



MOBILE APPS WITH THE IONIC FRAMEWORK

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@robertlair

SESSION GOALS

- ✓ What is the Ionic Framework?
- ✓ How do I setup an Ionic development environment?
- ✓ How are Ionic applications built?
- ✓ How is native functionality added to Ionic apps?
- ✓ How do I prepare and deploy Ionic apps?
- ✗ Angular/React/JavaScript

...there is a ton to cover. Please hold questions till the end of the talk

SO MANY MOBILE APP DEV OPTIONS

YOU MUST CHOOSE



...BUT CHOOSE WISELY

SO MANY MOBILE APP DEV OPTIONS...

NATIVE

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Fastest
Runtime
Experience

Best Access to
Device
Functionality

WEB

\$

Poor Mobile
Experience

Lack of Access to
Device
Functionality

Not Discoverable
from App Stores

HYBRID NATIVE

\$\$\$\$

Fast Runtime
Access to Device
Functionality

Discoverable from
App Stores

Looks & Feels
Native

Bigger Learning
Curve

PROGRESSIVE WEB APP

\$\$

Discoverable via
App Stores or
Web

Poor Install
Experience on iOS

Looks & Feels
Close to Native

Opportunity to
Access Device
Functionality

HYBRID WEB

\$\$

Slower Runtime

Developed with
Web Technology

Access to Device
Functionality

Discoverable from
App Stores

Looks & Feels
Native

THE PROBLEM WITH HYBRID-WEB APPS

Unlike native app development, there is no provided SDK that provides standard UI patterns and repeatable functionality such as components, gestures, and animations out of the box.

And that is where Ionic comes in...

WHAT IS IONIC?

- ✓ UI Component Toolkit for Building Hybrid-Web Mobile Apps
- ✓ Can build for Android, iOS, PWAs, and Desktop (Electron)
- ✓ Open Source Technology, Completely Free to Use
- ✓ Outputs Mobile Apps that closely resemble native apps
- ✓ Access to Native Capabilities of Devices
- ✓ Large Community (Millions of Developers)

WHAT MAKES UP IONIC?

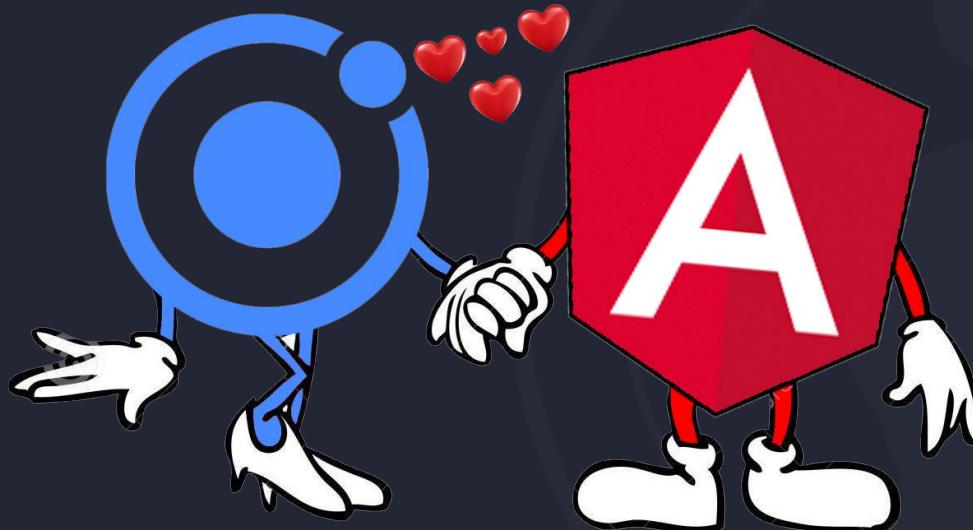
- ✓ Ionic CLI
- ✓ Library of Web Components that look and feel native
- ✓ Capacitor for Access to Native Functionality

HISTORY OF IONIC

- ✓ Original version released in 2013
- ✓ Version 1 - 3 based on Angular & Apache Cordova
- ✓ Version 4 (Early 2019) rewrite based on Web Components
- ✓ Capacitor added with Version 4 to replace Cordova
- ✓ Support for Upcoming Angular 9.0 Currently in Beta
- ✓ Version 5 Rumored to be Announced Early 2020

