JS

NATIVE DEVICE FEATURES

JS

Agenda

Workflow & Dev Tips

Ionic Post App

Capacitor JS & Native API’s

Build for Platforms

Native Device Features & Plugins

Today's Apps

Ionic Post App & Improvements

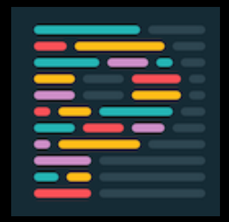
Deploy your Ionic Post App

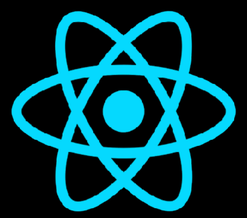
Ionic Camera App

Ionic Post App w/ @capacitor/camera API

Ionic Post App w/ @capacitor/storage

Workflow





Workflow & Tips

Open in Integrated Terminal || `cd` into projects

Run existing projects && `npm install`

Ionic CLI: `ionic start` && `ionic serve`

Keybindings

Auto imports / fix imports

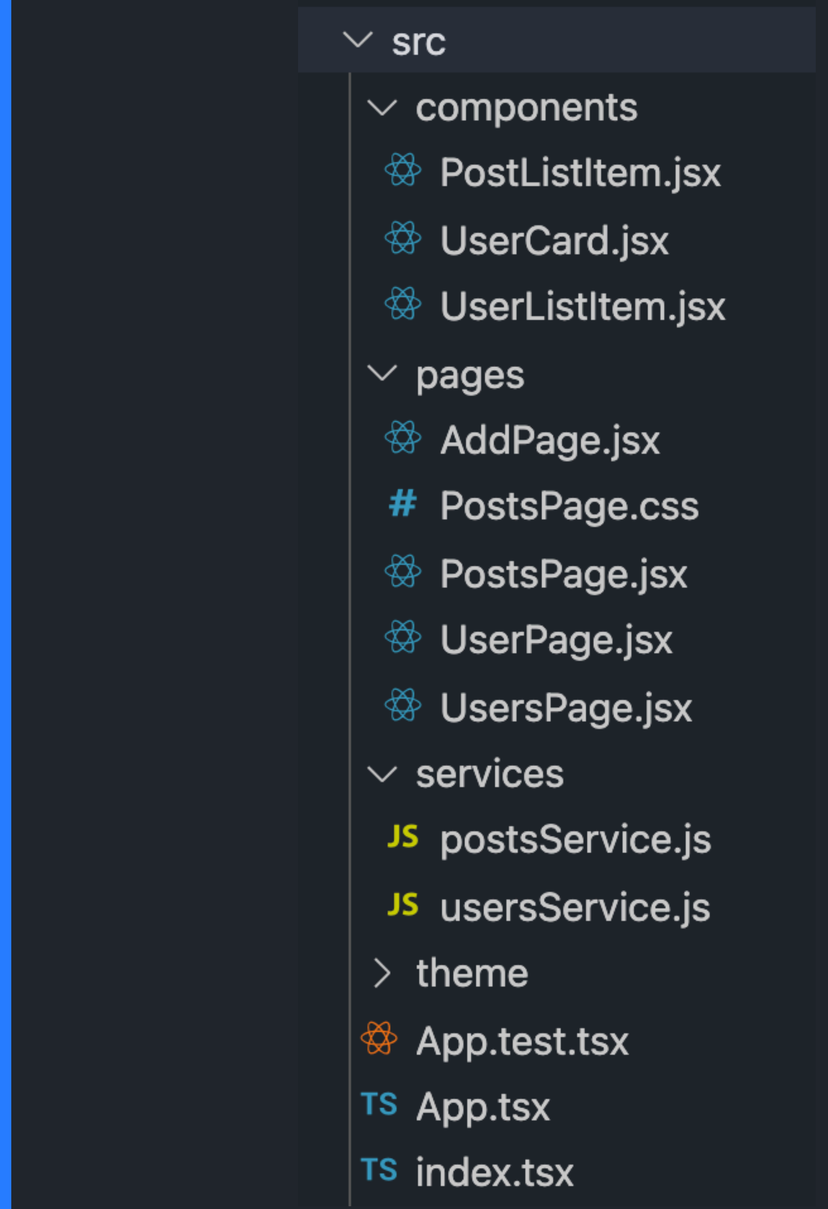
Ionic Dev Tips: https://ionicframework.com/docs/developing/tips

