Building Progressive Web Apps and Publishing in the App Stores

Alan Mendelevich
@ailon

Web vs. Native

Web apps	Native (via stores)
Write once run anywhere	Performance & API access
Open	Native look & feel
Huge ecosystem	Consumer friendly discovery
Easy deploys	Works offline
Linkable	One click away

Progressive Web Apps are

Progressive Web Apps are NOT

Progressive Web Apps are NOT a framework

Progressive Web Apps are NOT a library

Progressive Web Apps are NOT a cult

Progressive Web Apps are a set of characteristics that make web apps more native-like (enabled by standard web technologies).

Web apps	Native (via stores)
Write once run anywhere	Performance & API access
Open	Native look & feel
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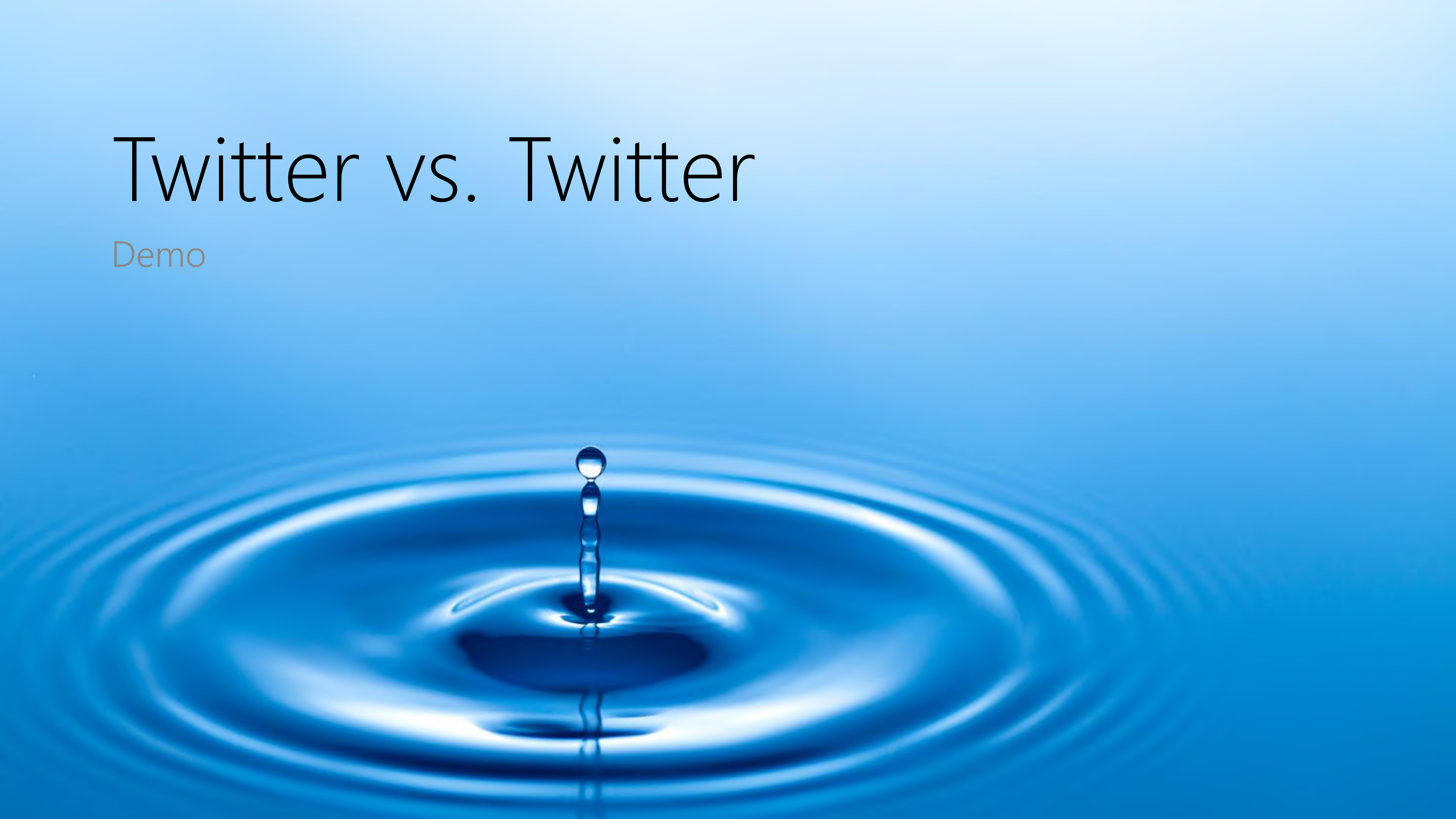
Progressive Web Apps are

- Progressive
- Responsive
- Connectivity independent
- App-like
- Fresh
- Safe
- Discoverable
- Re-engageable
- Installable
- Linkable

* original definition by Frances Berriman and Alex Russell (2015)

Twitter vs. Twitter

Demo



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AMCHARTS

MVP Microsoft® Most Valuable Professional

Agenda

Lap around PWA tech

State of the Union (May 2019)

PWAs in the app stores

PWA Basics

Minimum Viable PWA

HTTPS

Manifest

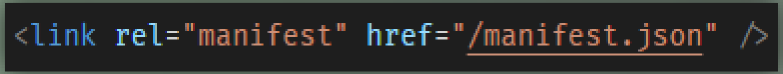
Service Worker

Web App Manifest

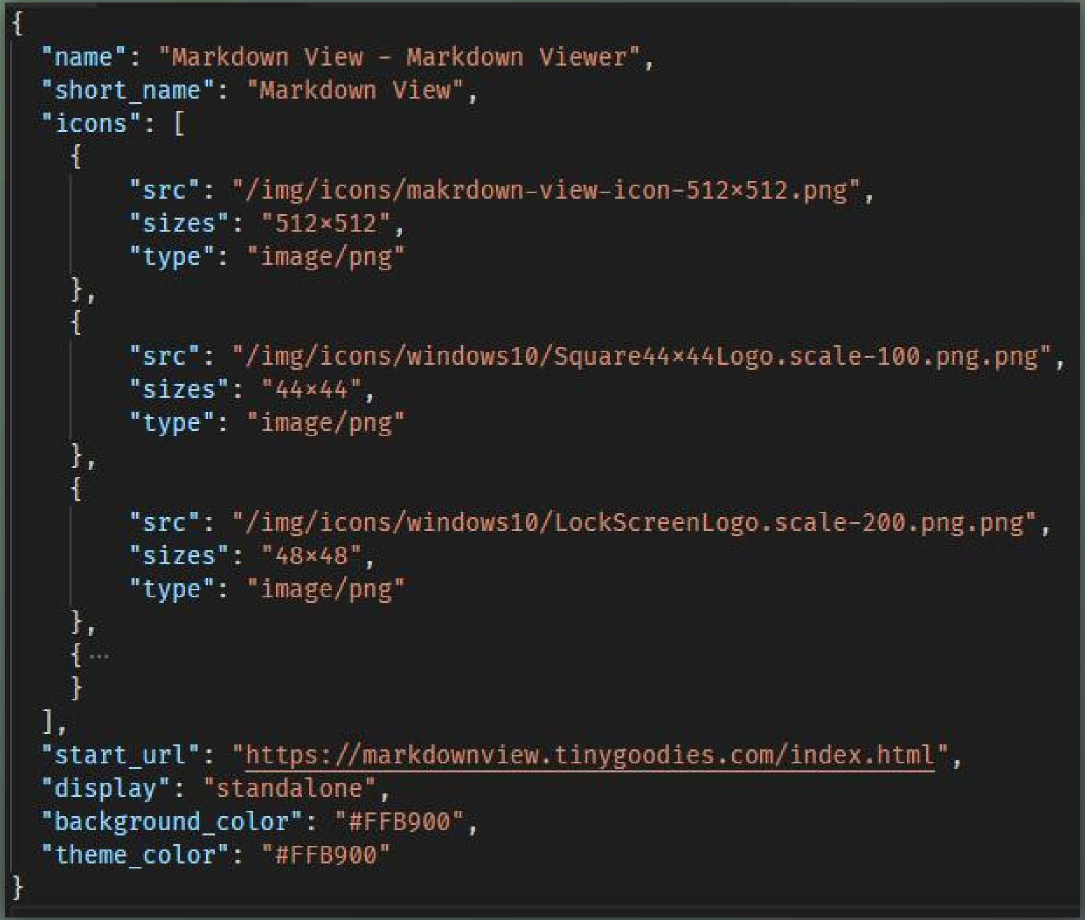
Provides information about the app

Specifies design elements (icons, colors)

Specifies preferred display mode, orientation, etc.