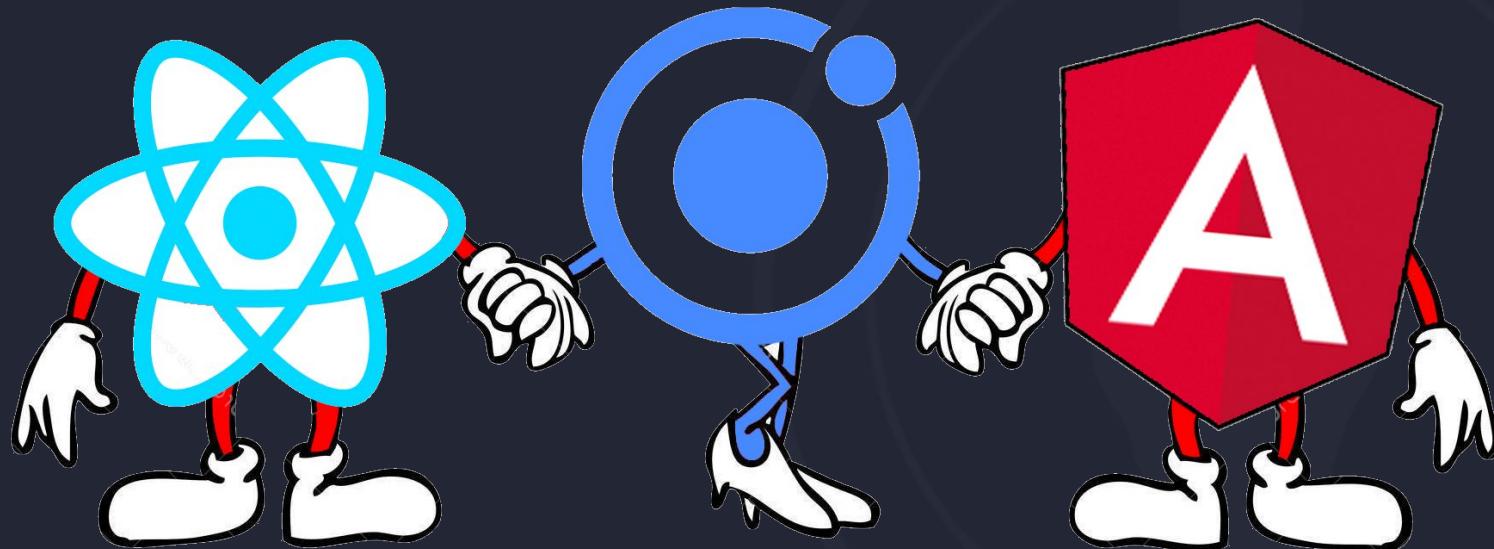
IONIC & ANGULAR

In Earlier Versions of Ionic, Angular was the only fully supported platform



IONIC & ANGULAR & REACT

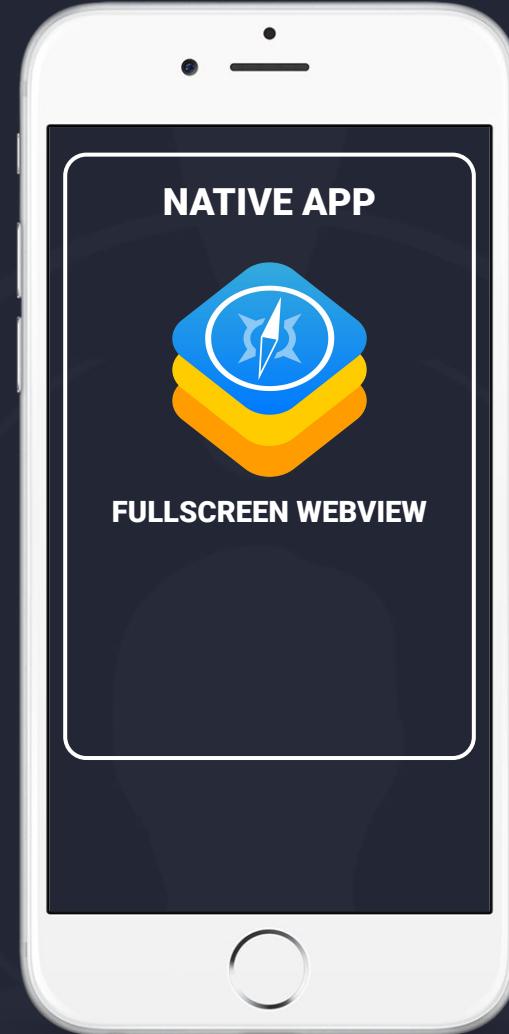
Now React is also a 1st Class Citizen with Ionic



