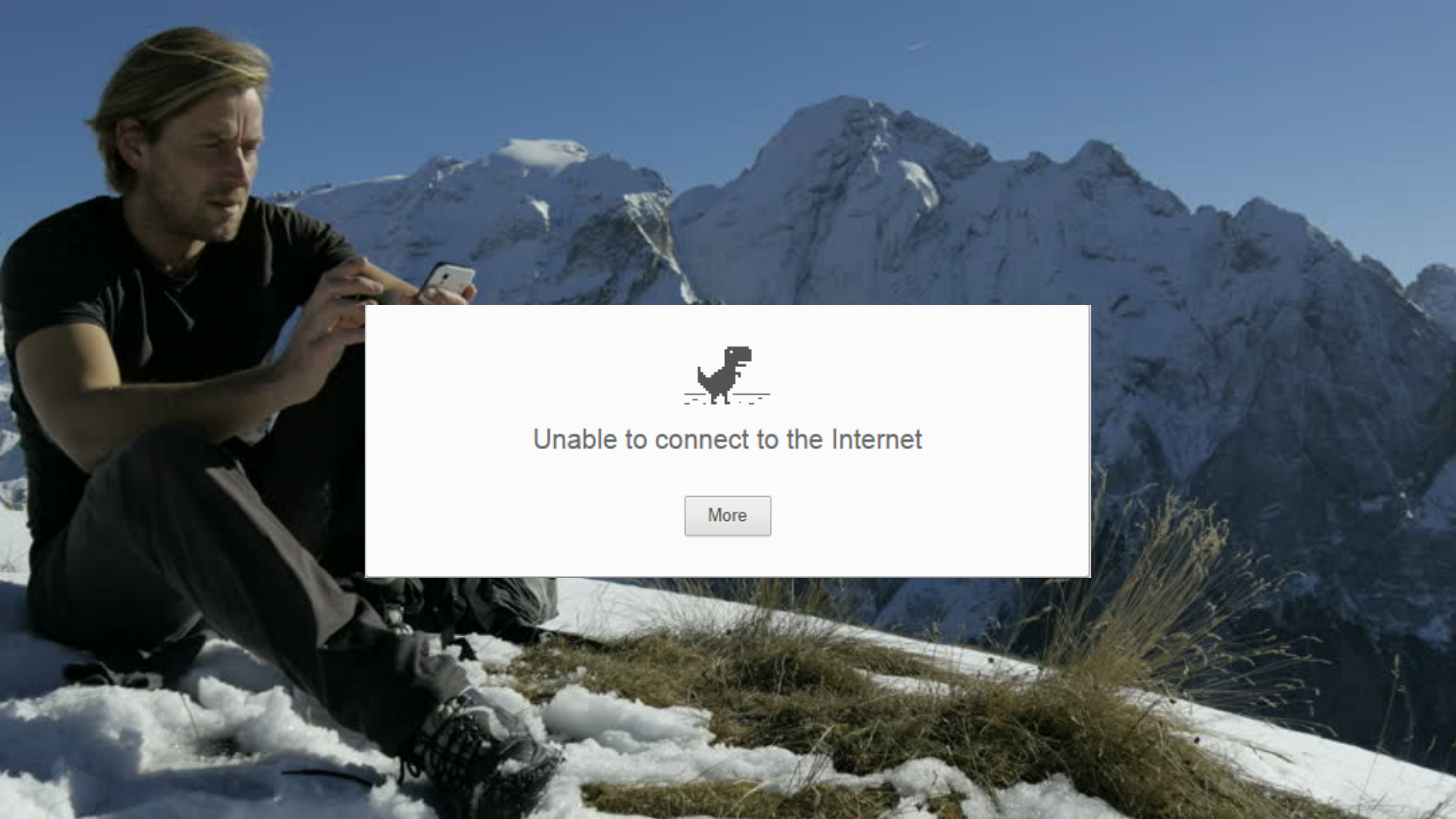
Progressive Web Applications

Start developing today


Unable to connect to the Internet
More

“I’ve got the power”
PWA

Discoverable

From web search results and supporting app stores

Installable

Pin and launch from the home screen

Re-engageable

Send push notifications, even when the app isn't active

Network Independent

Works offline and in low-network conditions

Progressive

Experience scales up (or down) with device capabilities

Safe

Provides a secure HTTPS endpoint and other user safeguards

Responsive

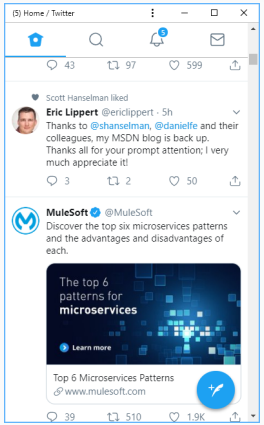
Adapts to the user's screen size / orientation and input method