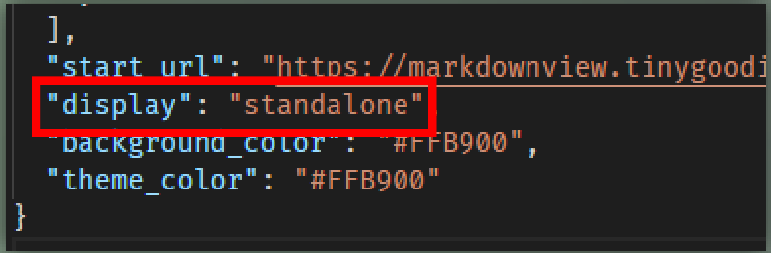
```html
<link rel="manifest" href="/manifest.json" />
```



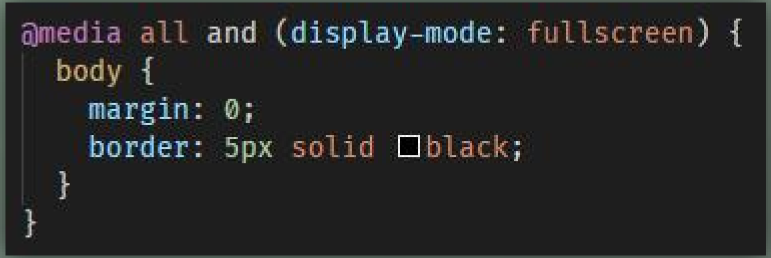
```json
{
  "name": "Markdown View - Markdown Viewer",
  "short_name": "Markdown View",
  "icons": [
    {
        "src": "/img/icons/makrdown-view-icon-512×512.png",
        "sizes": "512×512",
        "type": "image/png"
    },
    {
        "src": "/img/icons/windows10/Square44×44Logo.scale-100.png.png",
        "sizes": "44×44",
        "type": "image/png"
    },
    {
        "src": "/img/icons/windows10/LockScreenLogo.scale-200.png.png",
        "sizes": "48×48",
        "type": "image/png"
    },
    {…
    }
  ],
  "start_url": "https://markdownview.tinygoodies.com/index.html",
  "display": "standalone",
  "background_color": "#FFB900",
  "theme_color": "#FFB900"
}
```

Manifest: display mode – “display”

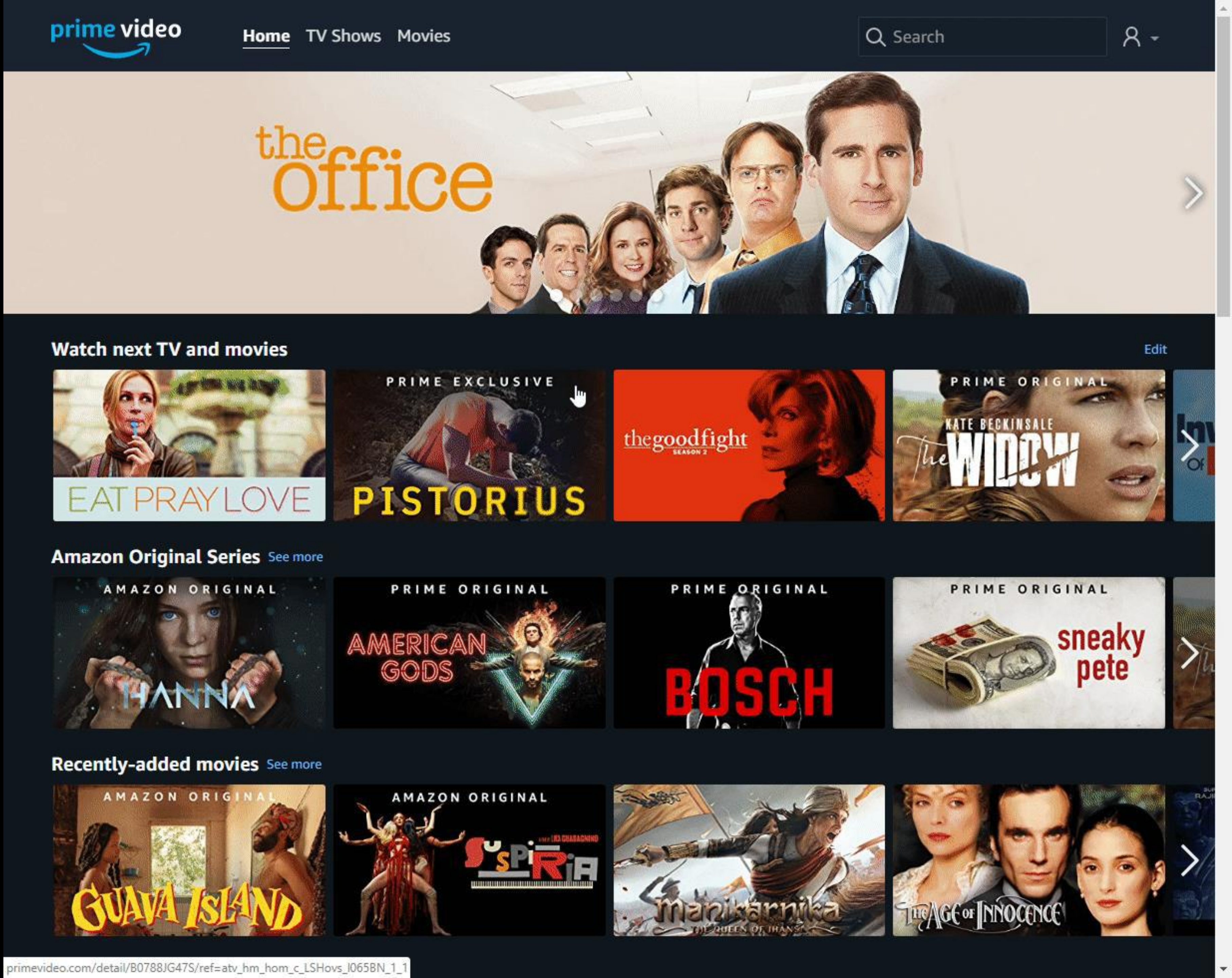
- browser
- minimal-ui
- standalone
- fullscreen



```
  ],
  "start_url": "https://markdownview.tinygoodi
  "display": "standalone"
  "background_color": "#FFB900",
  "theme_color": "#FFB900"
}
```



```
@media all and (display-mode: fullscreen) {
  body {
    margin: 0;
    border: 5px solid □black;
  }
}
```



