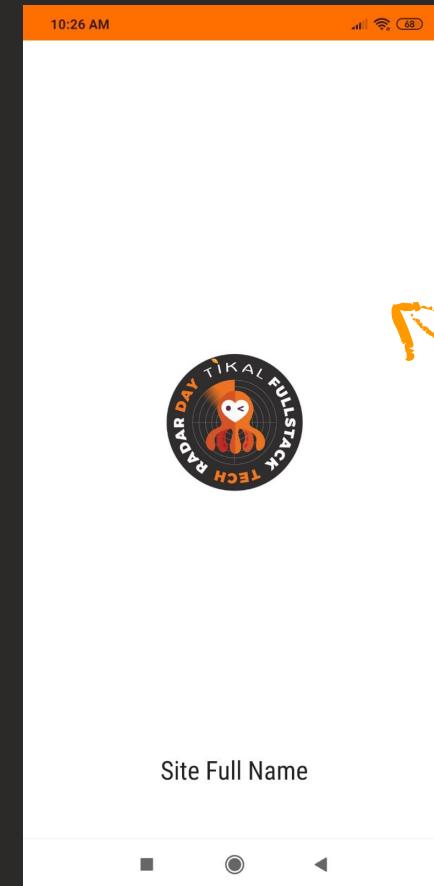


**FULLSTACK TECH
RADAR DAY**
FULL DAY OF FULLSTACK.

When: May 15, 2019
Where: Dan Panorama Tel-Aviv

Manifest props (presentation)

```
{  
  "start_url": "/",  
  "theme_color": "#ff6f00",  
  "background_color": "#ffffff", ←  
  "display": "standalone",  
  "orientation": "any",  
  "scope": "/",  
}
```

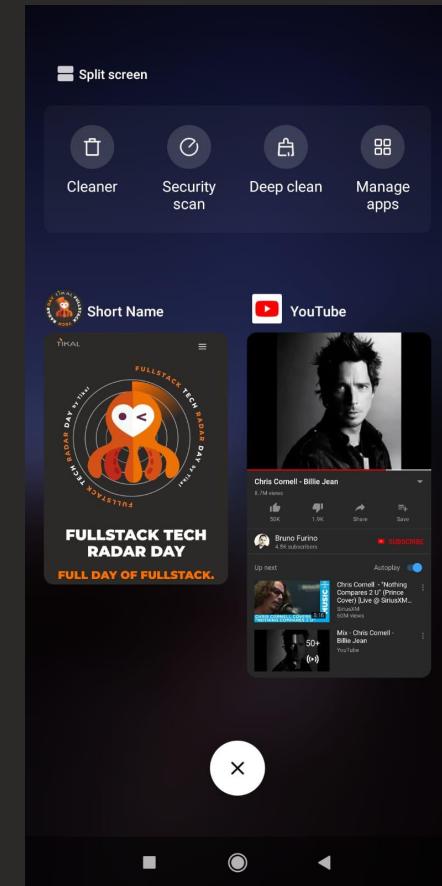
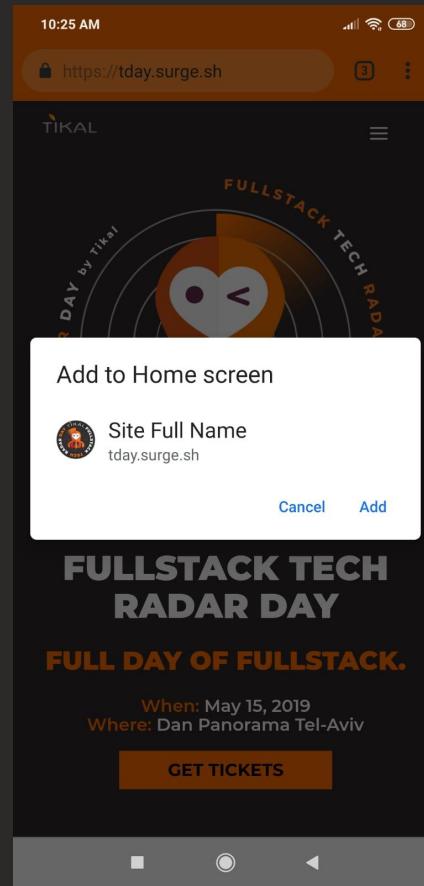


Manifest props (icons)

```
[  
  {  
    "src": "img/logo-192.png",  
    "type": "image/png",  
    "sizes": "192x192"  
  },  
  {  
    "src": "img/logo-512.png",  
    "type": "image/png",  
    "sizes": "512x512"  
  }  
]
```

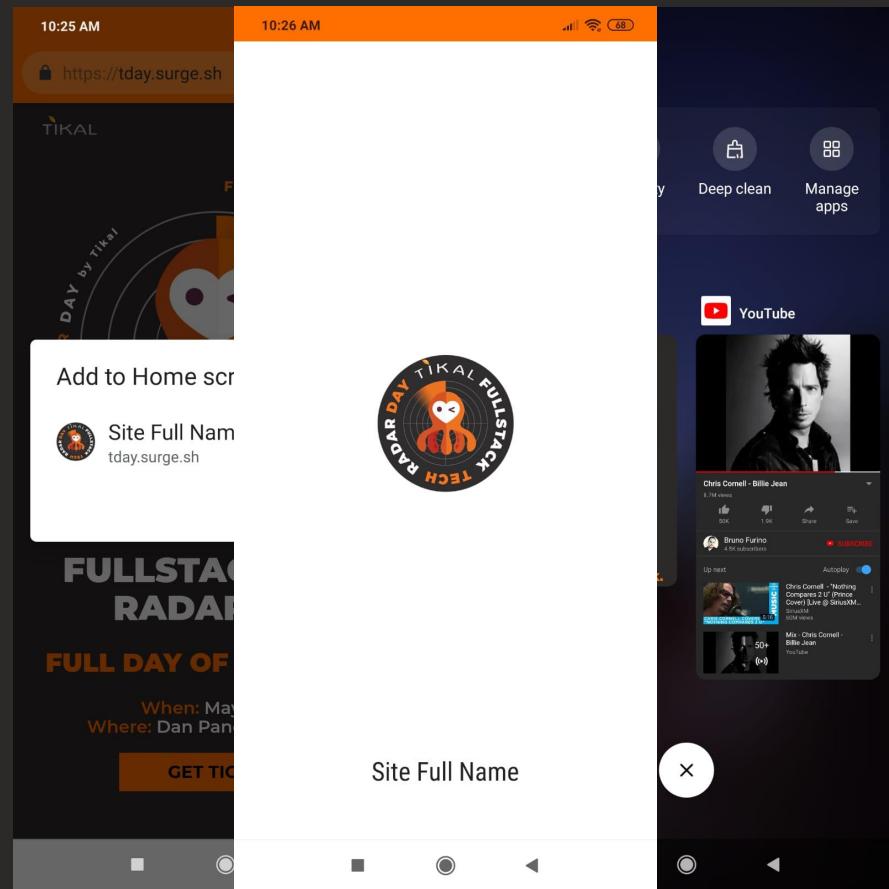
Manifest props (icons)

```
[  
  {  
    "src": "img/logo-192.png",  
    "type": "image/png",  
    "sizes": "192x192"  
  },  
  {  
    "src": "img/logo-512.png",  
    "type": "image/png",  
    "sizes": "512x512"  
  }]  
]
```



Manifest props (icons)

```
[  
  {  
    "src": "img/logo-192.png",  
    "type": "image/png",  
    "sizes": "192x192"  
  },  
  {  
    "src": "img/logo-512.png",  
    "type": "image/png",  
    "sizes": "512x512"  
  }]  
]
```



Manifest props (others)

- dir
- lang
- description



realfavicongenerator.net

[DOING]