Ionic Post App

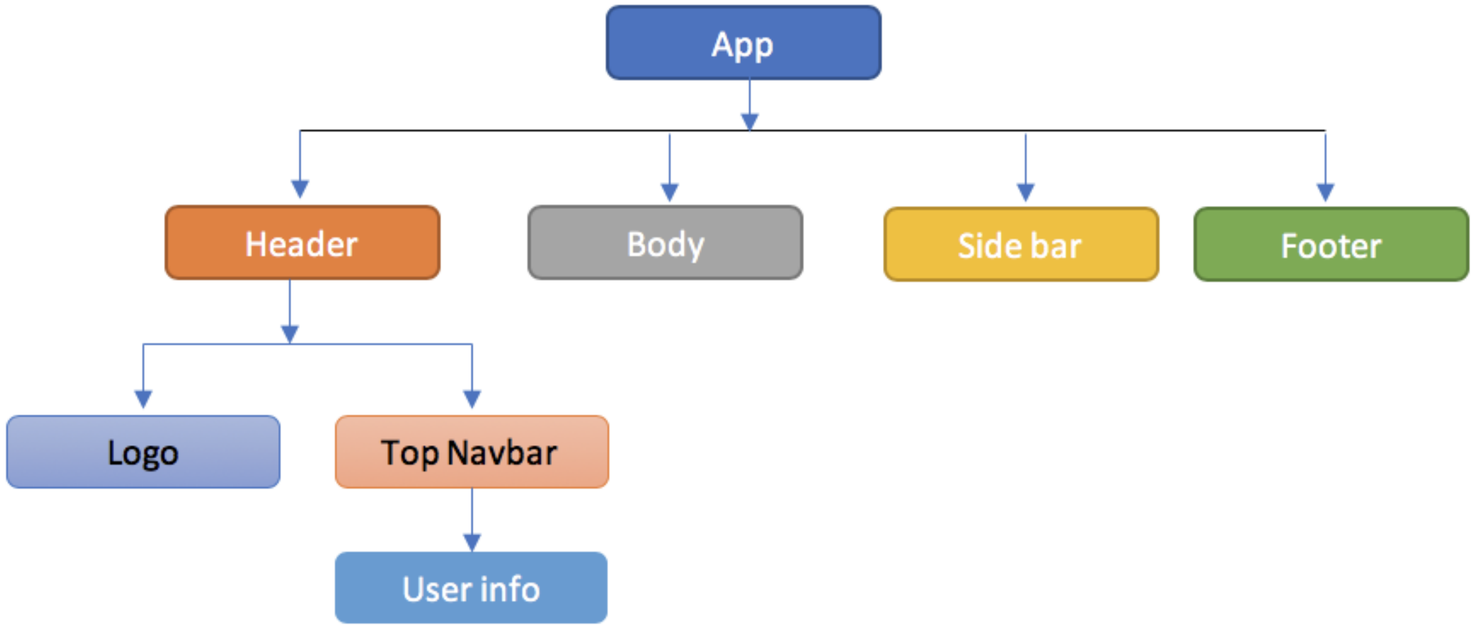
ionic-post-app*

Thinking in React

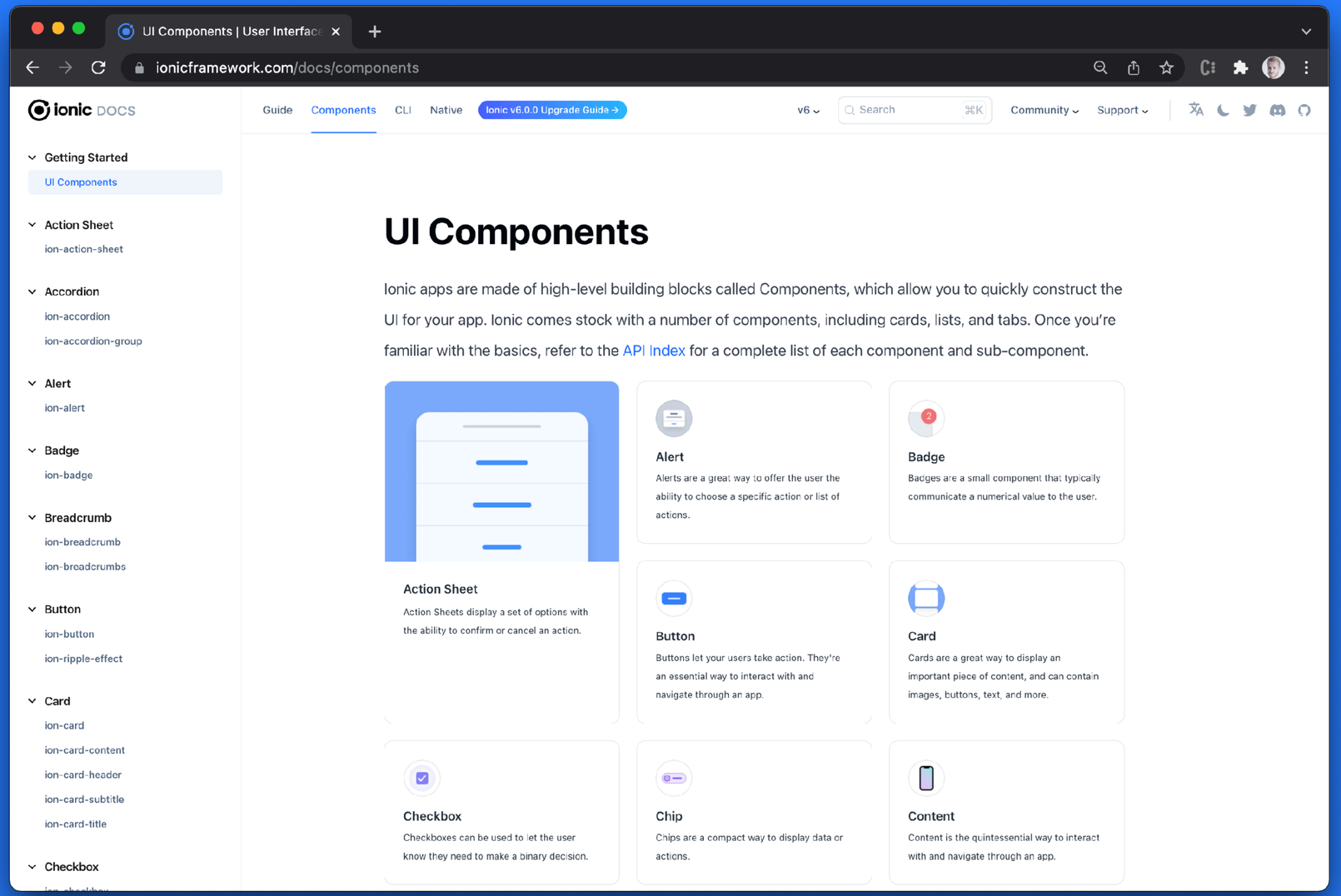
In React, UI is a **function** of **props** & **states**. The UI is built with (function) **Components**.