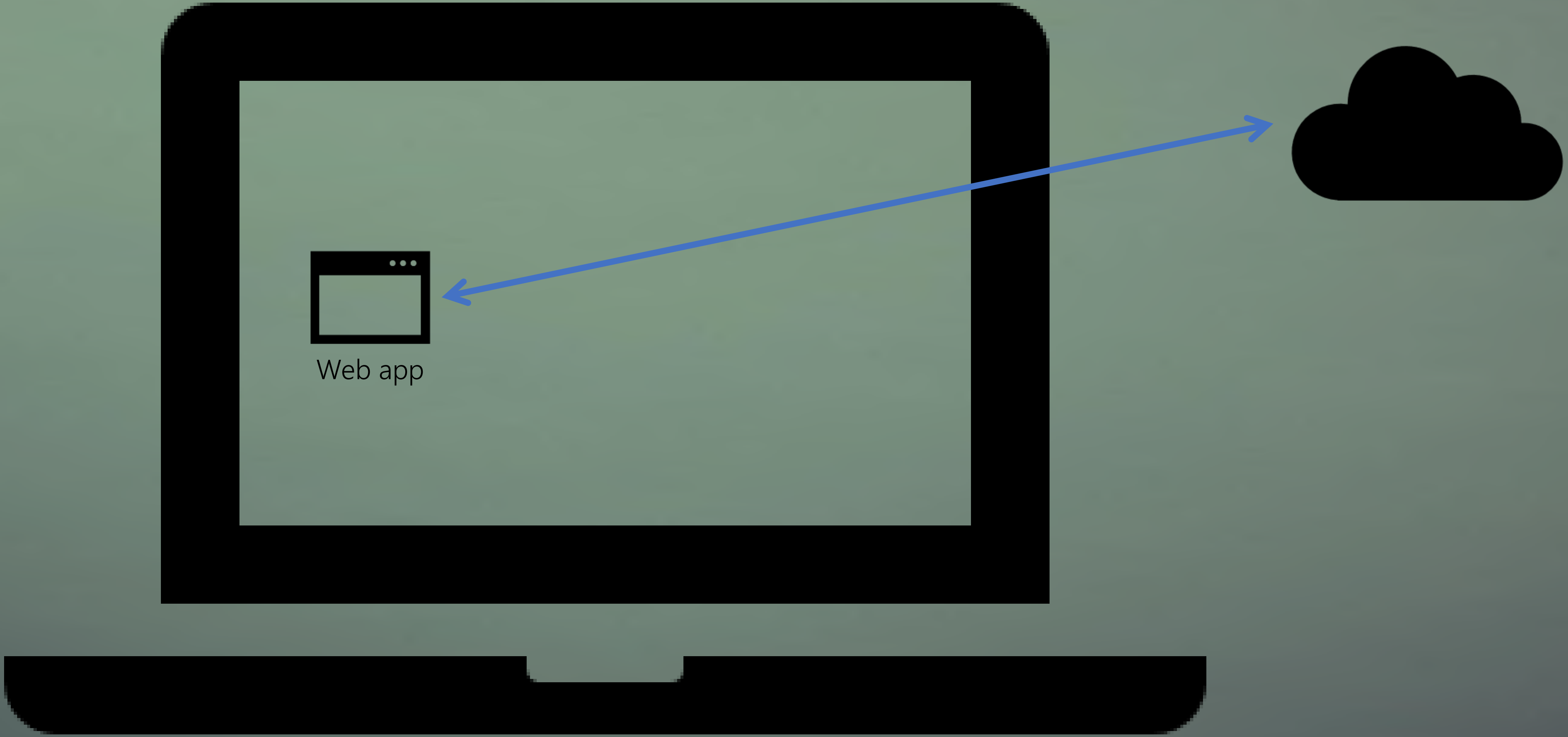
Watch next TV and movies

Amazon Original Series

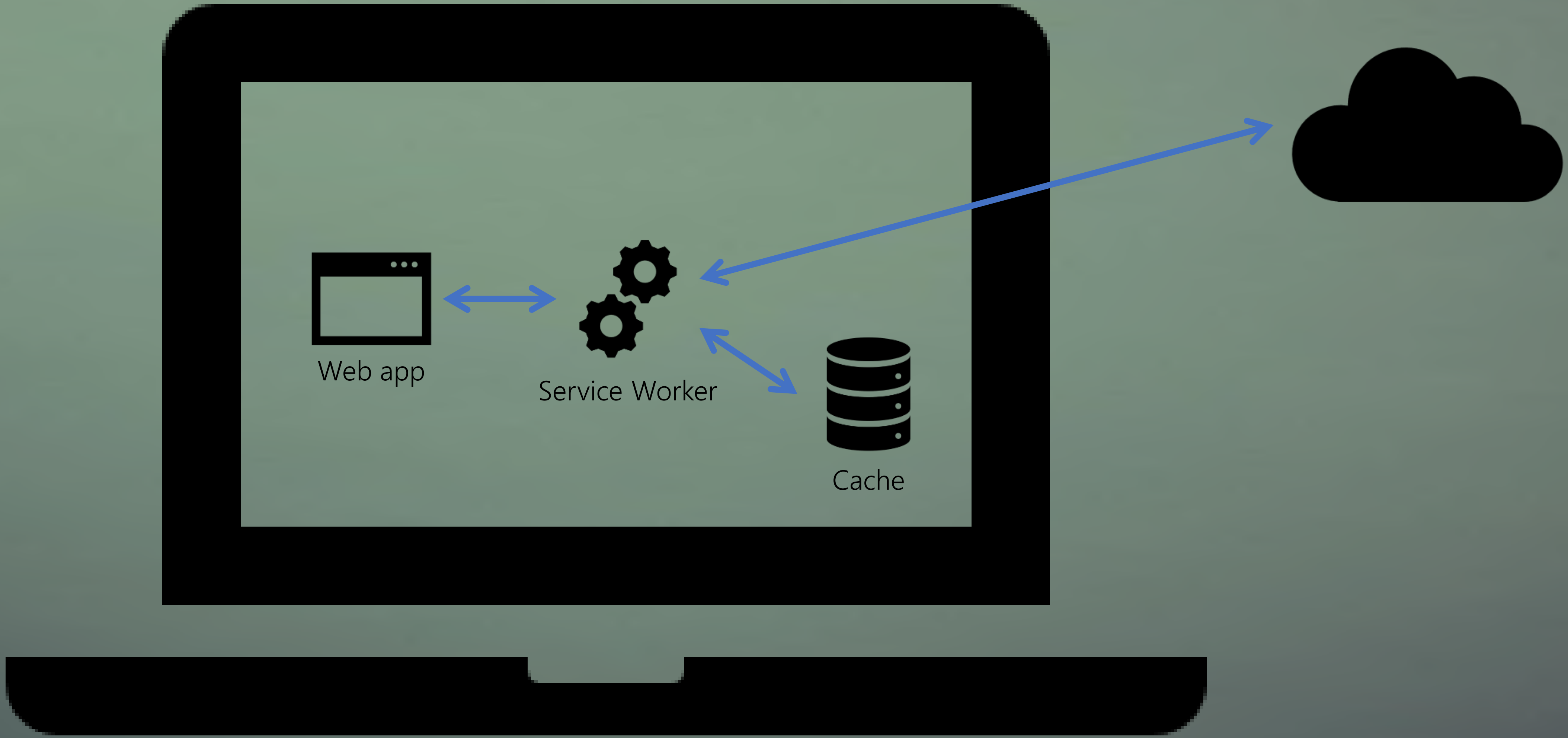
Recently-added movies

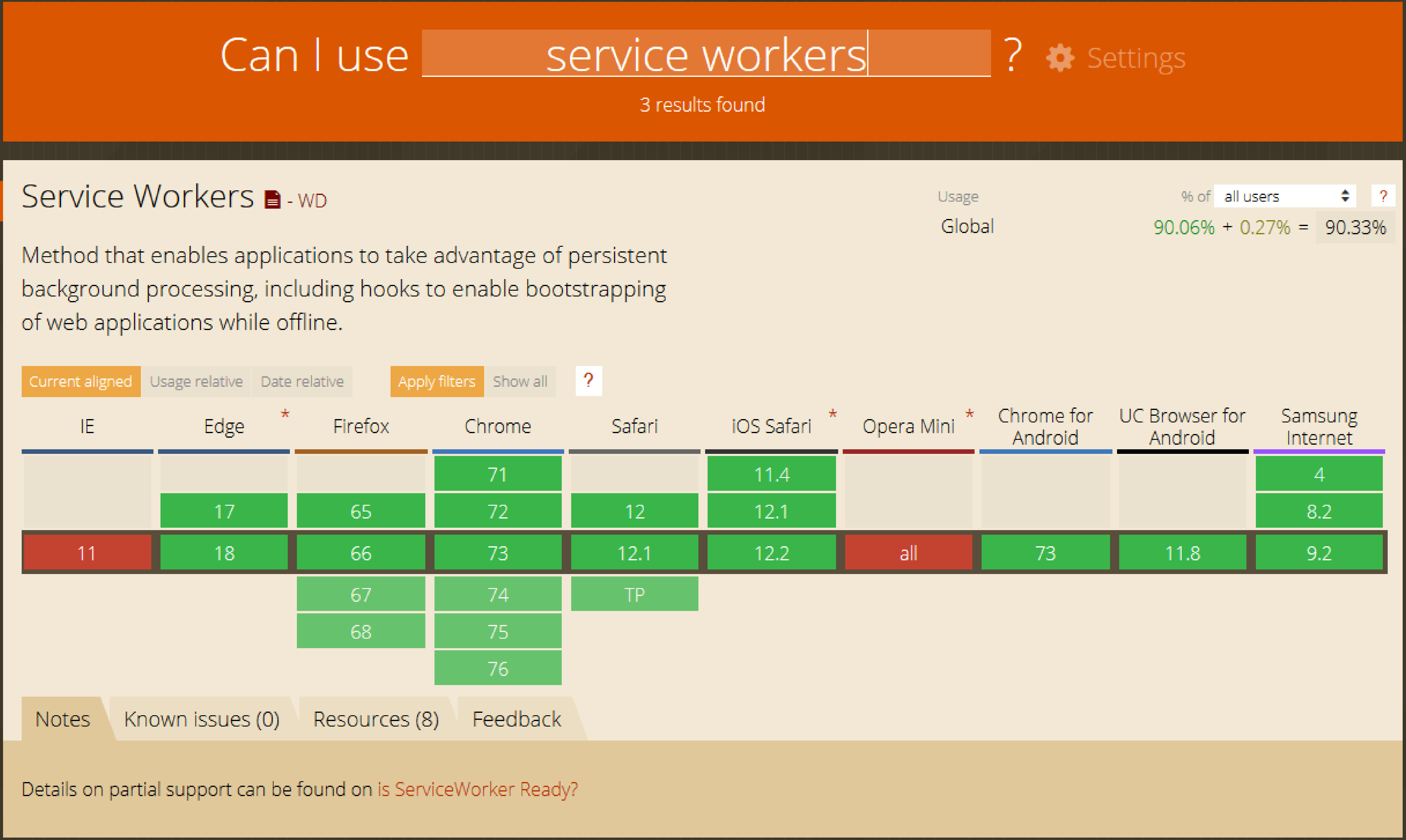
primevideo.com/detail/B0788JG47S/ref=atv_hm_hom_c_LSHovs_I065BN_1_1

Typical network request



Service Worker





Can I use service workers ? Settings

3 results found

Service Workers - WD

Usage

Global

% of all users ?

90.06% + 0.27% = 90.33%

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

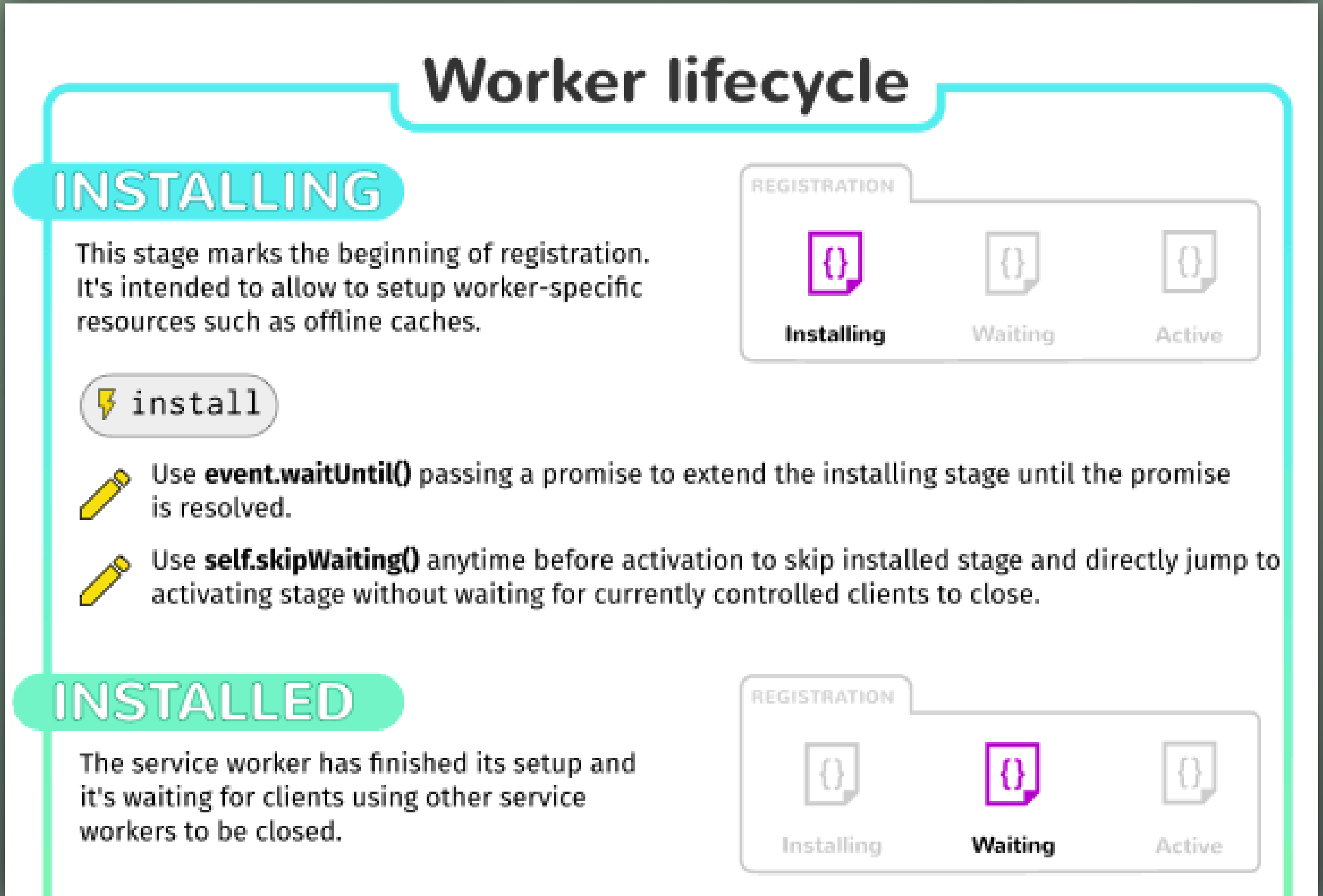
Current aligned | Usage relative | Date relative | Apply filters | Show all | ?