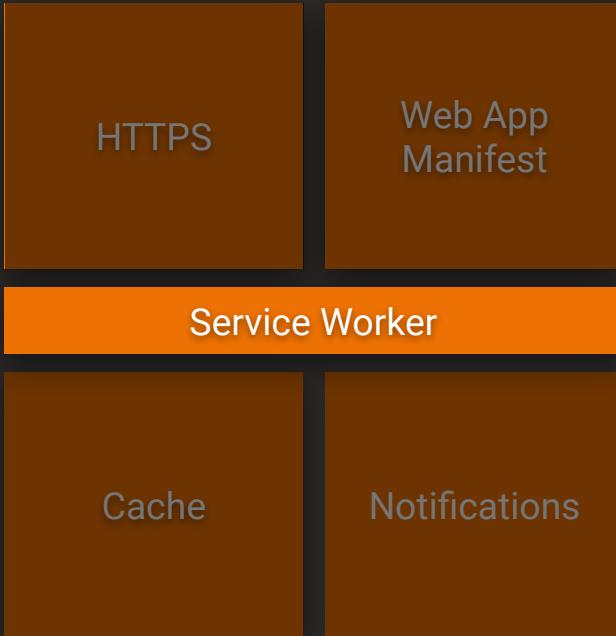


FULLSTACK TECH RADAR DAY

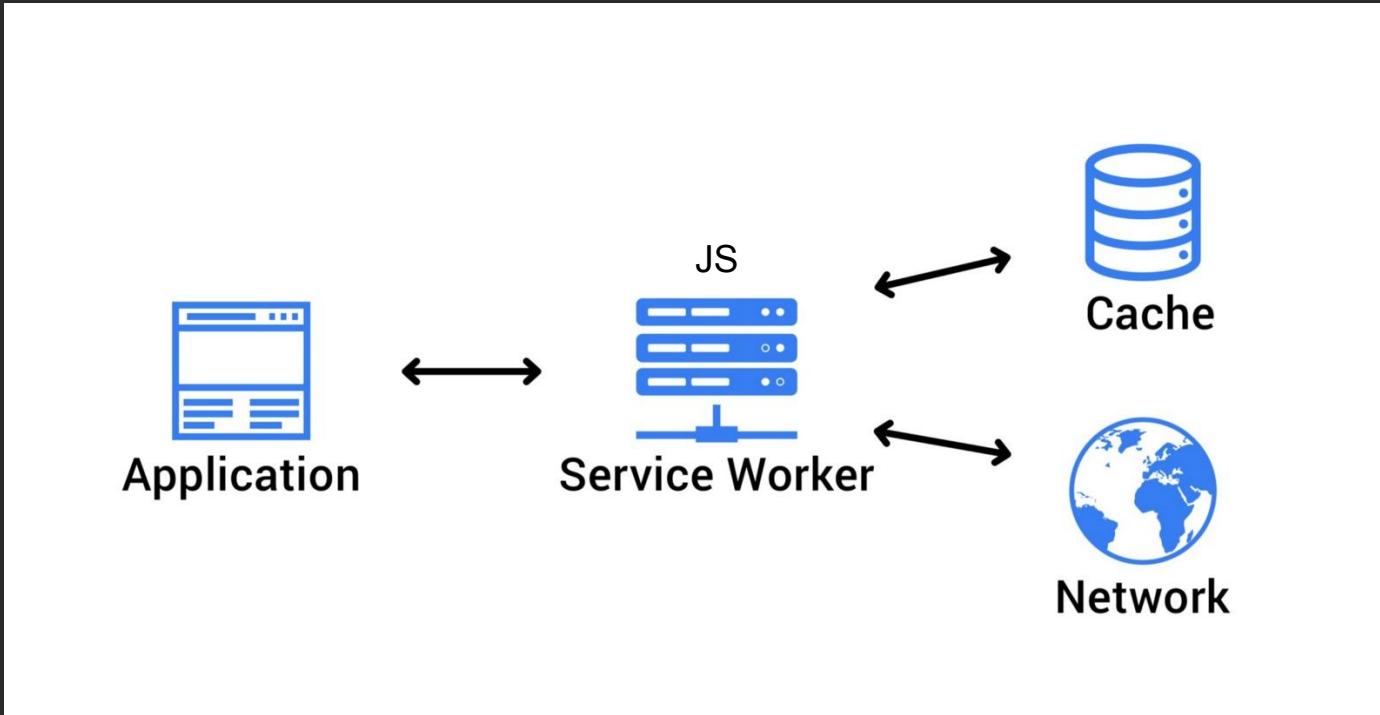


Let's test it !!

<https://developers.google.com/web/tools/lighthouse/#devtools>



What is a service worker

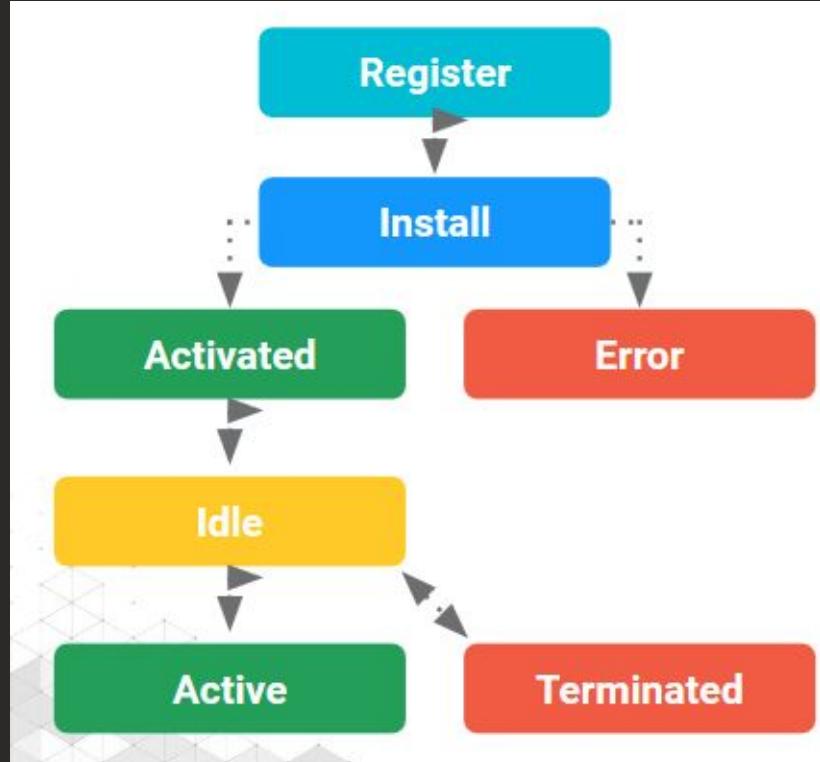


SW Support



- HTTPS required
- No DOM access
- No global state
- Event driven

SW Life Cycle



Elements Console Sources Network Performance Memory Application Security Audits Redux ⚠ 3 ⋮ X

Application

- Manifest
- Service Workers**
- Clear storage

Storage

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

Cache

- Cache Storage
 - workbox-precache-https
 - workbox-precache-https
 - images-cache - https://tday.surge.sh

Service Workers

Offline Update on reload Bypass for network

tday.surge.sh [Update](#) [Unregister](#)

Source [sw.js](#)
Received 5/11/2019, 1:46:34 PM

Status ● #2058 activated and is running [stop](#)

Clients <https://tday.surge.sh/> [focus](#)

Push [Push](#)

Sync [Sync](#)

[CODING]

step-3-sw

Register a SW

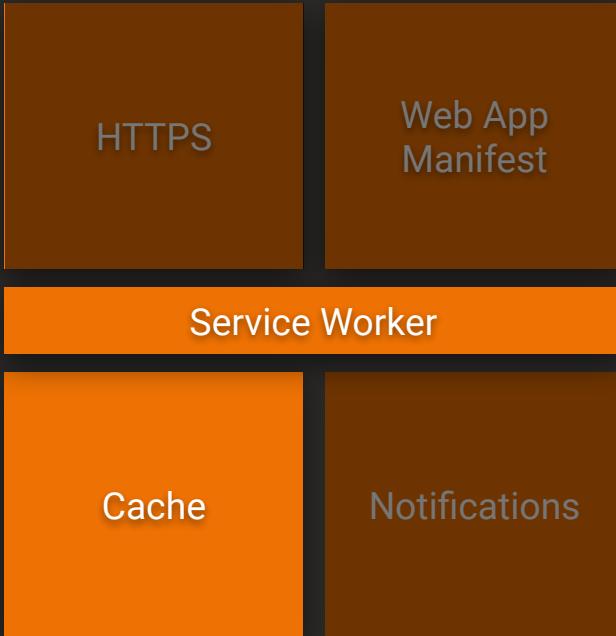
pwa/index.js

```
if ('serviceWorker' in navigator) {  
  navigator.serviceWorker.register('sw.js')  
} // sw.js can literally be empty, but must exist
```

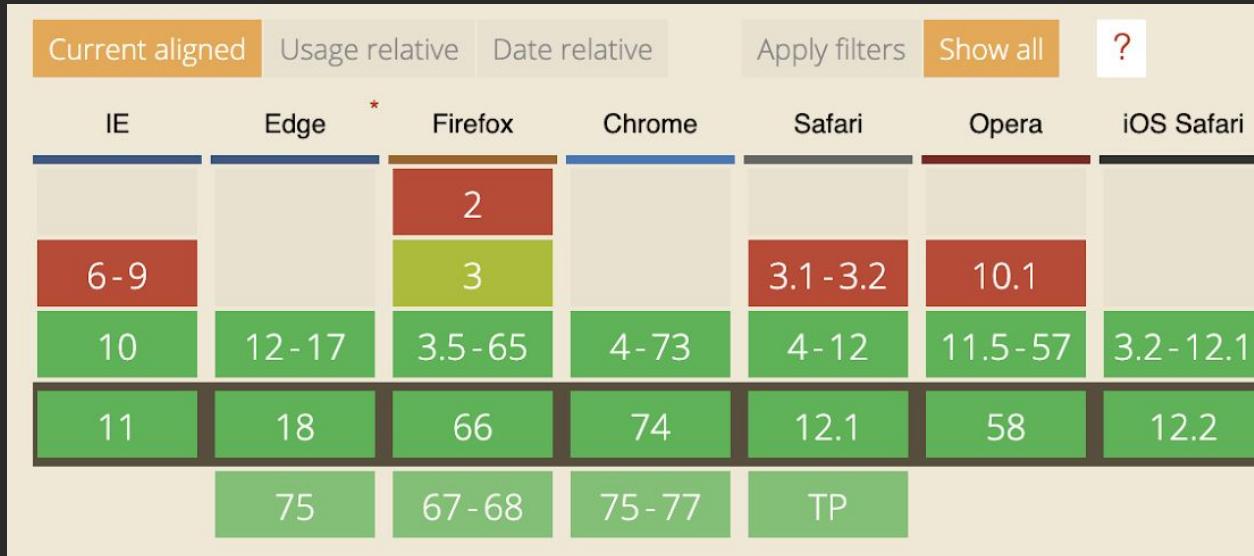


Let's test it !!