APP STRUCTURED IN COMPONENTS



UI Components

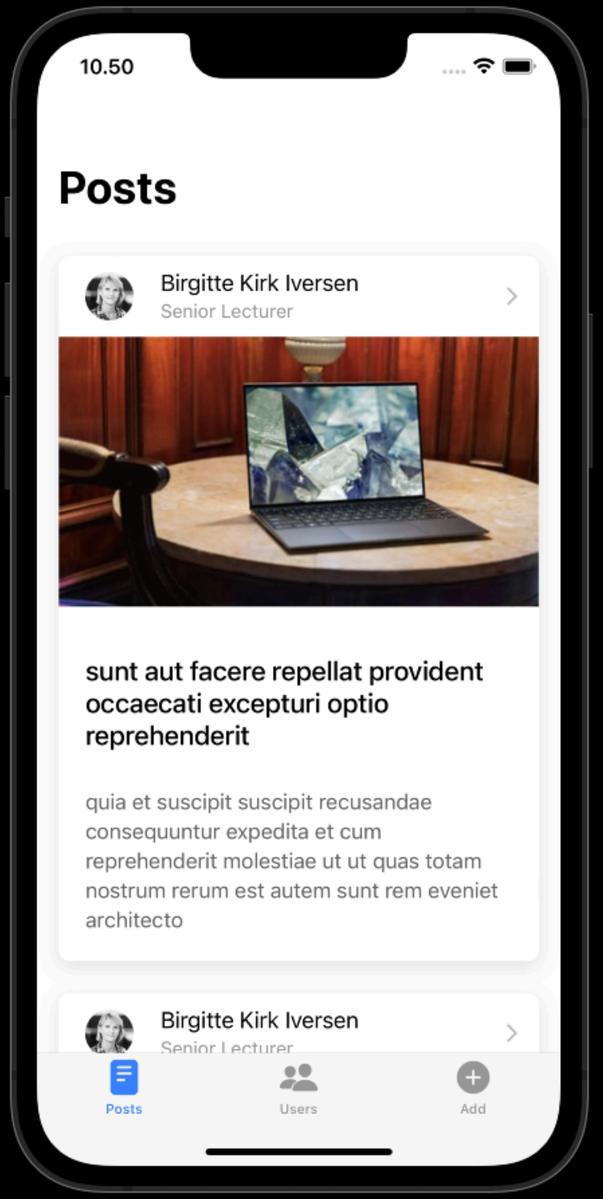


Ionic Post App

9. Improve your post view by adding user details (post create by...). Start by adding hardcoded user details like user avatar and user name using Ionic UI Components.