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			71		11.4				4
	17	65	72	12	12.1				8.2
11	18	66	73	12.1	12.2	all	73	11.8	9.2
		67	74	TP					
		68	75						
			76						

Notes | Known issues (0) | Resources (8) | Feedback

Details on partial support can be found on is ServiceWorker Ready?

Service Worker Lifecycle



Worker lifecycle

INSTALLING

This stage marks the beginning of registration. It's intended to allow to setup worker-specific resources such as offline caches.

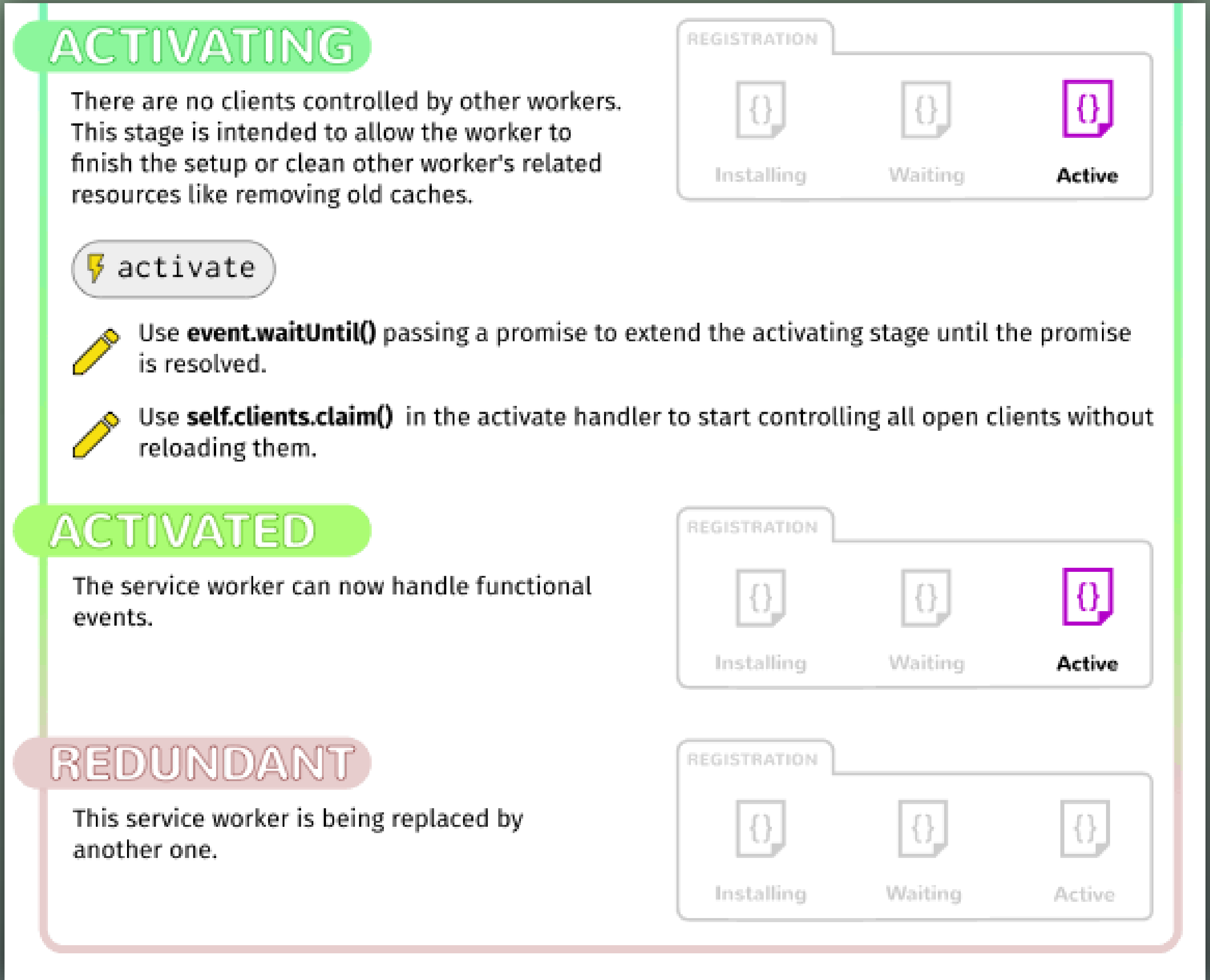
install

- Use **event.waitUntil()** passing a promise to extend the installing stage until the promise is resolved.
- Use **self.skipWaiting()** anytime before activation to skip installed stage and directly jump to activating stage without waiting for currently controlled clients to close.

INSTALLED

The service worker has finished its setup and it's waiting for clients using other service workers to be closed.

Service Worker Lifecycle (cont.)



ACTIVATING

There are no clients controlled by other workers. This stage is intended to allow the worker to finish the setup or clean other worker's related resources like removing old caches.

`activate`

- Use **event.waitUntil()** passing a promise to extend the activating stage until the promise is resolved.
- Use **self.clients.claim()** in the activate handler to start controlling all open clients without reloading them.

ACTIVATED

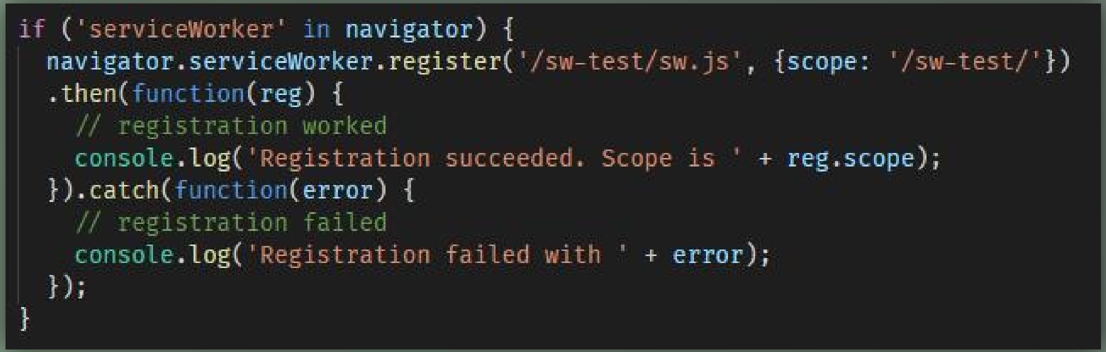
The service worker can now handle functional events.

REDUNDANT

This service worker is being replaced by another one.

Service Worker Lifecycle in Code

Register SW in your main code



```
if ('serviceWorker' in navigator) {
  navigator.serviceWorker.register('/sw-test/sw.js', {scope: '/sw-test/'})
  .then(function(reg) {
    // registration worked
    console.log('Registration succeeded. Scope is ' + reg.scope);
  }).catch(function(error) {
    // registration failed
    console.log('Registration failed with ' + error);
  });
}
```

