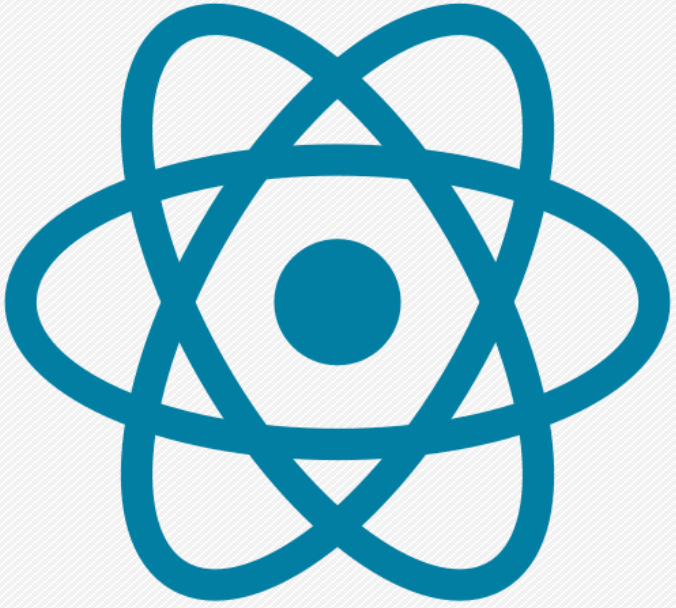
REACT NATIVE

FROM AN ANDROID DEV



Michael Fazio

Speaker notes

- I hope you've had a great week at THAT!

SPECIAL THANKS TO ALL OUR AWESOME CAMP SPONSORS!

Unspecified

HEARTLAND BUSINESS SYSTEMS

CLOUDFLARE

DATASTAX

Temporal PROPELAUTH PIECES FOR DEVELOPERS redgate MESCIUS FORMERLY GRAPECITY, INC. AWS Amplify

Speaker notes

- Thank you to all the sponsors for making THAT possible
- Food's expensive here. Like, *really* expensive.

Speaker notes

- It's me!
- Hi, I'm Michael.

Kotlin

Speaker notes

- I'm a fan of Kotlin
- It's from JetBrains

Speaker notes

- I'm also a fan of Android

The Pragmatic Programmers

Kotlin and Android Development

featuring Jetpack

Build Better, Safer Android Apps

Speaker notes

- I wrote a book
- "Kotlin and Android Development featuring Jetpack"
- Pragmatic Bookshelf, from the guys that brought you "The Pragmatic Programmer"

Speaker notes

- We're talking about React Native today
- I've been working with it lately

ReactNative

Xamarin

Android

Speaker notes

- Cross-platform tools are getting more and more popular
  - Flutter, React Native, Maui (Xamarin)
- It makes sense
  - Two platforms, one code base and language (in theory)
- Write once, deploy everywhere
- Again, I'm doing React Native now, and I've done Xamarin in the past

Speaker notes

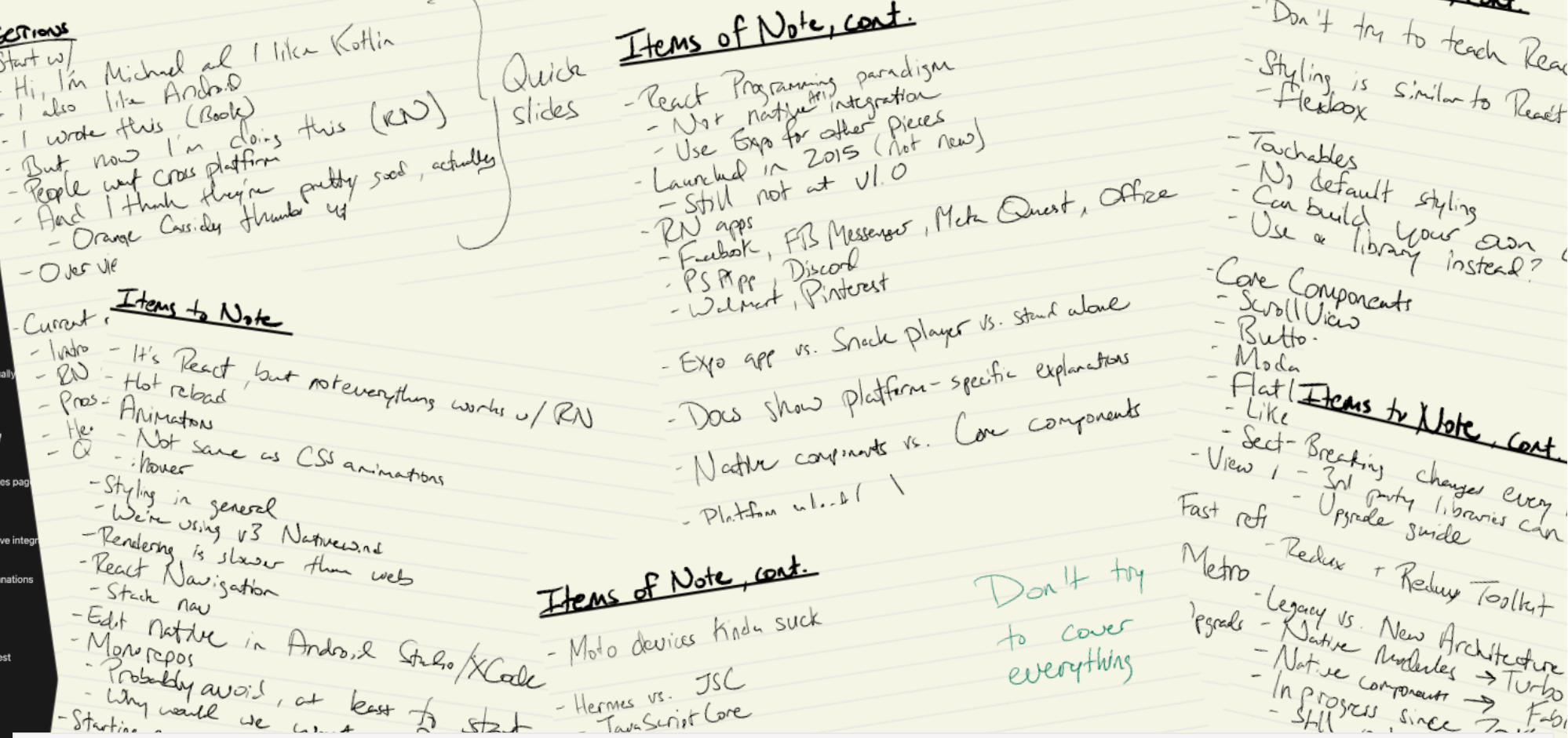
- Old tools were "Write once, suck everywhere"
- They weren't very good
  - Cordova, PhoneGap, etc

Speaker notes

- They're pretty good now!
- Specifically React Native, Flutter, Xamarin/Maui

Speaker notes

- We're talking about React Native today
- I've been working with it lately



Speaker notes

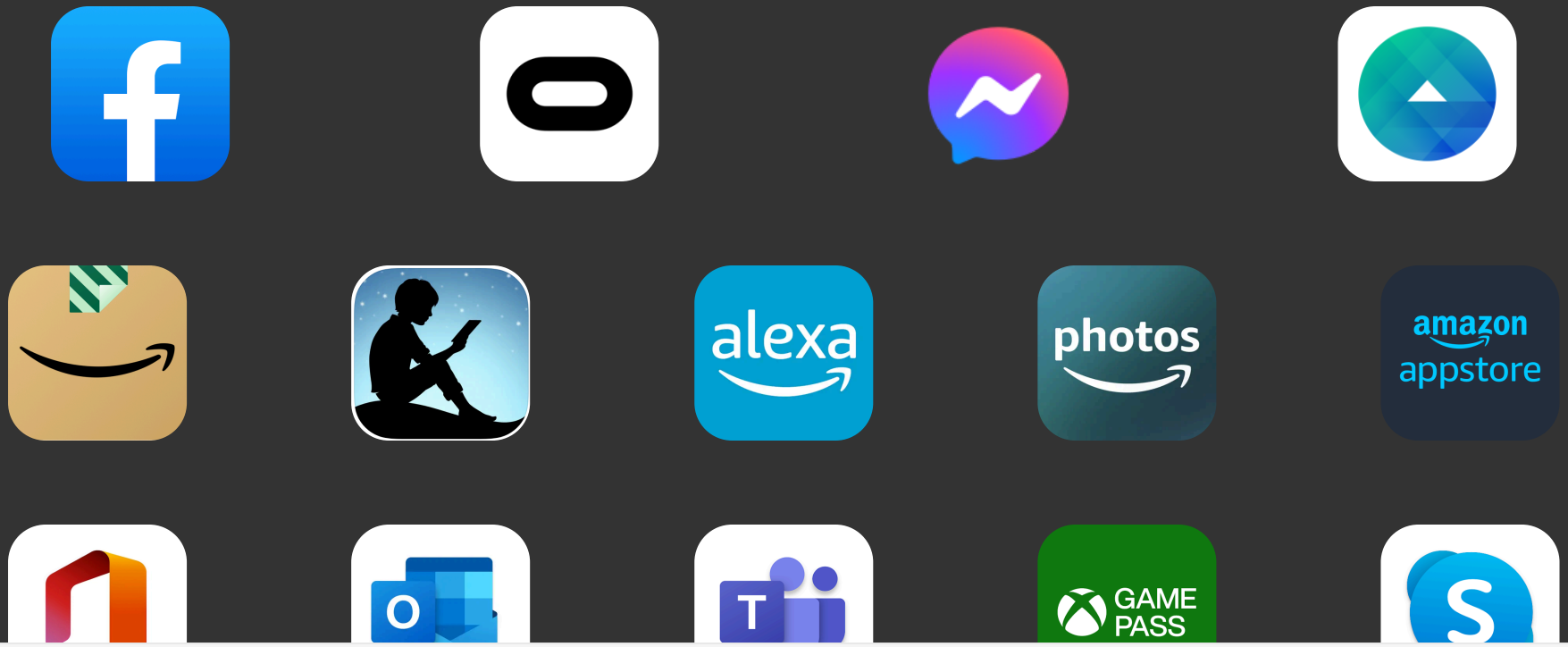
- There's a lot to cover
- Point out the "Don't try to cover everything" note
- I'll try to avoid jamming too much in here
- Note that these are my personal thoughts and not reflective of anyone/anything else
  - That includes my employer
- We can dig into things after the talk if you want

Speaker notes

- From Meta
- One of the few good things (I also include Oculus in here)
  - Yes, they bought Oculus, so that only kind of counts