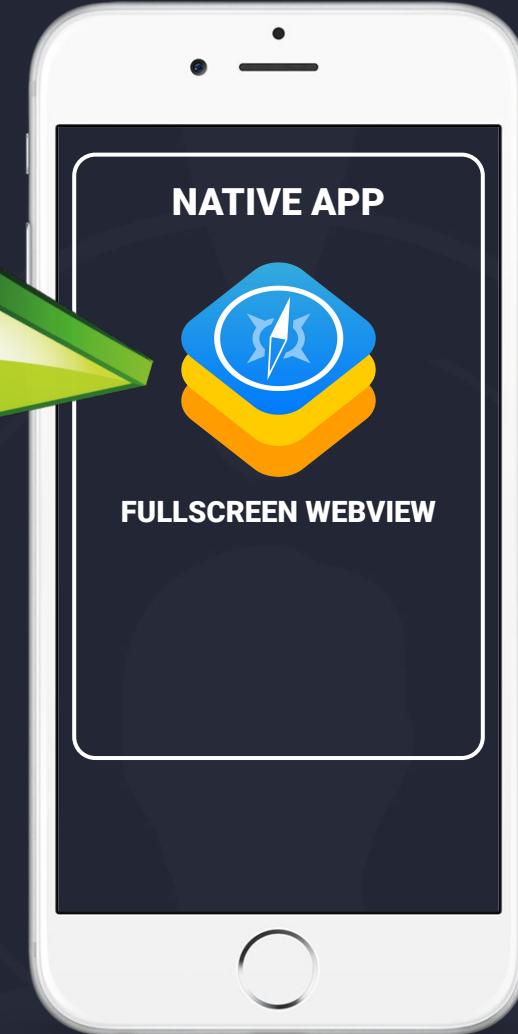
HYBRID MOBILE APPS



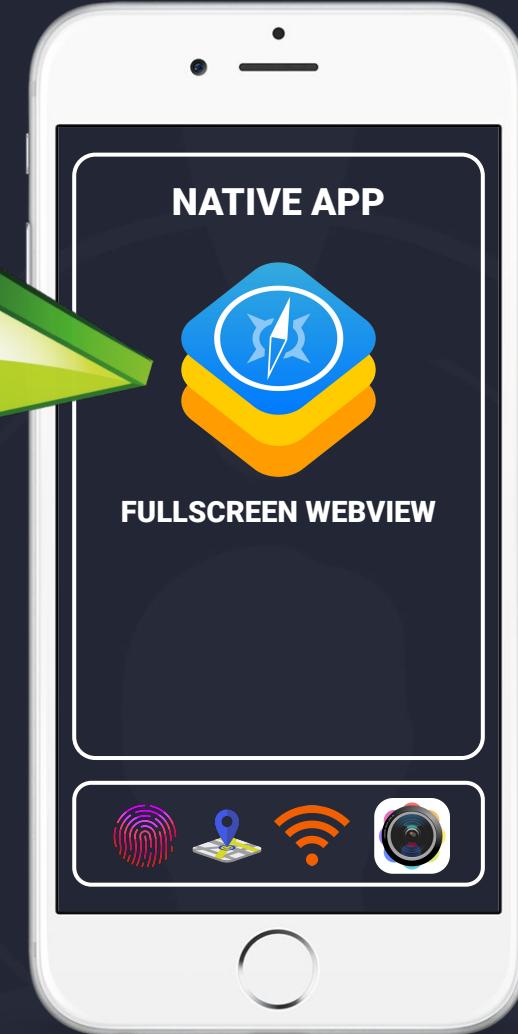
HYBRID MOBILE APPS



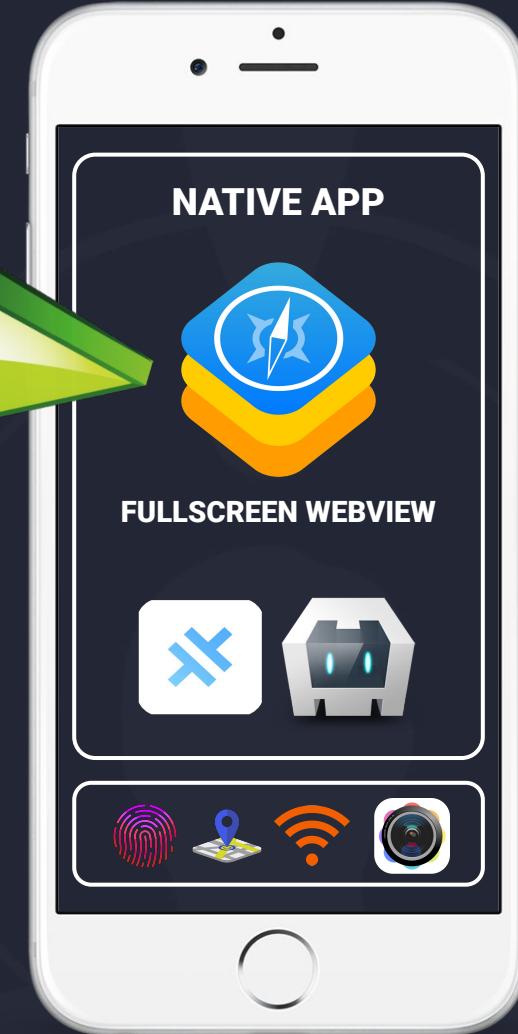
HYBRID MOBILE APPS



HYBRID MOBILE APPS



HYBRID MOBILE APPS



BEST TYPE OF APPS FOR IONIC

- ✓ CRUD Apps
- ✓ Business Apps
- ✗ Graphically Intense Apps
- ✗ Games
- ✗ Apps Dependent on Lots of Device Functionality

IONIC DEV ENVIRONMENT

INSTALLATION PRE-REQS

ALL DEPLOYMENT
TARGETS



Latest LTS

iOS DEPLOYMENT



(COCOAPODS)

ANDROID DEPLOYMENT



INSTALLING IONIC CLI

```
$ npm install -g ionic
```

VISUAL STUDIO CODE



Cordova Tools vsmobile.cordova-tools

Visual Studio Mobile Tools | ⚡ 795,040 | ★★★★★ | Repository | License

Code-hinting, debugging and integrated commands for Apache Cordova (PhoneGap). With added support for the Ionic Framework.

[Disable](#) [Uninstall](#)

Angular v7 Snippets johnpapa.angular2

John Papa | ⚡ 4,610,509 | ★★★★★ | Repository | License

Angular v7 snippets by John Papa

[Disable](#) [Uninstall](#)

This extension is recommended because you have Angular CLI installed. [Ignore Recommendation](#)

Angular Language Service angular.ng-template

Angular | ⚡ 1,315,720 | ★★★★★ | Repository

Editor services for Angular templates

[Disable](#) [Uninstall](#)

TSLint eg2 tslint

egamma | ⚡ 10,863,955 | ★★★★★ | Repository | License

TSLint for Visual Studio Code

[Reload to Update](#) [Disable](#) [Uninstall](#)