<https://developers.google.com/web/tools/lighthouse/#devtools>



Caches



Application	Path	Responses
Manifest	/css/first-section.css	
Service Workers	/css/main.css	
Clear storage	/css/second-section.css	
Storage	/css/third-section.css	
▶ Local Storage	/css/tikal-tech-radar.css	
▶ Session Storage	/index.html	
▶ IndexedDB	/js/app.js	
Web SQL	/js/default.js	
▶ Cookies	/js/scripts.js	
	/js/workbox.js	
Cache	/schedule/index.html	
▼ Cache Storage	/site.webmanifest	
workbox-precache-https	/speakers/index.html	
workbox-precache-https	/updates/Can-Kubernetes-Keep-a-Secret.html	
images-cache - https://to	/updates/Full-Cycle-Development-at-netflix.html	
Application Cache	/updates/Interview-With-Haggai-About-Chaos-Engineering.html	
	/updates/OnRadar-Episode-1-A-Config-Keeping-tale.html	

Simple caching

sw.js

1

```
caches.open('cache-name', () =>  
  caches.addAll([  
    'script.js',  
    'style.css',  
    'http://www.url.com',  
    'etc.js'  
  ]));
```

Simple caching

sw.js

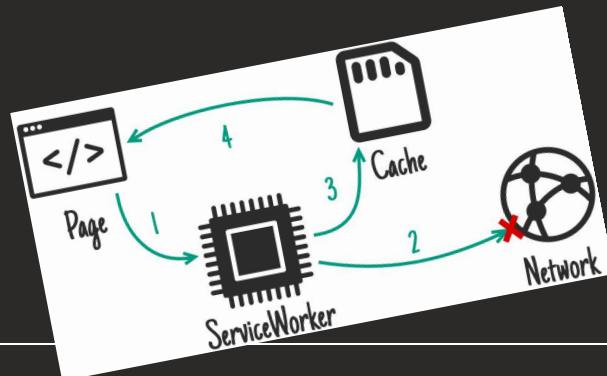
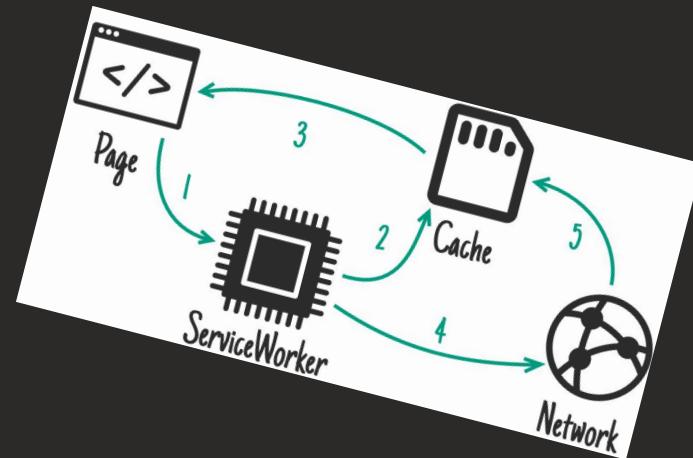
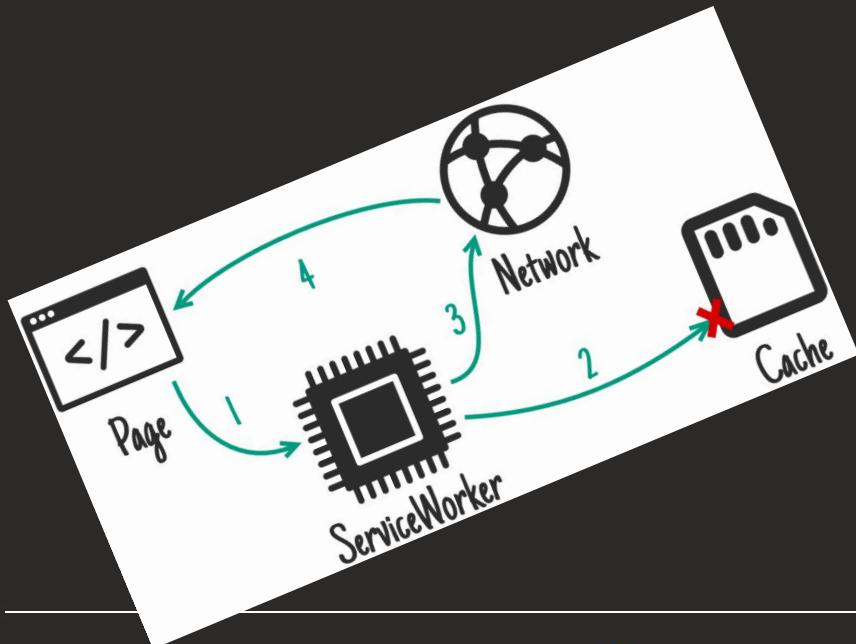
1

```
caches.open('cache-name', () =>
  caches.addAll([
    'script.js',
    'style.css',
    'http://www.url.com',
    'etc.js'
  ]));
```

2

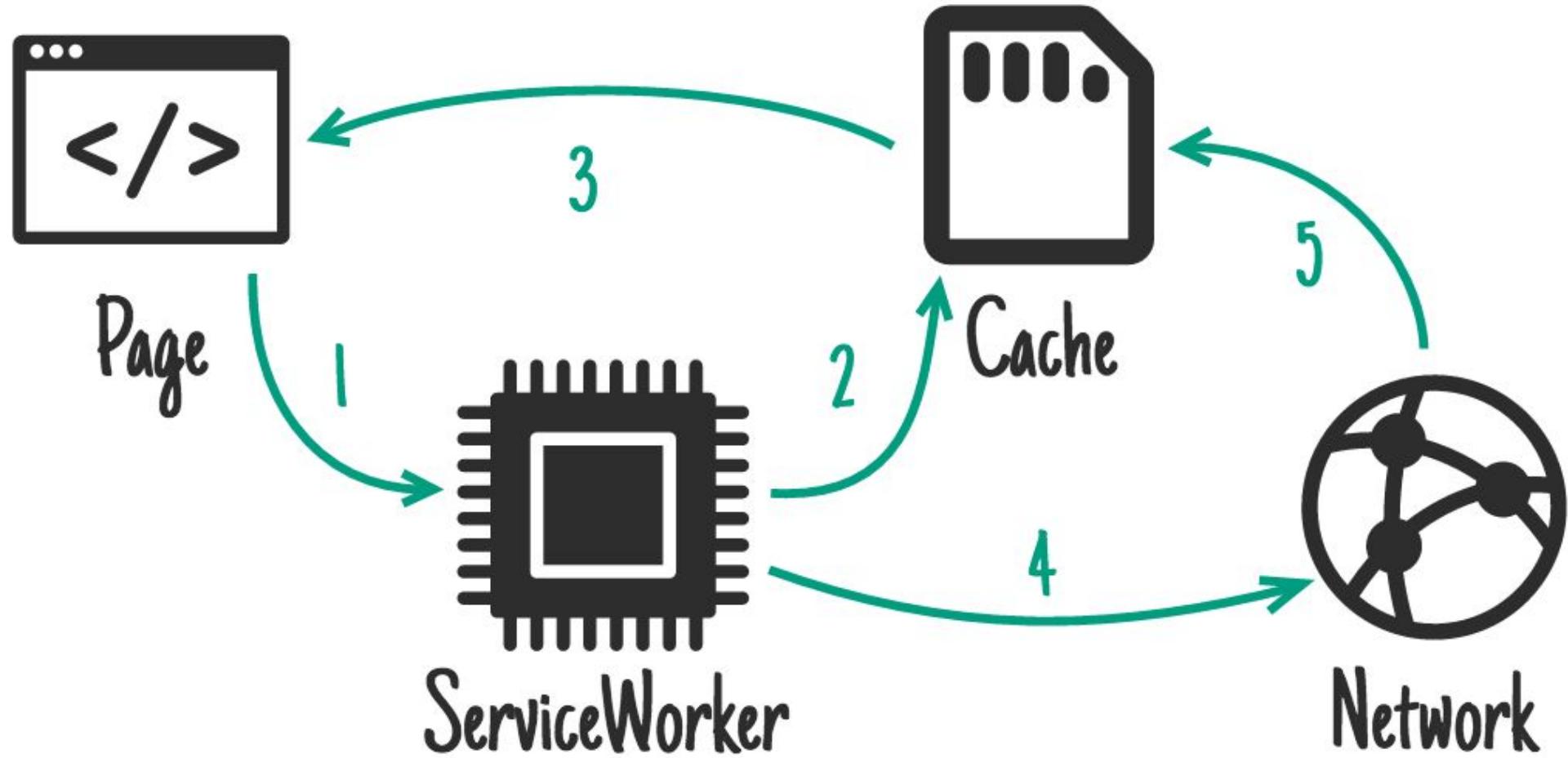
```
self.addEventListener('fetch', (e) => {
  e.responseWith(
    caches.match(e.request).then(res => res || fetch(e.request))
  )
})
```