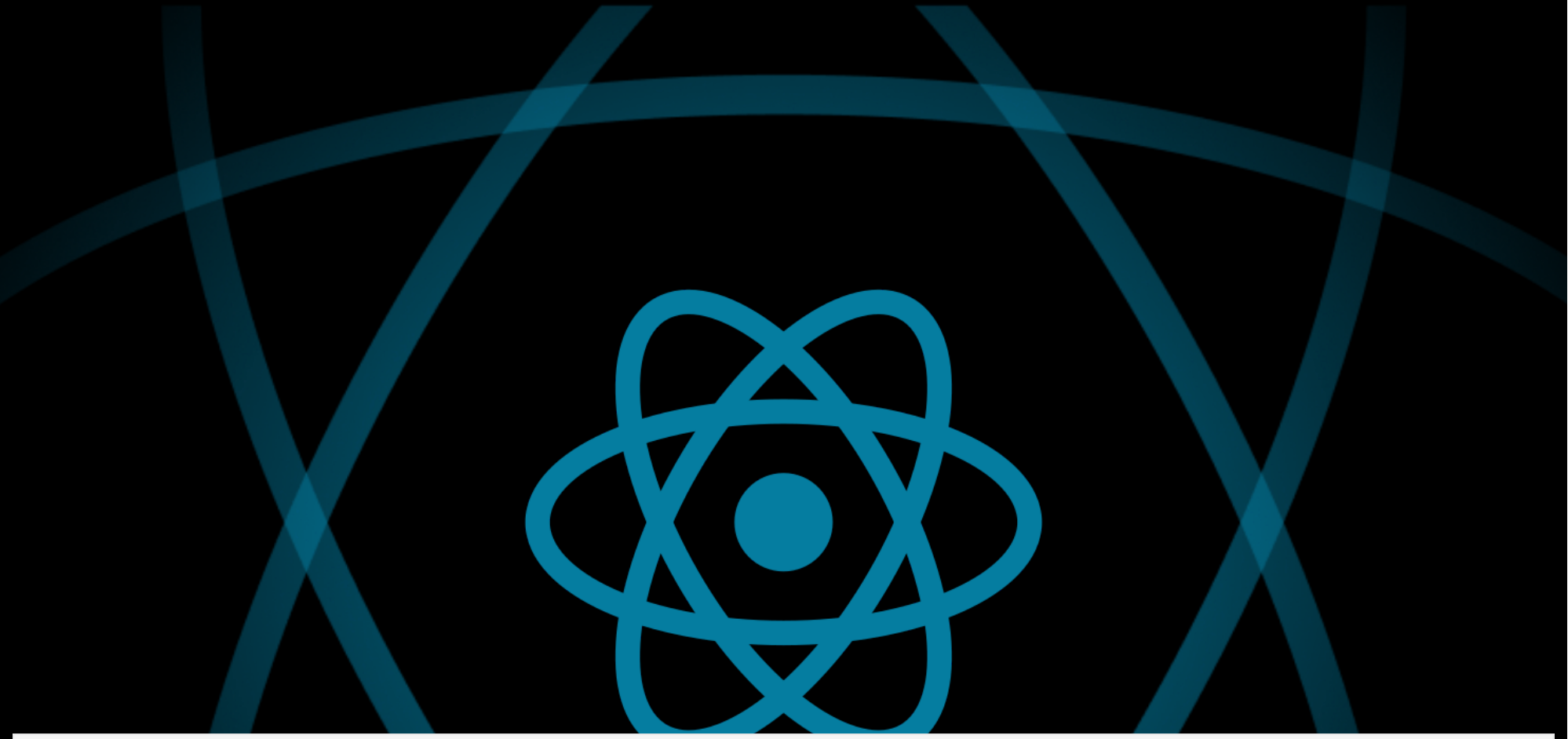
Speaker notes

- Not new, started in 2015
  - A simpler time



Speaker notes

- Tons of apps are RN
  - Meta apps
    - Facebook/FB Messenger/Meta Quest
  - Amazon Shopping/Alexa/Kindle
  - Microsoft Office
    - Sorry, Teams as well. Don't hold it against RN.
  - PS App/Discord
  - Walmart/Pinterest
  - Tesla



Speaker notes

- React programming paradigm
- Mainly for UI
  - Need something else for most native integrations
- I'm not going to teach React at all here
  - Many people to do that better than I

Speaker notes

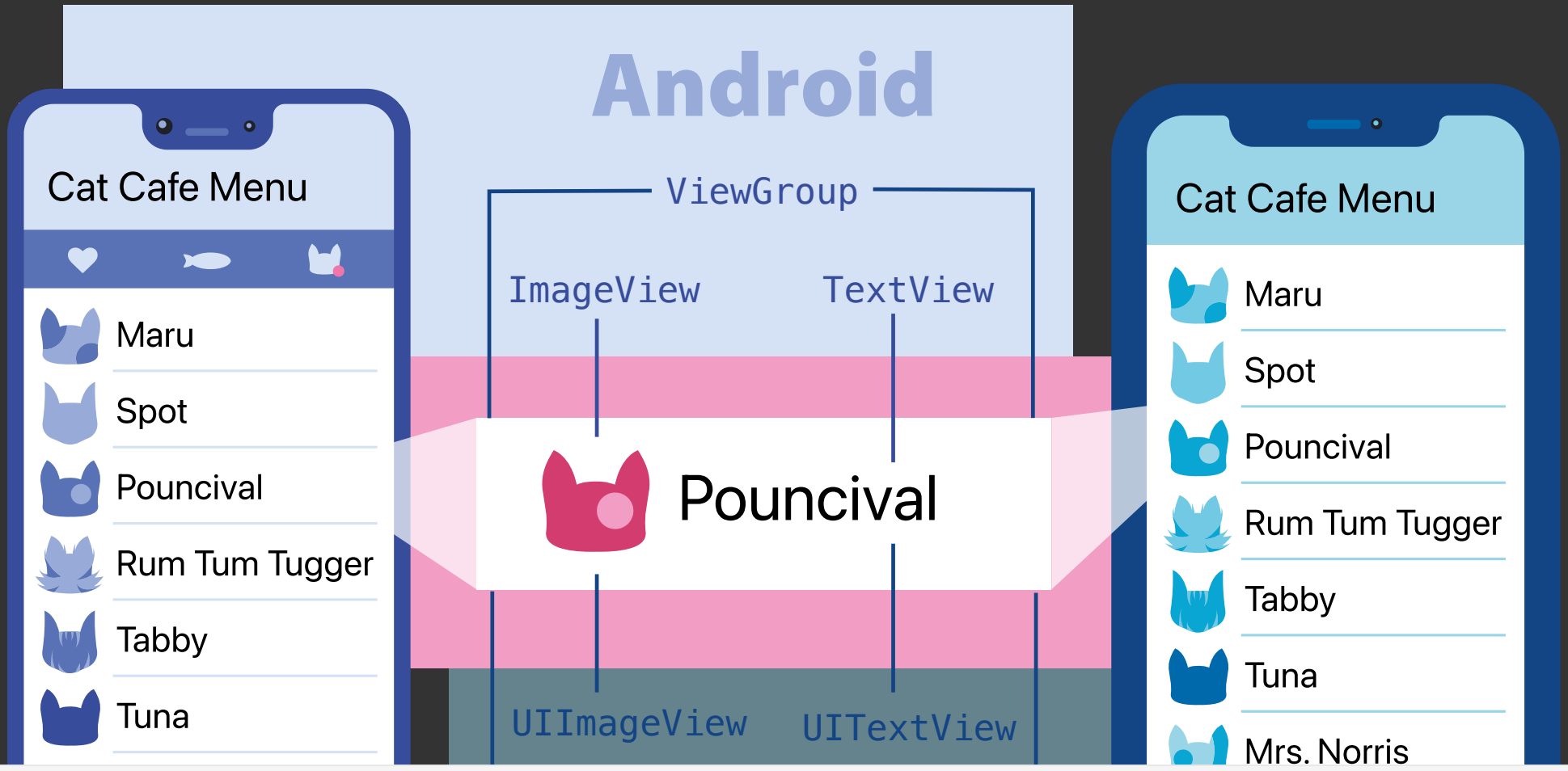
- It's React so you can use stuff like Redux and Redux Toolkit easily

Speaker notes

- You use JavaScript to write your code

Speaker notes

- Or even better, you can use TypeScript
- Enabled by default in new projects
- First time I didn't feel like I was fighting against TS
- JS or TS, you'll use your normal editor for dev
  - VS Code, WebStorm, etc.



Speaker notes

- React Native components that are using the native (Android/iOS) views
- An image plus text becomes:
  - Android: `ImageView` and `TextView` inside a `ViewGroup`
  - iOS: `UIImageView` and `UITextView` inside a `UIView`

REACT NATIVE → ANDROID → IOS

- `<View>` → `<ViewGroup>` → `<UIView>`
- `<Text>` → `<TextView>` → `<UITextView>`
- `<Image>` → `<ImageView>` → `<UIImageView>`
- `<ScrollView>` → `<ScrollView>` → `<UIScrollView>`
- `<TextInput>` → `<EditText>` → `<UITextField>`

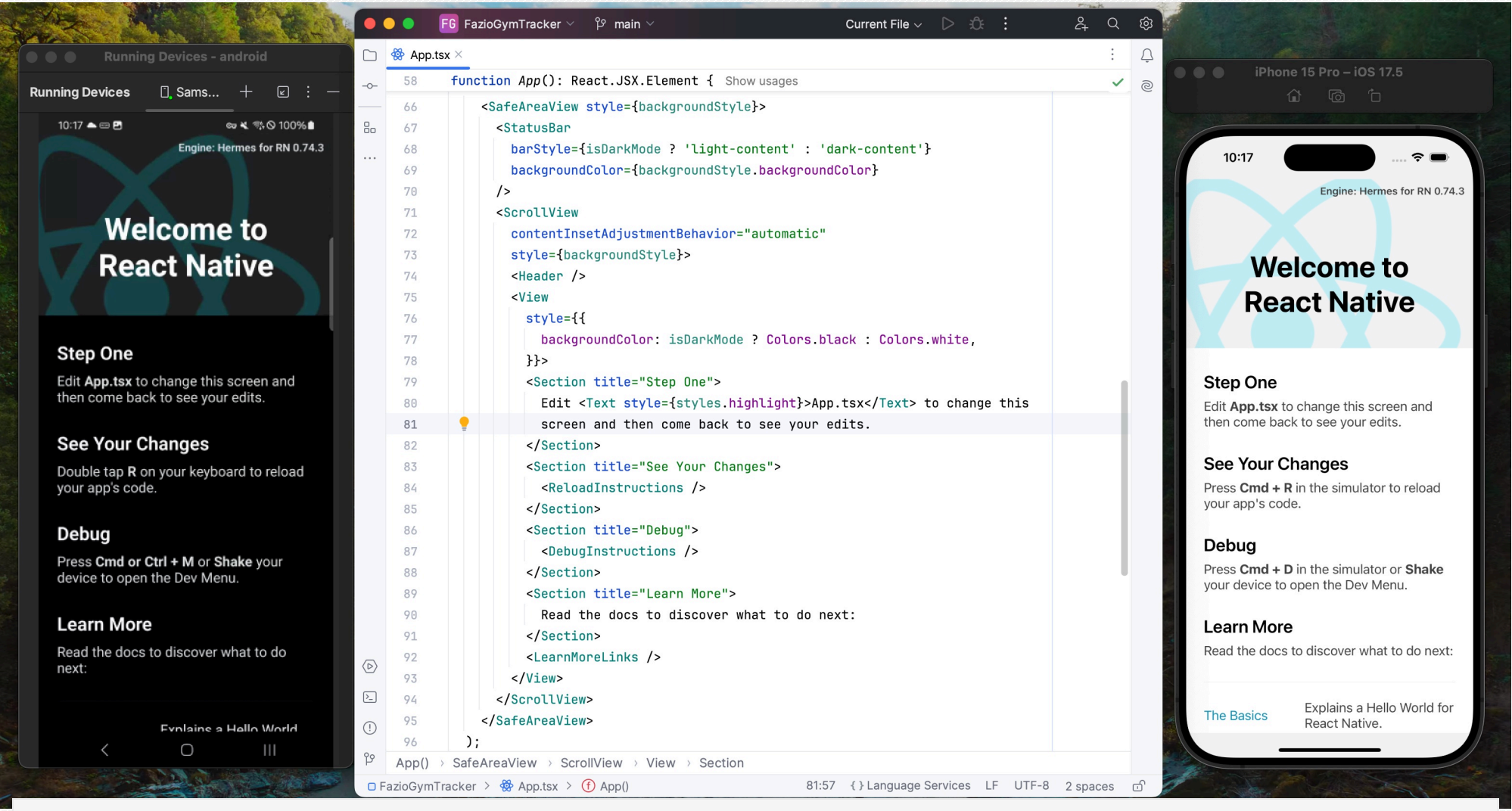
Speaker notes

- View, Text, Image, ScrollView, TextInput
  - All have Android/iOS views under the hood
- FlatList/SectionList
  - Like RecyclerView
  - SectionList makes groupings easier
- Button
  - Not much here
  - “A basic button component that should render nicely on any platform. Supports a minimal level of customization.”

```
function Section(
    {children, title}: SectionProps
): React.JSX.Element {
    const isDarkMode = useColorScheme() === 'dark';
    const titleColor =
        isDarkMode ? Colors.white : Colors.black;
    return (
        <View style={styles.sectionContainer}>
            <Text
                style={[
                    styles.sectionTitle,
                    { color: titleColor },
                ]}>
                {title}
            </Text>
        </View>
    );
}
```