IONIC CLI

IONIC CLI

ionic --help

ionic <command> --help

```
CLI 4.6.0

Usage:
$ ionic <command> [<args>] [--help] [--verbose] [--quiet] [--no-interactive] [--no-color] [--confirm] [options]

Global Commands:

config <subcommand> ..... Manage CLI and project config values (subcommands: get, set, unset)
docs ..... Open the Ionic documentation website
info ..... Print project, system, and environment information
init ..... (beta) Initialize existing projects with Ionic
login ..... Login to Ionic Appflow
logout ..... Logout of Ionic Appflow
signup ..... Create an account for Ionic Appflow
ssh <subcommand> ..... Commands for configuring SSH keys (subcommands: add, delete, generate, list, setup, use)
start ..... Create a new project

Project Commands:

build ..... (beta) Build web assets and prepare your app for any platform targets
capacitor <subcommand> ..... (beta) Capacitor functionality (subcommands: add, copy, open, run, sync, update)
(alias: cap)
cordova <subcommand> ..... Cordova functionality (subcommands: build, compile, emulate, platform, plugin, prepare, requirements, resources, run)
doctor <subcommand> ..... Commands for checking the health of your Ionic project (subcommands: check, list, treat)
generate ..... (beta) Automatically create framework features (alias: g)
git <subcommand> ..... Commands relating to git (subcommands: remote)
integrations <subcommands> ..... Manage various integrations in your app (subcommands: disable, enable, list)
link ..... Connect local apps to Ionic Appflow
repair ..... Remove and recreate dependencies and generated files
serve ..... (beta) Start a local dev server for app dev/testing (alias: s)
ssl <subcommand> ..... (experimental) Commands for managing SSL keys & certificates (subcommands: generate)

roberts-mbp:codeMash2 robertlair$ 
```

IONIC CLI: START

Creates a new Ionic App

\$ ionic start

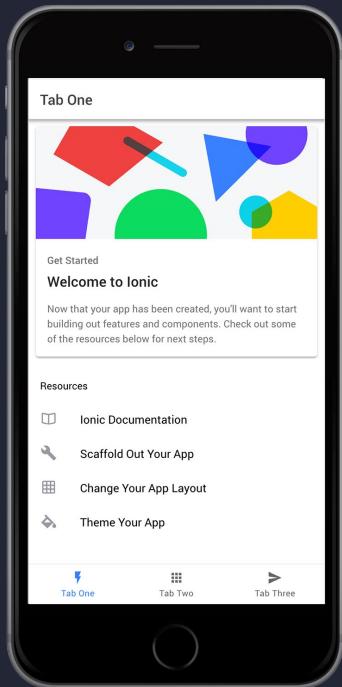
Running without any arguments will
prompt you with options

```
...  
roberts-mbp-3:codemash2020 robertlair$
```

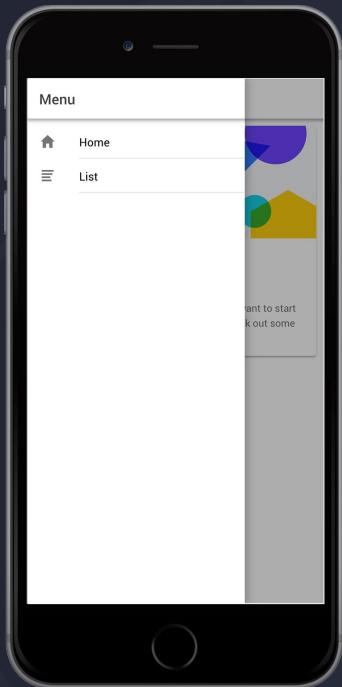
STARTER TEMPLATES



blank



tabs



sidemenu

IONIC CLI: GENERATE

Uses the Angular CLI to generate features such as pages, components, directives, services, etc.

```
$ ionic generate <type> <name>
```

Example:

```
ionic generate page pages/sessionDetail  
ionic g service services/sessionData
```

IONIC CLI: BUILD

Builds web assets and prepares app for any platform targets

```
$ ionic build [options]
```

Example:
ionic build --prod
ionic build

IONIC CLI: SERVE

Starts a local dev server for app testing

```
$ ionic serve [options]
```

Examples:

ionic serve

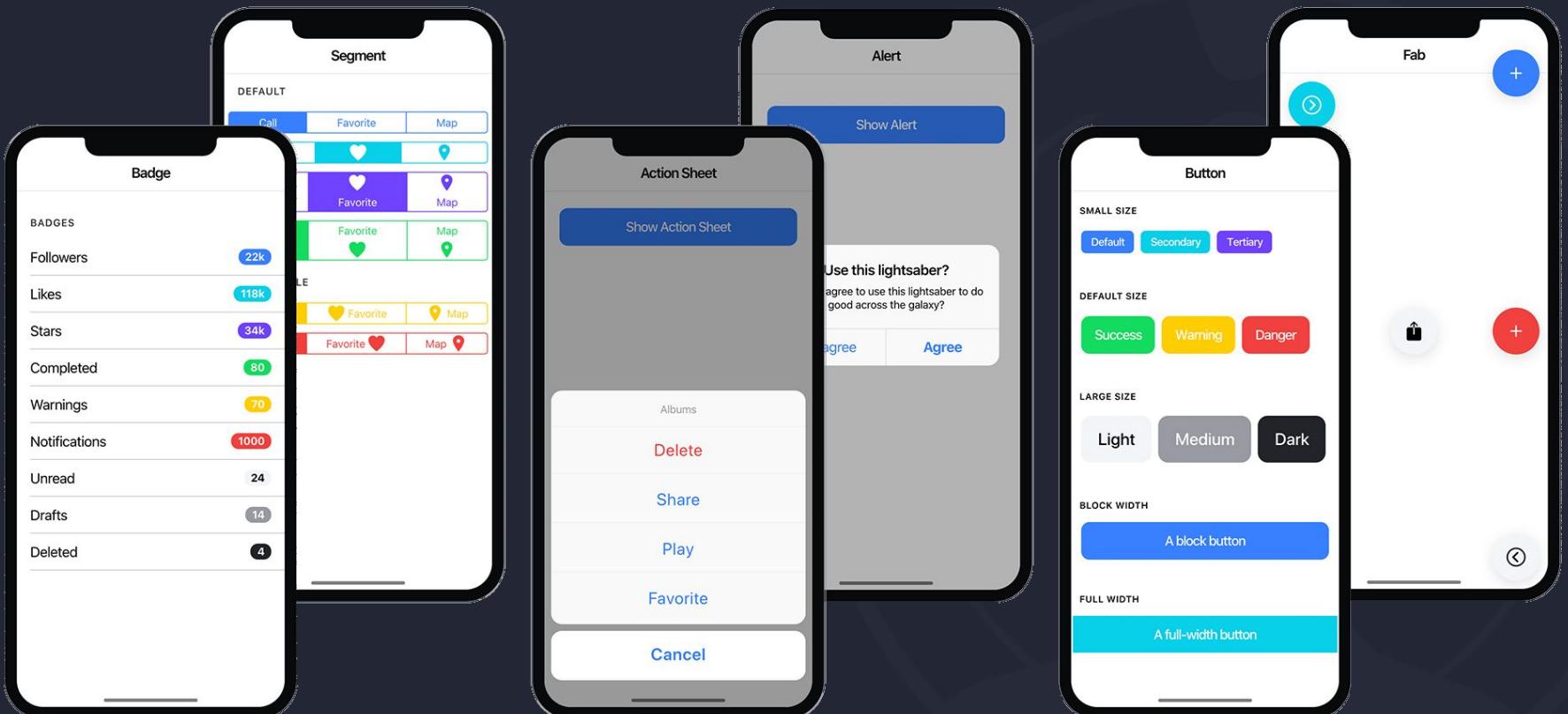
ionic serve --lab

IONIC COMPONENTS

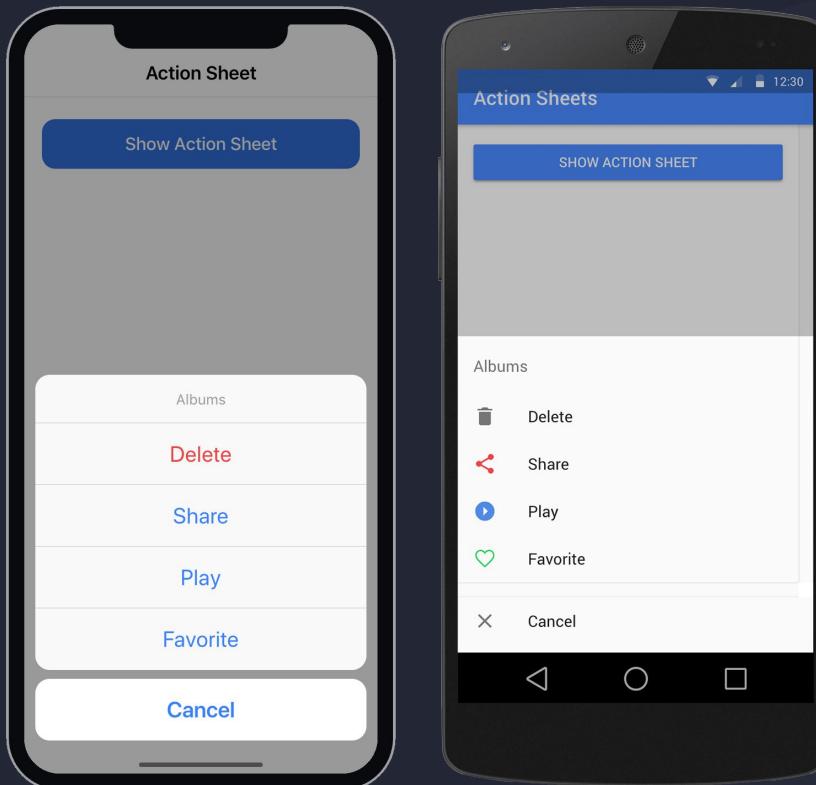
IONIC COMPONENTS

- | | | |
|----------------|-------------------|------------------|
| ✓ Action Sheet | ✓ Infinite Scroll | ✓ Refresher |
| ✓ Alert | ✓ Input | ✓ Searchbar |
| ✓ Badge | ✓ List | ✓ Select |
| ✓ Button | ✓ Loading | ✓ Slides |
| ✓ Card | ✓ Menu | ✓ Spinner |
| ✓ Checkbox | ✓ Modal | ✓ Tabs |
| ✓ Datetime | ✓ Navigation | ✓ Toast |
| ✓ Fab | ✓ Popover | ✓ Virtual Scroll |
| ✓ Grid | ✓ Range | |

IONIC COMPONENTS



STYLED FOR PLATFORM

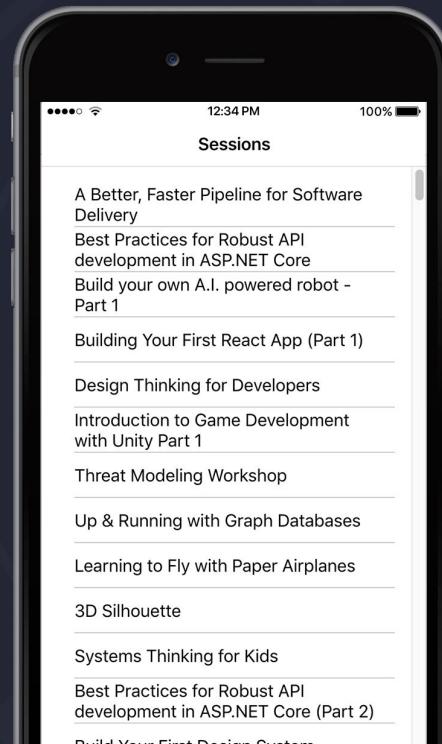
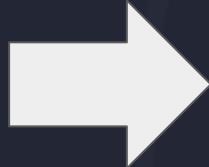