Caching Strategies



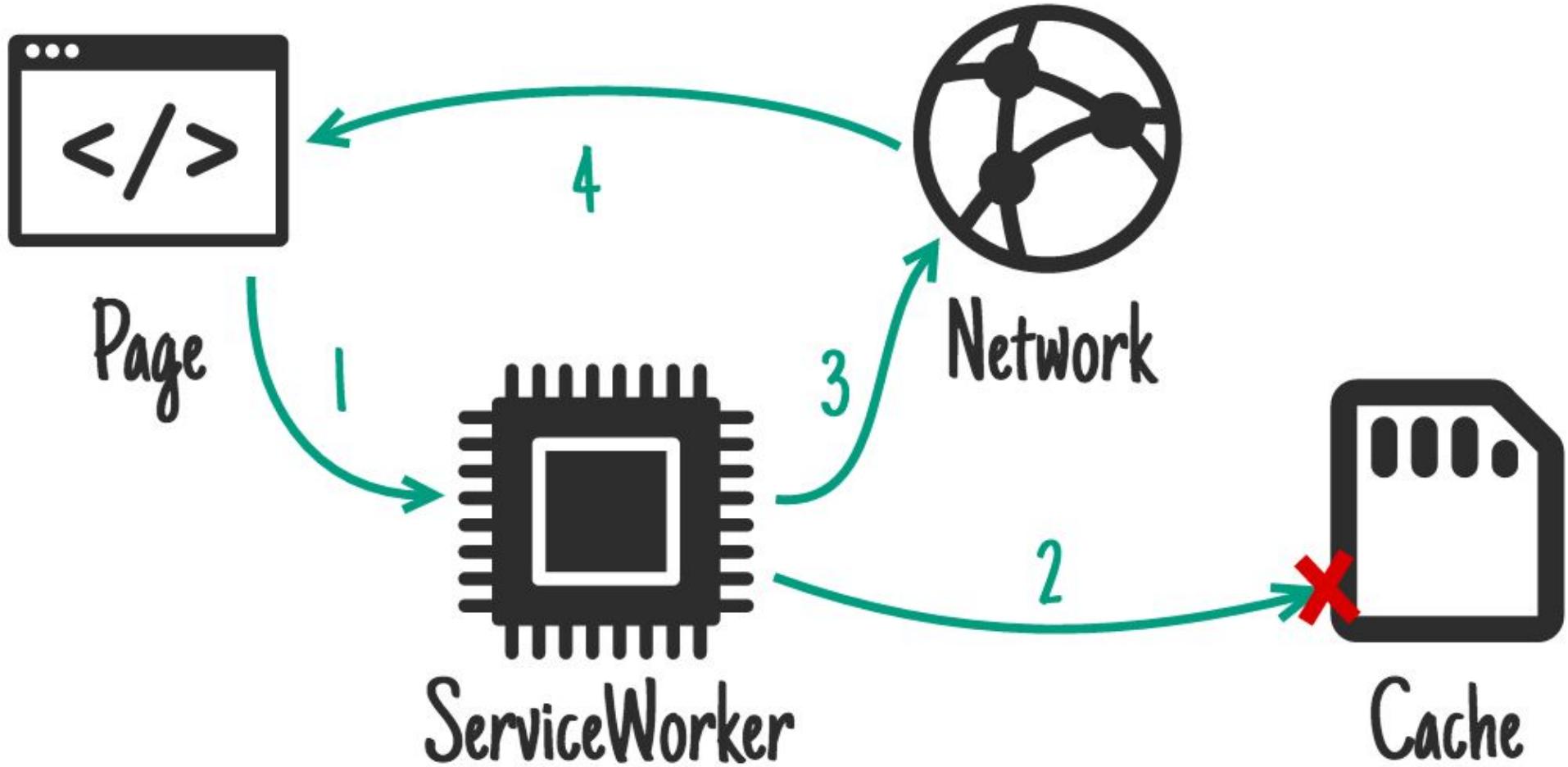


Stale-While-Revalidate



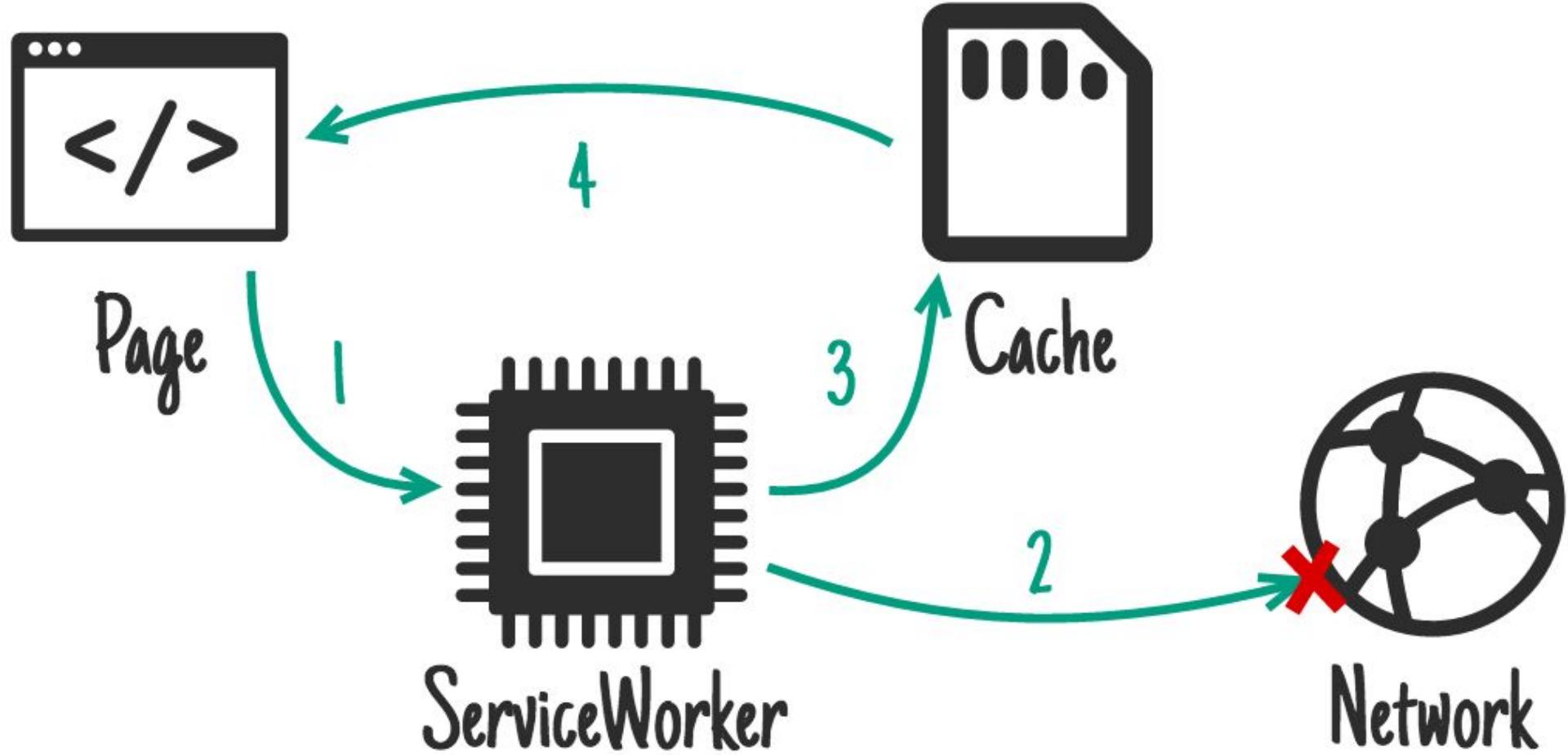


Cache First



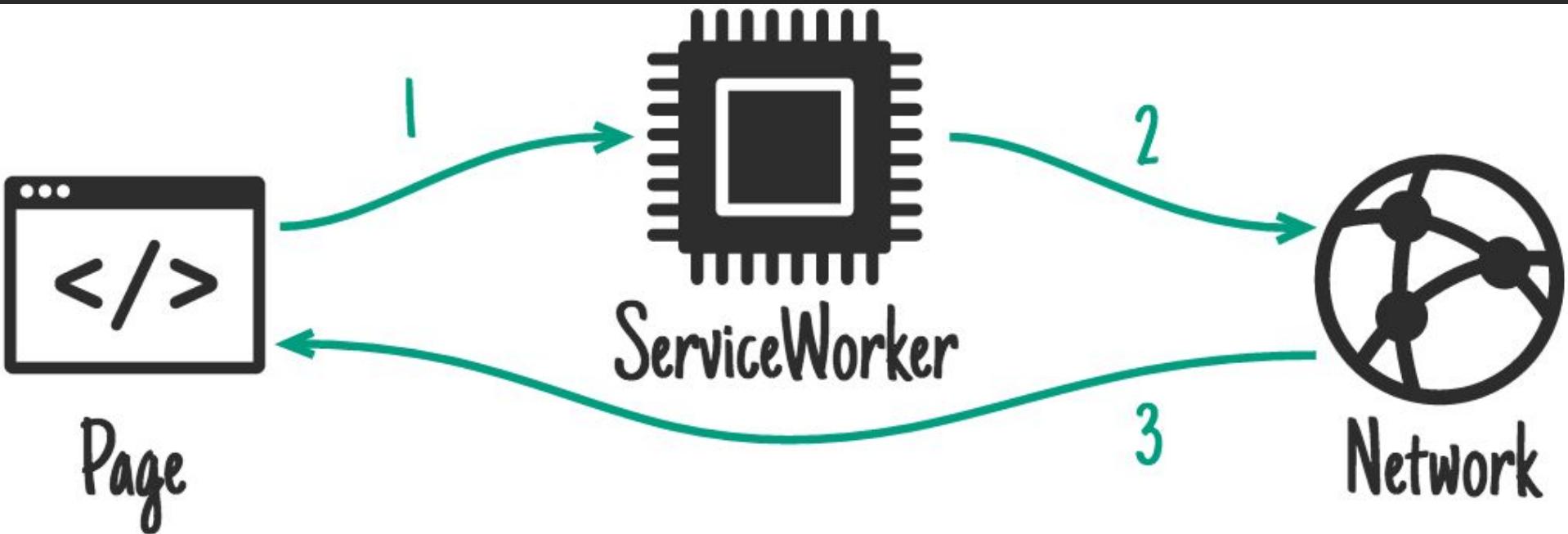


Network First



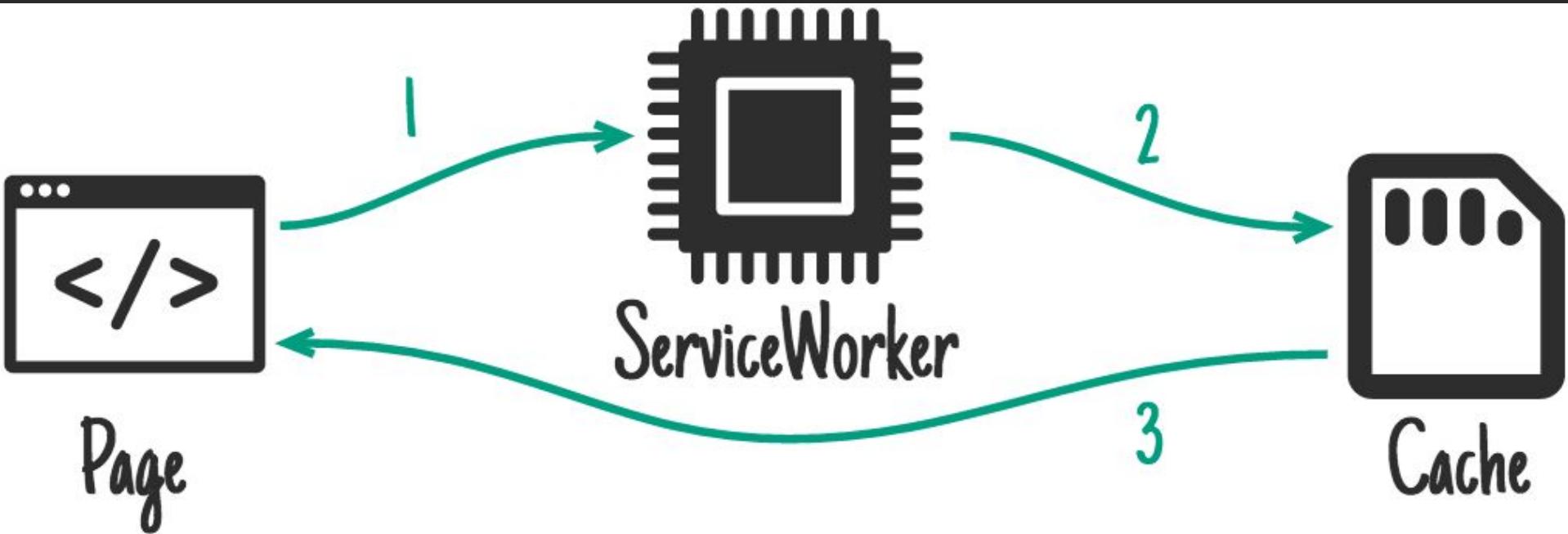


Network Only





Cache Only





[CODING]

step-4-caching

pwa/sw/caching.js

```
const cssFiles = [
  '/css/first-section.css',
  '/css/main.css',
  '/css/second-section.css',
  '/css/third-section.css',
  '/css/tikal-tech-radar.css',
];
```

```
const scriptsFiles = [
  '/js/app.js',
