

# Kirupa Chinnathambi

Program Manager on Web Apps

---

TWITTER

@kirupa

BLOG

[kirupa.com](http://kirupa.com)



#msedgesummit

# PWA, HWA, Electron, oh my!

Making sense of the evolving web app landscape



# Web vs. Native



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# Benefits of Web Apps



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Web apps run everywhere!



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Phone



Desktops



Wearables



TV



Laptops



VR / AR / MR



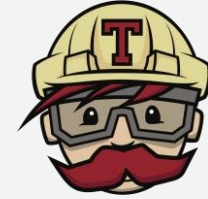
Tablets



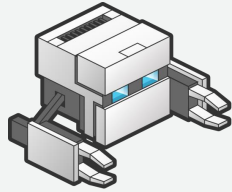
#msedgesummit



#msedgesummit



*BABEL*



*Knockout.*



Lo



*ember*

**GitHub**





One codebase to rule them all...



#msedgesummit



# Benefits of Native Apps



#msedgesummit

# Better device integration



#msedgesummit



10:09

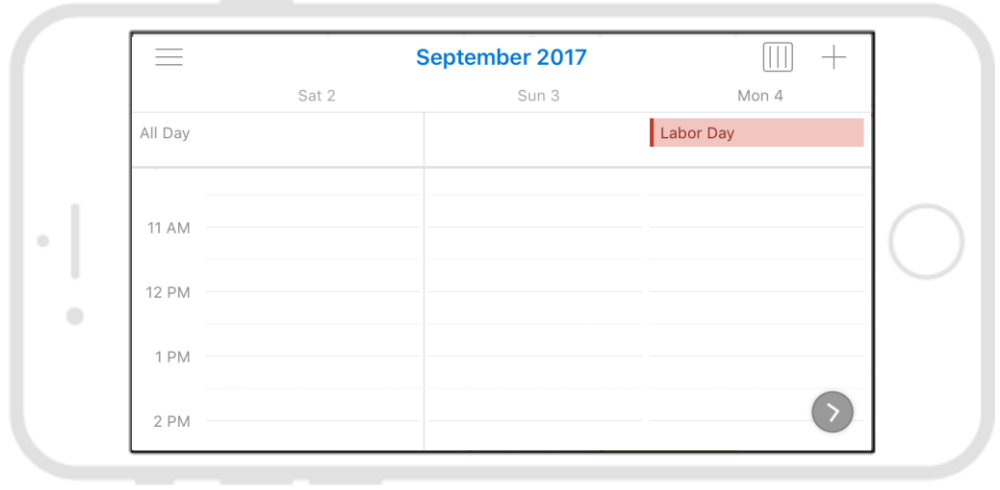
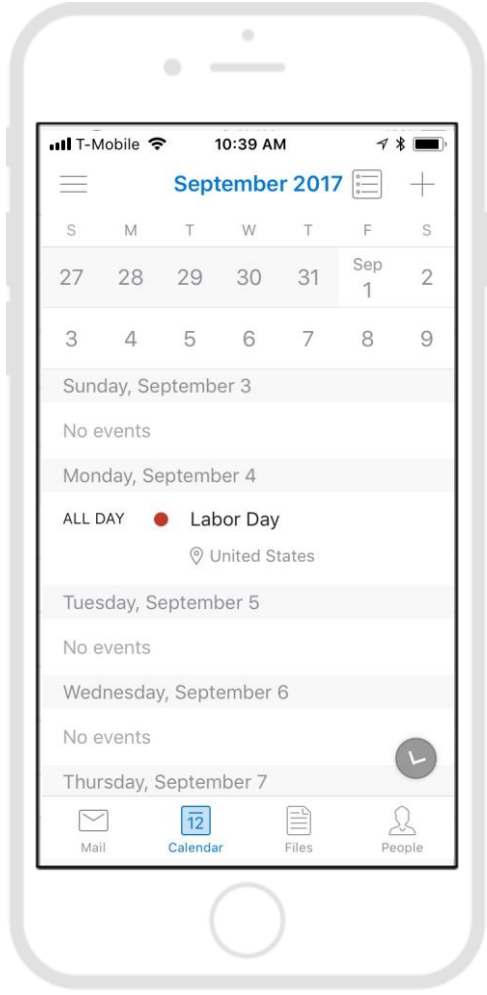
Flight SFO → ORD  
On time Gate 88  
Depart 3:45PM







Hello, Cherie Yang



How do you  
choose which to  
build for?



#msedgesummit



# Focus on great UX!



#msedgesummit

Our users don't care  
about the underlying  
technology!



#msedgesummit

Is it possible to...



#msedgesummit

1. Reach everyone with a web app?



#msedgesummit

1. Reach everyone with a web app?
2. Maximize code reuse?



1. Reach everyone with a web app?
2. Maximize code reuse?
3. Provide a great (native) user experience across devices?



**Yes!**



#msedgesummit

# Web vs. Native



#msedgesummit



# Web & Native

~~Web vs. Native~~



#msedgesummit

Web  Native

~~Web & Native~~

~~Web vs. Native~~

1. Build an awesome web app

2. Take your existing web app native



#msedgesummit

1. Build an awesome web app

2. Take your existing web app native



#msedgesummit



Build an *Awesome* Web App!



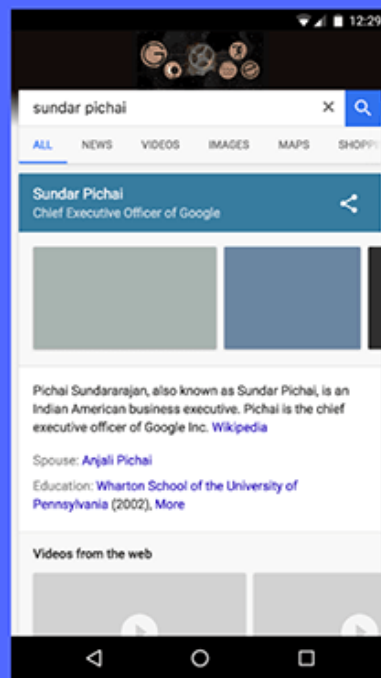
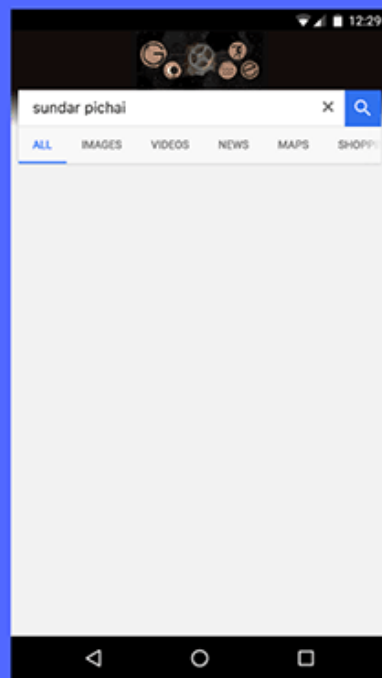
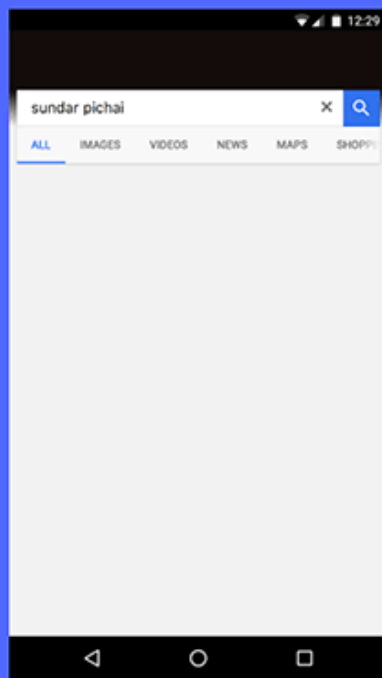
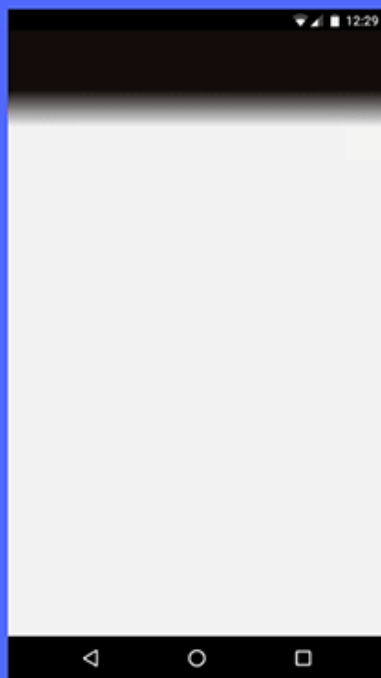
Build a Progressive Web App (PWA)

PWAs are just web apps...

PWAs are just web apps that  
provide a great user experience!



⚡ Start and run really **REALLY** fast!



First Paint  
(FP)

First Contentful  
Paint (FCP)

First Meaningful  
Paint (FMP)

⚡ Start and run really **REALLY** fast!

📦 Work across a variety of screen sizes, input modes, etc.



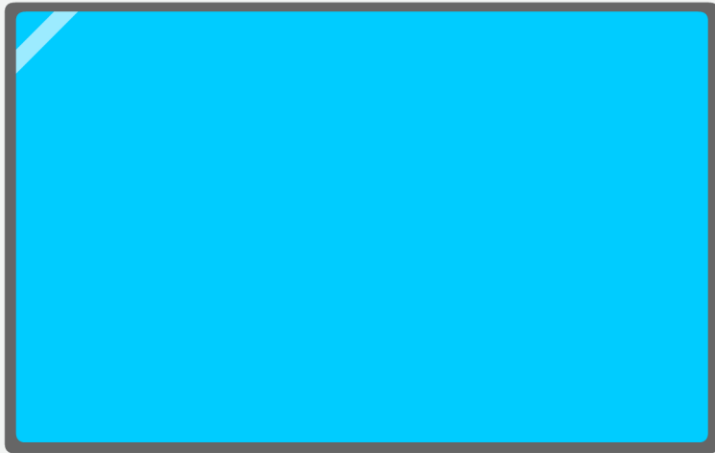
Phone



Desktops



Wearables



TV



Laptops



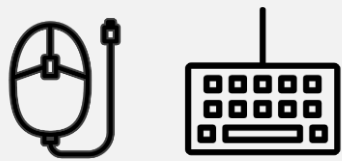
VR / AR / MR



Tablets



#msedgesummit



Mouse / Keyboard



Touch



Gamepad



Remote



MR



Voice

⚡ Start and run really **REALLY** fast!

📦 Work across a variety of devices, screen sizes, etc.

👉 Run over HTTPs

- ⚡ Start and run really **REALLY** fast!
- 📦 Work across a variety of devices, screen sizes, etc.
- 👉 Run over HTTPs
- ☎️ Work offline / reliably under poor network conditions



## You're not connected

And the web just isn't the same without you.

Let's get you back online

- Check that your network cables are plugged in.
- Make sure you're not in airplane mode.
- See if your wireless switch is turned on.
- Restart your router.

[Help me fix it](#)





Since 1998, we've helped millions of awesome people like **you** become a better developer. Welcome aboard!

[Ask a Question](#) or [Start Learning](#)

### NEW CONTENT



#### Queues in JavaScript

Learn all about everyone's favorite First In First Out (FIFO) data structure!

[read](#)



#### Stacks in JavaScript

Learn all about the Stack data structure and how you can easily use it in your web code



**Creating Web Animations**

[BUY](#)



**Learning React: A Hands-on Guide**

[BUY](#)



**JavaScript Absolute Beginner's Guide**

[BUY](#)



Check out Kirupa's new books!