Install

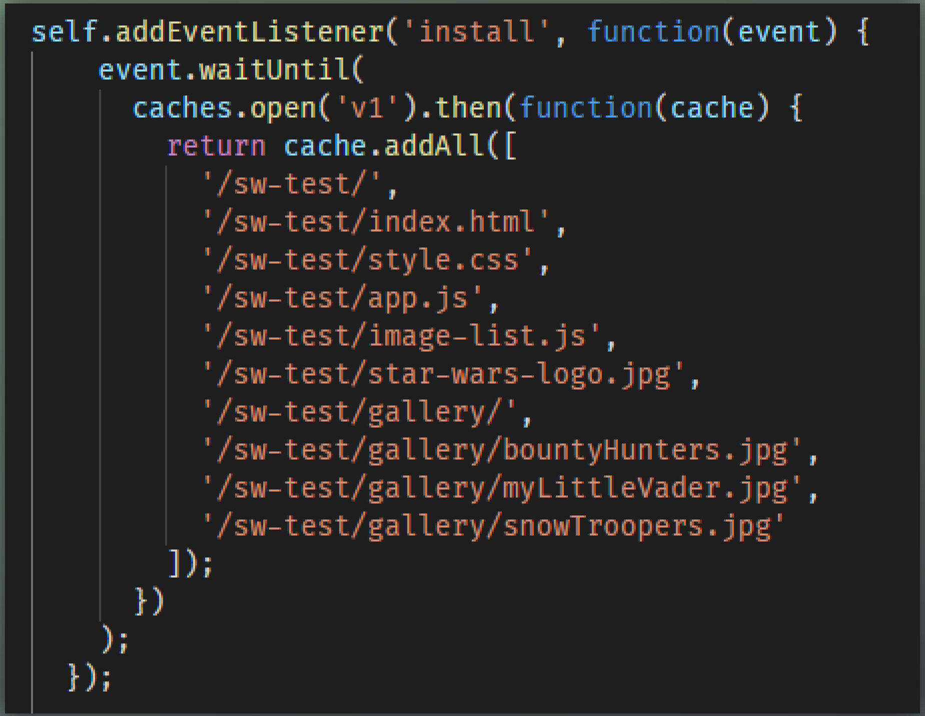
Handle events

Service Worker Lifecycle in Code

Register SW in your main code

Install

Handle events



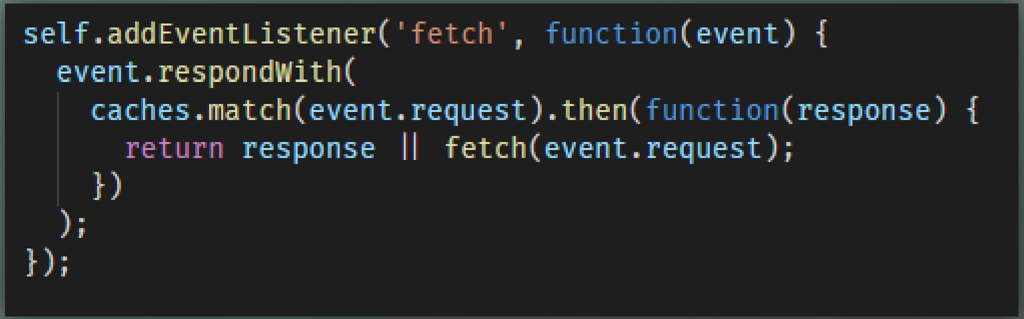
```
self.addEventListener('install', function(event) {
    event.waitUntil(
      caches.open('v1').then(function(cache) {
        return cache.addAll([
          '/sw-test/',
          '/sw-test/index.html',
          '/sw-test/style.css',
          '/sw-test/app.js',
          '/sw-test/image-list.js',
          '/sw-test/star-wars-logo.jpg',
          '/sw-test/gallery/',
          '/sw-test/gallery/bountyHunters.jpg',
          '/sw-test/gallery/myLittleVader.jpg',
          '/sw-test/gallery/snowTroopers.jpg'
        ]);
      })
    );
  });
```

Service Worker Lifecycle in Code (simplified)

Register SW in your main code

Install

Handle events



```
self.addEventListener('fetch', function(event) {
  event.respondWith(
    caches.match(event.request).then(function(response) {
      return response || fetch(event.request);
    })
  );
});
```

Service Worker: Caching strategies

Network or cache

Cache only

Cache and update

Cache, update and refresh

https://serviceworke.rs

Building PWAs in 2019

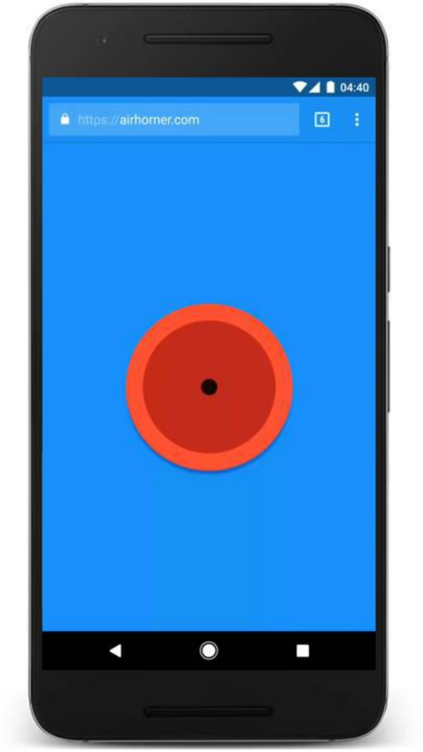
PWA builder

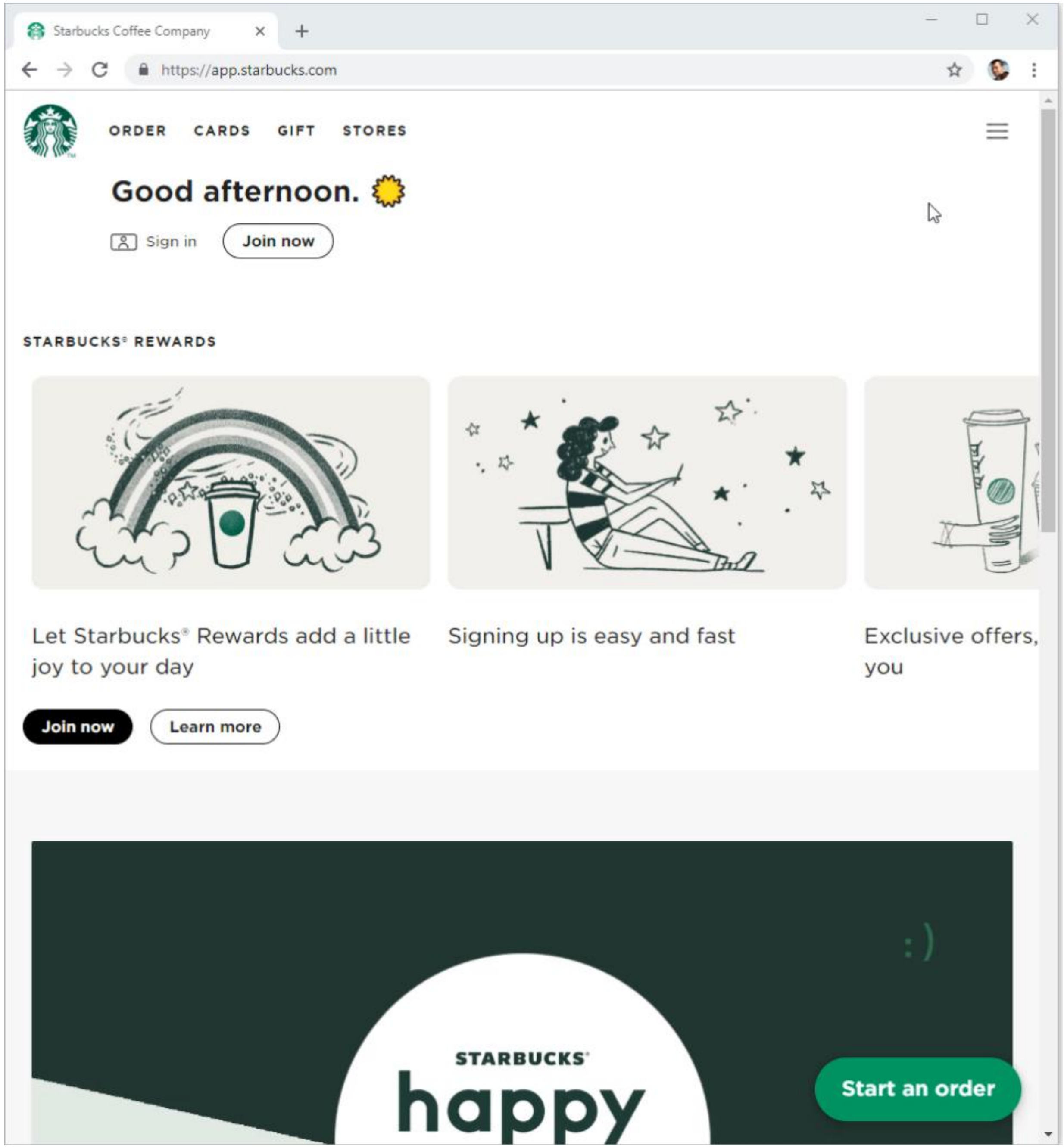
Demo

https://www.pwabuilder.com

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

Install experience





Good afternoon.

Sign in

Join now

STARBUCKS® REWARDS

Let Starbucks® Rewards add a little joy to your day

Signing up is easy and fast

Exclusive offers, you

Join now

Learn more

STARBUCKS® happy

:)

Start an order

PWAs in App Stores

But WHY!?

Web apps	Native (via stores)
Write once run anywhere	Performance & API access
Open	Native look & feel
Huge ecosystem	Consumer friendly discovery
Easy deploys	Works offline
Linkable	One click away

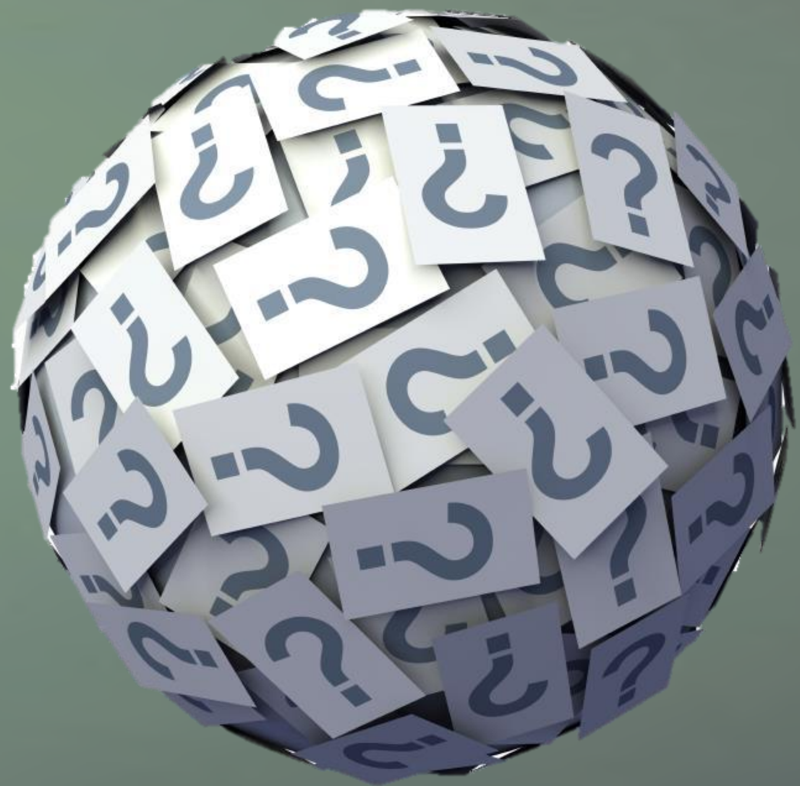
"So, when will I be able to download our shiny new app from the app store?"