Speaker notes

- One block of code, both platforms
- It's standard React in most ways
- Create reusable components to have in your app



Speaker notes

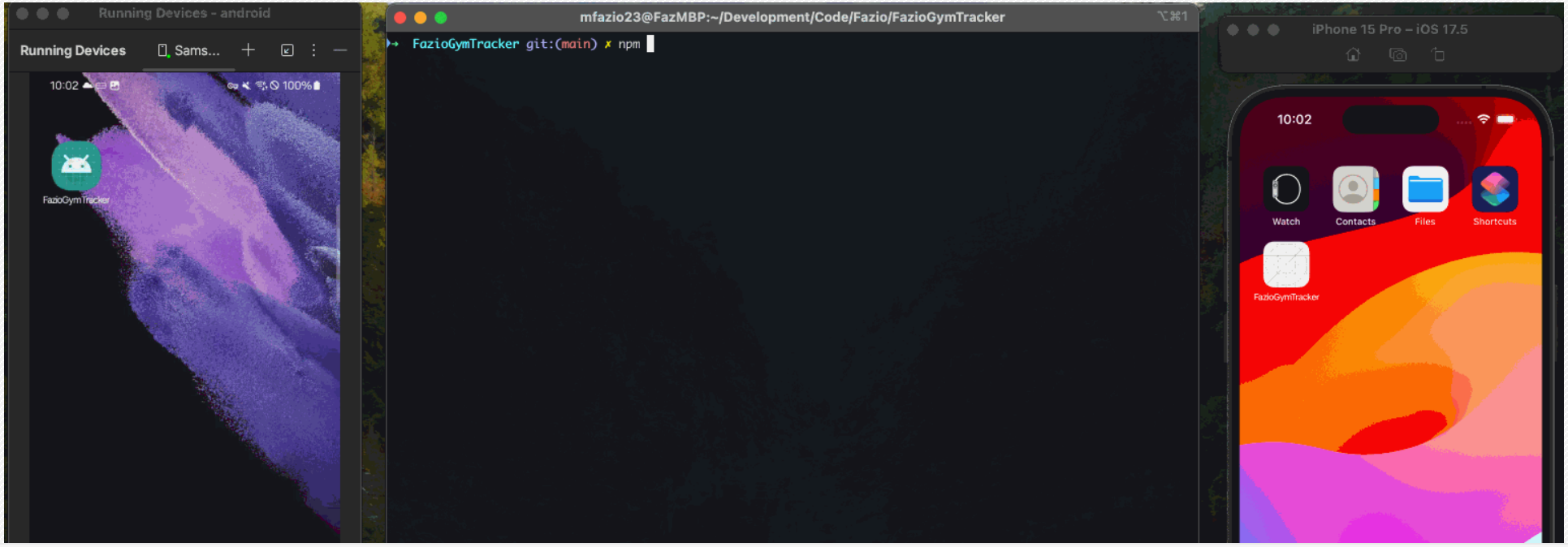
- One block of code, both platforms

METRO

Speaker notes

- Metro
- Think of it as webpack for React Native
- You can start the app from Metro

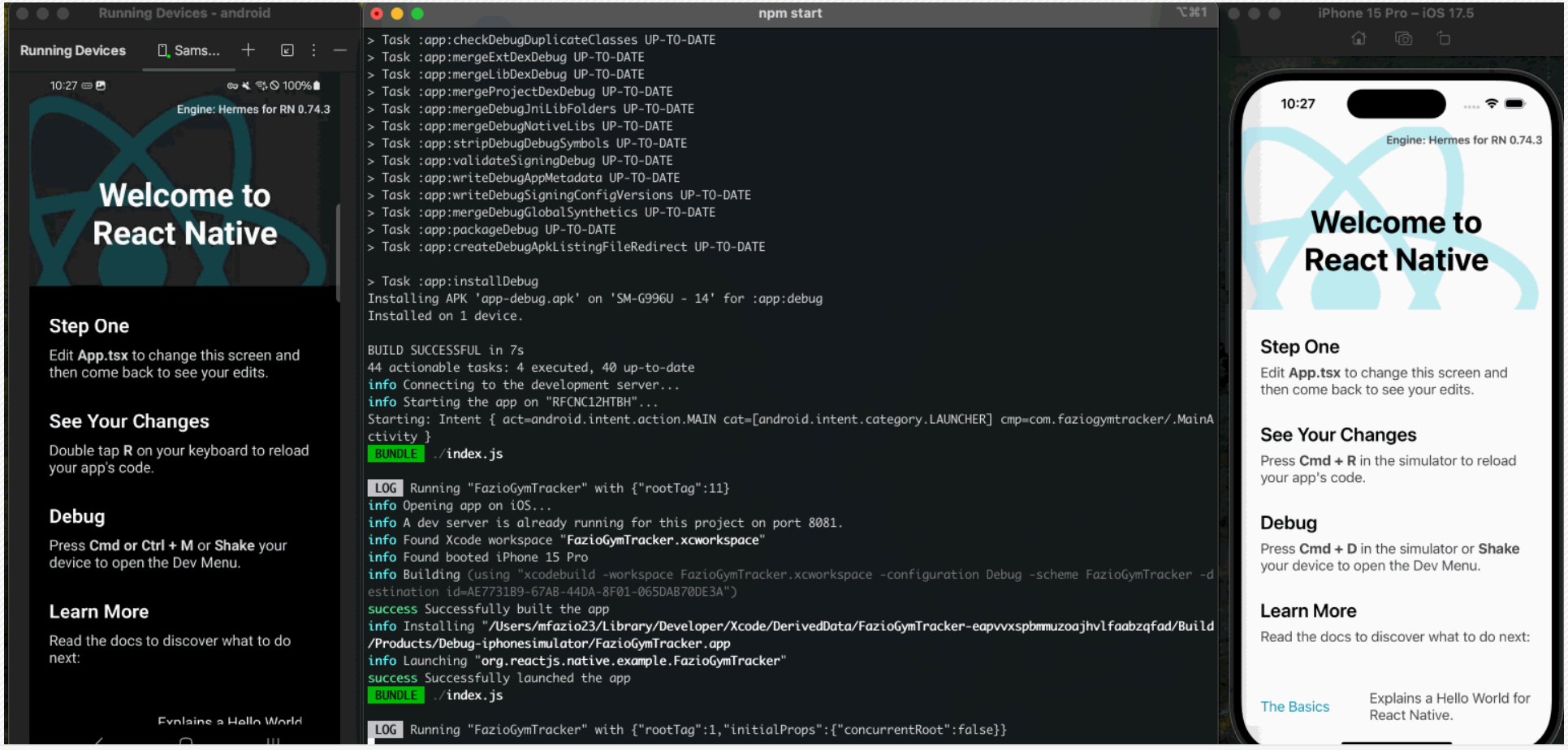
METRO



Speaker notes

- Run `npm start` to fire up Metro
- Hit "a" in the window to start the Android app
  - Builds the app
  - Deploys to the device
  - Bundles the JS code
- Hit "i" in the window to start the iOS app
- Note that logs are shown in the Metro window