### NEWSLETTER

No spam. No fluff. Just awesome content sent straight to your inbox!

- ⚡ Start and run really **REALLY** fast!
- 📦 Work across a variety of devices, screen sizes, etc.
- 👉 Run over HTTPs
- ☎️ Work offline / reliably under poor network conditions
- 💬 Can view and send push notifications



**Dropbox**

Janey Smith invited you to the shared folder 'Studio6'

accept

decline




11:36 AM  
1/6/2016

- ⚡ Start and run really **REALLY** fast!
- 📦 Work across a variety of devices, screen sizes, etc.
- 👉 Run over HTTPs
- ☎️ Work offline / reliably under poor network conditions
- 💬 Can view and send push notifications
- 🎮 Provide better device integration

# PWAs and Android

1:53

https://www.lyft.com/auth?next=http:




## Get a ride in minutes

We'll send a text to verify your phone

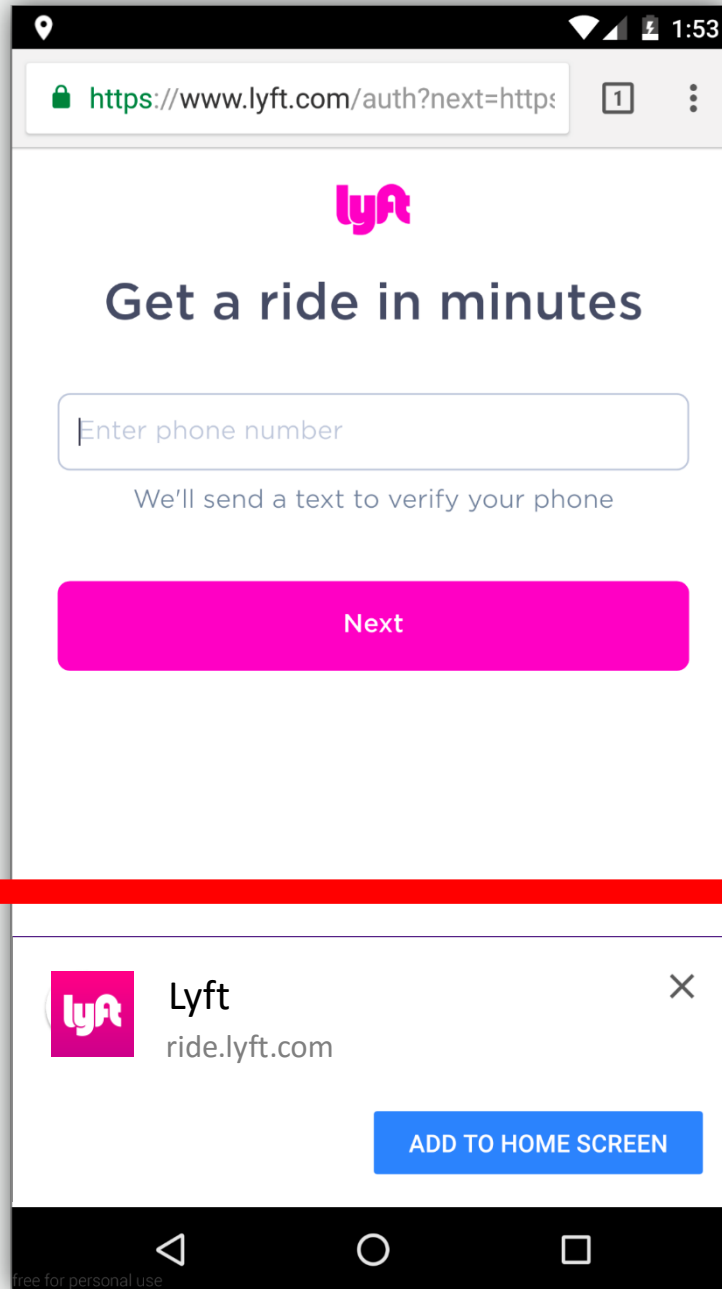
Next

---

 Lyft ×  
ride.lyft.com

ADD TO HOME SCREEN

free for personal use



https://www.lyft.com/auth?next=http:



## Get a ride in minutes

We'll send a text to verify your phone

Next

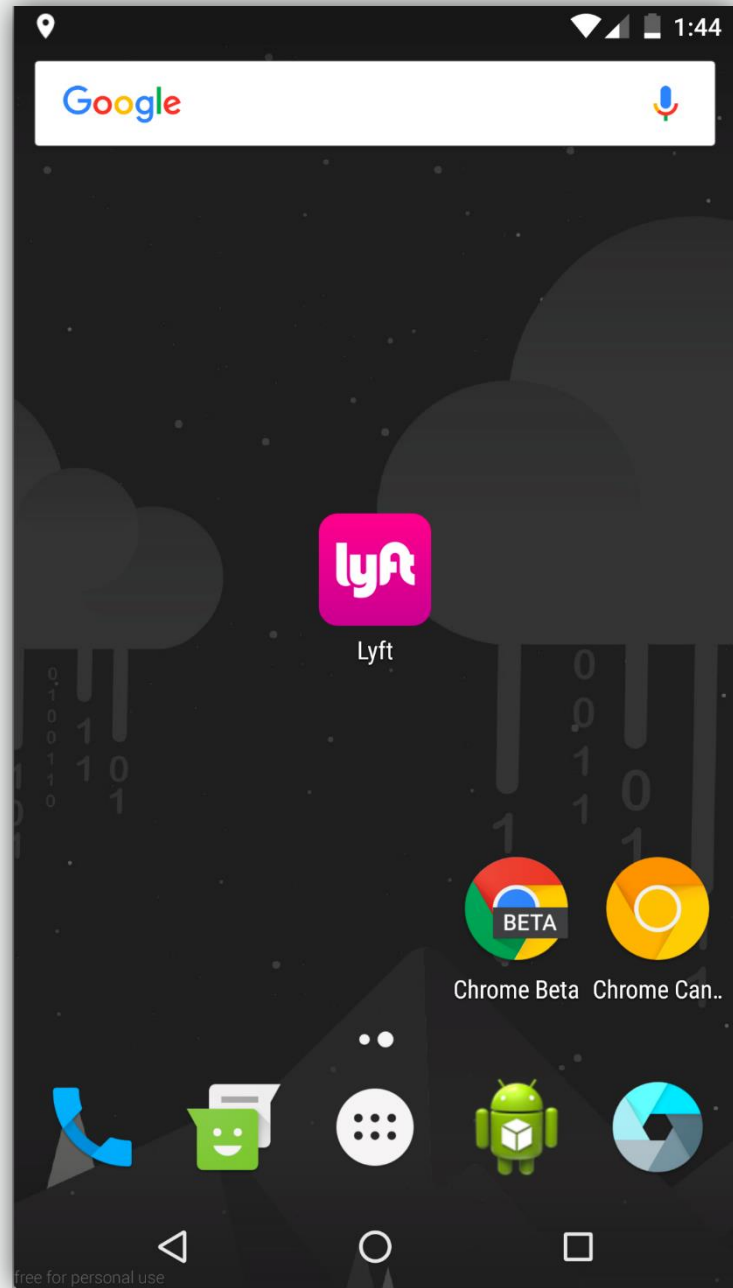


Lyft  
ride.lyft.com

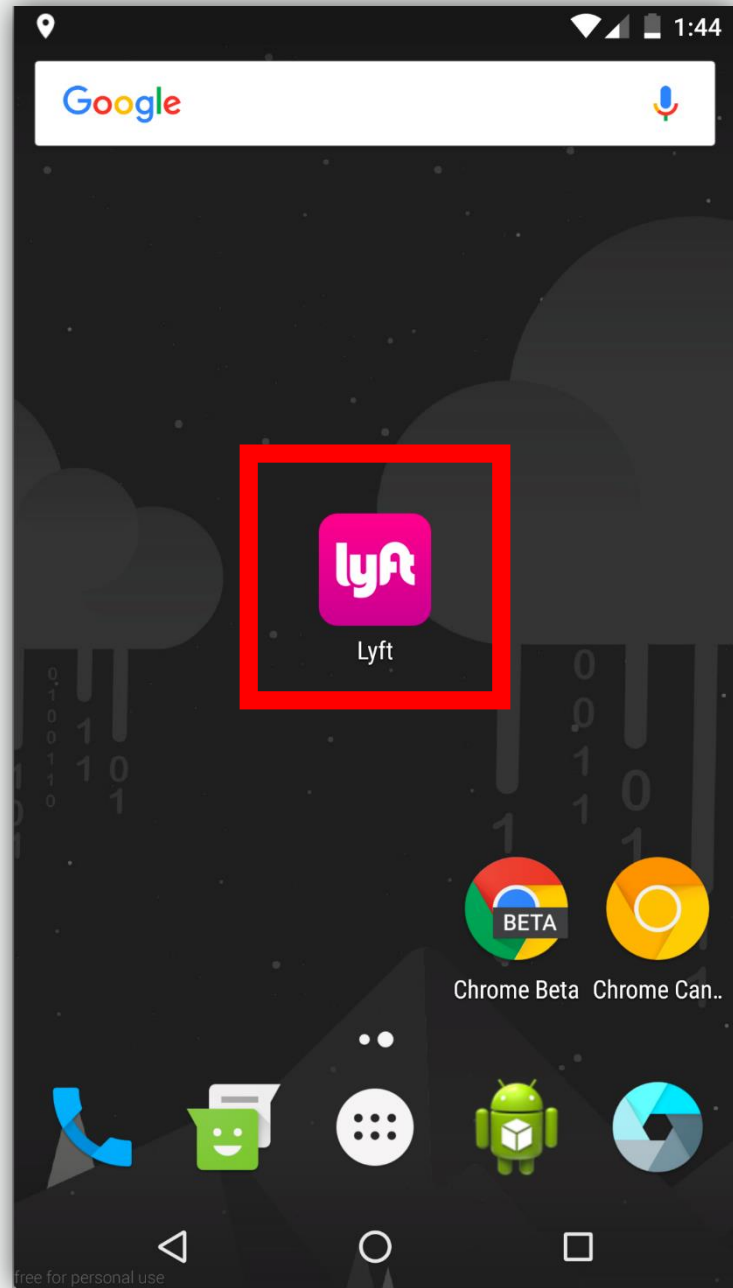


ADD TO HOME SCREEN

free for personal use

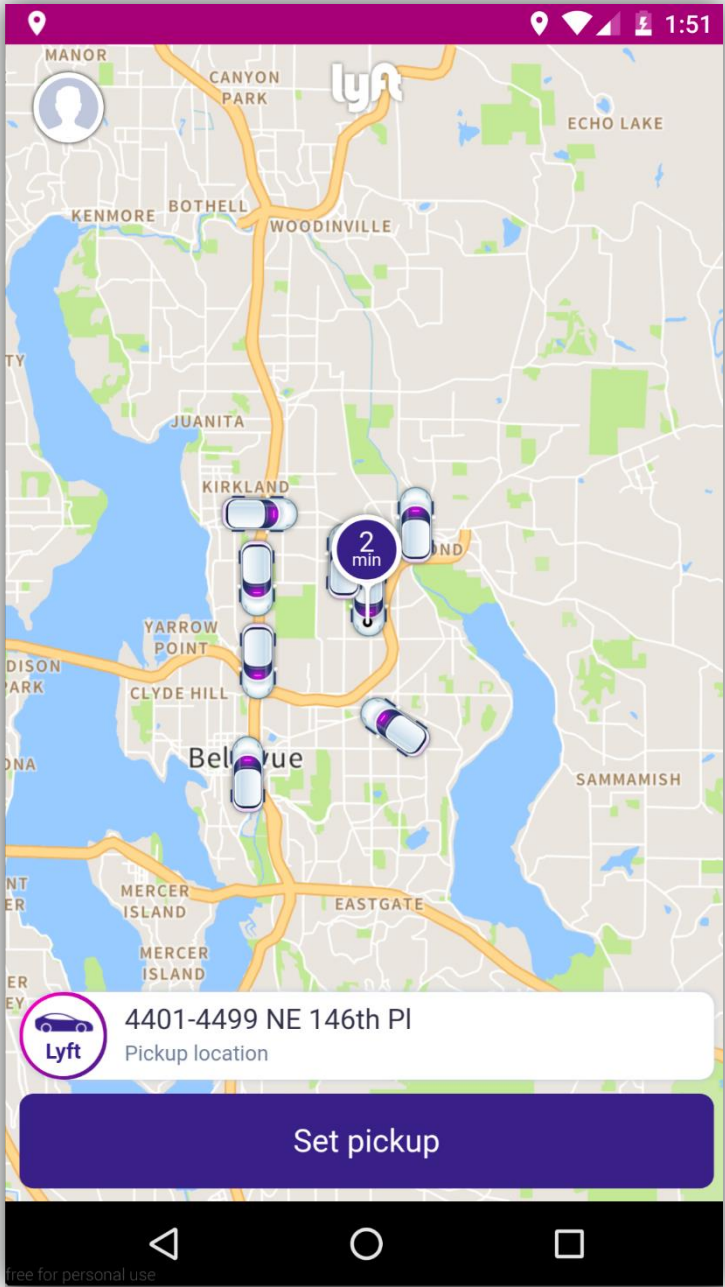








Lyft



Your app will still work in the browser. It just might do more when “installed”.