COMPONENTS: MORE INFORMATION

<https://ionicframework.com/docs/components>

DEMO: CodeMash App

Goal: Create a simple listing of CodeMash Sessions



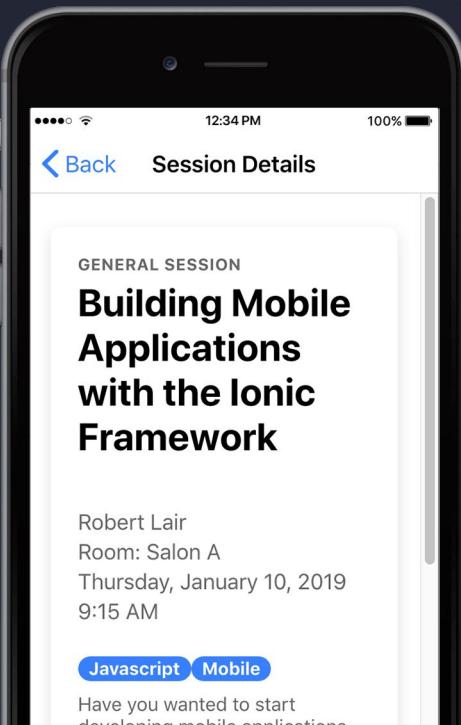
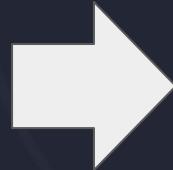
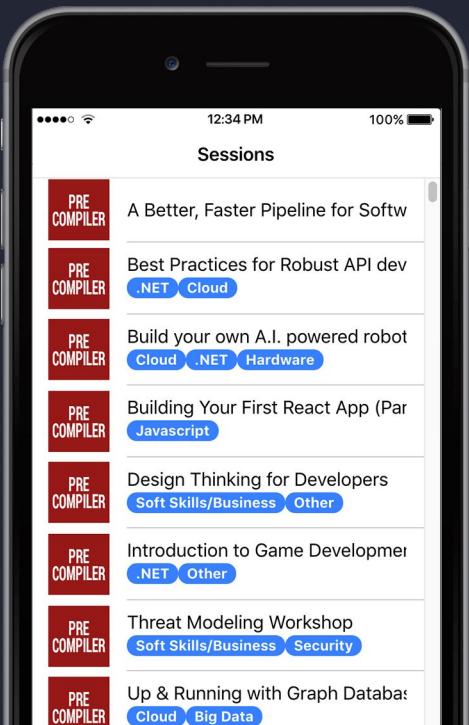
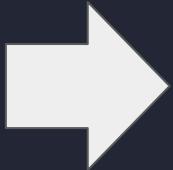
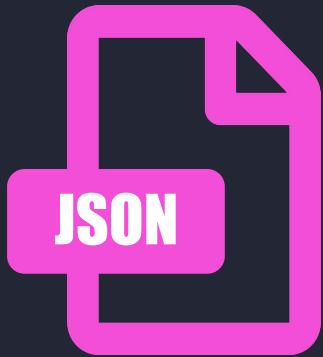
src
app
home
models
services
app-routing.module.ts
app.component.html
app.component.scss
app.component.spec.ts
app.component.ts
app.module.ts
assets
environments
theme
global.scss
index.html
main.ts
polyfills.ts
test.ts
zone-flags.ts
typings
www
.gitignore
angular.json
browserslist
ionic.config.json
karma.conf.js
package-lock.json
package.json
tsconfig.app.json
tsconfig.json
tsconfig.spec.json
tslint.json

IONIC DIRECTORY STRUCTURE

src	Contains files and folders you will be working on to build your app
app	Contains the web application source
assets	Contains any static assets to be copied to the device
theme	Contains CSS4 variables representing the global theme
www	The output of the build process. You should never edit files in this folder
packages.json	Lists all the dependencies for your app

DEMO: CodeMash App

Goal: Expand simple listing of CodeMash Sessions



NATIVE FUNCTIONALITY

NATIVE FUNCTIONALITY



IONIC CLI: CAPACITOR

Capacitor commands for a capacitor integrated project

```
$ ionic capacitor <command>
```

Examples:

```
ionic capacitor add ios  
ionic capacitor sync  
ionic cap open ios
```

Adding Capacitor to Project

1

Enable Capacitor in the Project

ionic integrations enable capacitor

Adding Capacitor to Project

1

Enable Capacitor in the Project

ionic integrations enable capacitor

2

Update the application configuration

capacitor.config.json

Adding Capacitor to Project

1

Enable Capacitor in the Project

ionic integrations enable capacitor

2

Update the application configuration

capacitor.config.json

3

Add Platform(s)

ionic cap add ios

Adding Capacitor to Project

1

Enable Capacitor in the Project

ionic integrations enable capacitor

2

Update the application configuration

capacitor.config.json

3

Add Platform(s)

ionic cap add ios

4

Build the application

ionic build [--prod]

Adding Capacitor to Project

1

Enable Capacitor in the Project

ionic integrations enable capacitor

2

Update the application configuration

capacitor.config.json

3

Add Platform(s)

ionic cap add ios

4

Build the application

ionic build [--prod]