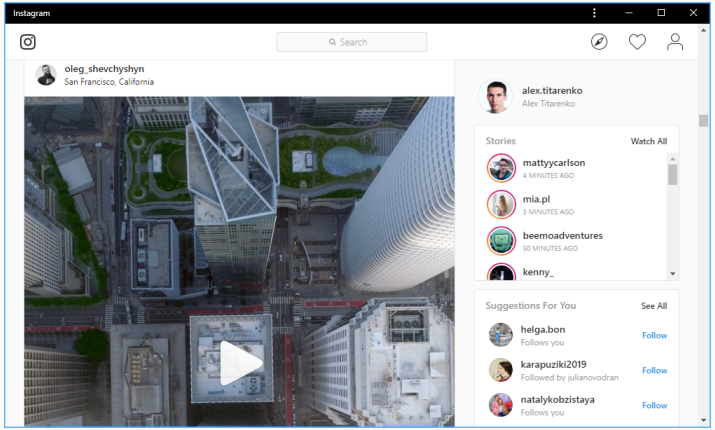
Linkable

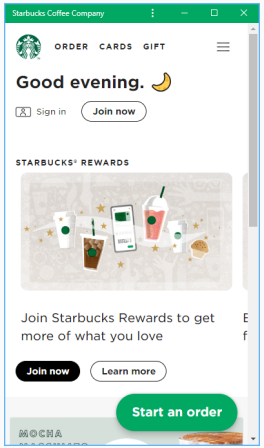
Share and launch from a standard hyperlink

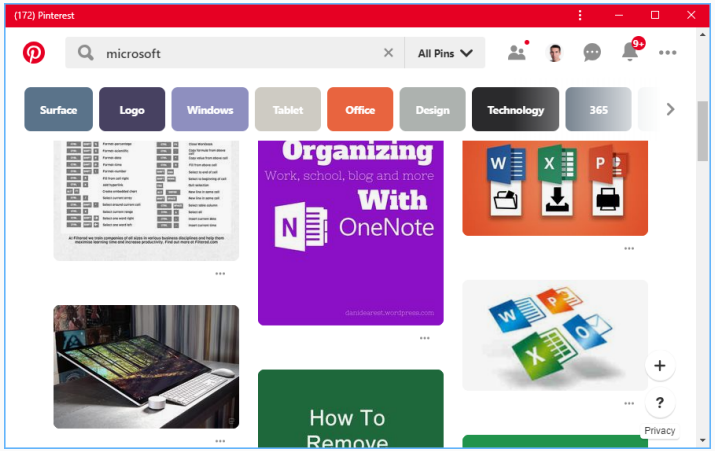
10 Progressive Web Applications that you can use right now

- Twitter
  https://mobile.twitter.com/
- Uber
  https://m.uber.com/
- Google Photos
  https://photos.google.com/
- Instagram
  https://www.instagram.com/
- Starbucks
  https://app.starbucks.com/
- Tinder
  https://tinder.com/
- Fandango Movies
  https://mobile.fandango.com/
- OLX
  https://www.olx.in/
- Pinterest
  https://www.pinterest.com/
- Telegram
  https://web.telegram.org/



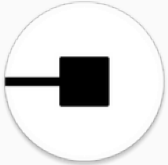






Success stories

Twitter Lite (PWA) saw a **65%** increase in pages per session, **75%** in Tweets, and a **20%** decrease in bounce rate. Twitter Lite loads in under **3** seconds for repeat visits even on slow networks.



Uber's PWA was designed to be fast even on 2G. The core app is only **50k** gzipped and takes less than **3** seconds to load on 2G networks.

Pinterest rebuilt their mobile site as a PWA and core engagements increase by **60%**. They also saw a **44%** increase in user-generated ad revenue and time spent on the site has increased by **40%**.