# PWAs and Windows

A PWA in Windows will be a native app (aka a UWP) with all the advantages that it provides.



# Hacker News (YC)

thekingshorses

★★★★★ 13

Free

Get Share



Everyone More

## Description

Read Hacker News (<http://news.ycombinator.com>) articles and comments with this clean, simple, modern looking and fast performing universal app.

- Upvote stories
- Reply
- Upvote, downvote comments
- One touch saving to Pocket or Readability to read it later

### Themes

- A beautiful design user interface with loads of customizable options...

More

## Available on



PC



Mobile




HoloLens



Hub

## Screenshots PC



 Store

**Hacker News (YC)**

Just got installed, check it out.

1:00p



Launch

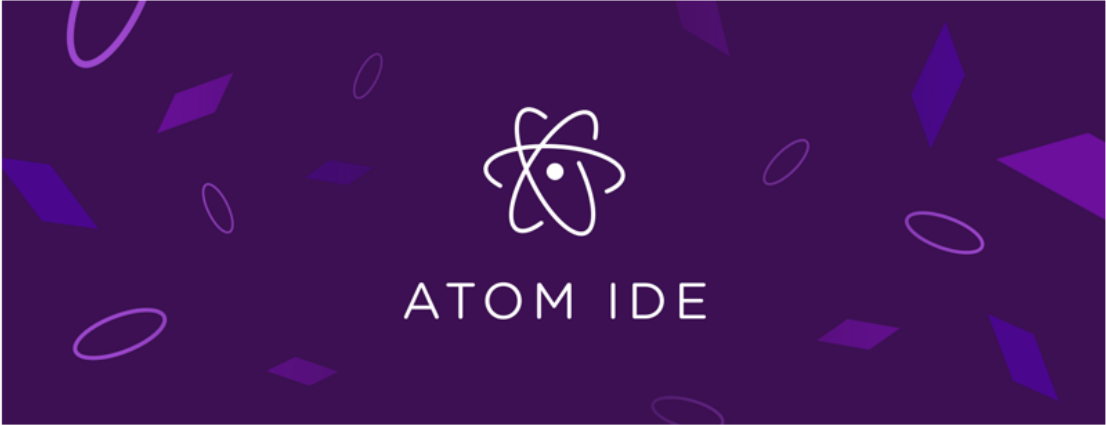
Pin to Start



HN


Hacker News (YC)

Hacker News Frontpage Login

<p><b>Daniel Kahneman "I placed too much faith in underpowered studies"</b></p> <p>skmurphy 4 hrs  <a href="https://replicationindex.wordpress.com/2017/02/02/re...">https://replicationindex.wordpress.com/2017/02/02/re...</a></p>	122	<p><b>Introducing Atom-IDE</b></p> <p>208 gisenberg 3 hrs 131</p> <p><a href="https://blog.atom.io/2017/09/12/announcing-atom-ide.html">https://blog.atom.io/2017/09/12/announcing-atom-ide.html</a></p> <p><a href="https://news.ycombinator.com/item?id=15229127">news.ycombinator.com/item?id=15229127</a></p>
<p><b>iPhone X</b></p> <p>interconnector 47 mins  <a href="http://www.apple.com/iPhone-x">http://www.apple.com/iPhone-x</a></p>	215	 <p>GitHub, in collaboration with Facebook, are pleased to announce the launch of Atom-IDE - a set of optional packages to bring IDE-like functionality to Atom.</p> <p>The start of this journey includes smarter context-aware auto-completion as well as a host of code navigation features such as an outline view, go to definition, find all references as well as other useful functions such as hover-to-reveal information, errors and warnings (diagnostics) and document formatting.</p> <p>Our initial release includes packages for TypeScript, Flow, Javascript, Java, C# and PHP that utilize the power of language servers to provide deep syntactical analysis of your code and projects. The <a href="#">language server protocol</a> is being adopted by a number of organizations including Microsoft, Eclipse, Sourcegraph, Palantir, Red Hat, Facebook and now GitHub too!</p>
<p><b>North American Regional Dialects and Accents (2016)</b></p> <p>fern12 14 hrs  <a href="http://aschmann.net/AmEng/#SmallMap">http://aschmann.net/AmEng/#SmallMap</a></p>	117	
<p><b>Introducing Atom-IDE</b></p> <p>gisenberg 3 hrs  <a href="https://blog.atom.io/2017/09/12/announcing-atom-id...">https://blog.atom.io/2017/09/12/announcing-atom-id...</a></p>	131	
<p><b>Mal - Make a Lisp, in 68 languages</b></p> <p>ingve 10 hrs  <a href="https://github.com/kanaka/mal#mal---make-a-lisp">https://github.com/kanaka/mal#mal---make-a-lisp</a></p>	32	
<p><b>iPhone X announced</b></p> <p>danieljelb 2 hrs  <a href="https://www.theverge.com/2017/9/12/16288806/apple...">https://www.theverge.com/2017/9/12/16288806/apple...</a></p>	194	
<p><b>Curl's backdoor threat</b></p> <p>sohkamyung 13 hrs  <a href="https://daniel.haxx.se/blog/2017/09/12/the-backdoor-t...">https://daniel.haxx.se/blog/2017/09/12/the-backdoor-t...</a></p>	136	
<p><b>60 journalists all spend one week covering Cincinnati's battle with heroin</b></p> <p>carlungz 6 hrs  <a href="http://www.cincinnati.com/pages/interactives/seven-d...">http://www.cincinnati.com/pages/interactives/seven-d...</a></p>	24	
<p><b>Dyslexia</b></p>	147	

Hacker News (YC)

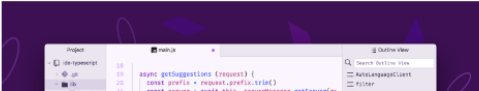
Introducing Atom-IDE  
208 gisenberg 3 hrs 131  
<https://blog.atom.io/2017/09/12/announcing-atom-ide.html>  
[news.ycombinator.com/item?id=15229127](https://news.ycombinator.com/item?id=15229127)



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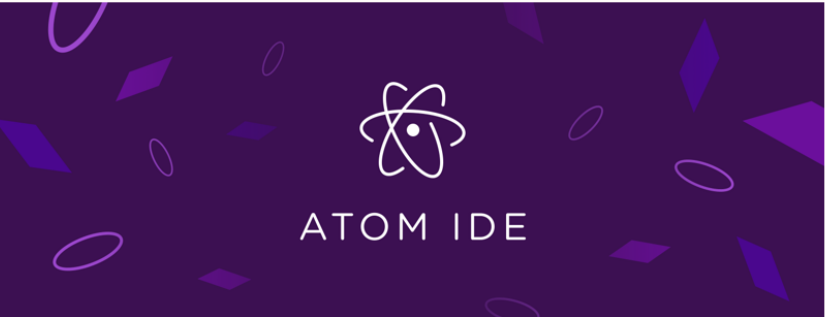


Hacker News (YC)

Hacker News Frontpage Login

Daniel Kahneman "I placed too much faith in underpowered studies"	122
skmurphy 4 hrs <a href="https://replicationindex.wordpress.com/2017/02/02/re...">https://replicationindex.wordpress.com/2017/02/02/re...</a>	322
iPhone X	215
interconnector 47 mins <a href="http://www.apple.com/iphone-x">http://www.apple.com/iphone-x</a>	192
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iPhone X announced	194
danjelb 2 hrs <a href="https://www.theverge.com/2017/9/12/1628806/apple...">https://www.theverge.com/2017/9/12/1628806/apple...</a>	112
Curl's backdoor threat	136
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Dyslexia	147

Introducing Atom-IDE  
208 gisenberg 3 hrs 131  
<https://blog.atom.io/2017/09/12/announcing-atom-ide.html>  
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Where your app  
will run!



There are two ways your PWA  
can get into the Windows Store

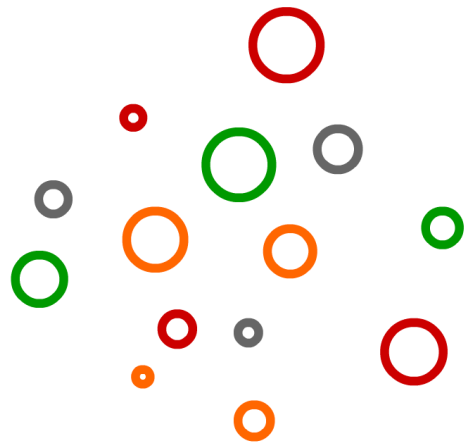
1. You submit it manually

2. We submit it automatically on your behalf with little effort from you

```
{
  "lang": "en",
  "short_name": "My App",
  "name": "My Totally Awesome App",
  "icons": [
    {
      "src": "img/launcher-icon-2x.png",
      "sizes": "96x96",
      "type": "image/png"
    },
    {
      "src": "img/launcher-icon-4x.png",
      "sizes": "192x192",
      "type": "image/png"
    }
  ],
  "start_url": "/pwa/?utm_source=homescreen",
  "display": "standalone",
  "orientation": "portrait",
  "background_color": "black"
}
```

# Meta Tags 2.0

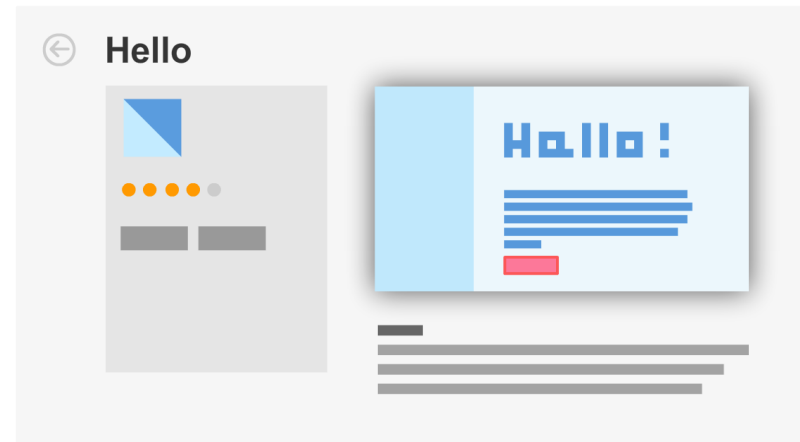




Crawl and Index PWAs



Convert to APPX



Searchable/Browseable in Store

What we are focusing on are  
apps with a quality user  
experience!