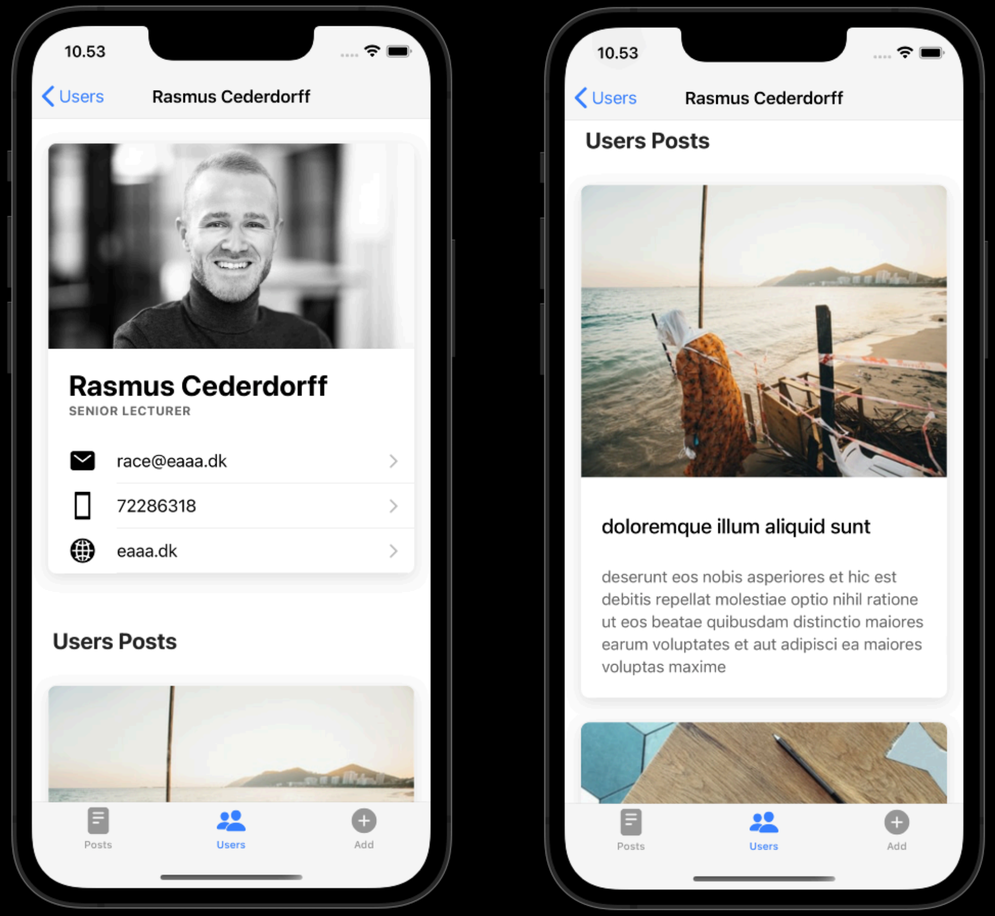
10. Implement logic to concatenate the posts array with user data from users array. All post objects have a `uid` property.

11. Use the concatenated array to display posts with user details dynamically.



Combine posts with users

```
import userService from "./usersService";

class PostService {
    constructor() {…
    }

    async fetchPosts() {…
    }

    async getPosts() {…
    }

    async getPostsWithUserDetails() {
        if (this.posts.length === 0) {
            await this.fetchPosts();
        }
        const users = await userService.getUsers();

        const postsWithUser = this.posts.map(post => {
            const user = users.find(user => user.id === post.uid);
            post = { ...post, user: user }; // combine objects with spread operator
            delete post.uid; // delete uid - it's inside post.user.id
            return post;
        });
        return postsWithUser;
    }
```



Ionic Post App

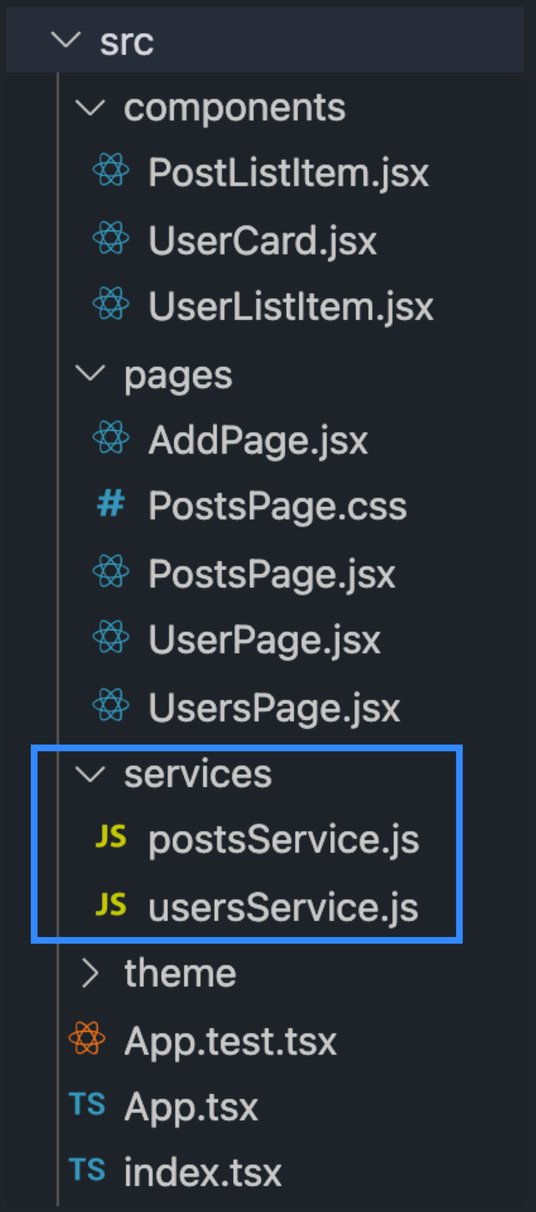
12. Improve the user detail view by displaying all posts created by the user. Again, think of the `uid` property on every post object and filter posts by given `uid`.

13. Components, components, components. When implementing improvements, think of how to (re-)use your existing components. No code duplicating is allowed.

Ionic Post App Improvements

Review your app and make sure to “think in React”. Use reusable components like `PostListItem`, `UserCard`, `UserListItem`, etc.

Create services to handle your logic for `posts` and `users`. Export and import services in needed components.