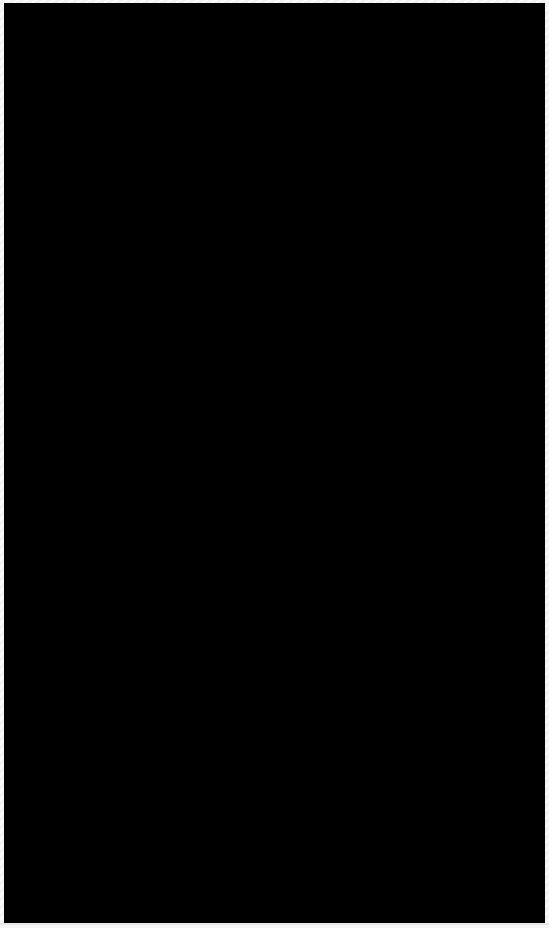
DEV MENU



Speaker notes

- Dev menu
- Hit "D" in the terminal
- Shake the device

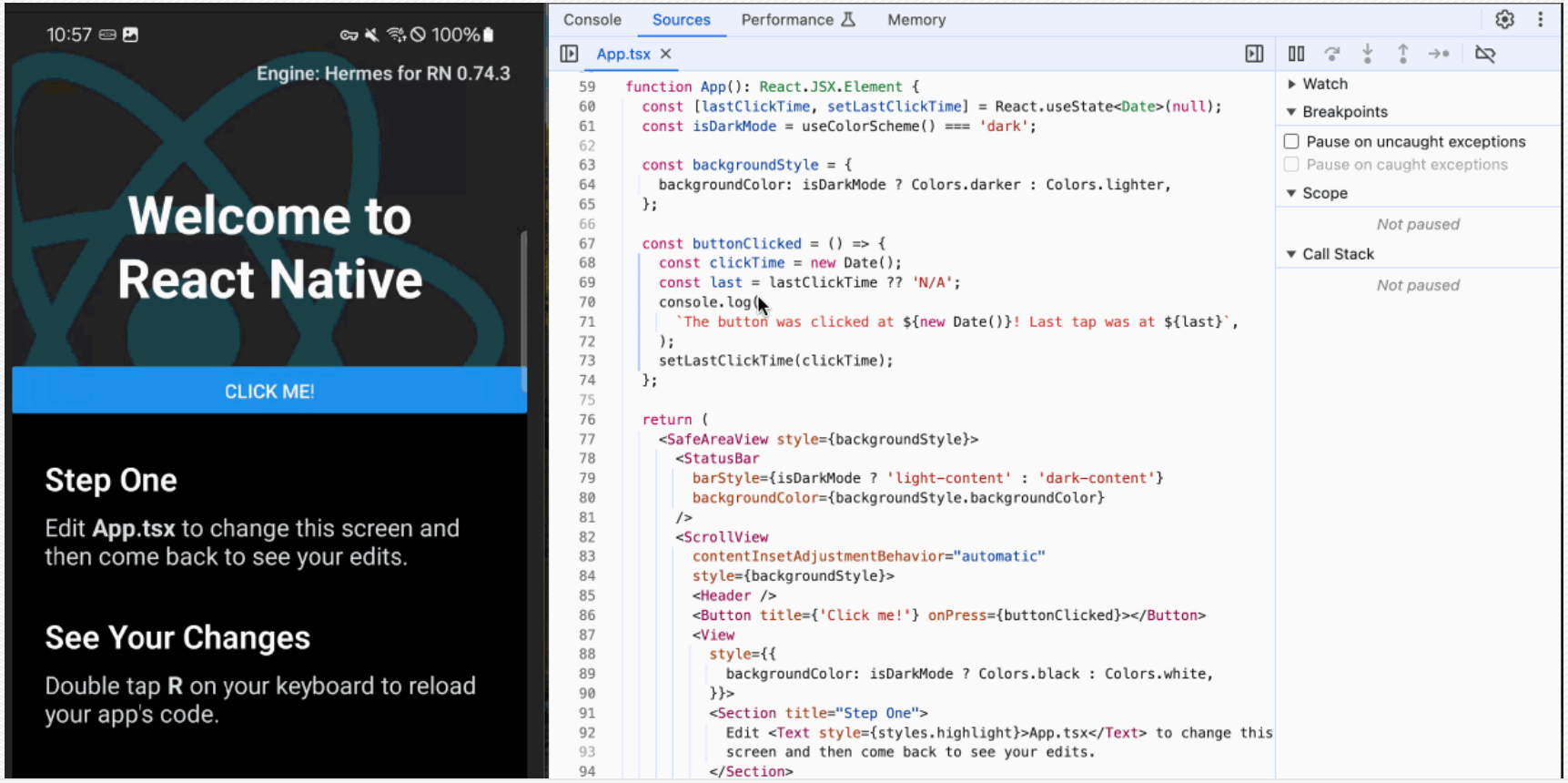
ELEMENT INSPECTOR



Speaker notes

- Dev menu
- Hit "D" in the terminal
- Shake the device

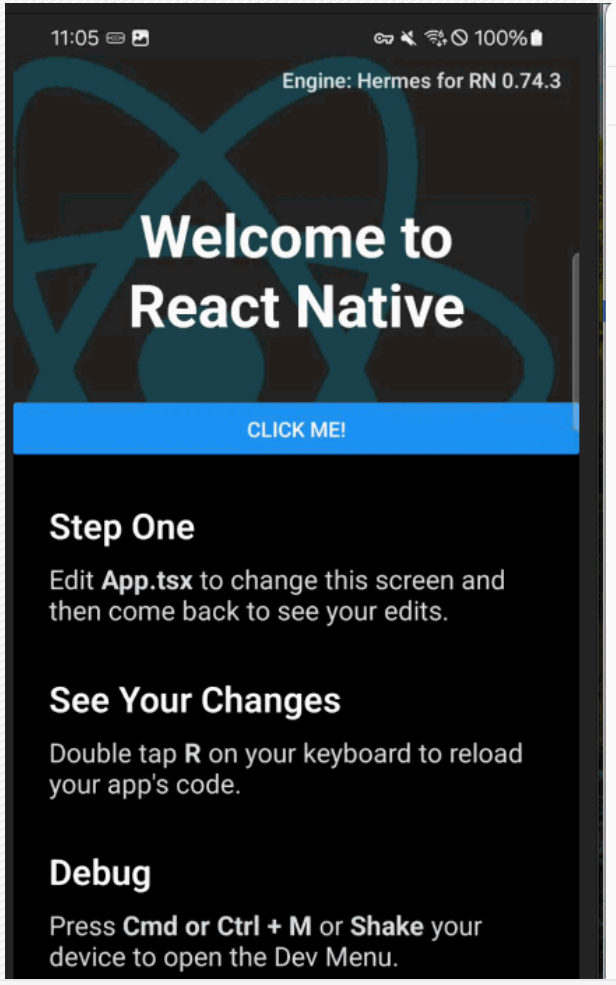
CHROME DEBUGGER

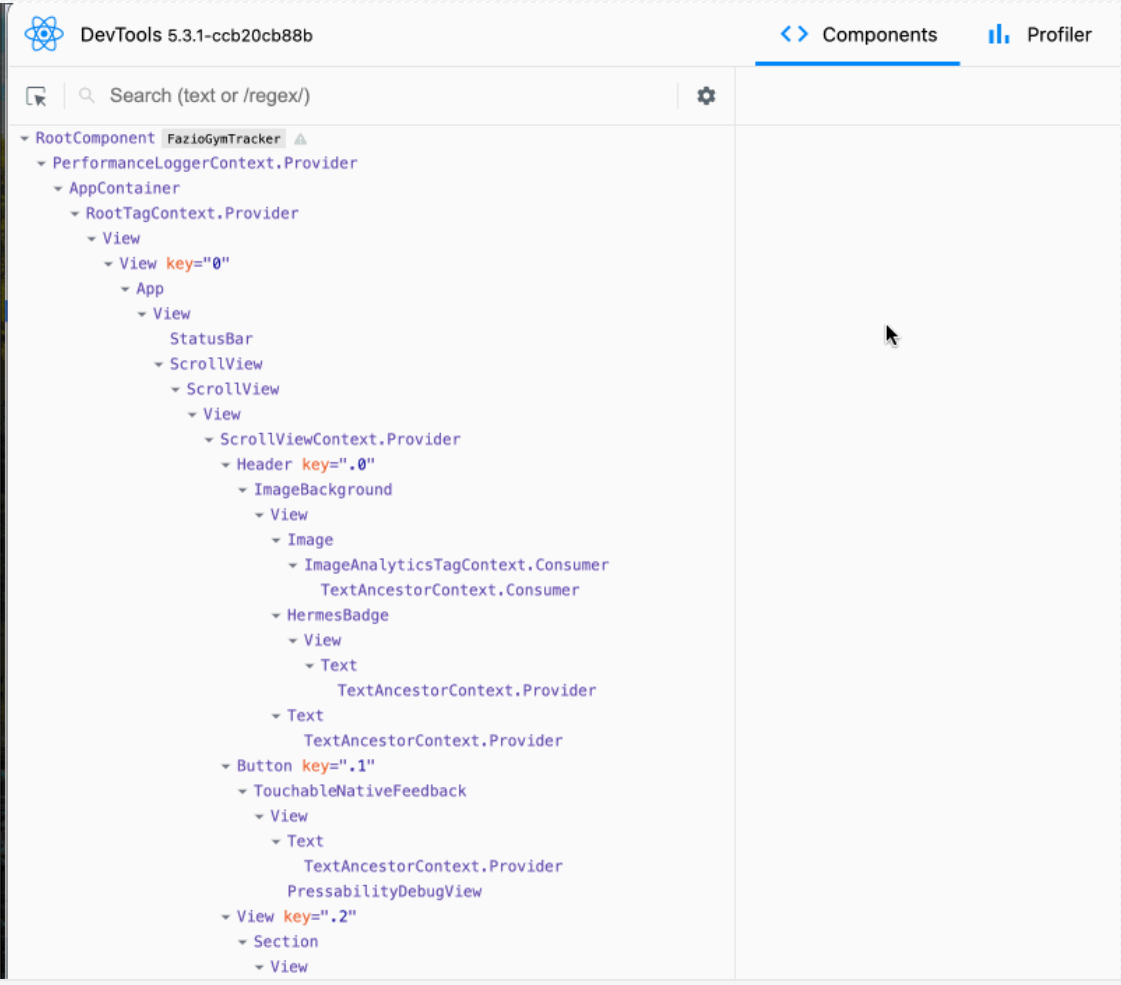


Speaker notes

- `chrome://inspect`
- Open the "Hermes React Native" link in there to bring up the Chrome dev tools
- Able to see the code, set breakpoints, view console logs
- React DevTools

REACT DEVTOOLS





Speaker notes

- React DevTools
  - Gives you React-specific inspection info

Speaker notes

- If you need to integrate at a lower level than what RN offers:
  - There's likely a library for whatever you need
  - But if not, you can create a native module
- Note that all native modules are initialized at app start, so be careful how many you have
- Do not have Coroutine support out of the box

NATIVE MODULES

```
class TimberModule(
  reactContext: ReactApplicationContext
) : ReactContextBaseJavaModule(reactContext) {

  override fun getName() = "TimberModule"

  @ReactMethod
  fun log(level: String, message: String, tag: String = "") {
    val logLevel = getLogLevelFromString(level)

    Timber.tag(tag).log(logLevel, message)
  }

  private fun getLogLevelFromString(level: String): Int {...}
}
```

Speaker notes

- You can do `console.log(...)` on the RN side, but if you want to integrate directly with Timber, here's how it could work
- Console logs from RN *will* show up in Logcat

NATIVE MODULES

```
class PrefsModule(reactContext: ReactApplicationContext) :
    ReactContextBaseJavaModule(reactContext) {
  private val sharedPrefs = ...// Get prefs from reactContext

  @ReactMethod
  fun setValue(id: String, value: String) {
    with(sharedPrefs.edit()) {
      putString(id, value)
      apply()
    }
  }
```

Speaker notes

- If you wanted to directly reach `SharedPreferences`, you could do something like this.
- Again, probably something that's already solved for you, but this is an example.
- All native module functions will be async
  - There's a flag to make them synchronous, don't use it
  - Either call something that can be run synchronously, or use a `Promise`
- `promise.resolve` comes back as a Promises that can be `awaited` in the JS side.
- I excluded the `getName()` function for space

NATIVE MODULES

```
import {NativeModules} from 'react-native';

const {TimberModule} = NativeModules;

export enum LogLevel {
    DEBUG = 'Debug',
    VERBOSE = 'Verbose',
    INFO = 'Info',
    ERROR = 'Error',
    WARN = 'Warn',
}

interface TimberInterface {
    log(level: LogLevel, message: string, tag?: string): void;
}

export default TimberModule as TimberInterface;
```

Speaker notes

- Reference the native modules by name in the JS/TS code
- Recommend creating a wrapper to make other calls cleaner
- No type safety between Native and JS layers (if you're using Typescript)

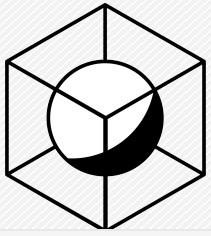
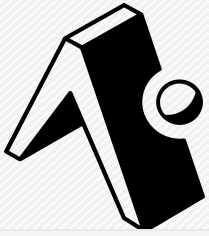
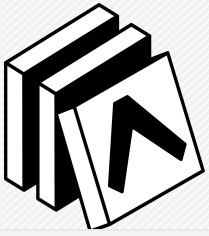
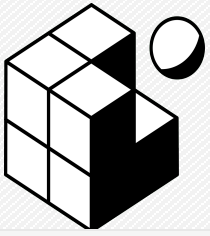
NATIVE MODULES

```
import {NativeModules} from 'react-native';

const {PrefsModule} = NativeModules;

interface PrefsInterface {
    getValue(id: string): Promise<string>;
    setValue(id: string, value: string): void;
}

export default PrefsModule as PrefsInterface;
```

```
import {PrefsModule} from './modules/PrefsModule';

const currentValue = await PrefsModule.getValue('valueId');

PrefsModule.setValue('valueId', 'newValue');
```