We are piloting this experience with a limited set of apps right now, and expect to see more in the upcoming months.

PWAs are great for developers!

PWAs are great for users!

For many of you, a PWA  
might just be all you  
need!



#msedgesummit



# Taking Your Existing Web App Native



Taking Your Existing Web App Native  
(by extending and building on your PWA)

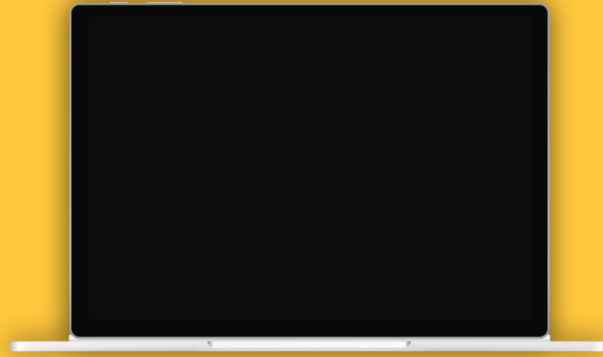




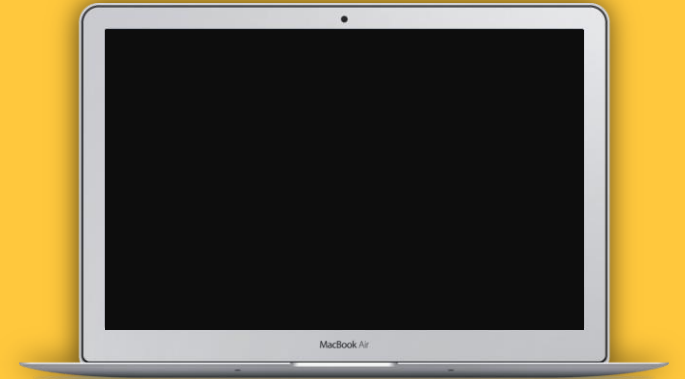
iOS



Android



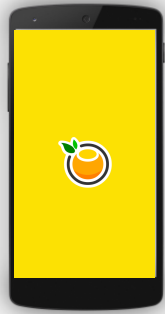
Windows



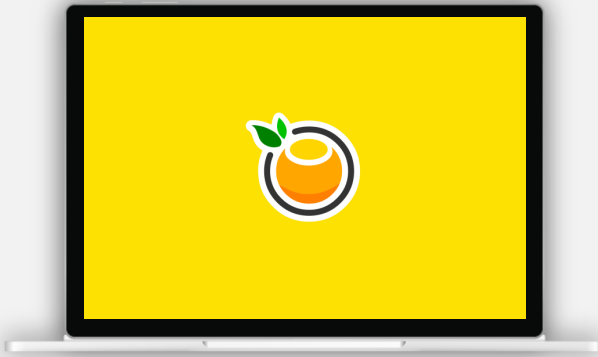
macOS



iOS



Android

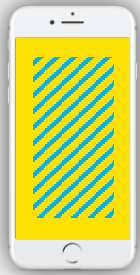


Windows



macOS

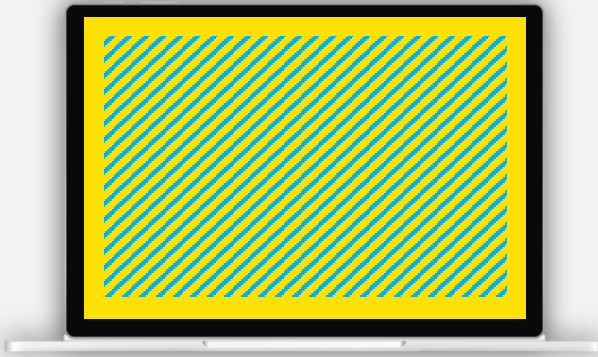
The content is still  
largely your PWA



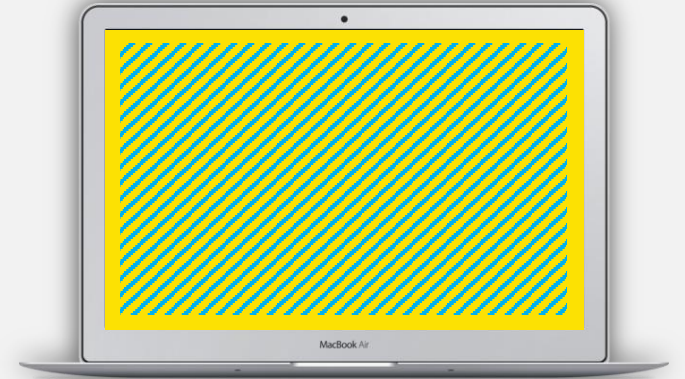
iOS



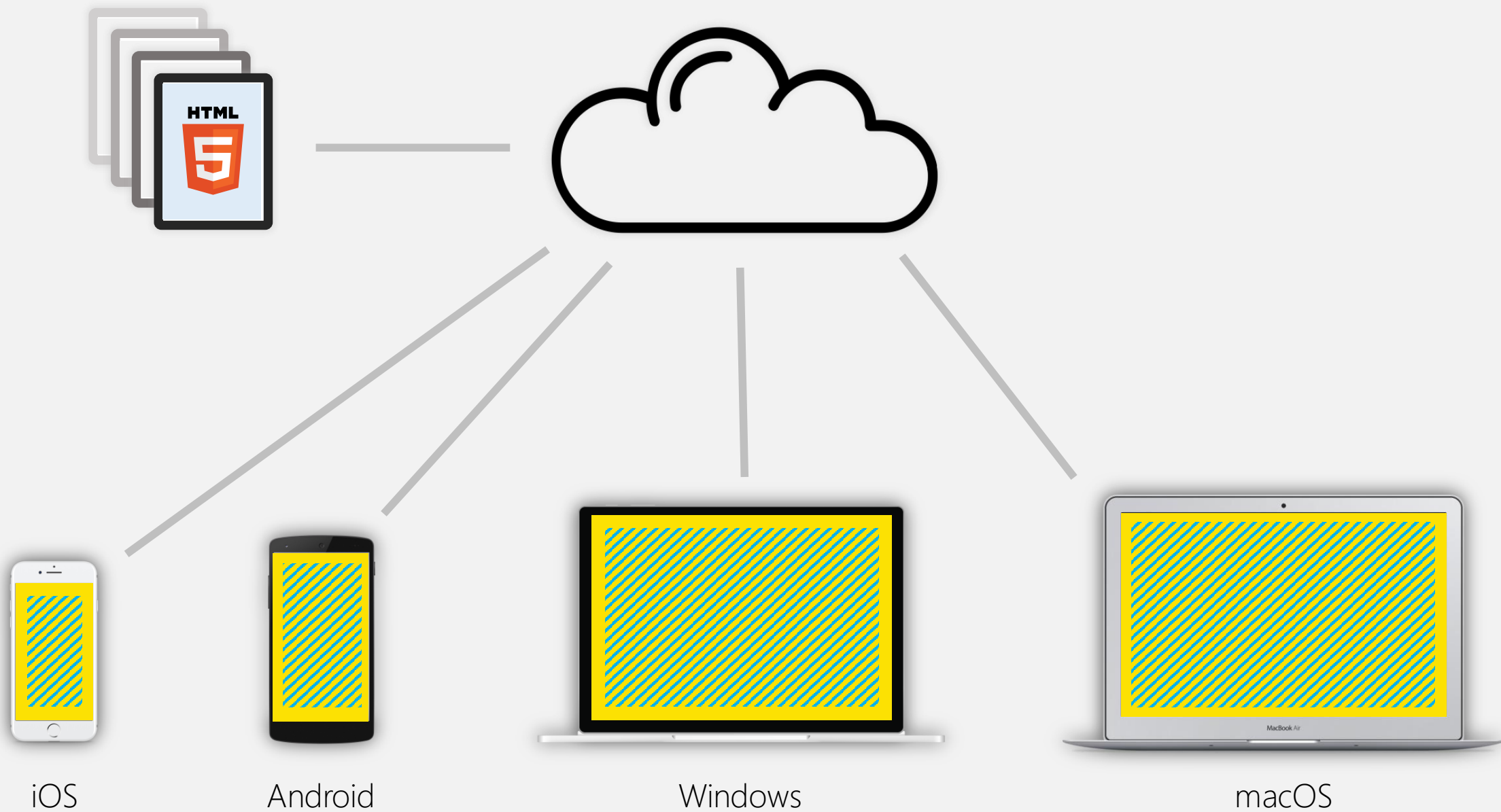
Android



Windows



macOS



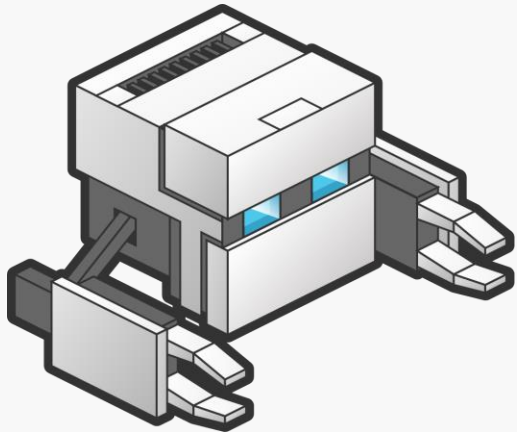
WebView!

These aren't the webviews of 2015!

You don't have to deal with webviews directly if you don't want to!



iOS and Android



# Apache Cordova

This is what powers Ionic Framework and Adobe Phonegap as well.

<https://cordova.apache.org/>

Windows 7, Windows 8,  
and macOS

Traditional Desktop



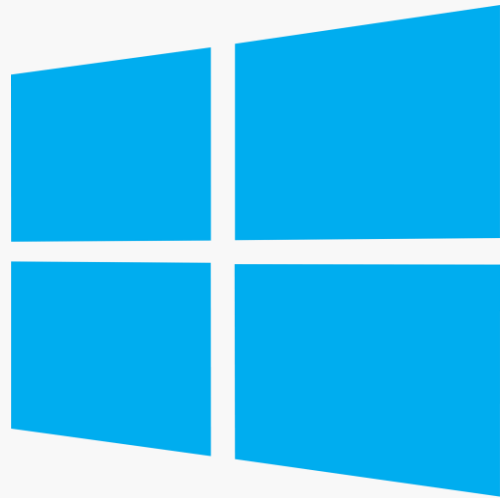
# Electron

Build desktop apps using HTML, CSS, JS, and Node!