5

Sync changes to the output directory (i.e. ios, android)

ionic cap sync

Importing Capacitor Plugins

1

Import the Plugins from Capacitor Core

```
import { Plugins } from '@capacitor/core';
```

Importing Capacitor Plugins

1

Import the Plugins from Capacitor Core

```
import { Plugins } from '@capacitor/core';
```

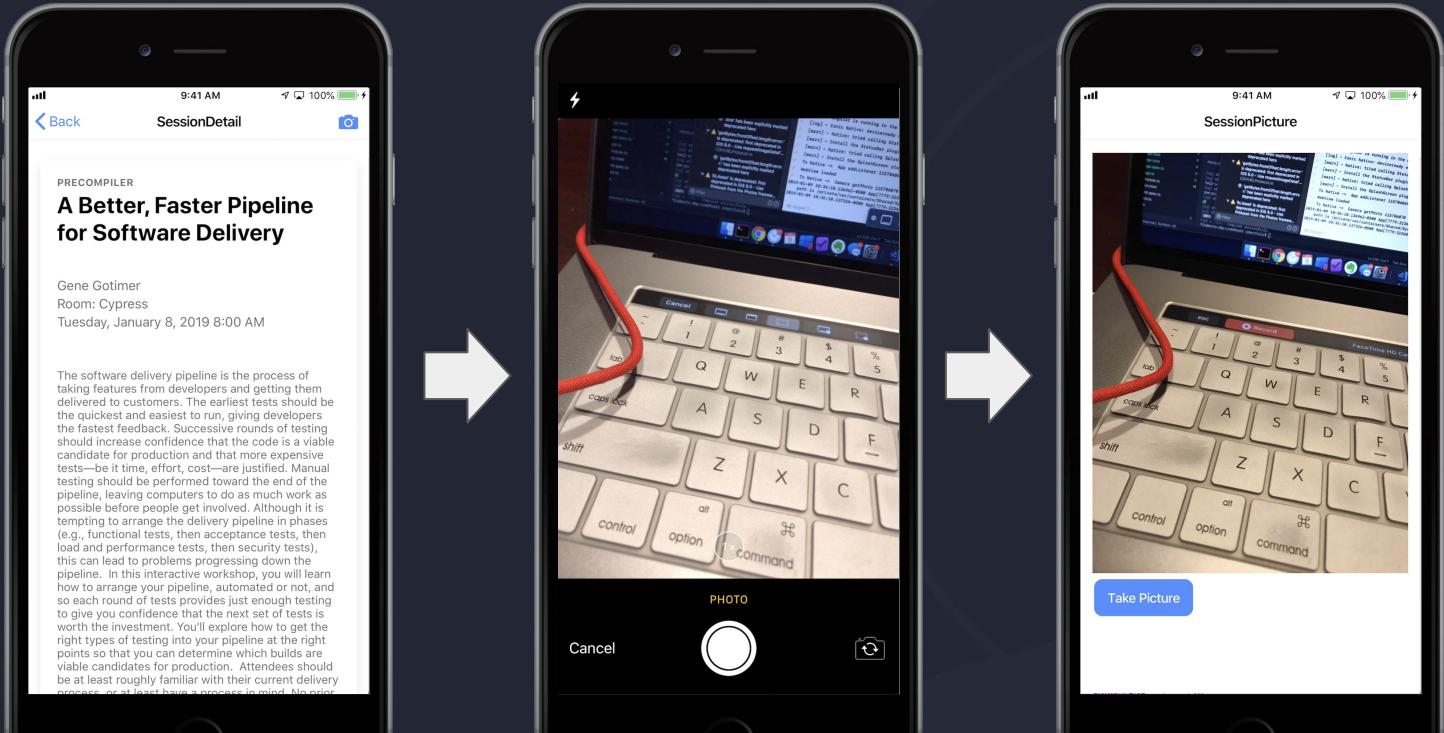
2

Destructure Camera from Plugins

```
const { Camera } from Plugins;
```

DEMO: CodeMash App + Native

Goal: Add Camera Functionality to App



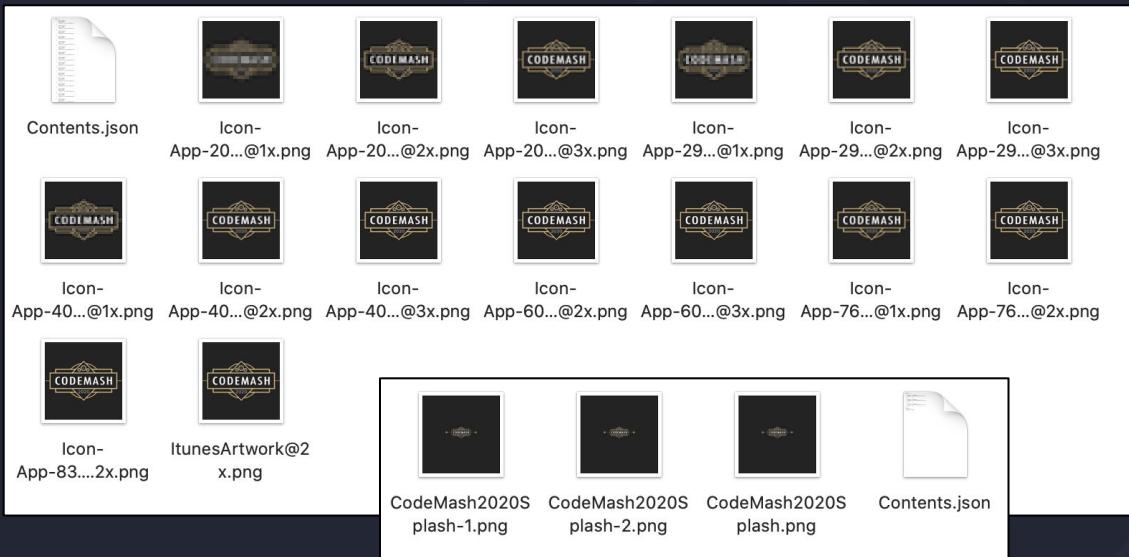
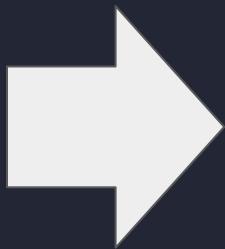
PREPARING APP FOR DEPLOYMENT