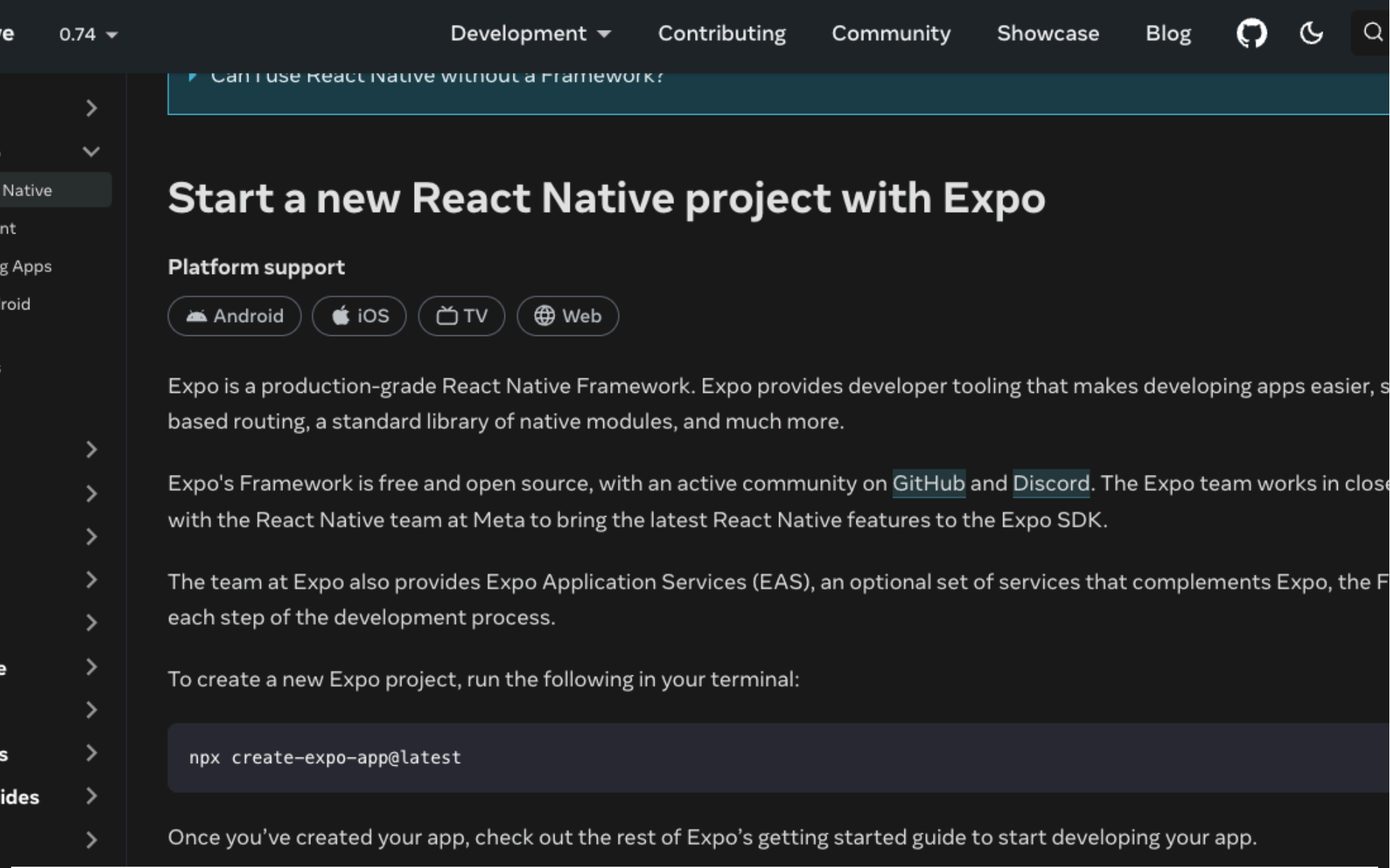
Speaker notes

Expo

Speaker notes

- Framework on top of React Native
  - `expo-cli` - Command line tool to create and manage projects
  - `expo-snack` - Online editor to test out code
- Has a ton of libraries you can quickly use for your app
  - `expo-camera`, `expo-location`, `expo-notifications`, etc.
- Can use Expo libraries in a vanilla React Native app if you want

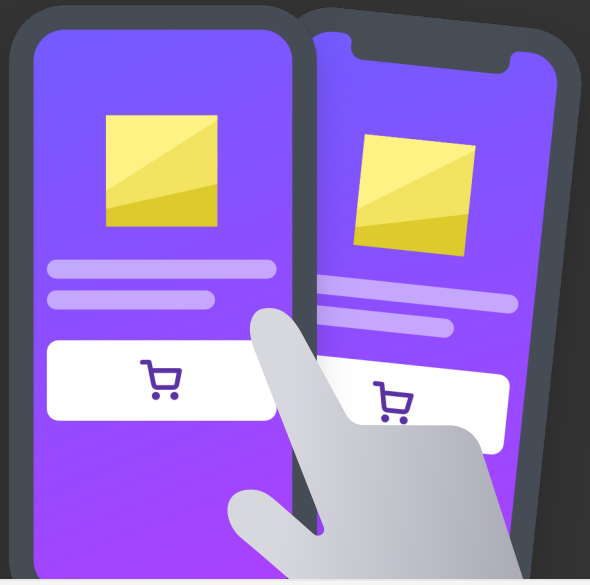


Speaker notes

- The RN site in their intro says to use a framework and call out Expo

EXPO GO

```
$ npm start

Developer tools running on
http://localhost:19002
Starting bundler

› Press a | open Android emulator
› Press i | open iOS simulator
› Press w | open web
```



Speaker notes

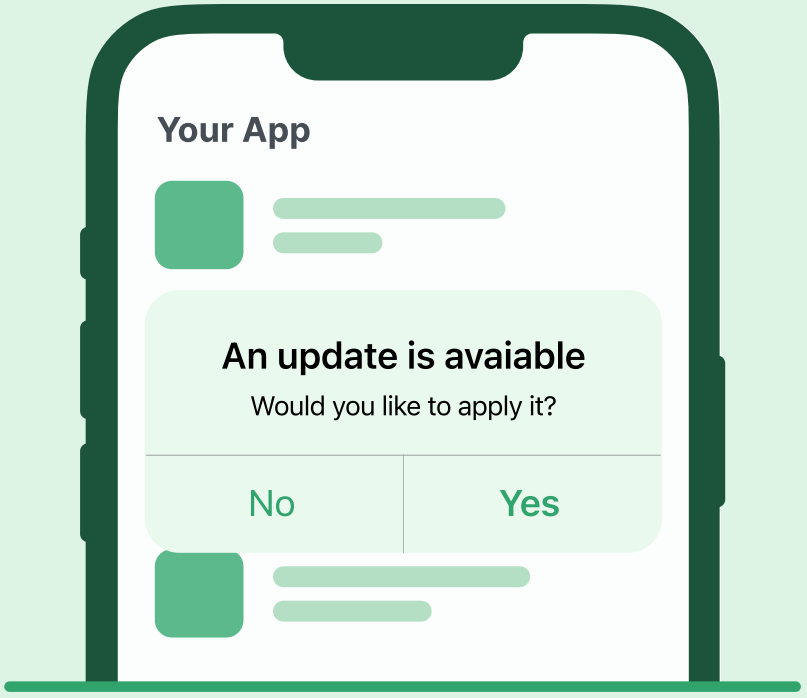
- Quick way to test things out
- Don't use it long term
- No custom native modules
- Mentioned because Expo apps usually start here
- Easier to get up and running with iOS than deploying an app normally

EXPO APPLICATION SERVICES

Speaker notes

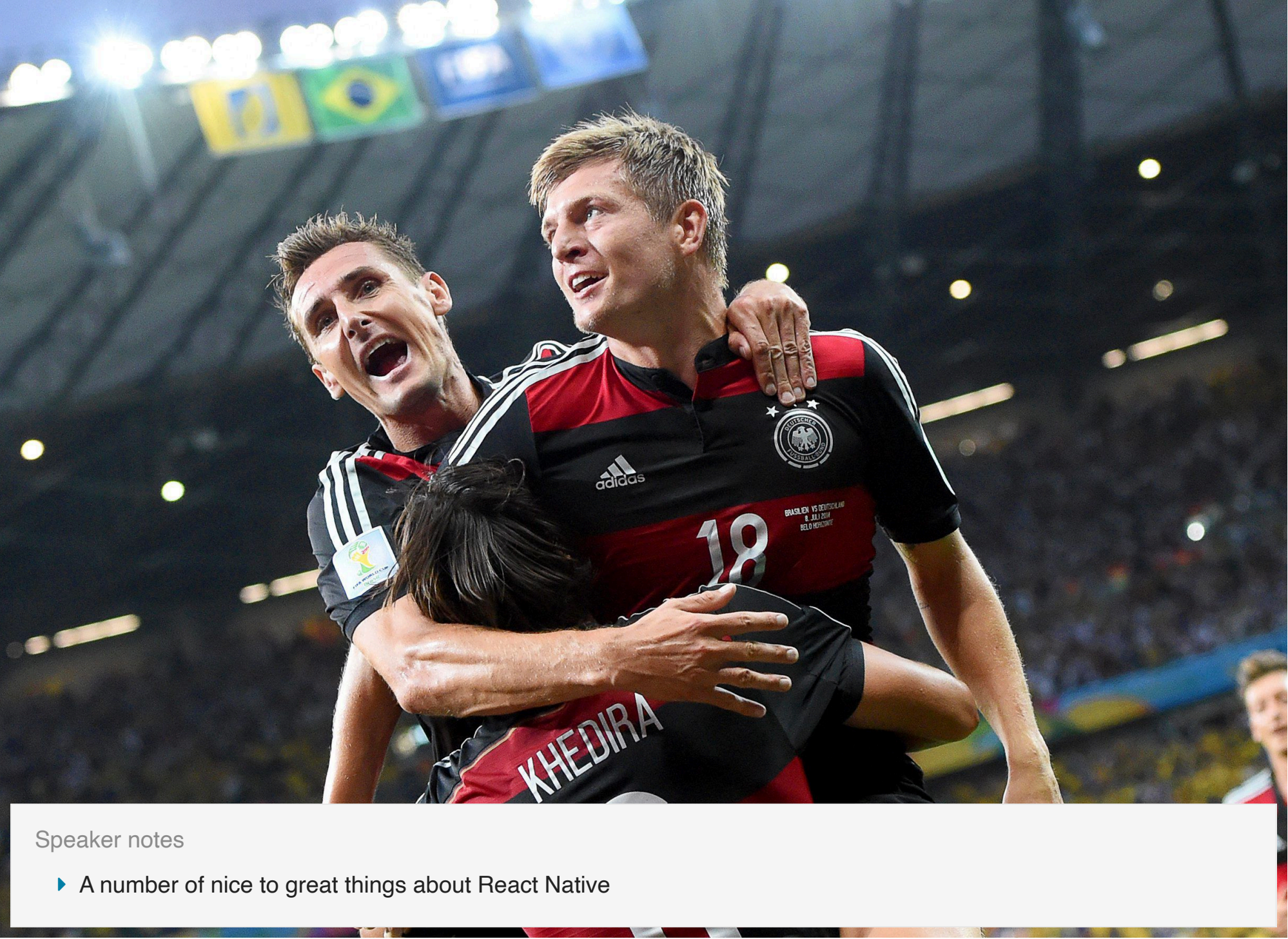
- Expo Application Services (EAS)
- Haven't used EAS yet, but it's on my radar
- Cloud builds
  - Native should work as well
- Quick Play Store submissions