Before you start…

Who are my users and where are they coming from?

Is my app appropriate for app stores?

Are app store rules compatible with my app and business?



Microsoft Store

Microsoft Store

Richest story today*

Based on Hosted Web Apps

Access to native APIs*

Microsoft Store – Publishing your PWA

Get Microsoft Store Partner Center account

Reserve app name

Use PWA Builder and add missing icons

Use PWA Builder to generate AppX

Upload to Partner Center

Publish to Microsoft Store

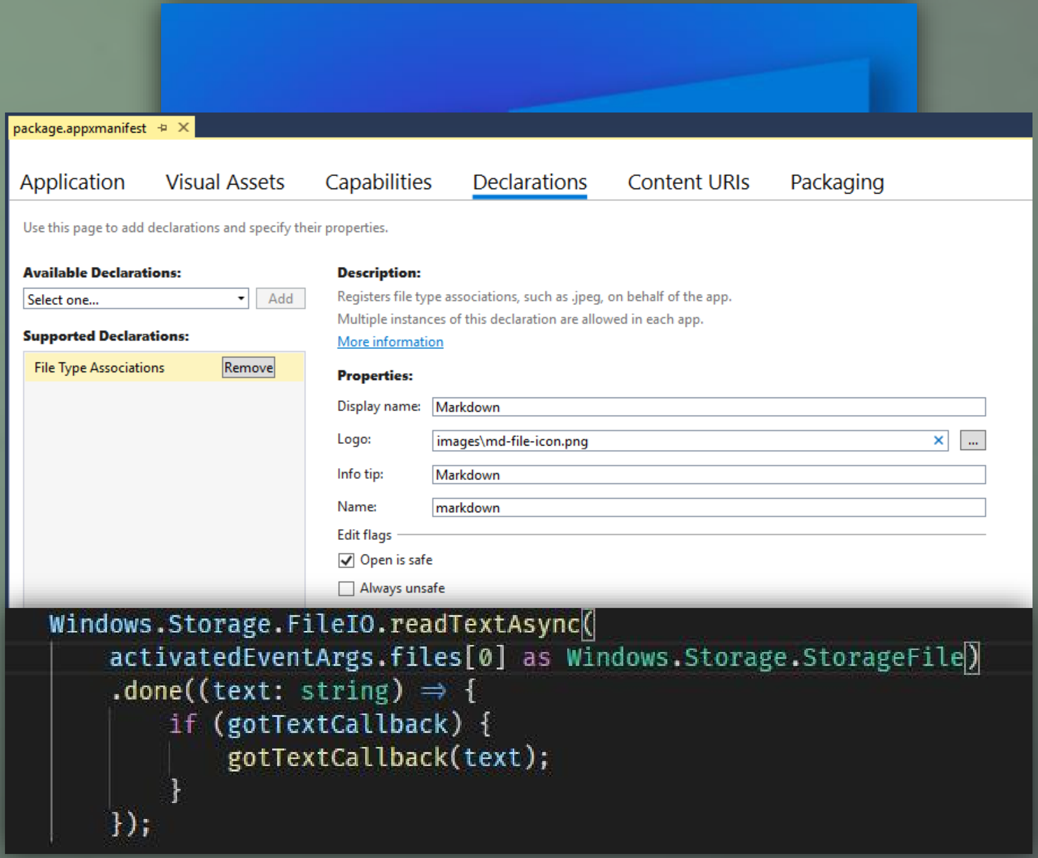
Demo

Microsoft Store – Accessing Windows APIs

Test window.Windows

Add capabilities to appxmanifest if needed

Access WinRT APIs via Windows.xxx



Use this page to add declarations and specify their properties.

Available Declarations:

Select one... | Add

Supported Declarations:

File Type Associations | Remove

Description:

Registers file type associations, such as .jpeg, on behalf of the app.
Multiple instances of this declaration are allowed in each app.
More information

Properties:

Display name: Markdown

Logo: images\md-file-icon.png

Info tip: Markdown

Name: markdown

Edit flags

☑ Open is safe

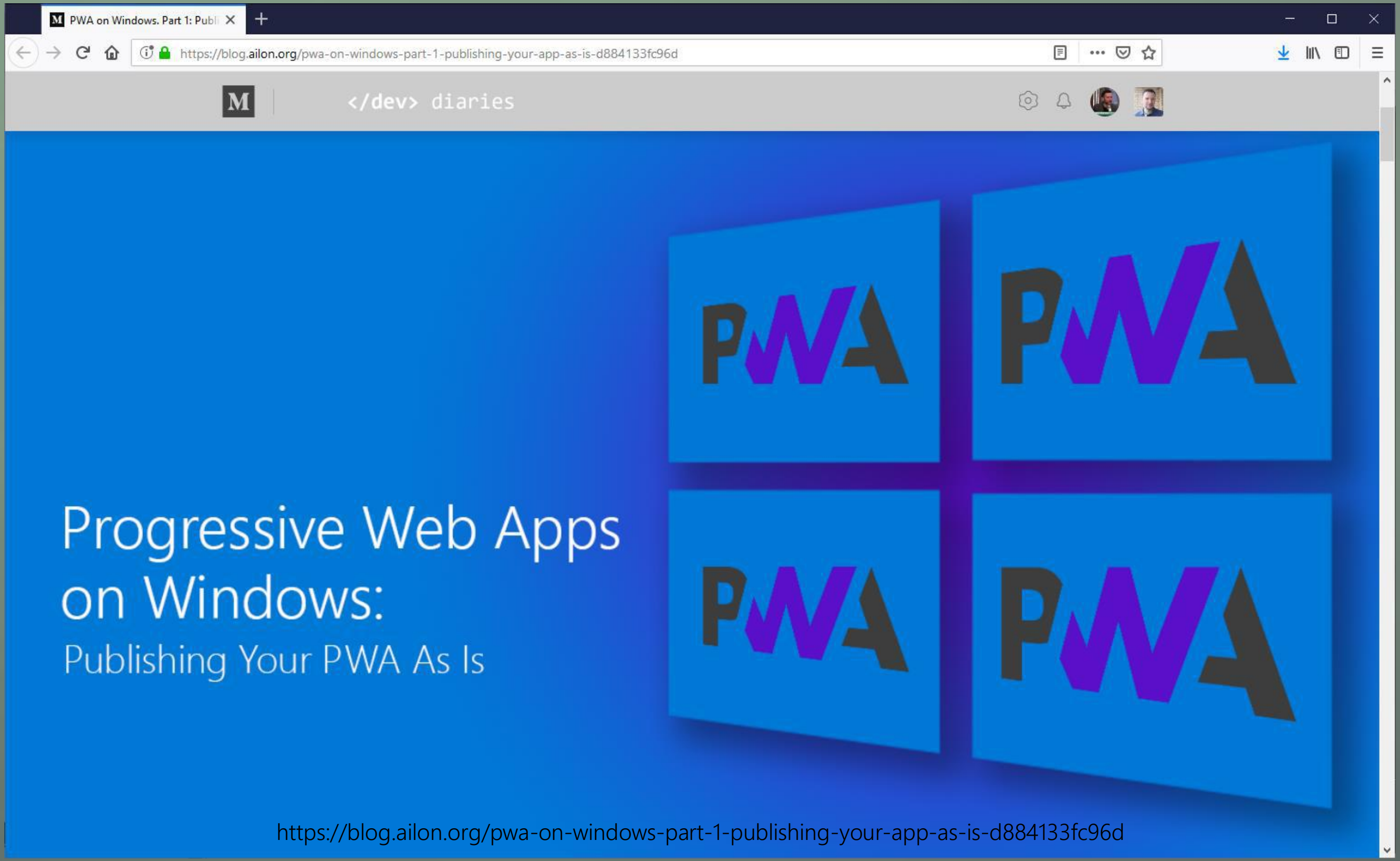
☐ Always unsafe

```
Windows.Storage.FileIO.readTextAsync(
    activatedEventArgs.files[0] as Windows.Storage.StorageFile)
    .done((text: string) => {
        if (gotTextCallback) {
            gotTextCallback(text);
        }
    });
```