Ionic Post App

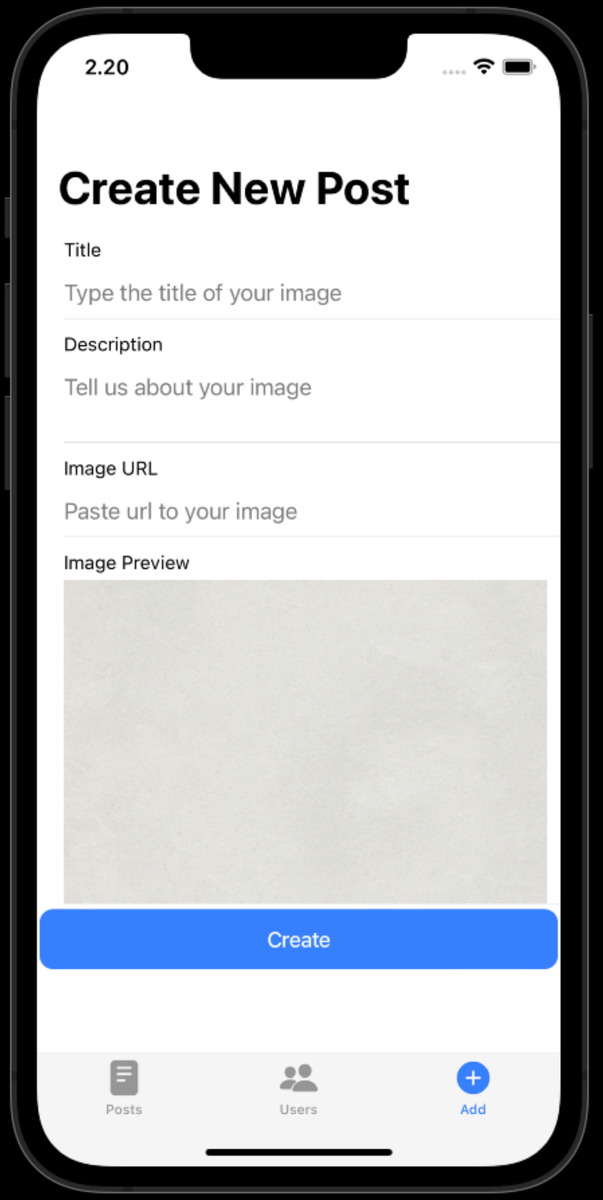
14. Implement the missing tab, Add.

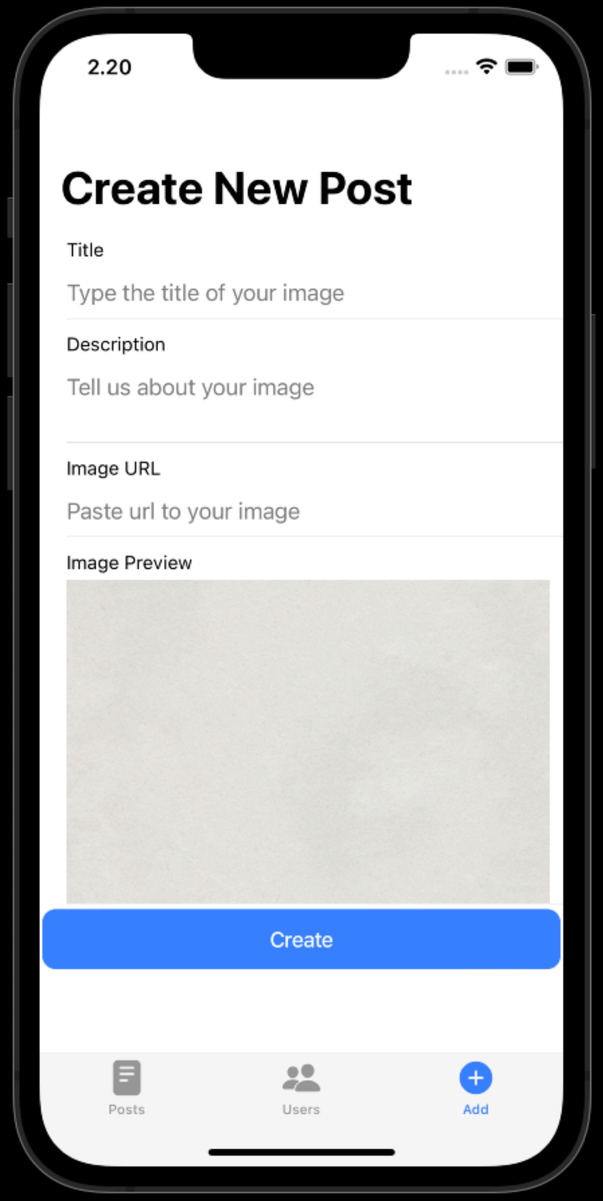
15. Explore Ionic UI Components like `IonInput`, `IonButton` etc.

16. Implement the Add tab with UI Components to create a new post object with the following properties: `uid`, `id`, `title`, `body` & `image`.
`uid` can be hardcoded. `image` can be a URL.