<https://electron.atom.io>

Windows 10

Web  Native

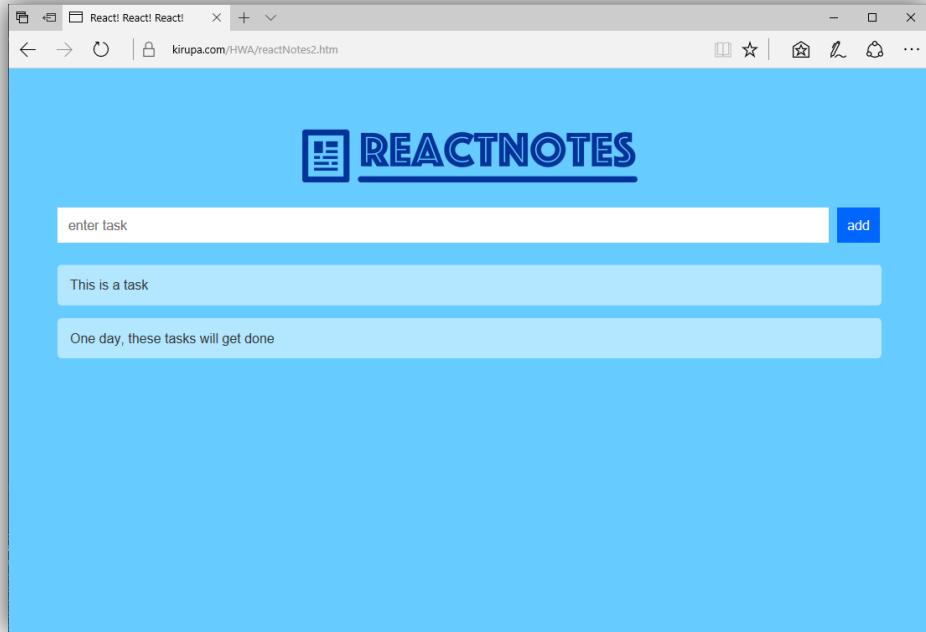


# Progressive Web App

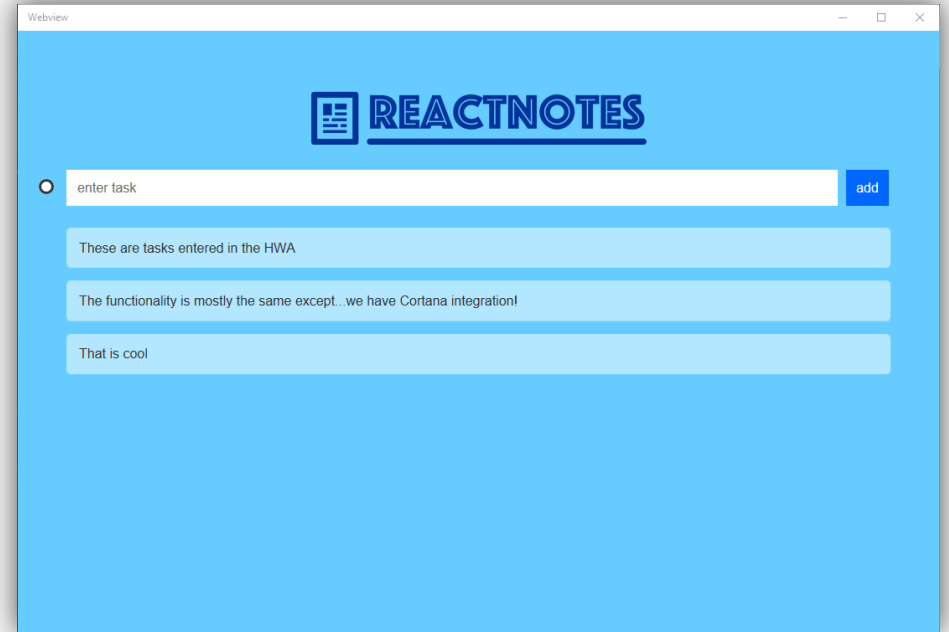
They are just Universal Windows Platform (UWP) apps just like any other Windows app you install!

<https://aka.ms/hostedwebapps>





PWA in Edge

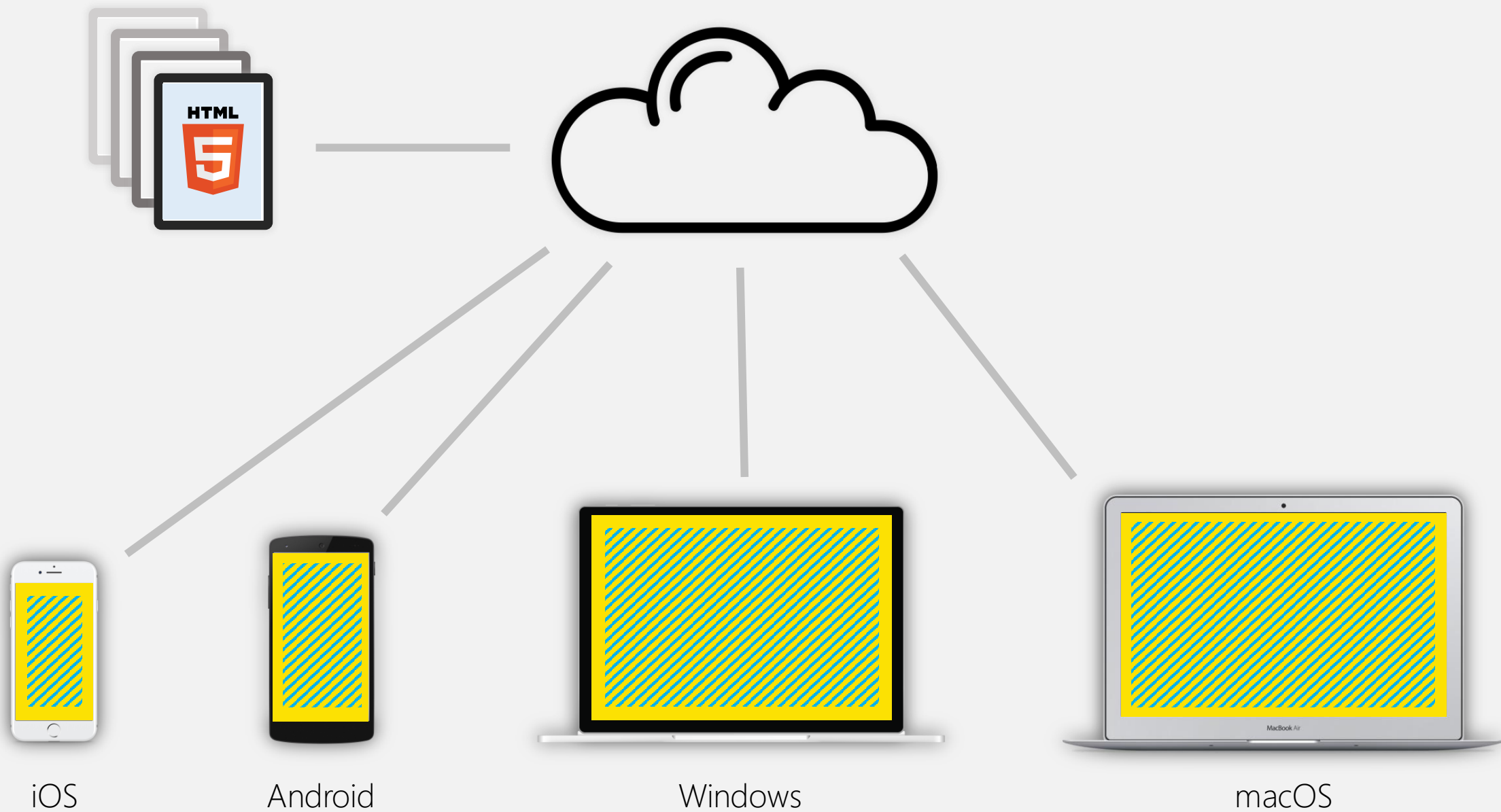


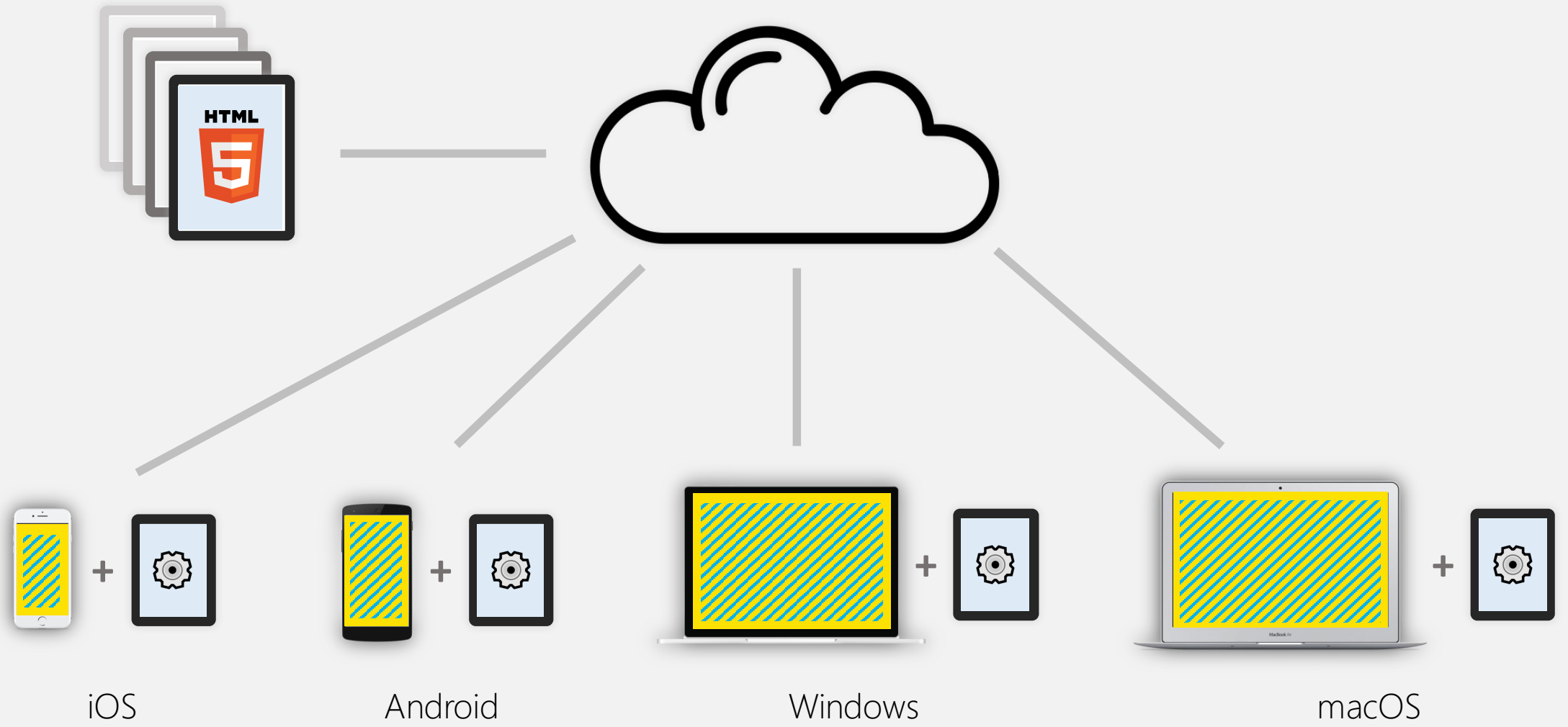
PWA as a UWP

How to detect if you are in an app environment:

```
if (typeof Windows !== "undefined") {  
    // Windows specific code goes here  
}
```

```
function speechTest() {  
    var speech = Windows.Media.SpeechRecognition.SpeechRecognizer;  
  
    if (typeof Windows !== "undefined") {  
        var defaultLang = speech.systemSpeechLanguage;  
  
        recognizer = speech.SpeechRecognizer(defaultLang);  
        recognizer.compileConstraintsAsync();  
    }  
}  
speechTest();
```





We are reusing our web app in its entirety through each native app solution!

Across Microsoft, we are using  
this approach for building  
many of our apps!



#msedgesummit



# Say "Hi" to Chandra Chivukula

Principal Engineering Manager, Microsoft Teams Desktop Clients

(@chandrachiv)



How many of you have heard  
of Microsoft Teams before ?