Markdown View - Accessing WinRT APIs

Demo

PWAs in Microsoft Store – Learn more…



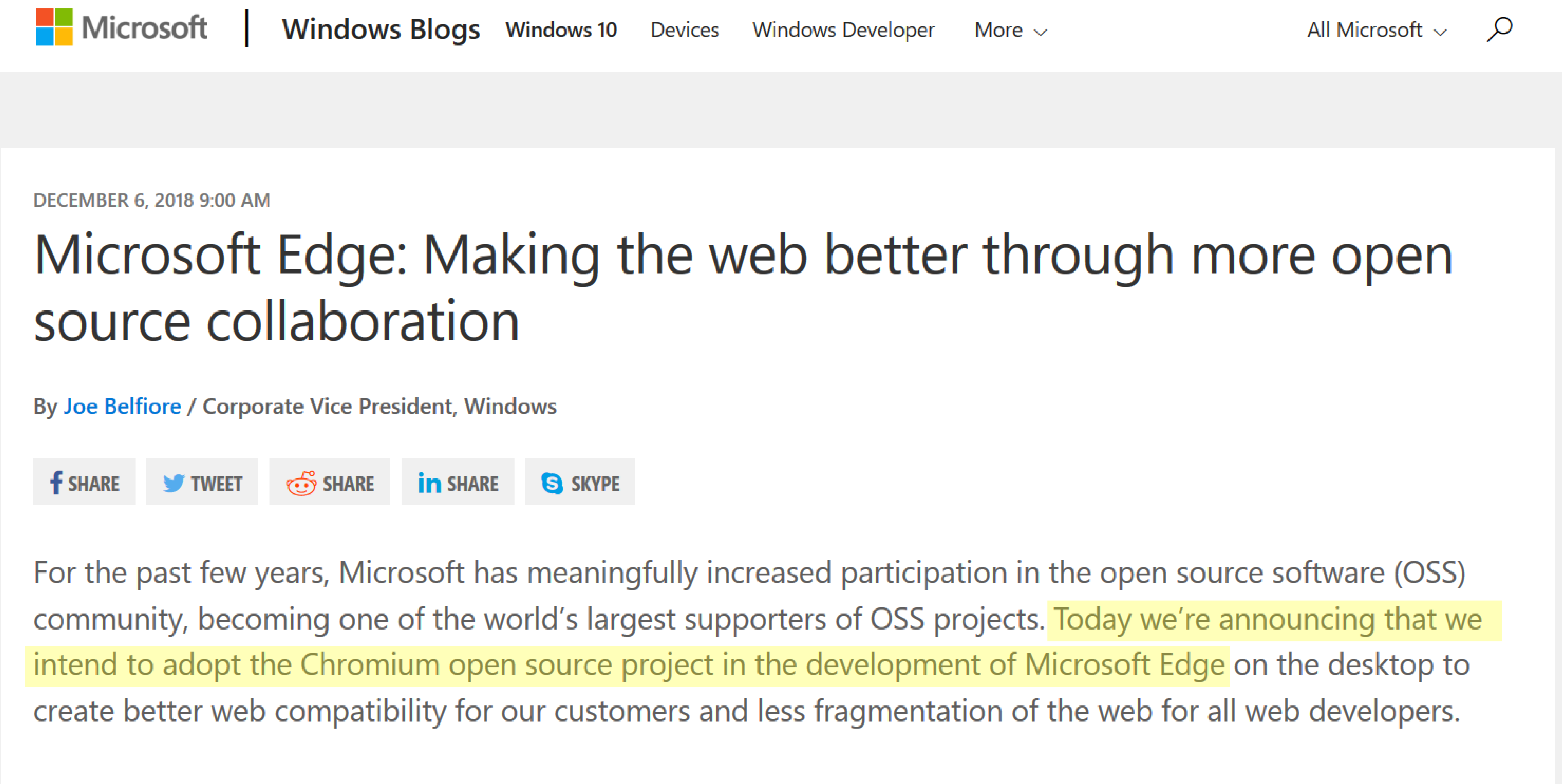
PWA on Windows. Part 1: Publ
https://blog.ailon.org/pwa-on-windows-part-1-publishing-your-app-as-is-d884133fc96d
</dev> diaries
PWA
PWA
PWA
PWA

Progressive Web Apps on Windows:

Publishing Your PWA As Is

https://blog.ailon.org/pwa-on-windows-part-1-publishing-your-app-as-is-d884133fc96d

[bit.ly/pwa-win](bit.ly/pwa-win)

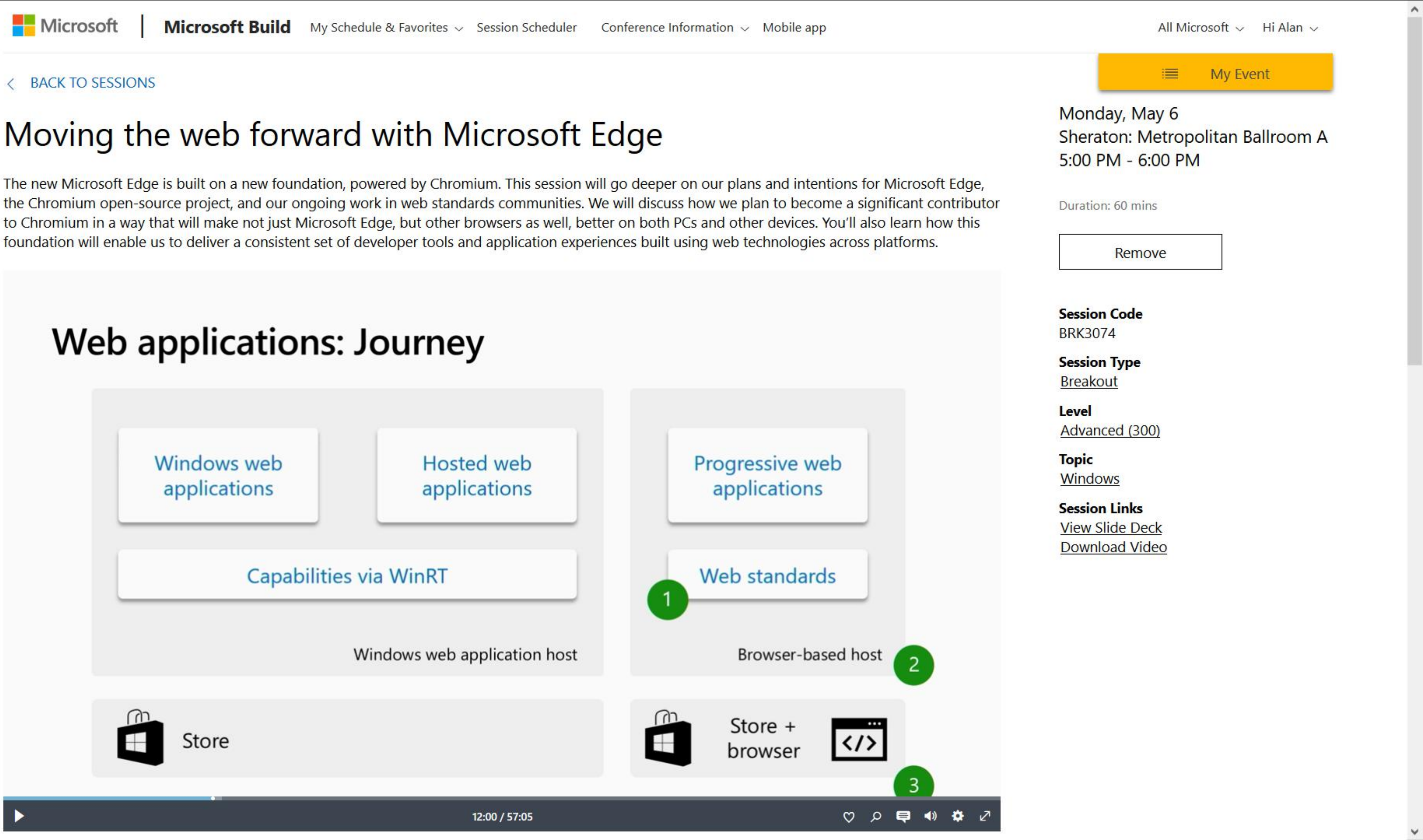


DECEMBER 6, 2018 9:00 AM

Microsoft Edge: Making the web better through more open source collaboration

By Joe Belfiore / Corporate Vice President, Windows

For the past few years, Microsoft has meaningfully increased participation in the open source software (OSS) community, becoming one of the world's largest supporters of OSS projects. Today we're announcing that we intend to adopt the Chromium open source project in the development of Microsoft Edge on the desktop to create better web compatibility for our customers and less fragmentation of the web for all web developers.



Moving the web forward with Microsoft Edge

The new Microsoft Edge is built on a new foundation, powered by Chromium. This session will go deeper on our plans and intentions for Microsoft Edge, the Chromium open-source project, and our ongoing work in web standards communities. We will discuss how we plan to become a significant contributor to Chromium in a way that will make not just Microsoft Edge, but other browsers as well, better on both PCs and other devices. You'll also learn how this foundation will enable us to deliver a consistent set of developer tools and application experiences built using web technologies across platforms.

Web applications: Journey

Windows web applications

Hosted web applications

Capabilities via WinRT

Windows web application host

Progressive web applications

Web standards

1

Browser-based host

2

Store

Store + browser

3

12:00 / 57:05

Monday, May 6
Sheraton: Metropolitan Ballroom A
5:00 PM - 6:00 PM

Duration: 60 mins

Remove

Session Code
BRK3074

Session Type
Breakout

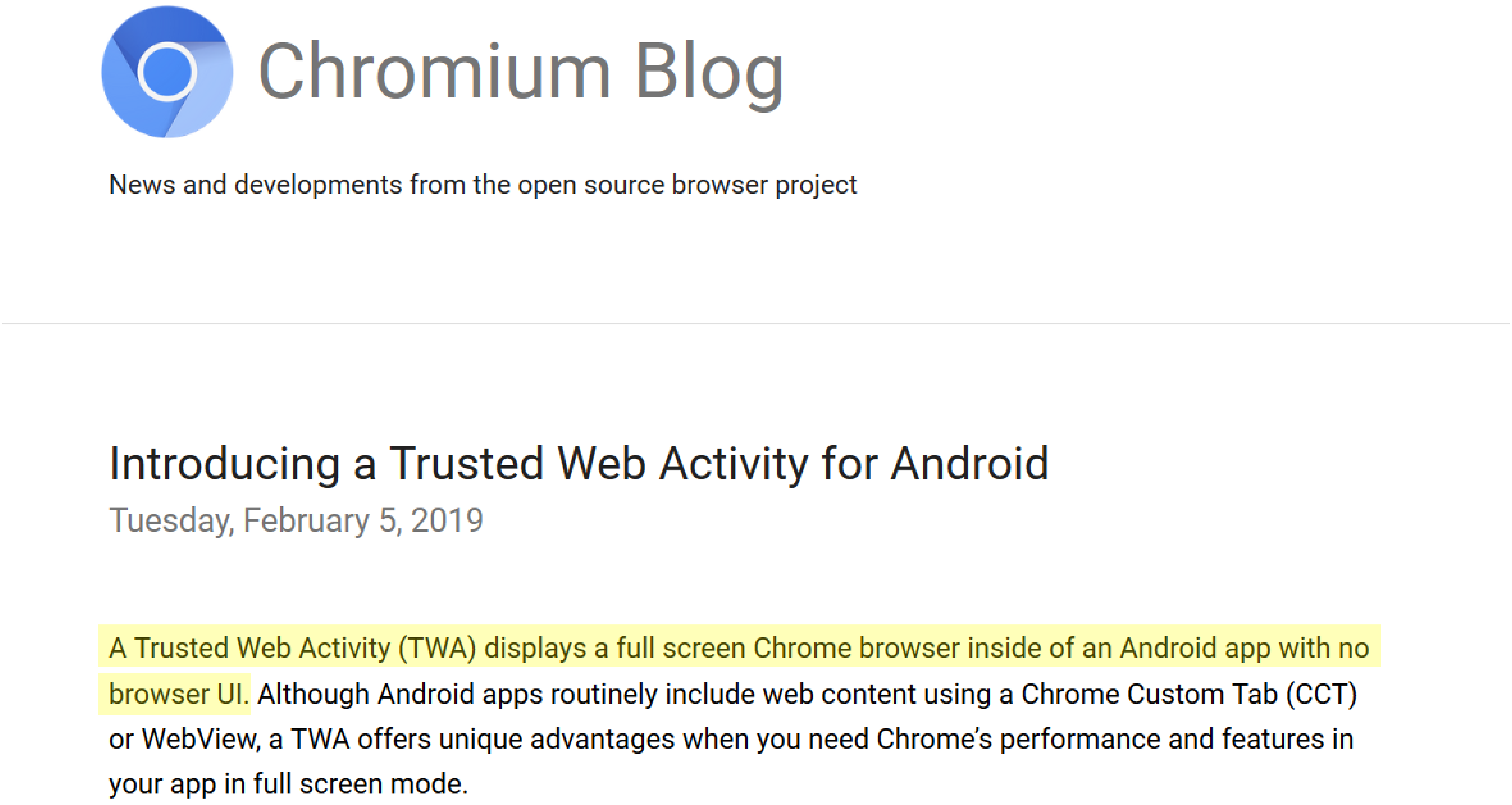
Level
Advanced (300)