EAS UPDATE



Speaker notes

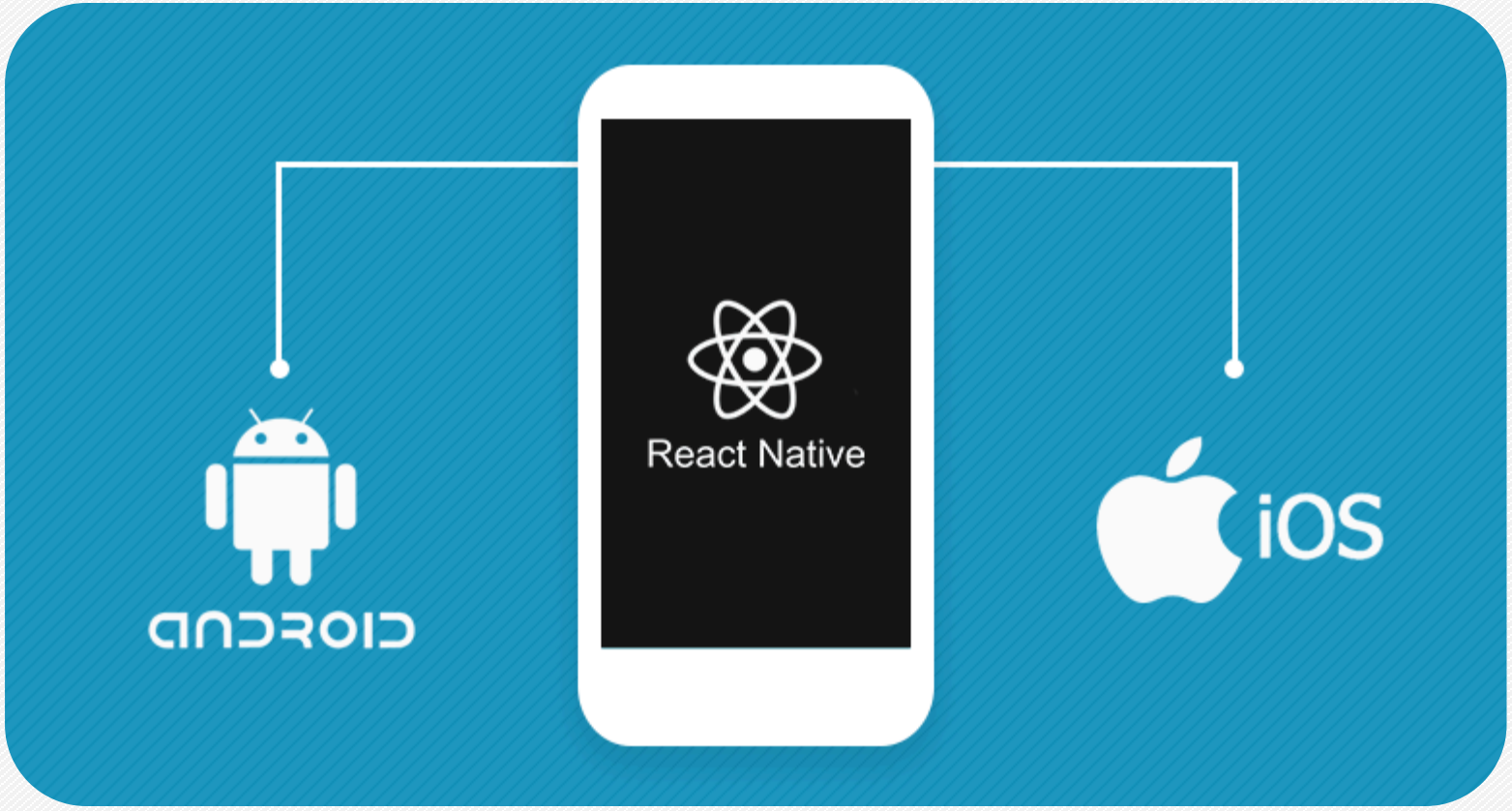
- EAS Update
  - Push out updates without a Play Store release
  - Able to hotfix without needing people to manually update
  - Works with Expo and pure RN apps
  - Only can do smaller fixes



Speaker notes

- A number of nice to great things about React Native

CROSS-PLATFORM



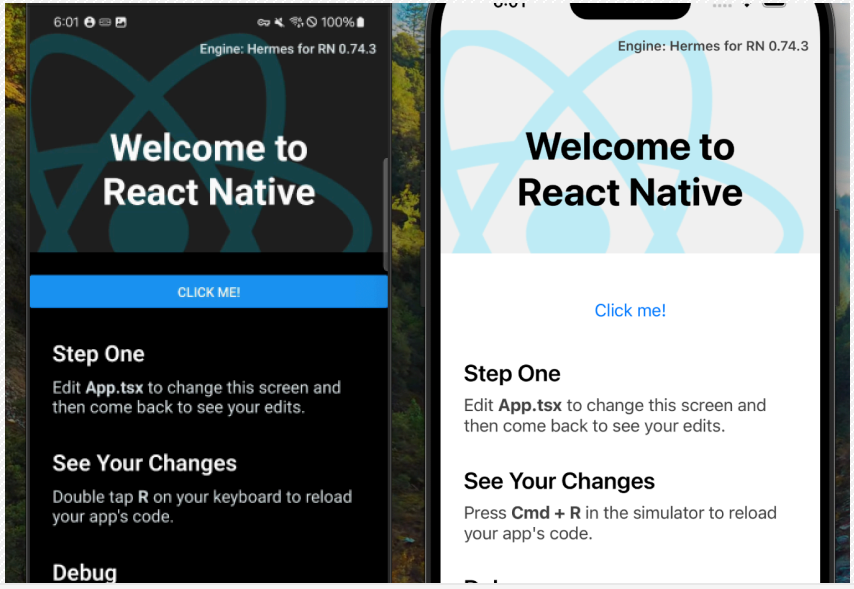
Speaker notes

- It *does* work pretty well with sharing code between platforms
  - Not always, but overall it's good, especially if you use libraries

CROSS-PLATFORM

```
const topMargin = (Platform.OS === 'android') ? 24 : 40;
```

```
const topMargin = Platform.select({
  ios: 40,
  android: 24,
});
```

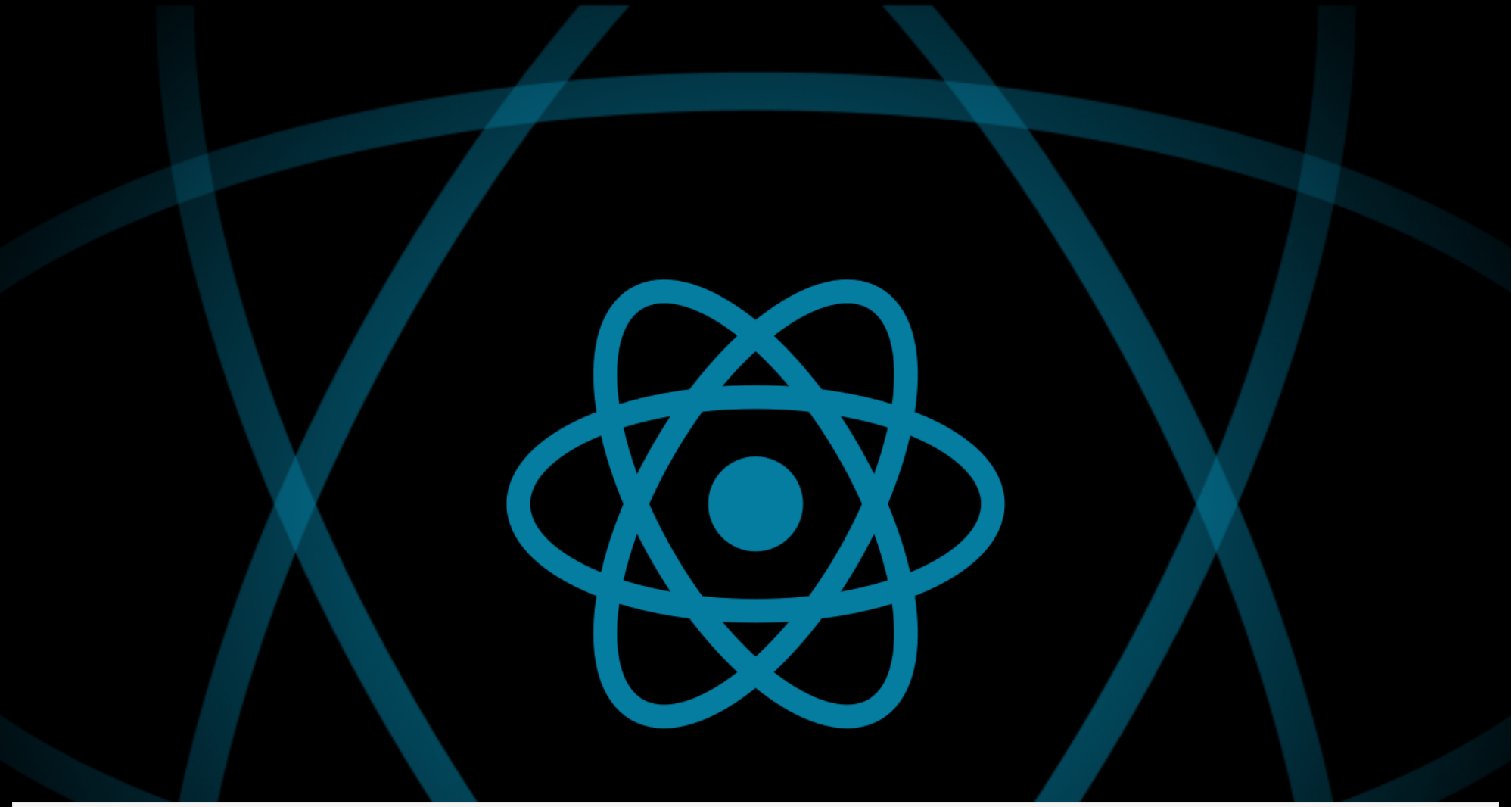


Speaker notes

- It *does* work pretty well with sharing code between platforms
  - Not always, but overall it's good, especially if you use libraries

Speaker notes

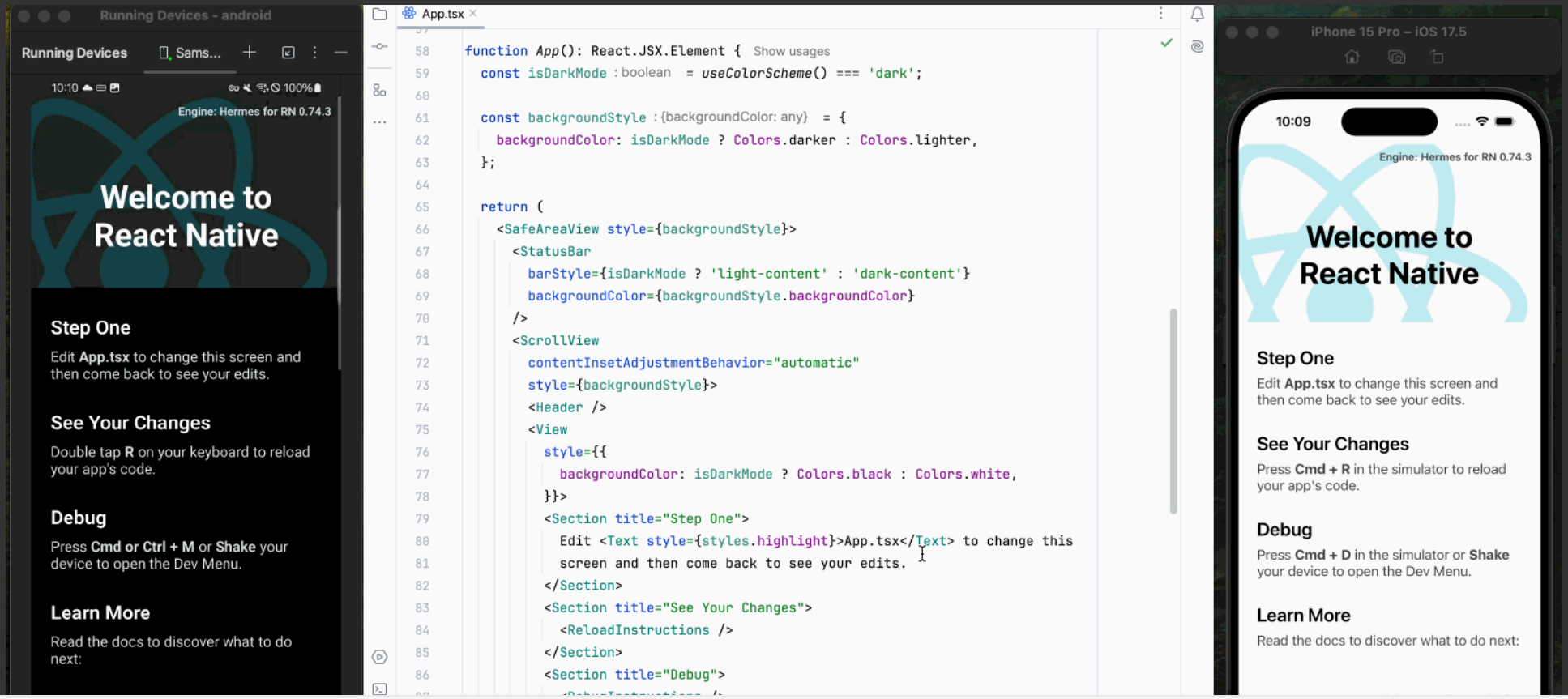
- You use JavaScript to write your code
- It's well known
- Nothing weird like Dart or Objective-C
- TypeScript is extra handy
- Tons of docs, libraries, tooling is established
- Only need one language for most of your code