#msedgesummit

- Activity
- Chat
- Teams
- Meetings
- Files
- Feedback
- Settings

- Search
- Favorites
- Meekan** 10:54 am  
Ok! I'm moving Coffee with Alexan...
  - Annette Gamble** 8:14 am  
We could try adding a border u...
  - Patti Hull** 8:01 am  
Yes
- Recent
- Antonio Clausen** 6:14 am  
Can you send that link again?
  - Gordon Wilhite** 6:10 am  
While I have you, is there anythi...
  - Alexandria Cummings** 6:08 am  
I'm free later
  - Paul Raynor** 10/5  
I turned the SOW in last Friday t...
  - Josefina Osborn** 10/5  
MJ sent me the comps yesterday
  - Christa Huber** 10/5  
Does this look weird?
  - Cameron Pitcher** 10/4  
Where is that ramen restaurant yo...
  - Beth, David, & Suki** 10/4  
Have you tried the new smoothie..
  - Rodger Ulmer** 10/4  
Can you check this chart?
  - Irene Compton** 10/4  
Haha!
  - Alica Gallagher** 10/2

### Meekan

#### Conversation

Meekan  
Sorry to interrupt you. This just came in. I noticed two overlapping meetings on your calendar:

1. Coffee with Alexandria - Tomorrow November 7 at 9:00am
2. Dentist appointment - Tomorrow November 7 at 8:30am

Would you like me to **delete** or **reschedule** either one of these meetings? Or just say **skip** to ignore.

Reschedule 1 10:50 am

Meekan  
**Coffee with Alexandria** was originally planned for tomorrow. I have 3 alternative suggestions:

This is the best one

1. Tuesday November 8 at 9:00am

This could also work nicely:

2. Tomorrow November 7 at 11:30am

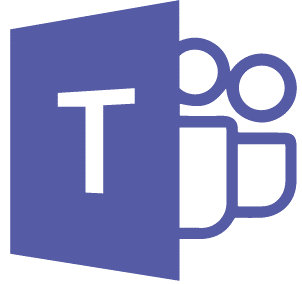
Say **book 1** to move the meeting to one of the new times

Show in calendar Cancel

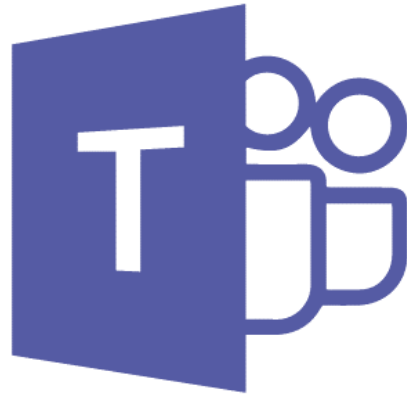
Book 1 10:54 am

Meekan  
Ok! I'm moving **Coffee with Alexandria** to Tuesday November 8 at 9:00am. Locked and synced!

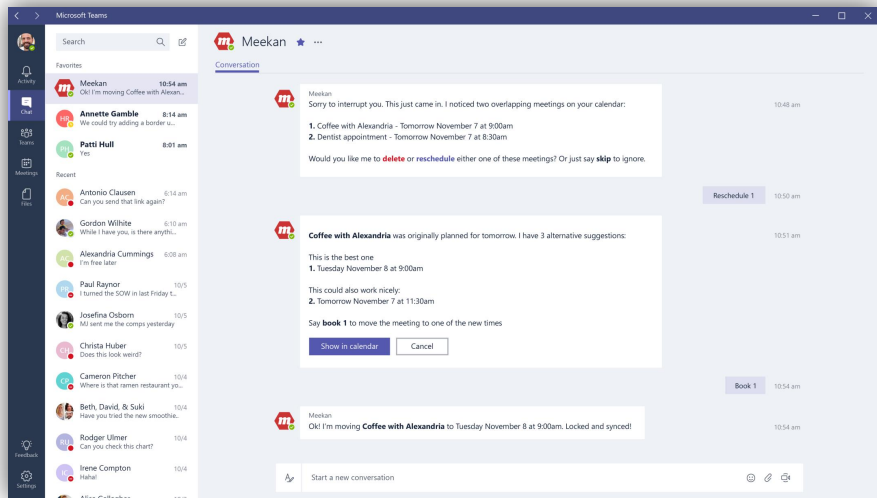
Start a new conversation



Teams is an awesome app for communicating and collaborating



Teams is awesome!





The way we communicate with each other at work goes beyond sending e-mails back and forth!


The way we collaborate is  
instead made up of...





#msedgesummit


 **Emilie Fialova** added Kirupa to the team.


 Micael Madrid 7:33 PM  
Hola **Kirupa!**


 Ayala Sato 7:33 PM  
hi!


 Kirupa 7:33 PM  
Hello!


 Johanna DeBey 7:40 PM  
Hey **Kirupa**, happy to have you here!

 Babek Shammass 7:40 PM  
How are you?

 Danielle Morrison 7:40 PM  
welcome!!

 Reply

 Emilie Fialova 7:40 PM  
**Ayala**, can you send the design excel spreadsheet?

 Reply



Real-time threaded  
conversations



Live audio and video chatting



2017\_RangeDesigns.xlsx

	A	B
1		
2	<b>Octavia</b>	<b>Design 1</b>
3	Tested for: 243 lbs	Tested for: 275 lbs
4	Width: 16 1/8"	Width: 17 1/8"
5	Depth: 19 5/8"	Depth: 20 5/8"
6	Seat width: 15 3/8"	Seat width: 15 3/8"
7	Seat depth: 15 3/4"	Seat depth: 15 3/4"
8	Seat height: 17 3/4"	Seat height: 17 3/4"
9	Height: 37 3/8"	Height: 37 3/8"
10		
11		

Sheet1

Activity Chat Teams Meetings Files Apps Feedback

Edit Close

Ayala Sato 7:34 PM  
Sure! Just finished the new batch. Once I get your go-ahead we'll order materials. Let me know which you like best.

2017\_RangeDesigns.⋮

Emilie Fialova 7:34 PM  
Everyone's loving Design 2... thoughts?

Ayala Sato 7:34 PM  
Yup, that one's my fave. Does everybody agree?

Kadji Bell 7:34 PM  
Definitely 2. How could you go wrong?

Kirupa 7:35 PM  
Design 1 seems fine!

Reply

🗨️ 😊 ✎️ 🗑️

Viewing, editing,  
and commenting  
on documents



**GitHub**

Wrike



***meekan***



zendesk



Integration with  
many of your  
favorite services

And more!

And more!



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Besides showing off some cool and useful features, there is another reason why I wanted to show you all of this!



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# HTML



All of what you saw is implemented using web technologies!



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350k lines TypeScript, 260k lines HTML, 46k SASS



350k lines TypeScript, 260k lines HTML, 46k SASS



Angular, TypeScript, Webpack, SASS and *many* more!



350k lines TypeScript, 260k lines HTML, 46k SASS



Angular, TypeScript, Webpack, SASS and *many* more!



~200 different OSS components





350k lines TypeScript, 260k lines HTML, 46k SASS



Angular, TypeScript, Webpack, SASS and *many* more!



>200 different OSS components



Extensive shared code: Web, Electron (Win/Mac), and Windows 10

We started out with web code  
for several reasons



#msedgesummit

1. Reach the most number of users



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2. Ship frequently and test our changes without any delay



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The screenshot shows a Microsoft Teams chat window in dark theme. The browser address bar displays the URL: [https://teams.microsoft.com/\\_/#/conversations/19:ed0e765c-bd68-4d4c-a548-400496c4e4a](https://teams.microsoft.com/_/#/conversations/19:ed0e765c-bd68-4d4c-a548-400496c4e4a). The left sidebar contains navigation options: Activity, Chat, Teams, Meetings, Get apps, Feedback, and Int. The main chat area shows a conversation with T-Bot. The chat history includes messages from Chandra Chivukula (9:26 AM), Mary Sun (8/11), Som Beerana (8/10), Mentoring call :) (8/10), and T-Bot (6/16). The T-Bot message contains a list of questions: "Who knows about product testing?", "When is Kurt Delbene available to meet?", and "Who does Brian Macdonald report to?". Below the list, there is a note: "For more examples, type 'help' in WhoBot. Try it out and let us know what you think! Please send feedback to whobothelp@microsoft.com". A reminder message follows: "Reminder: WhoBot is highly confidential so no sharing outside Microsoft. Please remind colleagues using WhoBot of this requirement. The messages you send to WhoBot will be logged and used to improve the product over time." A button labeled "Click here to start chatting with Who..." is visible. At the bottom, there is a text input field with the placeholder "Type your questions here" and a send button.

The screenshot shows a Microsoft Teams chat window in light theme. The browser address bar displays the URL: [https://teams.microsoft.com/\\_/#/conversations/19:ed0e765c-bd68-4d4c-a548-400496c4e4a](https://teams.microsoft.com/_/#/conversations/19:ed0e765c-bd68-4d4c-a548-400496c4e4a). The left sidebar contains navigation options: Activity, Chat, Teams, Meetings, Get apps, Feedback, and Int. The main chat area shows a conversation with T-Bot. The chat history includes messages from Chandra Chivukula (9:26 AM), Mary Sun (8/11), Som Beerana (8/10), Mentoring call :) (8/10), and T-Bot (6/16). The T-Bot message contains a list of questions: "Who knows about product testing?", "When is Kurt Delbene available to meet?", and "Who does Brian Macdonald report to?". Below the list, there is a note: "For more examples, type 'help' in WhoBot. Try it out and let us know what you think! Please send feedback to whobothelp@microsoft.com". A reminder message follows: "Reminder: WhoBot is highly confidential so no sharing outside Microsoft. Please remind colleagues using WhoBot of this requirement. The messages you send to WhoBot will be logged and used to improve the product over time." A button labeled "Click here to start chatting with Who..." is visible. At the bottom, there is a text input field with the placeholder "Type your questions here" and a send button.

3. My team is made up of  
awesome web developers!

We also wanted to extend our web solution to a native app to better take advantage of device capabilities