Use an `onSubmit` event on the form fired by `IonButton` with type of `submit`. Implement a handleSubmit function in App Page Component, creating a new `post` object with value from inputs (or states).

17. The new `post` object must be pushed to the `array` of `posts` using the `posts`' service. Make sure to fetch the posts data before pushing the new object.

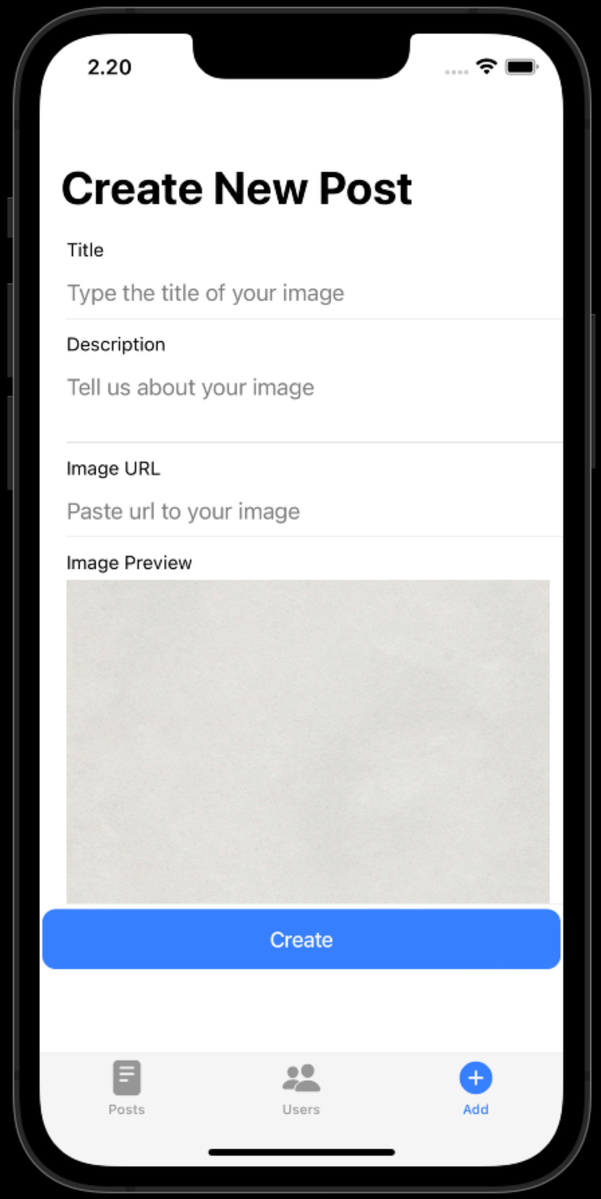





```tsx
export default function AddPage() {
    const [title, setTitle] = useState("");
    const [body, setBody] = useState("");
    const [url, setUrl] = useState("");

// ...

<form onSubmit={handleSubmit}>
    <IonItem>
        <IonLabel position="stacked">Title</IonLabel>
        <IonInput value={title} placeholder="Type the title of your image"
        onIonChange={e => setTitle(e.target.value)} />
    </IonItem>
    <IonItem>
        <IonLabel position="stacked">Description</IonLabel>
        <IonTextarea value={body} placeholder="Tell us about your image"
        onIonChange={e => setBody(e.target.value)}></IonTextarea>
    </IonItem>
    <IonItem>
        <IonLabel position="stacked">Image URL</IonLabel>
        <IonInput value={url} type="url" placeholder="Paste url to your image"
        onIonChange={e => setUrl(e.target.value)} />
    </IonItem>
    <IonItem>
        <IonLabel position="stacked">Image Preview</IonLabel>
        <IonImg src={url === "" ? fallbackUrl : url} />
    </IonItem>
    <IonButton type="submit" expand="block">
```

Form Object

```
export default function FormStateObject() {
    const [formData, setFormData] = React.useState({ firstName: "", lastName: "", mail: "" });

    function handleChange(event) {
        const name = event.target.name;
        const value = event.target.value;
        setFormData(prevFormData => {
            return {
                ...prevFormData,
                [name]: value
            };
        });
    }

    return (
        <form>
            <input type="text" placeholder="First Name" onChange={handleChange} name="firstName" />
            <input type="text" placeholder="Last Name" onChange={handleChange} name="lastName" />
            <input type="email" placeholder="Mail" onChange={handleChange} name="mail" />

            <p>Form data object: {JSON.stringify(formData)}</p>
        </form>
    );
}
```




```
export default function AddPage() {
    const [title, setTitle] = useState("");
    const [body, setBody] = useState("");
    const [url, setUrl] = useState("");
    const fallbackUrl = "https://media.istockphoto.com/photos/white-paper-texture-ba

    function handleSubmit(event) {
        event.preventDefault();

        const newPost = {
            uid: 4,
            title: title,
            body: body,
            image: url
        };
        postService.createPost(newPost);
    }

    return (
        <IonPage>
            <IonHeader>…
            </IonHeader>
            <IonContent fullscreen>
                <IonHeader collapse="condense">…
                </IonHeader>
                <form onSubmit={handleSubmit}>
                    <IonItem>
                        <IonLabel position="stacked">Title</IonLabel>
```