  '/js/default.js',
  '/js/scripts.js',
  '/js/platform.js',
  '/js/workbox.js',
  '/pwa/index.js',
```

Precache Static Files

precaching

```
workbox.precaching.precacheAndRoute( [...cssFiles,  
...scriptsFiles, ...htmlFiles, ...otherFiles]);
```

Cache Images (Cache First)

cacheFirst

```
// images
workbox.routing.registerRoute(
  /(.*)\.(?:png|gif|jpg|svg|ico|jpeg)/,
  workbox.strategies.cacheFirst({ cacheName: 'images' })
);
```

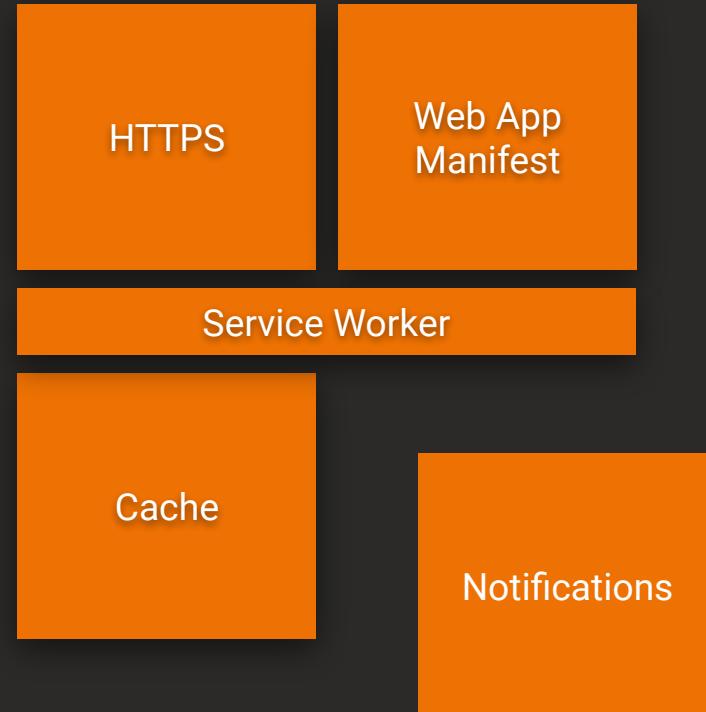


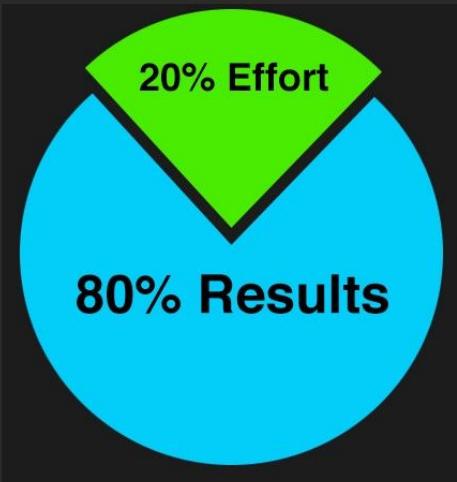
Let's test it !!