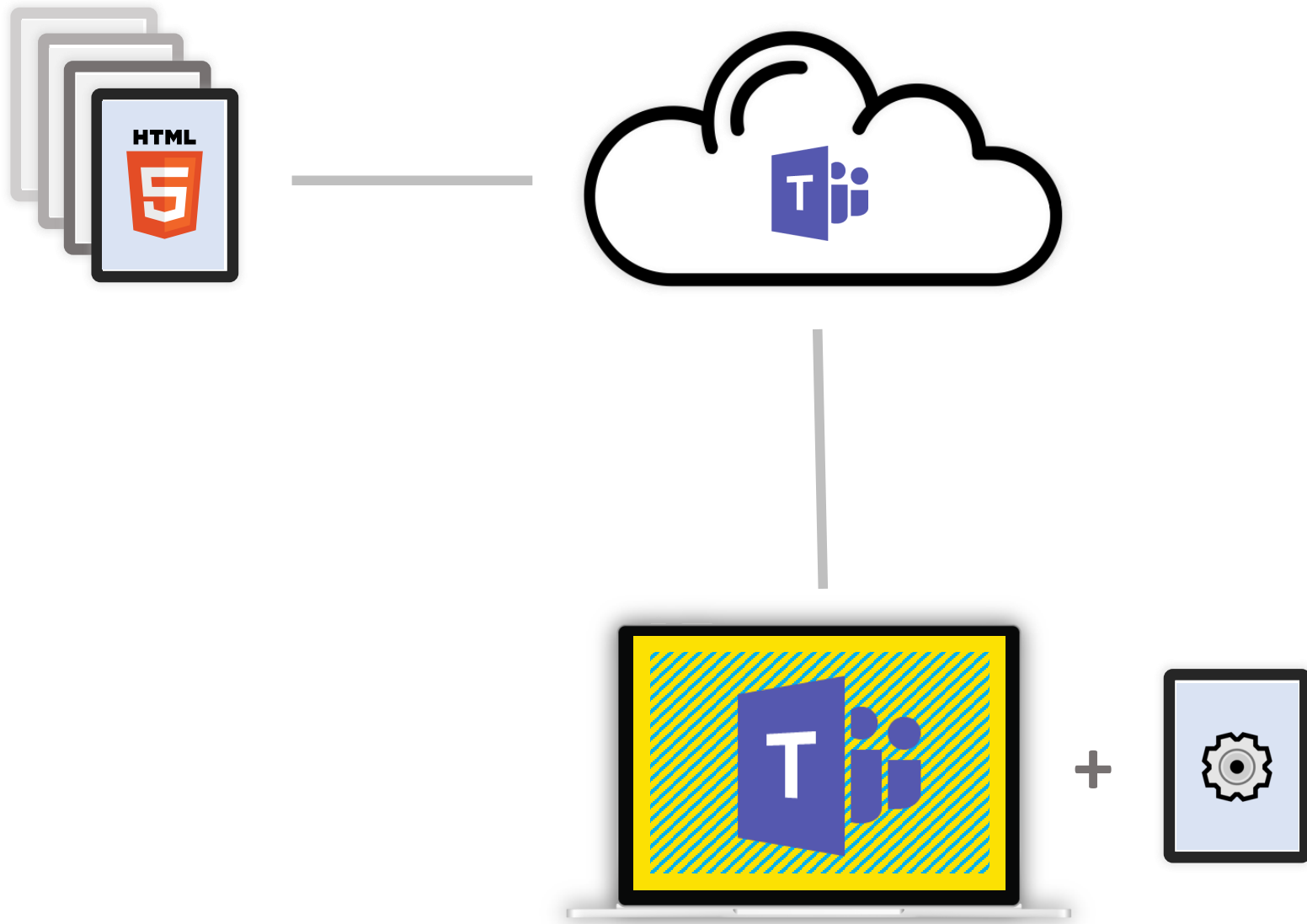
#msedgesummit

In addition to some of the reasons Kirupa highlighted earlier...



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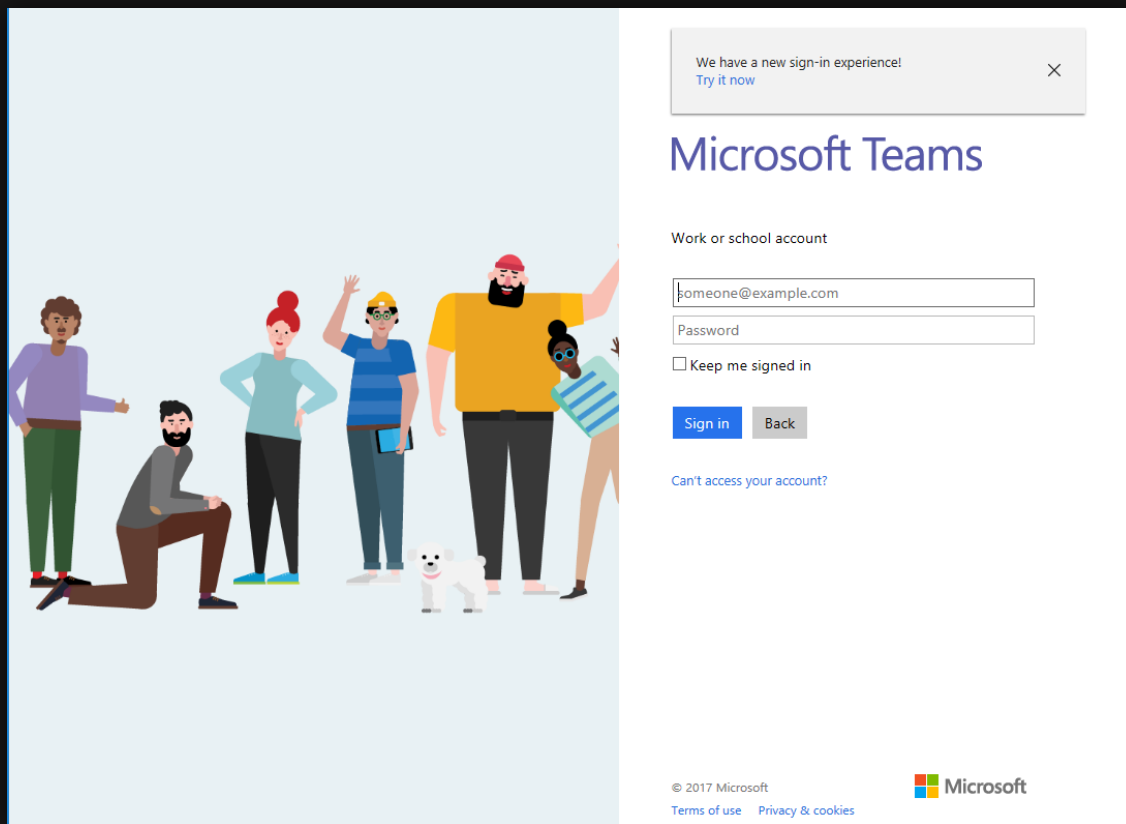
Computer



The Skype team developed a media component written in C/C++ that supports really smooth, high quality audio and video calling, screen sharing, and more!



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We also wanted to provide better authentication experience. We use Azure Active Directory Library for Electron and WAM for Windows 10.



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We wanted to provide a great web experience. We wanted to provide a more tailored experience on native devices!



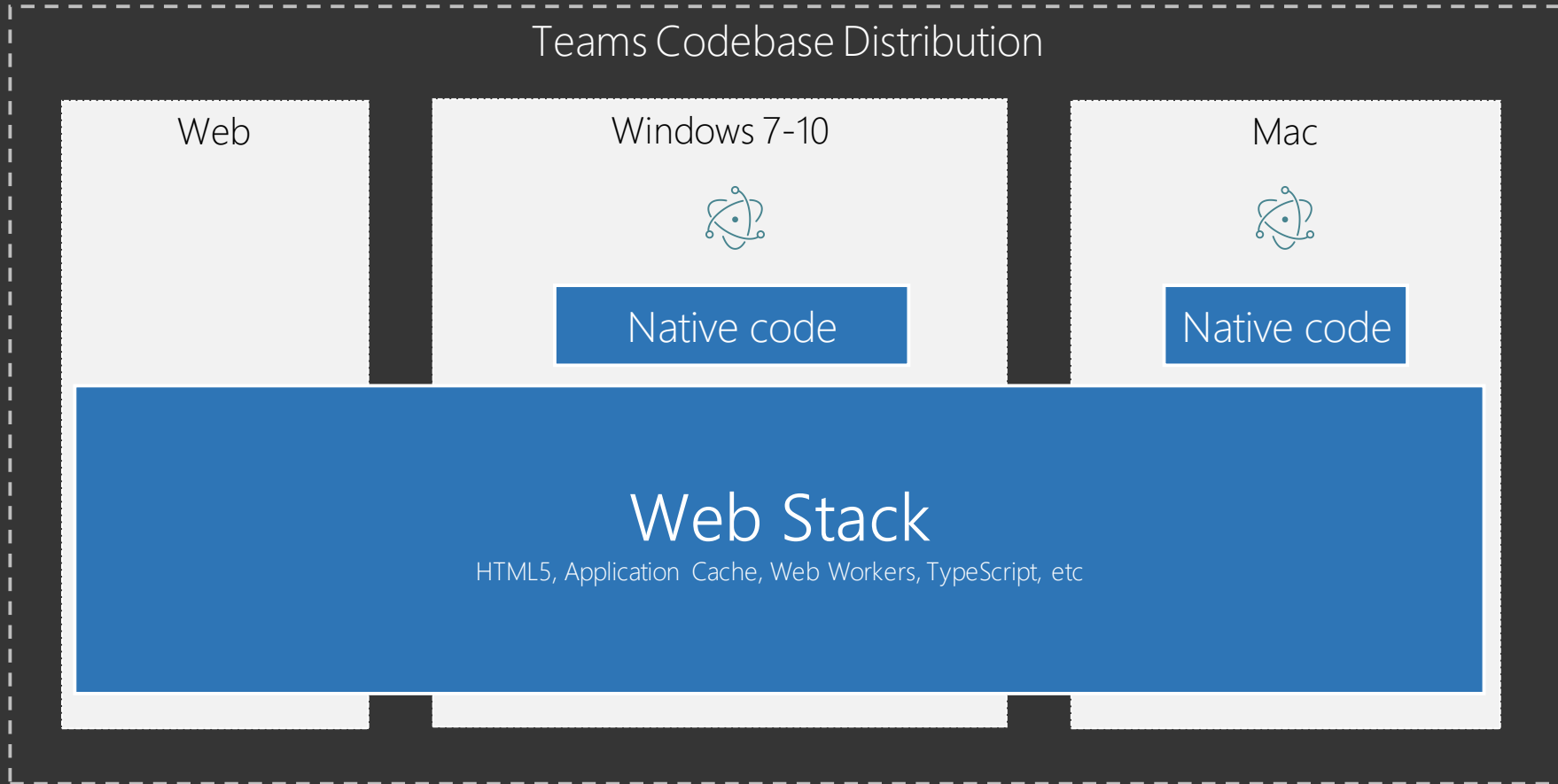
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We wanted to do all of this while still maintaining a single code base!



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## Teams Codebase Distribution

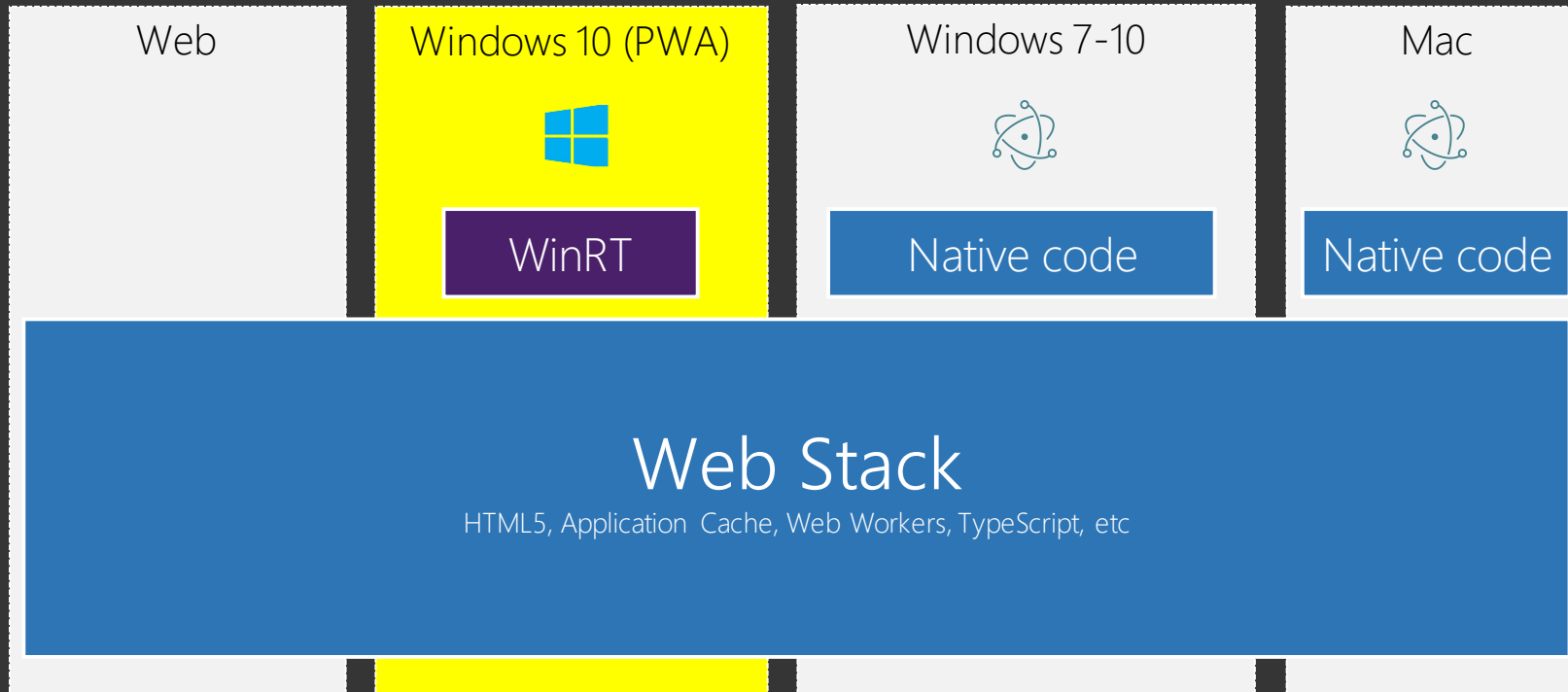


Browsers: Edge, IE11, latest Chrome, latest Firefox  
Desktop: Windows 10, 8.1, 7(SP1), Mac OS X 10.10+