Speaker notes

- React's really nice to use
- Well known
- Tons of resources

FAST REFRESH



Speaker notes

- Quick feedback on changes in your app
  - Change a view, see it on your device pretty much right away
- Edits to a component used by multiple other components will cause the other components to be refreshed as well
- Worst-case scenario, the whole app refreshes for you

Speaker notes

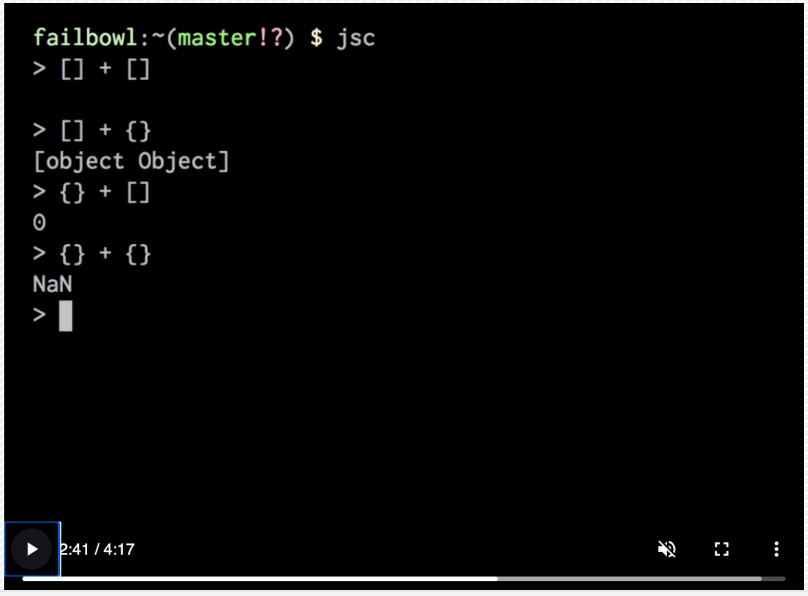
- There are also some things that aren't so great
- 2014 World Cup in Brazil
- Germany/Brazil ended 7-1
- Semifinal match

Speaker notes

- You use JavaScript to write your code
- You're in the node space
  - Massive `node_modules` directory

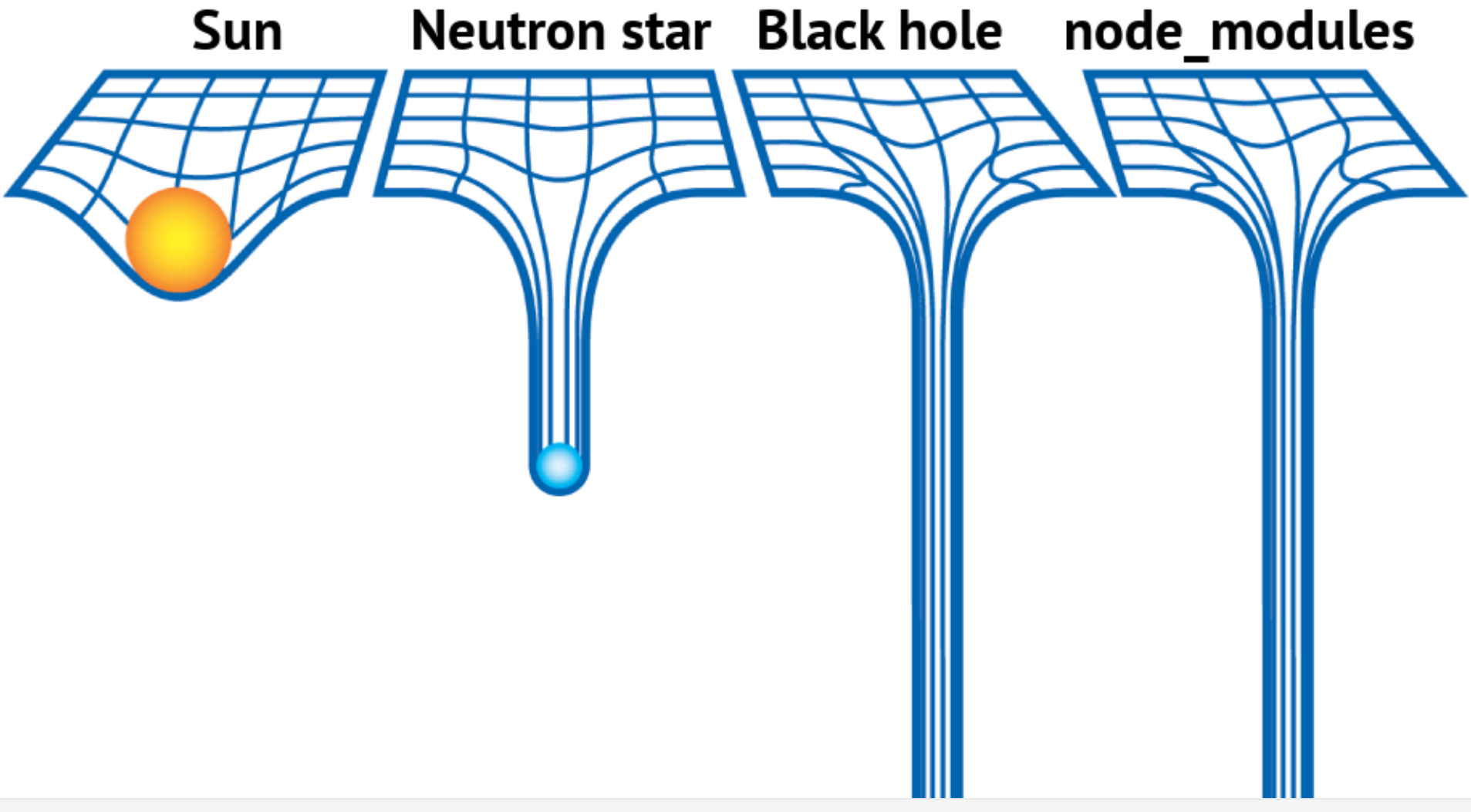
JAVASCRIPT ...WAT

```
[] + [] // ""

[] + {} // "[object Object]"

{} - [] // 0
```



Speaker notes

- https://www.destroyallsoftware.com/talks/wat
- A lightning talk by Gary Bernhardt from CodeMash 2012



Speaker notes

- You're in the node space
  - Massive `node_modules` directory

0.74.3 Latest

Compare

Titozzz released this 3 weeks ago · 1833 commits to main since this release <> v0.74.3 8e5a936

Added

- Add the ReactMarkerConstants.CONTENT_APPEARED support on Android in bridgeless mode. (3c4d7618f0 by @Kudo)

Changed

- Feat: update CLI to 13.6.9 (d1e2a35061 by @szymonrybczak)

iOS specific

- Support `customizeRootView` from `RCTRootViewFactory` (3c4d761 by @Kudo)

Fixed

- Codegen computes output path relative to project root instead of current working directory. (d3e0430dea by @dmytrorykun)

Android specific

Speaker notes

- It's currently version 0.74.x
  - It’s not even 1.0 yet!
  - Breaking changes every new major release
  - They *do* have an upgrade guide
  - 3rd party libraries don’t always cooperate

React Native Upgrade Helper

Star 3,528

What's your app name?

FazioGymTracker

What's your app package?

dev.mfazio.gymtracker

What's your current react-native version?

0.72.1

To which version would you like to upgrade?

0.74.3

Show me how to upgrade!

Useful content for upgrading

Release 0.73

React Native 0.73 includes an updated process for the iOS privacy manifest, now required by Apple

1. Learn how to update your app's Apple privacy settings
2. React Native 0.73 changelog

Release 0.74

React Native 0.74 includes Yoga 3.0, Bridgeless by default under the New Architecture, batched onLayout updates, Yarn 3, removal of previously deprecated PropTypes, and some breaking changes, including updates to PushNotificationIOS. The Android Minimum SDK is now 23 (Android 6.0).

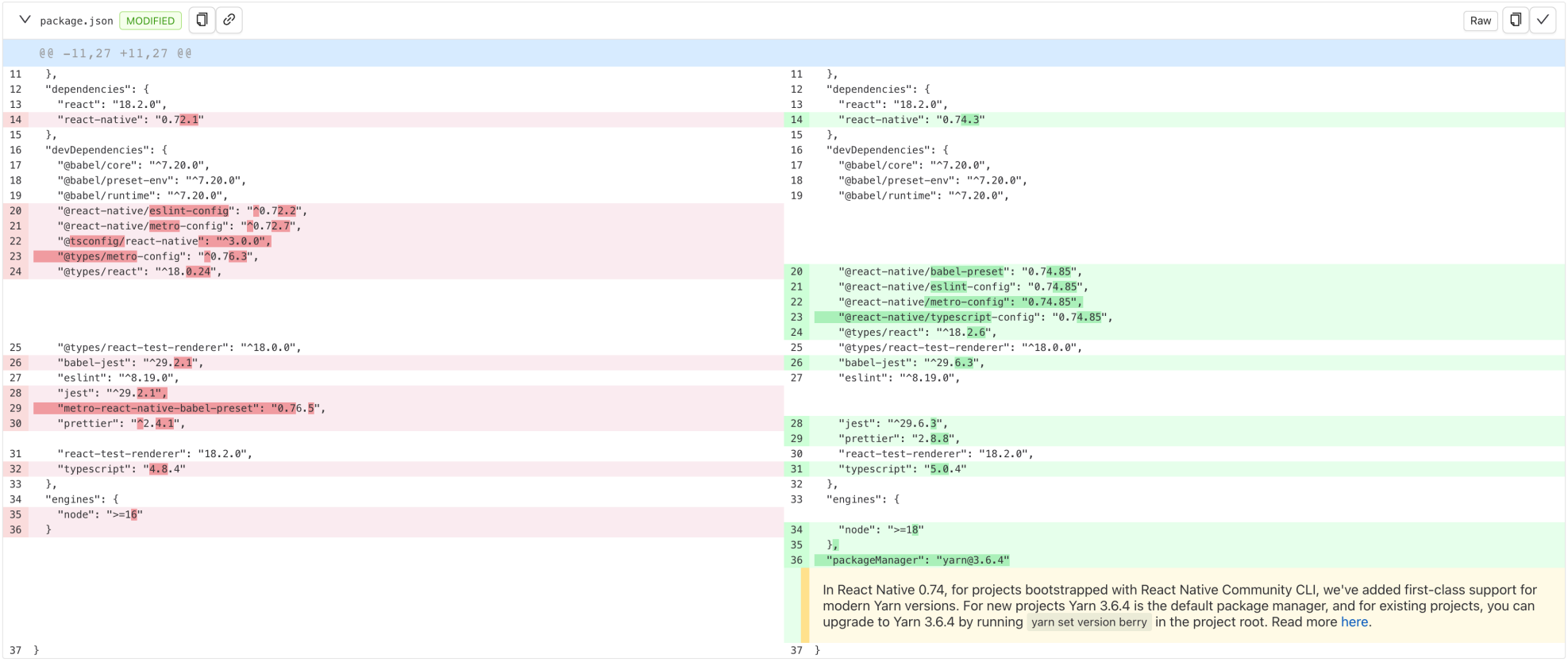
1. Official blog post about the major changes on React Native 0.74
2. React Native 0.74 changelog

You can use the following command to kick off the upgrade: `npx @rnx-kit/align-deps --requirements react-native@[major.minor]`.
`align-deps` is an OSS tool from Microsoft that automates dependency management. It knows which packages* versions are compatible with your specific version of RN, and it uses that knowledge to align dependencies, keeping your app healthy and up-to-date**. Find out more here.
* Not all packages are supported out-of-the-box.
** You still need to do the other changes below and verify the changelogs of the libraries that got upgraded.