SPLASH SCREEN & ICONS

- ✓ There are many devices our app could be running on
- ✓ Each device may have a different resolution/pixel density
- ✓ Result is many graphics must be created
- ✓ Ionic Resources, XCode, Android Studio, Several Websites

DEMO: CodeMash App - Icons/Splash

Goal: Expand simple listing of CodeMash Sessions



<https://makeappicon.com>



BONUS! STYLING IONIC APPS

IONIC COLOR GENERATOR

Color Generator

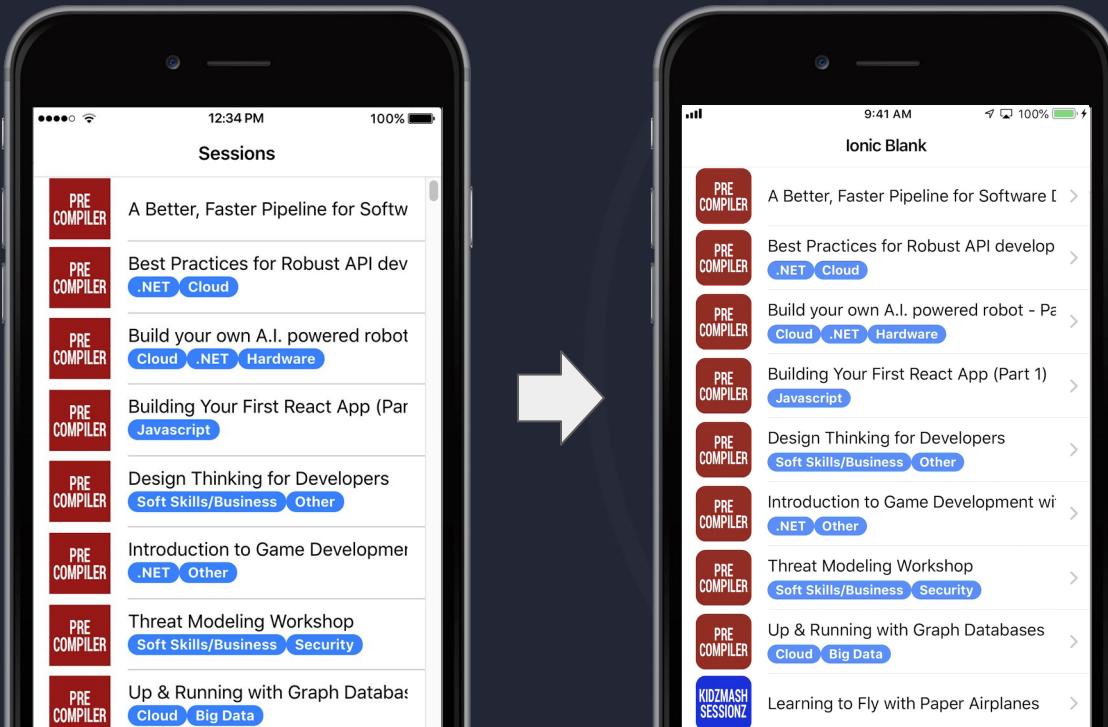
Create custom color palettes for your app's UI. Update a color's hex values, check the demo app on the right to confirm, then copy and paste the generated code directly into your Ionic project.

● Primary	 #ff0000
● Primary-shade	#e00000
● Primary-tint	#ff1a1a
● Secondary	 #0cd1e8
● Tertiary	 #7044ff
● Success	 #10dc60
● Warning	 #ffcce0
● Danger	 #f04141

The Ionic Color Generator interface features a sidebar on the left with a list of color categories: Primary, Primary-shade, Primary-tint, Secondary, Tertiary, Success, Warning, and Danger. Each category has a colored circular icon and a corresponding hex color code input field. To the right of the generator is a mobile application preview titled "Theme Preview". The preview shows a navigation bar with "IOS" and "MD" tabs, and tabs for "All" and "Favorites". It displays several UI components: a toggle switch labeled "A medium toggle", a disabled switch labeled "This is disabled", and three switches labeled "Danger!", "Success!", and "Aa". Below these are three rounded rectangular buttons in red, cyan, and purple, each labeled "Aa". At the bottom, there are three tabs: "Success" (green), "Warning" (yellow), and "Danger" (pink). A list of items follows: "Star" with a star icon, "Planet" with a planet icon, "Sun" with a sun icon, and "Moon" with a moon icon. The "Danger" tab is currently selected.

DEMO: Styling Ionic Apps

Goal: Round Corners of Avatar in Session Listing



ADDITIONAL RESOURCES

- ✓ Ionic: <https://ionicframework.com>
- ✓ Capacitor: <https://capacitor.ionicframework.com>
- ✓ Cordova: <https://cordova.apache.org>

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*Please use the CodeMash app to
fill out a survey about this talk*