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## Teams Codebase Distribution



Browsers: Edge, IE11, latest Chrome, latest Firefox

Desktop: Windows 10, 8.1, 7(SP1), Mac OS X 10.10+

\*app under development



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JS coolFeature.js ●

```
1  var platform = getPlatform().shortName;
2
3  if (platform == "Windows 10") {
4      //something Windows 10 specific
5  } else if (platform == "Electron") {
6      //something Win7, Win8, MacOS specific
7  } else if (platform == "Web") {
8      //something PWA specific
9  }
```

We need a scalable strategy to light up features for each platform!



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To reduce complexity, we decided to organize our code by file name!



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Let's take notifications for example.



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Core/Web: notificationsService.ts

Electron: Core + notificationsService.desktop.ts

Win10: Core + notificationsService.hwa.ts



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For Windows 10, for example, we would bundle `notificationsService.ts` with `notificationsService.hwa.ts` to generate the appropriate output.



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This approach has allowed us to scale our functionality for all three platforms while maintaining maximum code re-use throughout.



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- ✓ Build (dogfood)
  - ✓ Initialize Job
  - ✓ Get sources
  - ✓ Restore Nuget Packages
  - ✓ Build Agent Preinstall
  - ✓ Yarn install HWA Client
  - ✓ Build and Install HWA client
  - ✓ Build HWA Client AppStore
  - ✓ Upload Builds to Lab
  - ✓ Upload Builds AppStore to Lab
  - ✓ Publish Artifact: package
  - ✓ Publish Artifact: package appstore
  - ✓ Publish Artifact: \_releases
  - ✓ Post Job Cleanup
- ✓ Build (tap)
  - ✓ Initialize Job
  - ✓ Get sources
  - ✓ Restore Nuget Packages
  - ✓ Build Agent Preinstall
  - ✓ Yarn install HWA Client
  - ✓ Build and Install HWA client
  - ✓ Build HWA Client AppStore
  - ✓ Upload Builds to Lab
  - ✓ Upload Builds AppStore to Lab
  - ✓ Publish Artifact: package
  - ✓ Publish Artifact: package appstore
  - ✓ Publish Artifact: \_releases

teams-client-desktop-hwa-master-ci / Build 2017082802

[Edit build definition](#) [Queue new build...](#) [Download all logs as zip](#) [Retain indefinitely](#) [Release](#)

**Build succeeded**

Build 2017082802 [🔗](#)  
 Ran for 11.4 minutes (HWA-Pool), completed 9 days ago

[Summary](#) [Timeline](#) [Artifacts](#) [Code coverage\\*](#) [Tests](#)

**Build details**

Definition [teams-client-desktop-hwa-master-ci \(edit\)](#)  
 Source [master](#)  
 Source version [Commit 7c748e55](#)  
 Requested by Kevin Li (ASG)  
 Queue name [HWA-Pool](#)  
 Queued Monday, August 28, 2017 1:28 PM  
 Started Monday, August 28, 2017 1:28 PM  
 Finished Monday, August 28, 2017 1:40 PM  
 Retained state Retained by release

**Associated changes**

[7c748e5](#) Authored by Daniel Mariselli  
 Merged PR 52120: Updating gitignore to ignore the files generated from gulp test

Updating gitignore [...](#)

[81f4ca2](#) Authored by Kevin Li (ASG)  
 Merged PR 52162: Added configuration for TAP listing

Added configuration for TAP listing

Related w [...](#)

**Work items linked to associated changes**

[Task 156894](#) Setup Telemetry and Logging for HWA  
 Current state is Closed. Currently assigned to Kevin Li (ASG) <kevil@microsoft.com>.

[Task 160837](#) Add Code Coverage  
 Current state is Closed. Currently assigned to Daniel Mariselli <damarise@microsoft.com>.

**Test Results**

No test runs are available for this build.  
 Enable automated tests in your build definition by adding the [Visual Studio Test task](#).

**Code Coverage**

No build code coverage data available.

**Tags**

[Add tag...](#)

**Deployments**

Environments	Status
teams-client-desk... /...	
<a href="#">Dogfood - Pending Store Submission</a>	✓ Succeeded
<a href="#">Dogfood - Submit App to Windows...</a>	✓ Succeeded
<a href="#">Dogfood - Check App Submission</a>	✓ Succeeded
1 Pending Store Submission	Not Deployed
1 Submit App to Windows Store	Not Deployed
1 Check App Submission	Not Deployed
2 Pending Store Submission	Not Deployed
2 Submit App to Windows Store	Not Deployed
2 Check App Submission	Not Deployed
3 Pending Store Submission	Not Deployed
3 Submit App to Windows Store	Not Deployed
3 Check App Submission	Not Deployed
Not Used	Not Deployed

My name is Chandra! You can find me upstairs after this session to chat more.

Twitter: [@chandrachiv](https://twitter.com/chandrachiv)

LinkedIn: [www.linkedin.com/in/chandra-chivukula](https://www.linkedin.com/in/chandra-chivukula)



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We're hiring!

My name is Chandra! You can find me upstairs after this session to chat more.

Twitter: [@chandrachiv](https://twitter.com/chandrachiv)

LinkedIn: [www.linkedin.com/in/chandra-chivukula](https://www.linkedin.com/in/chandra-chivukula)



#msedgesummit



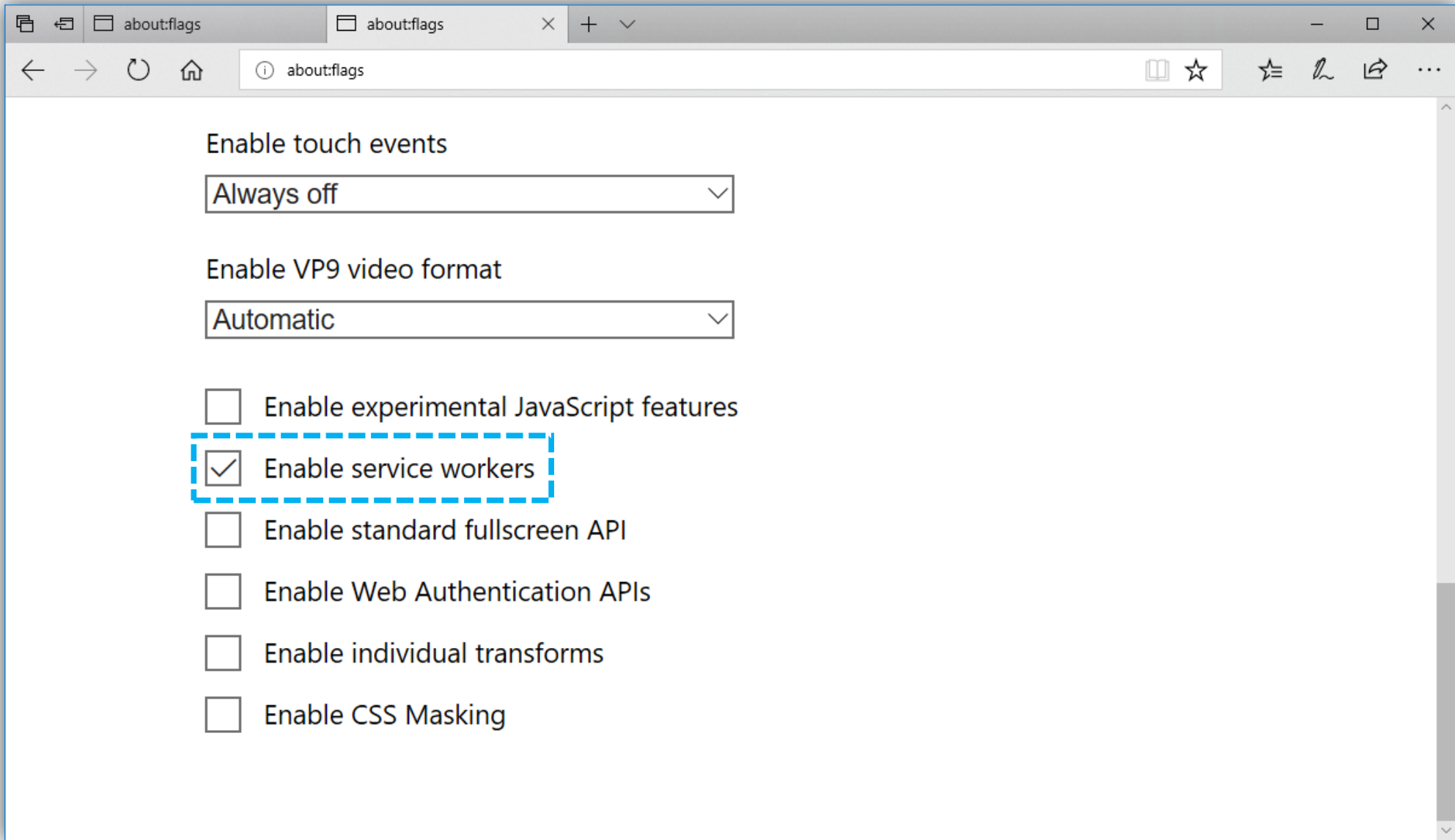
Let's turn it back over to Kirupa



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# Timeframe for PWAs on Windows

You can test PWAs in Edge by enabling Service Workers under **about:flags**.



Later this year, we will enable Service Worker functionality **on by default in preview builds of Windows**, followed by a rollout to stable builds in 2018.

For apps, you can test your PWA with a special entry defined in the manifest.

```
<uap:Rule Type="include"  
    Match="https://contoso.com/"  
    ServiceWorker="true"  
    WindowsRuntimeAccess="all" />
```

This allows you to experiment with pre-release features in your app, but you won't be allowed to submit your app to the Store.



Full PWA functionality on  
Windows 10 is expected in our  
upcoming release next year!

Ali's talk in a few minutes will go into much greater detail about our Service Worker plans.



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Is it possible to build a web app, maximize code reuse, and still provide a great (native) user experience across devices?



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1. Build the best possible web app you to reach the largest audience
2. Use any of the web/native frameworks we looked at to layer on native functionality





You/Your developers  
will be happy



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Your users will be  
happy



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# Thank you!

---

DECK [aka.ms/pwa\\_slides](https://aka.ms/pwa_slides)

RESOURCES [aka.ms/pwa\\_and\\_more](https://aka.ms/pwa_and_more)

TWITTER [@kirupa](https://twitter.com/kirupa)

BLOG [kirupa.com](https://kirupa.com)



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