Check out Upgrade Support if you are experiencing issues related to React Native during the upgrading process.

Speaker notes

- https://react-native-community.github.io/upgrade-helper/



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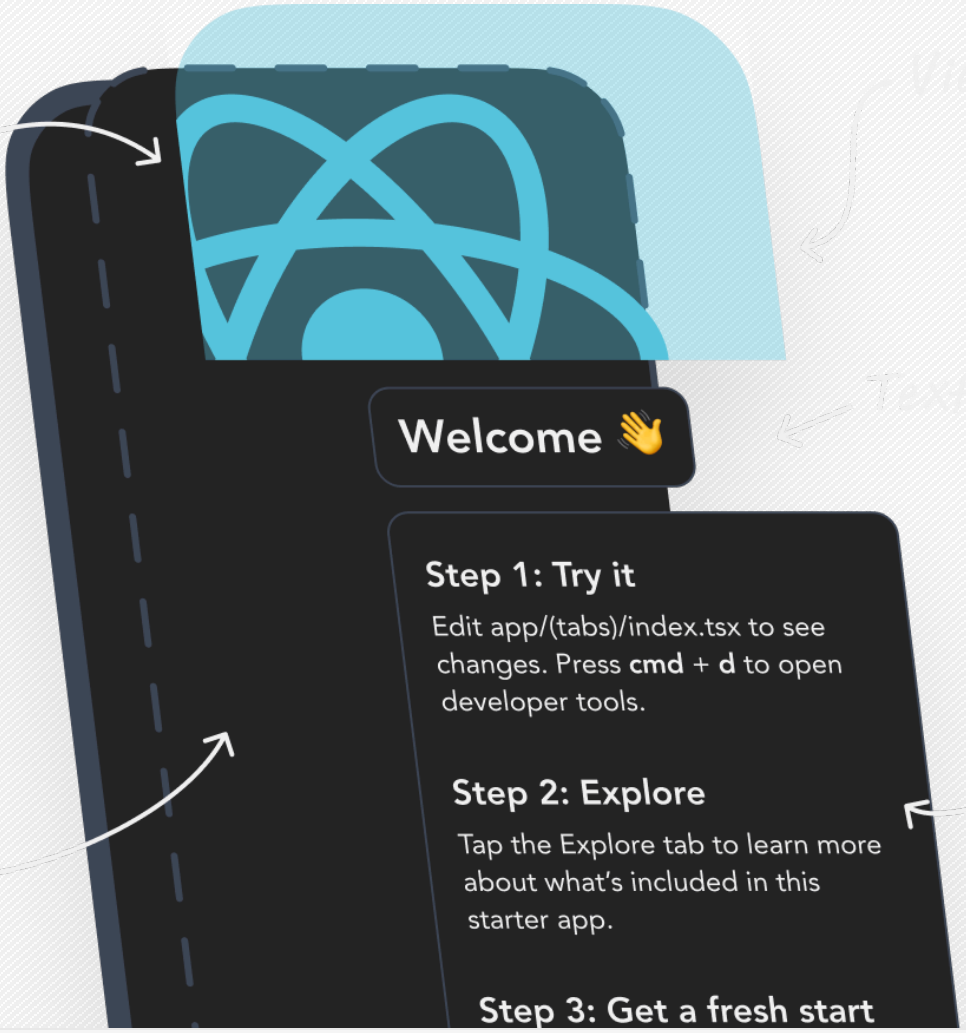


Speaker notes

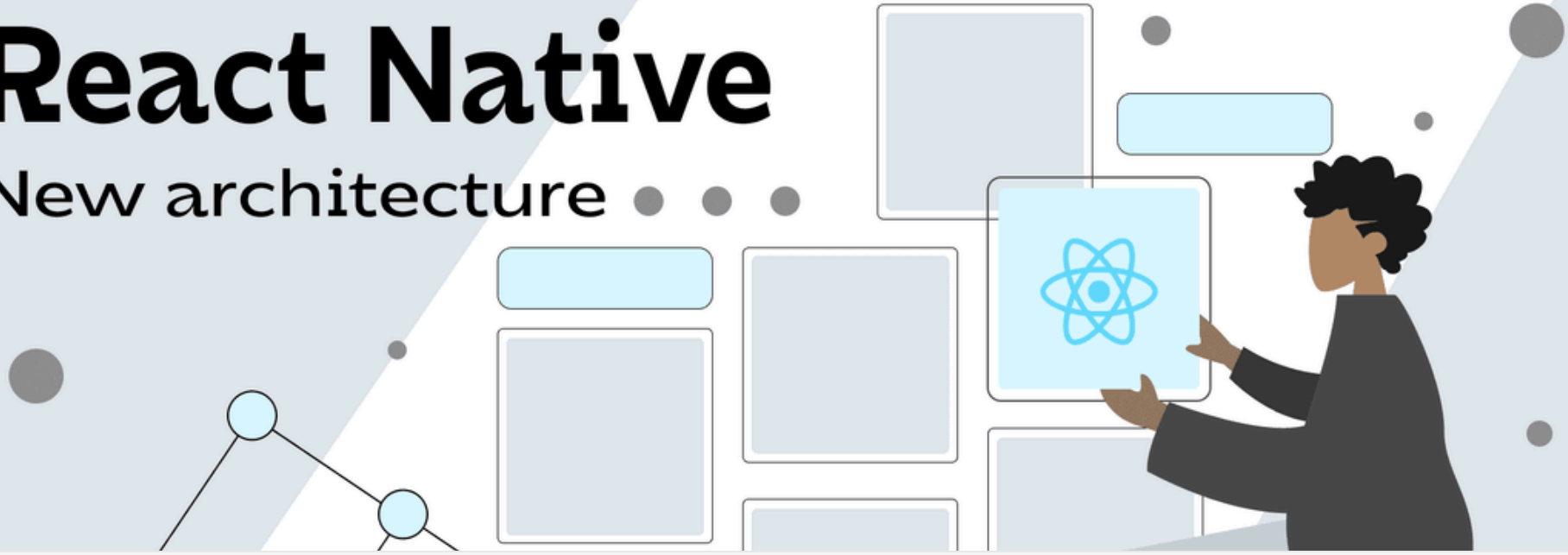
- Extra layers between you and the device
  - RN -> Native code -> Device
  - Fragmentation effects get even worse
- Yes, we're using native components, but we're still a layer above them

Speaker notes

- We've gone over some "cons", but here are some gotchas I've faced that could be useful
- These are some "heads up"s that I thought would be helpful

React Native

New architecture



Speaker notes

- New projects will likely use the current architecture
- There's a "New Architecture" that's available as well
- In progress since 2018
- Planned to be the default by end of 2024.
- "For most production apps, we do not recommend enabling the New Architecture today."
- Faster JS/Native interfacing
- Better layout and rendering

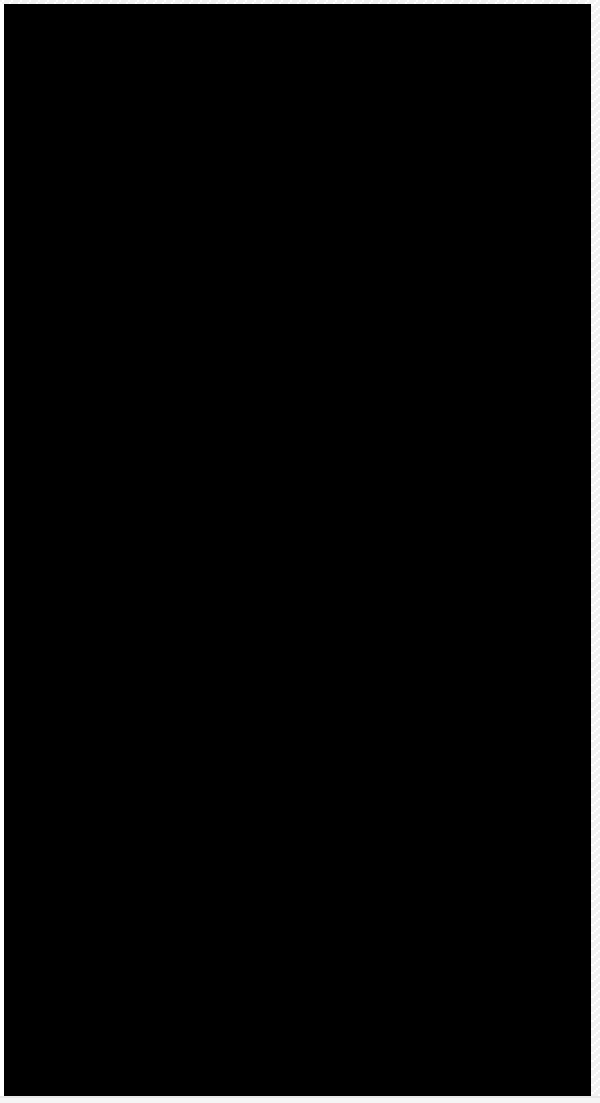
Speaker notes

- By default, this is the case, so don’t try to send it to someone
- You *can* create a build with the JS files bundled, but it takes extra work

Speaker notes

- Cocoapods is a dependency manager for iOS projects
- Usually don't have to mess with it too much directly
  - Update your `package.json` and RN should autolink
- But if you delete your `Podfile.lock`, you could end up with slightly different versions of dependencies
- Heads up in case you didn't change anything (or think you did)

```
84          <TextInput
85            style={{backgroundColor: 'purple'}}
86            keyboardType={keyboardType}
87            placeholder={'Issue'}
88          />
89
90          <TextInput
91            style={{backgroundColor: 'aqua'}}
92            keyboardType={keyboardType}
93            placeholder={'No issue here?'}
94          />
95
96          <TextInput
97            style={{backgroundColor: 'purple'}}
98            keyboardType={keyboardType}
99            placeholder={'First name will show up here'}
100         />
101
102         <TextInput
```



Speaker notes

- Here's a fun bug I found recently
- Some devices (this one's a Samsung S22+) will show suggestions for text input fields
- But the suggestions don't make sense, and the code is the same for all four fields.

Speaker notes

- What questions do you have?
- Available to chat otherwise, too

THANK YOU!

Speaker notes

- Thank you!