Topic
Windows

Session Links
View Slide Deck
Download Video

Developing…

Google Play



Chromium Blog

News and developments from the open source browser project

Introducing a Trusted Web Activity for Android

Tuesday, February 5, 2019

A Trusted Web Activity (TWA) displays a full screen Chrome browser inside of an Android app with no browser UI. Although Android apps routinely include web content using a Chrome Custom Tab (CCT) or WebView, a TWA offers unique advantages when you need Chrome's performance and features in your app in full screen mode.

Google Play – Publishing your PWA

Get Google Play Developer account

Download Android Studio

Create new project (Add no Activity) and follow the instructions in a tutorial* bit.ly/play-pwa

Associate your app and PWA
https://developers.google.com/digital-asset-links/tools/generator

Upload to Google Play Console

Google Play

Developers

Google Play – Criteria

Comply with Google Play policies

PWA badge in Lighthouse

80+ performance score in Lighthouse

Google Play

Developers

Lighthouse

Demo

Android Studio

Demo

Apple App Store

KEEP
CALM
AND
USE
WEBVIEW

Summary

“PWAs in Stores” story is unfolding as we speak. Make your best judgement.

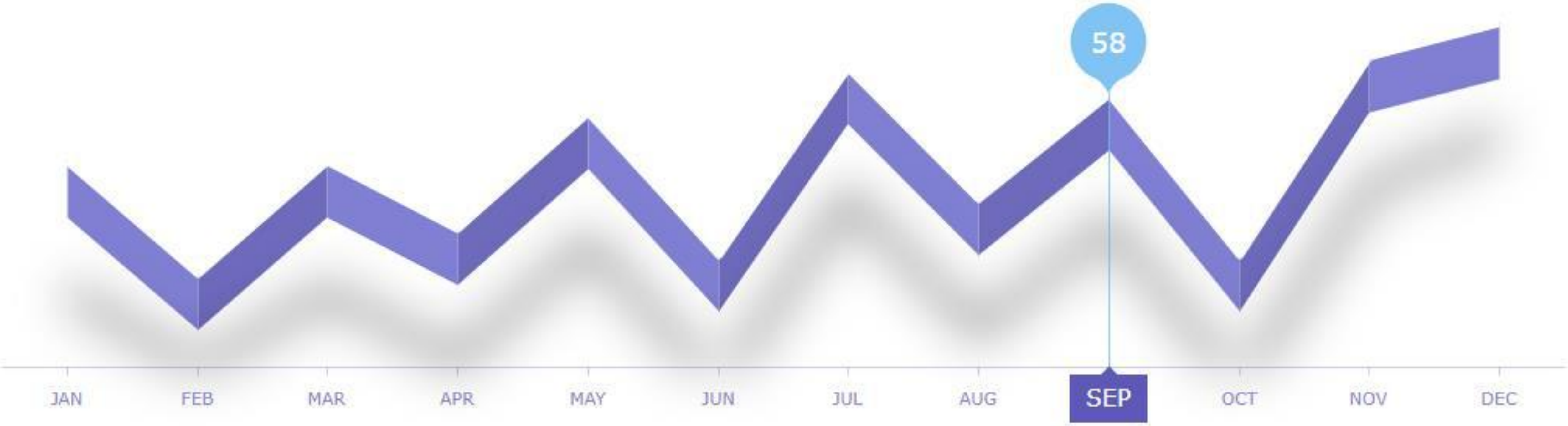
No reason to not build all your web apps as PWAs in 2019

Resources

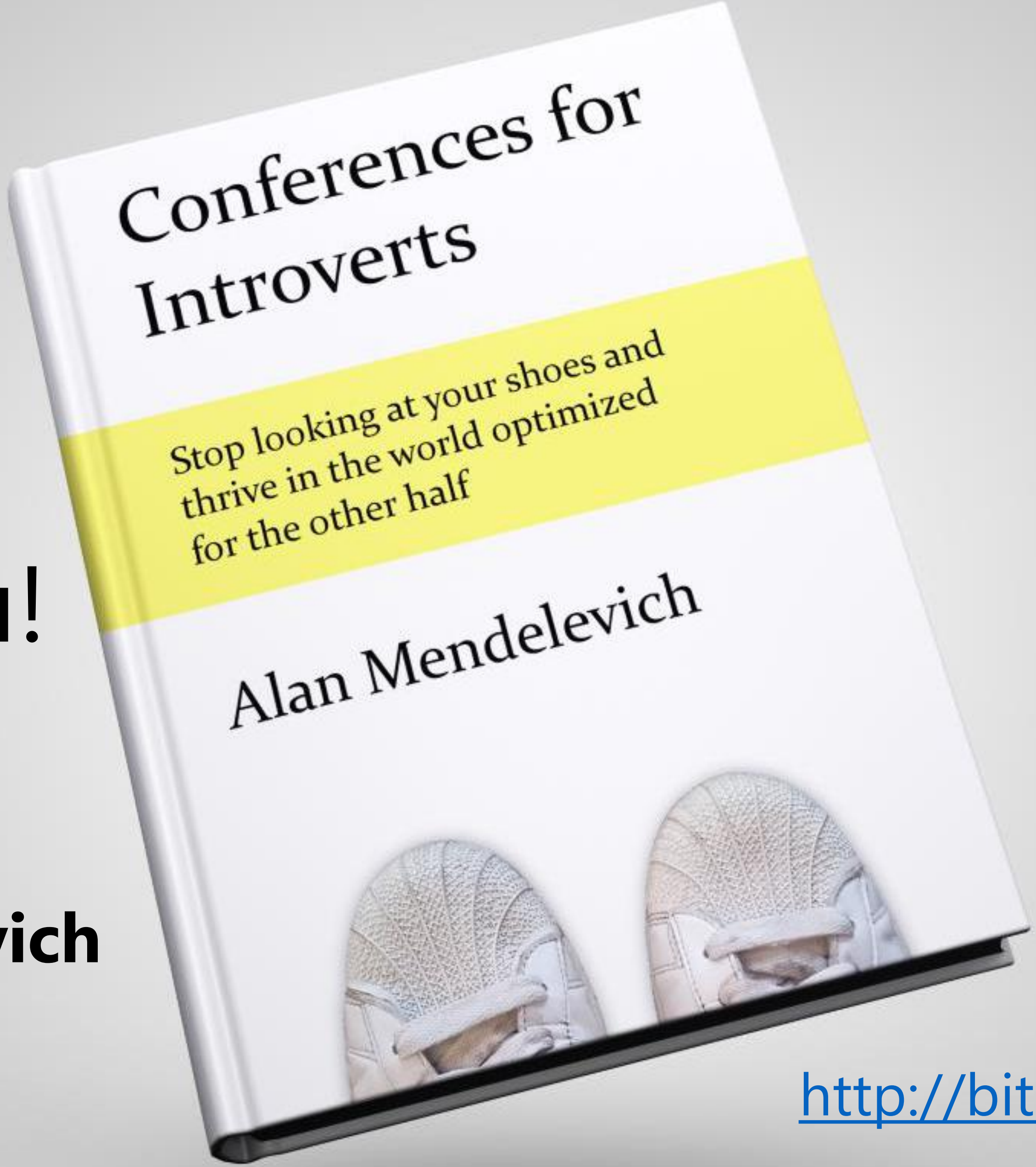
- Progressive Web Apps on MDN
  https://developer.mozilla.org/en-US/docs/Web/Progressive_web_apps
- Progressive Web Apps on Windows
  https://blog.ailon.org/pwa-on-windows-part-1-publishing-your-app-as-is-d884133fc96d
- How to Get a Progressive Web App into the Google Play Store
  https://css-tricks.com/how-to-get-a-progressive-web-app-into-the-google-play-store/
- SVGOMG / Trusted Web Activity demo
  https://github.com/GoogleChromeLabs/svgomg-twa
- PWA Builder
  https://pwabuilder.com/

AMCHARTS

https://amcharts.com



Thank you!



Conferences for Introverts

Stop looking at your shoes and thrive in the world optimized for the other half

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http://bit.ly/devdays-introvert