<https://developers.google.com/web/tools/lighthouse/#devtools>

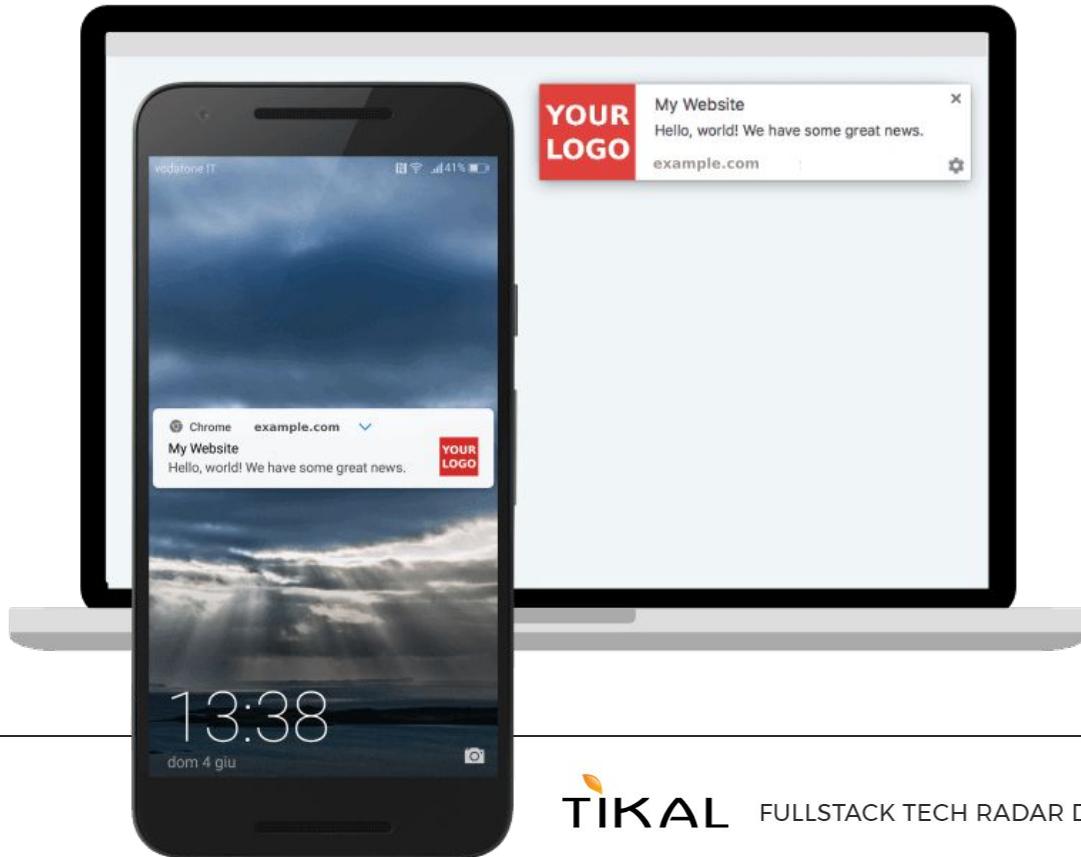
Now let's deploy and seek for differences



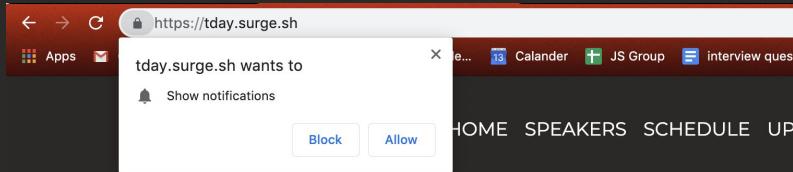




Push Notifications



Requires approval



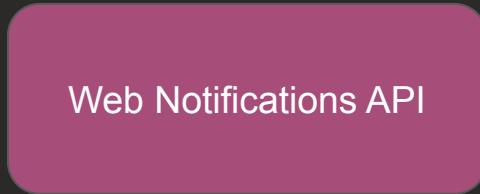
Push notifications APIs:

Web Notifications API

Service Worker

Push API

Web Notification API



(Notification Examples)

Support & Code

Web Notifications API



Support & Code

Web Notifications API

```
Notification.requestPermission().then(function(result) {  
  console.log(result);  
});
```

```
var img = '/to-do-notifications/img/icon-128.png';  
var text = 'HEY! Your task "' + title + '" is now overdue.';  
var notification = new Notification('To do list', { body: text, icon: img });
```

Let's talk about the push part:

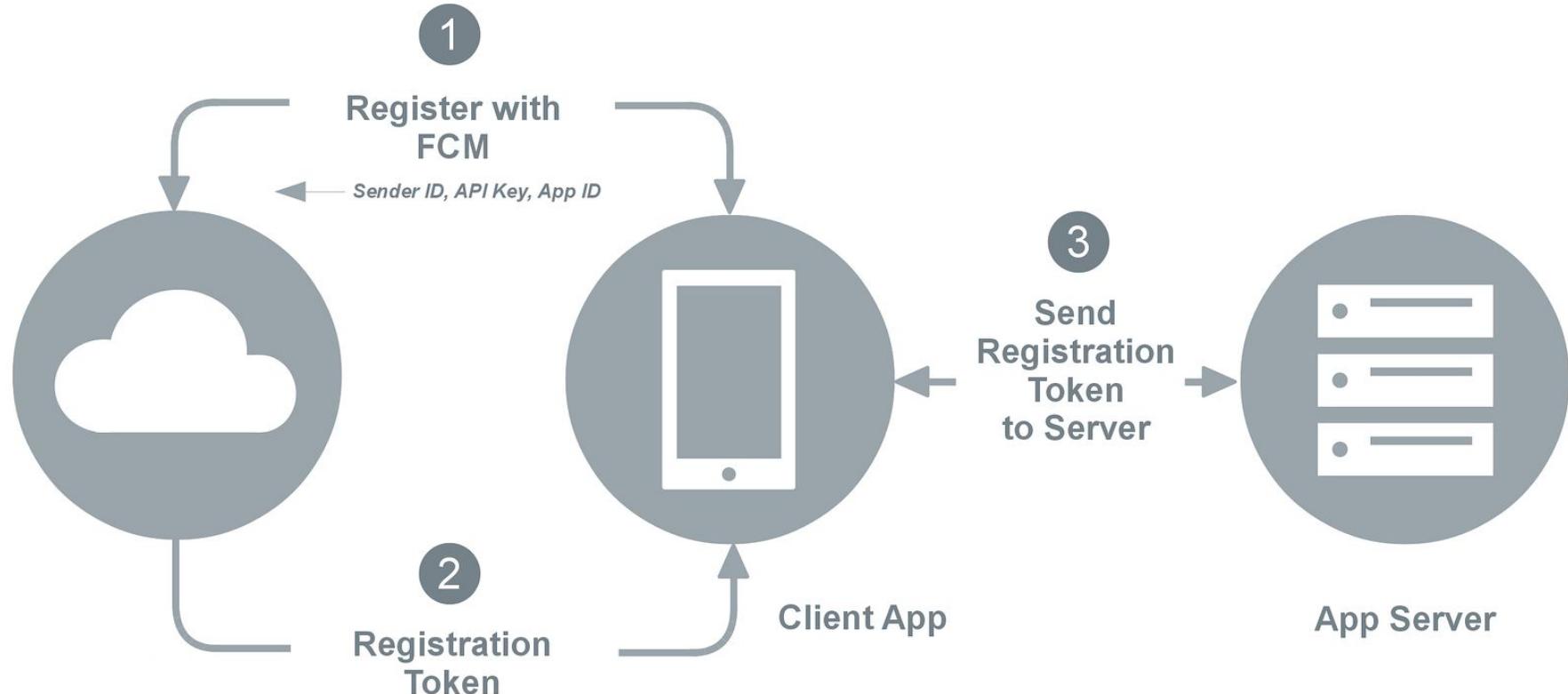


Web Notifications API

Service Worker

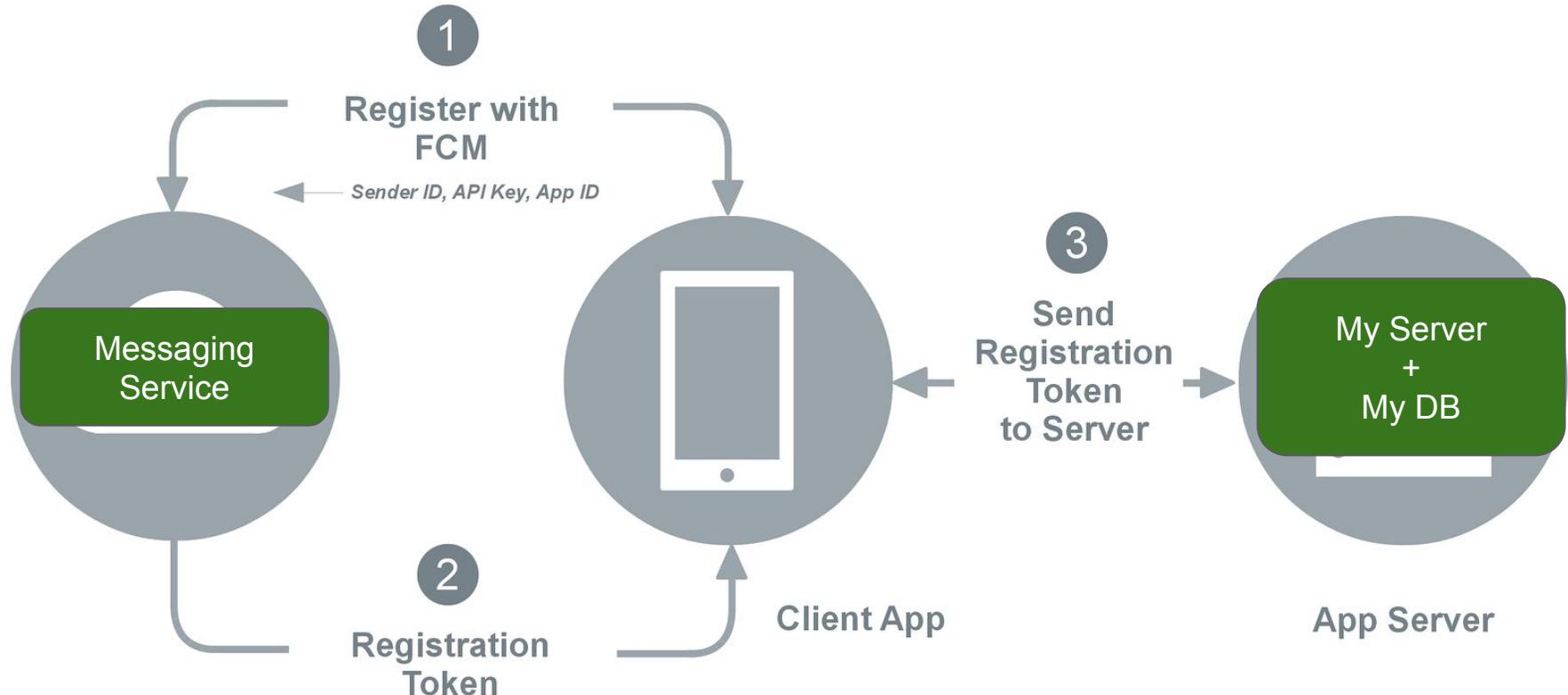
Push API

Step 1 - Identification



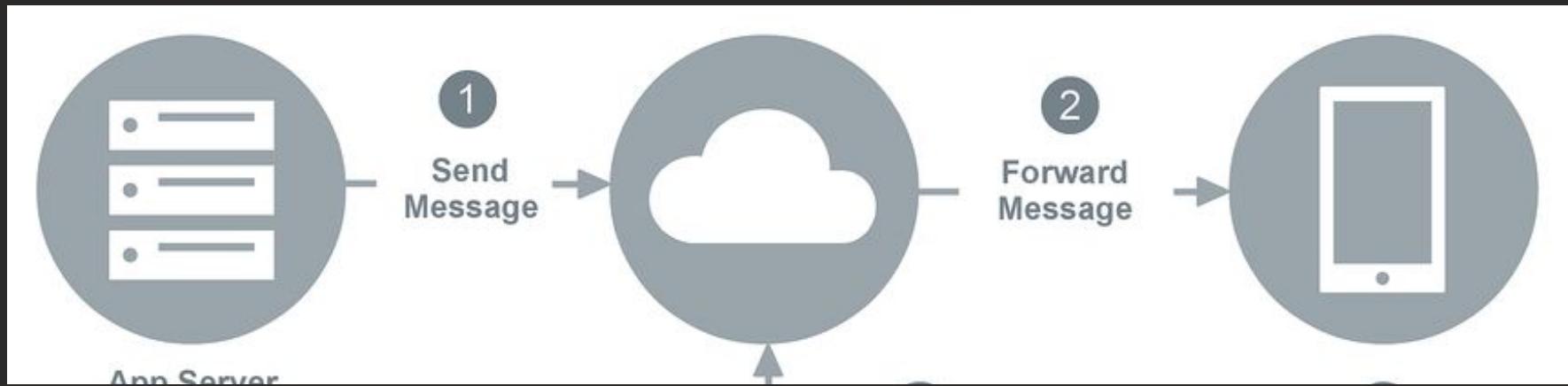
What is VAPID? <https://tools.ietf.org/html/draft-ietf-webpush-vapid-01>