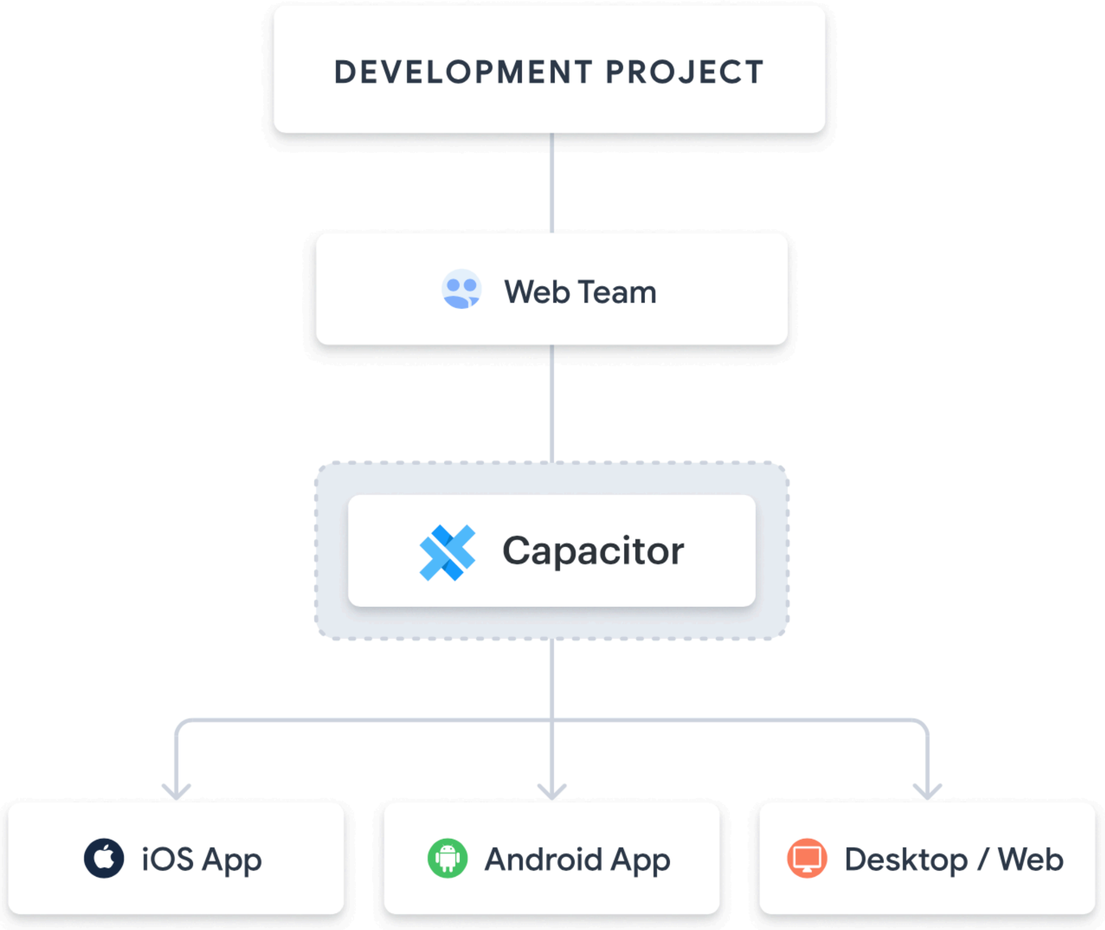
Form Object

```
export default function FormStateObject() {
    const [formData, setFormData] = React.useState({ firstName: "", lastName: "", mail: "" });

    function handleChange(event) {
        const name = event.target.name;
        const value = event.target.value;
        setFormData(prevFormData => {
            return {
                ...prevFormData,
                [name]: value
            };
        });
    }

    return (
        <form>
            <input type="text" placeholder="First Name" onChange={handleChange} name="firstName" />
            <input type="text" placeholder="Last Name" onChange={handleChange} name="lastName" />
            <input type="email" placeholder="Mail" onChange={handleChange} name="mail" />

            <p>Form data object: {JSON.stringify(formData)}</p>
        </form>
    );
}
```

Capacitor JS & Native API’s

Building Cross-platform Apps with Capacitor

Capacitor JS Project Flow



Web Native

“Web Native is the idea that teams should build modern Web Apps and combine them with tools like Capacitor that unlock powerful Native APIs to the app for the platform its running on.”

“Web Native is the full capability and access to developers of the Web Platform, with the full functionality and performance benefits of traditional native apps.”

“Web Native is "hybrid" done right, and it's the future of mobile app development.”

https://webnative.tech/

Back in the 2010s (Cordova)

Feature	Native	Web-only	Hybrid
Device Access	Full	Limited	Limited
Performance	High	Medium to High	Low
Development Language	Platform Specific	HTML, CSS, Javascript	HTML, CSS, Javascript
Cross-Platform Support	No	Yes	Yes
User Experience	High	Medium to High	Low
Code Reuse	No	Yes	Yes

Runs web apps across multiple platforms

Hybrid Apps

Today (Capacitor)

Feature	Native	Web-only	Hybrid
Device Access	Full	Limited	Full (with plugins)
Performance	High	Medium to High	Medium to High
Development Language	Platform Specific	HTML, CSS, Javascript	HTML, CSS, Javascript
Cross-Platform Support	No	Yes	Yes
User Experience	High	Medium to High	Medium to High
Code Reuse	No	Yes	Yes

Runs mordern web apps natively on iOS, Android, Electron and Webmultiple platforms.