Tinder cut load times from 11.91 seconds to **4.69 seconds** with their new PWA. The PWA is **90%** smaller than Tinder's native Android app. User **engagement is up** across the board on the PWA.

Success stories videos

- Pinterest
  https://www.youtube.com/watch?v=3bKMnYJzrqI
- Flipcard Lite
  https://www.youtube.com/watch?v=MxTaDhwJDLg

Minimal Progressive Web Application

- Web app manifest (manifest.json)
- App icon
- HTTPS
- Service Worker (sw.js)
- Html page (index.html)

Minimal Progressive Web Application: manifest.json

```
{
 "name": "First PWA",
 "short_name": "PWA",
 "start_url": "/",
 "display": "standalone",
 "theme_color": "#ffffff",
 "background_color":"#ffffff",
 "icons": [
   {
     "src": "logo-512.png",
     "sizes": "512x512",
     "type": "image/png"
   }]
}
```

Minimal Progressive Web Application: sw.js

```
self.addEventListener('install', function(event) {
 event.waitUntil(
   caches.open('app-cache').then(function(cache) {
     return cache.add('index.html');
   })
 );
});

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

Minimal Progressive Web Application: index.html

```
<!DOCTYPE html>
<html>
<head>
 <meta name="viewport" content="width=device-width, initial-scale=1" />
 <meta name="theme-color" content="#ffffff">
 <link rel="manifest" href="/manifest.json">
 <title>First PWA</title>
</head>
<body>
 <h1>First Minimal PWA. Hello Microsoft!</h1>
  <script>
   if('serviceWorker' in navigator) {
     navigator.serviceWorker.register('/sw.js');
   }
 </script>
</body>
</html>
```

My experience

https://multicalculator.app

Current browsers support for PWA features

	Service Workers	Web App Manifest	Push Notifications
Chrome	yes	yes	yes
Edge	yes	no	yes
Firefox	yes	no	yes
Safari	yes	no	no

Does it work with iPhone?

What you can do with web apps today

You can

- Audio & video capture
- Recording media
- Bluetooth
- Share API (sender)
- USB
- Online status
- Vibration
- Push messages
- Offline storage
- File access
- Speech recognition
- Clipboard (copy & paste)
- Offline mode
- Background sync
- Payments
- Credentials
- Geolocation

You can’t

- Fingerprint based auth
- NFC
- Contacts
- SMS
- Task scheduling (alarms, reminders, etc...)
- Share API (receiver)
- Lock screen integration
- Deep integration with the system

What about performance?

Hybrid Apps which you use everyday

- Netflix
- Instagram
- Evernote
- Twitter
- Amazon
- Uber

Hybrid Applications vs PWA

Hybrid Applications

- Require App Store
- Certification
- Build system needed
- Limited number of platforms
- Manual version update
- Application package with all assets
- All features from native apps

PWA

- Install from the Web
- Require Hosting
- Auto version update
- Works on every platform
- No package needed
- Only features which modern browser supports

What about App Stores?

- Google Play Store - TWA (Trusted Web Activities)
- Windows Store - Bing or package.appxmanifest
- Apple App Store - Hybrid solution
- Amazon App Store – Web apps
- Appscope – Web apps

PWA builder

https://www.pwabuilder.com/

What’s next?

- Tabbed PWAs
- Install applications from omnibox (search bar)
- Icon badges for installed apps
- Contact picker
- Full native file system access
- MIME-type handlers
- More...

Takeaways

Learning resources

- Get started with Progressive Web Apps
  https://docs.microsoft.com/en-us/microsoft-edge/progressive-web-apps/get-started
- Documentation from Mozilla foundation
  https://developer.mozilla.org/en-US/docs/Web/Progressive_web_apps
- Youtube playlists from Google Chrome Developers community
  https://bit.ly/2HLaxMU
- Intro to PWA from Google
  https://developers.google.com/web/progressive-web-apps/
- Workbox - JavaScript Libraries for adding offline support to web apps
  https://developers.google.com/web/tools/workbox/
- Twitter PWA success story
  https://blog.twitter.com/engineering/en_us/topics/open-source/2017/how-we-built-twitter-lite.html
- Uber PWA success story
  https://eng.uber.com/m-uber/
- Pinterest PWA success story
  https://bit.ly/2iRxC36

Questions?