Step 1 - Identification

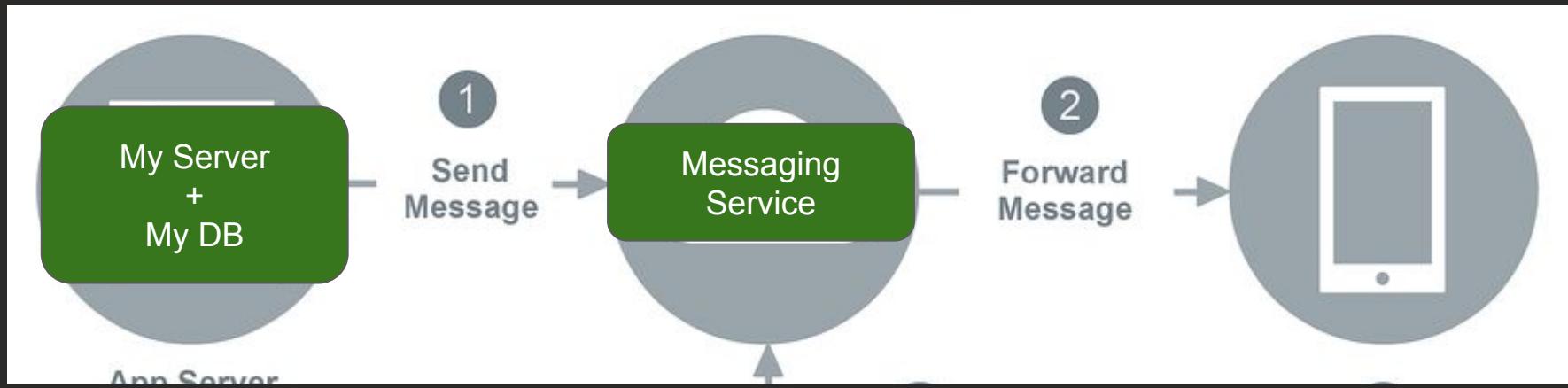


What is VAPID? <https://tools.ietf.org/html/draft-ietf-webpush-vapid-01>

Step 2 - sending the actual message



Step 2 - sending the actual message



Firebase stack



Firebase stack



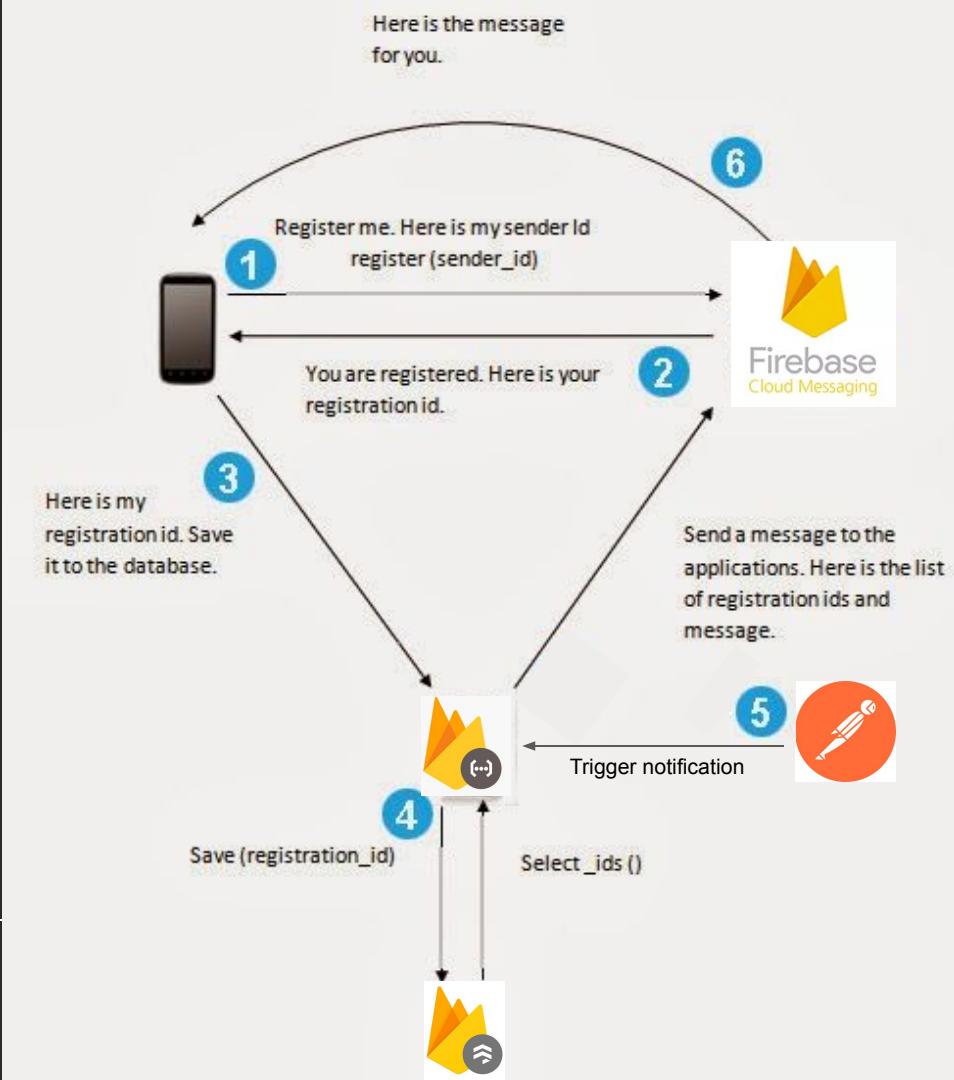
Messaging
Service

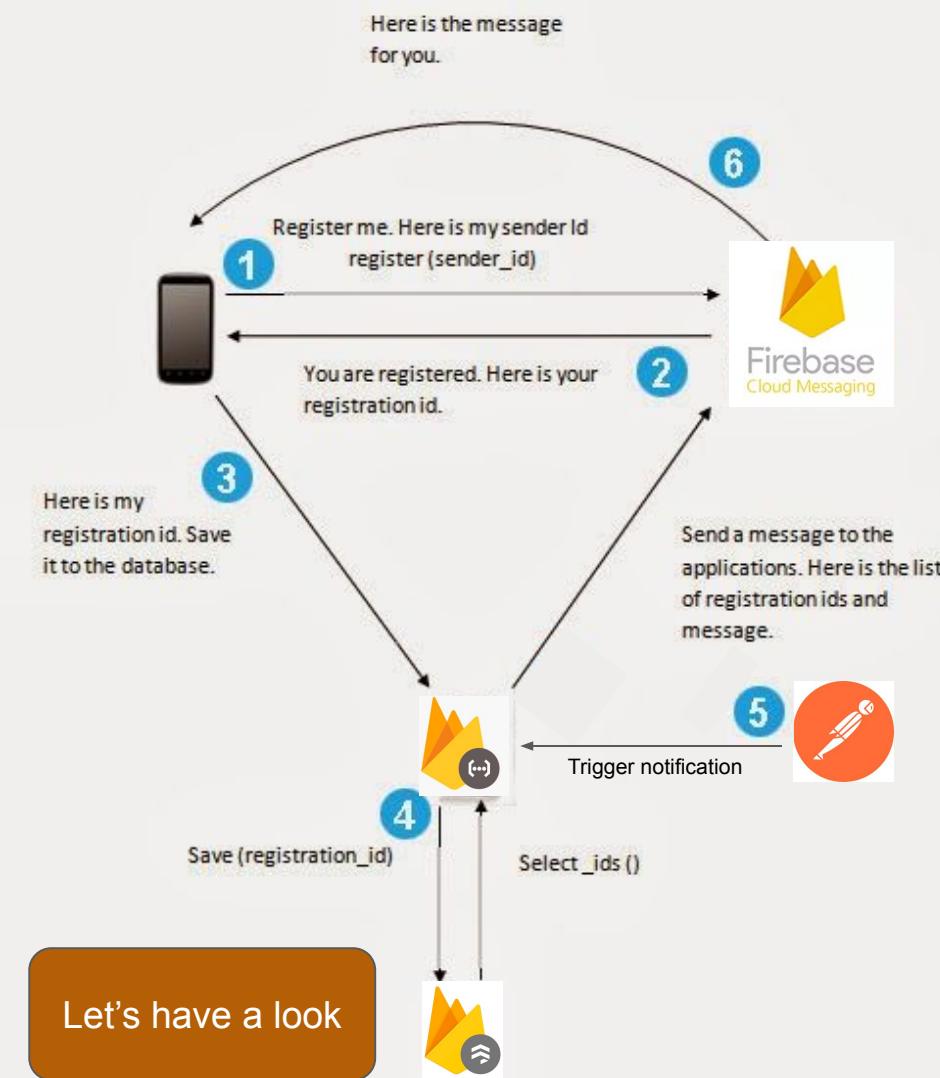


My Server



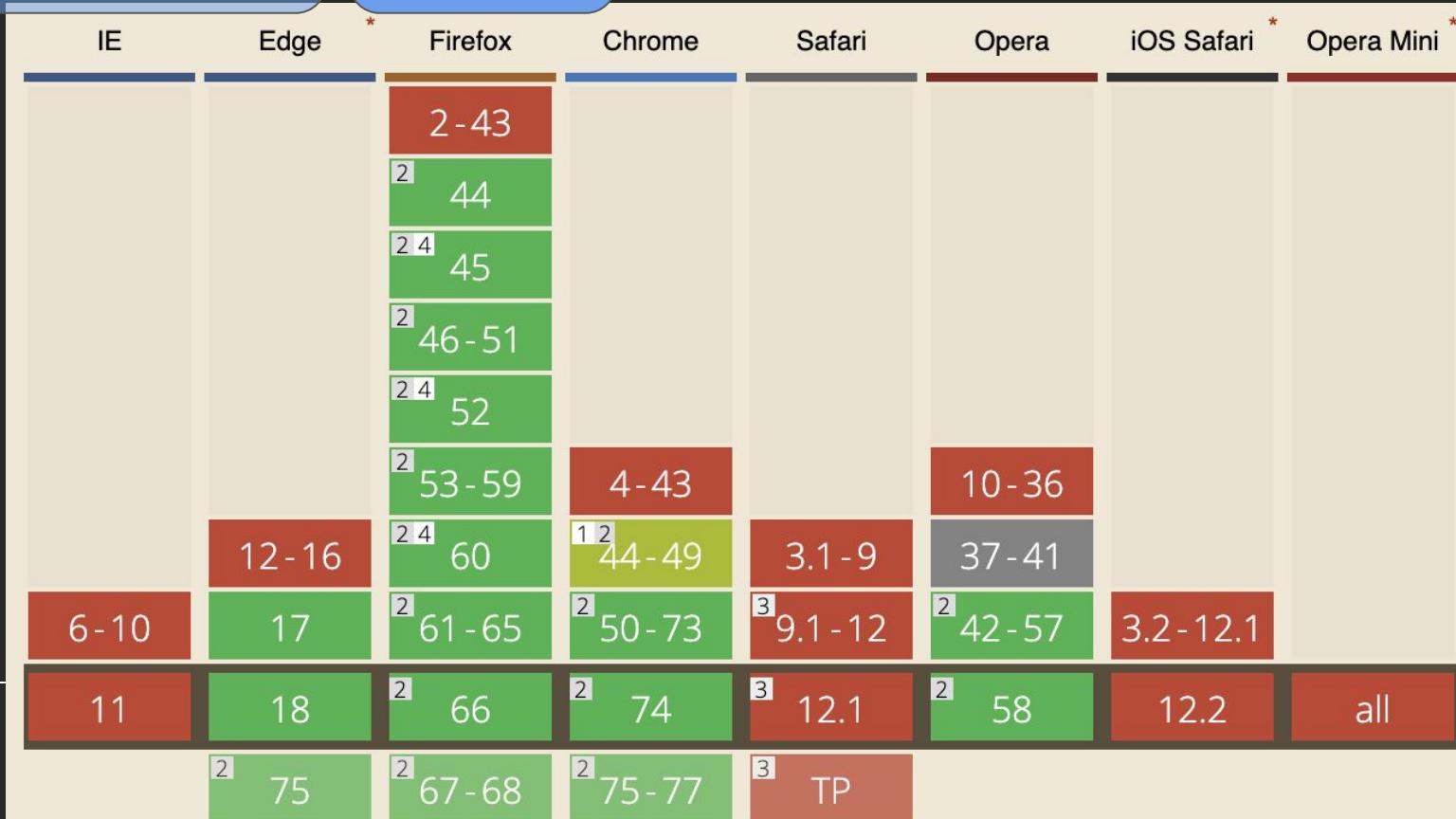
My DB





Service Worker

Push API



Service Worker

Push API

```
self.addEventListener('push', (event) => {
  const data = event.notification.data;
  self.registration.showNotification(data.title, data.options);
})

self.addEventListener('notificationclick', (event) => {
  event.notification.close();
})
```

Service Worker

Push API

```
self.addEventListener('push', (event) => {  
  const data = event.notification.data;  
  self.registration.showNotification(data.title, data.options);  
})  
  
self.addEventListener('notificationclick', (event) => {  
  event.notification.close();  
})
```



Web Notifications API

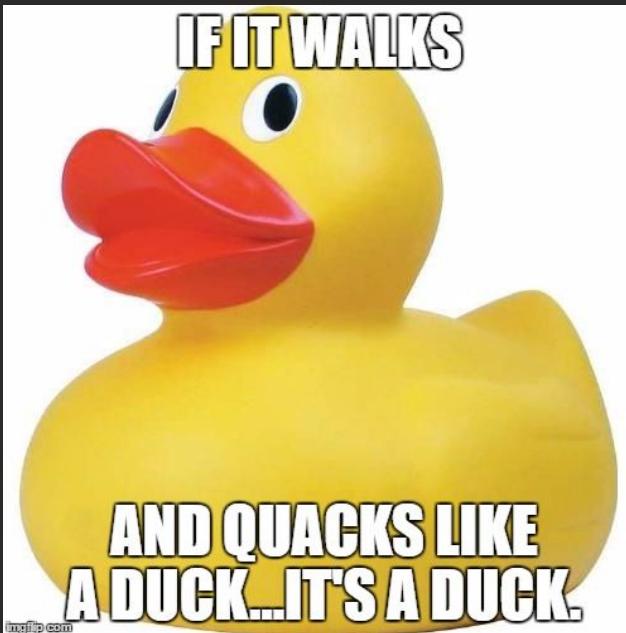
[OVERVIEW CODE]

final



FULLSTACK TECH RADAR DAY

Sum it APP



HTTPS

Web App
Manifest

Service Worker

Cache

Notifications

TWAs

Trusted Web Activities

- A full screen browser inside an Android app
- No browser UI is visible in the app
- A special case of a Chrome Custom Tab (CCT)
- Enables more features than webview
- Must be validated as ‘trusted’ (android manifest & and ‘.well-known’ folder on the site)



<https://appmaker.xyz/pwa-to-apk/>

[Thank You]



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