Web Navtive Apps & PWA

Capacitor

A cross-platform native runtime for web apps.

Capacitor is a cross-platform native runtime that makes it easy to build modern web apps that run natively on iOS, Android, and the Web. Representing the next evolution of Hybrid apps, Capacitor creates Web Native apps, providing a modern native container approach for teams who want to build web-first without sacrificing full access to native SDKs when they need it.

https://capacitorjs.com/

Capacitor

A cross-platform native runtime for web apps.

The Web View and the native app communicate through the use of Capacitor or Cordova plugins. Plugins provide native APIs such as camera, geolocation, and filesystem access to your web app.

UI (Web View)

JS, HTML & CSS | **Ionic React**

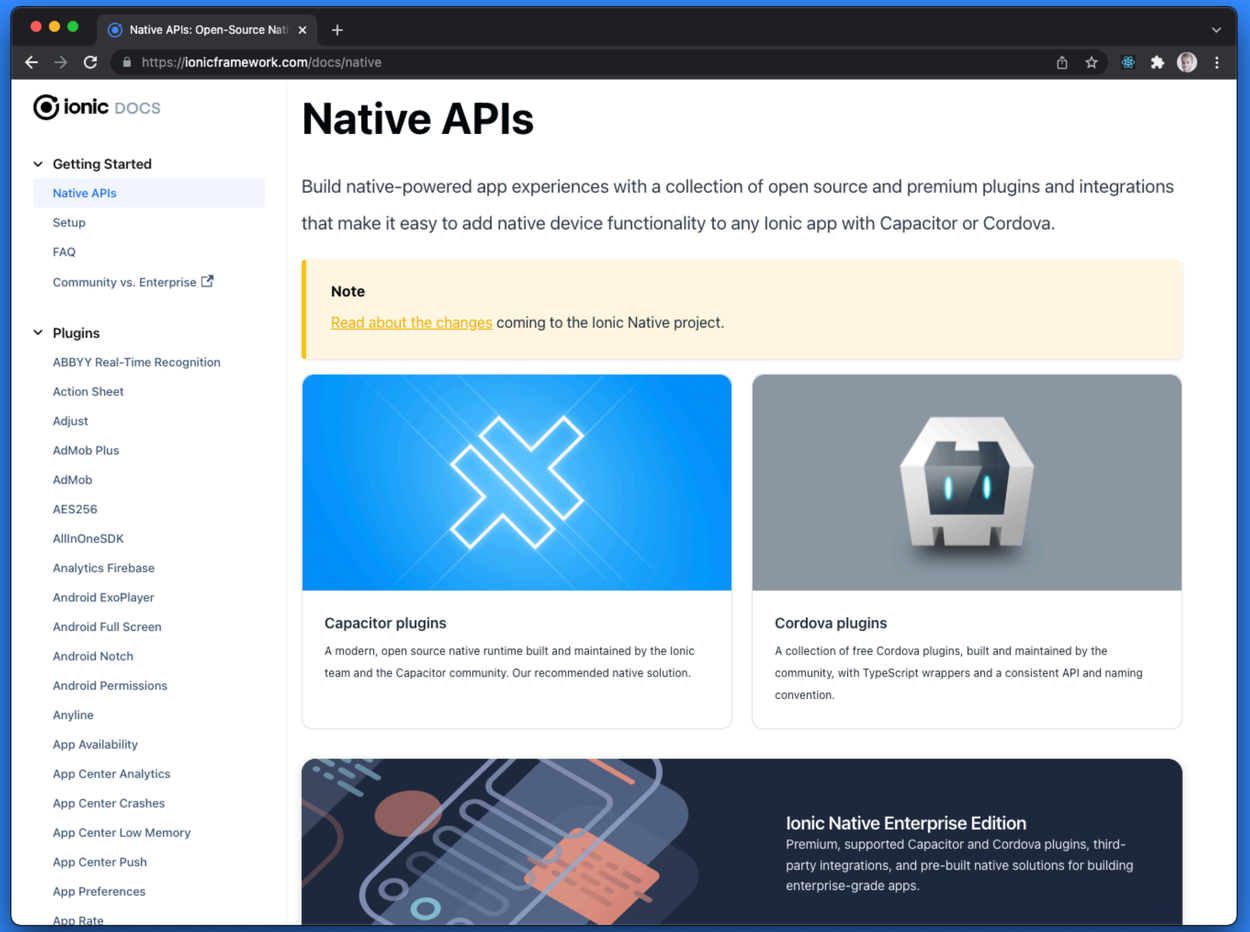
Capacitor

iOS, Android & PWA

https://capacitorjs.com/

Capacitor Plugins

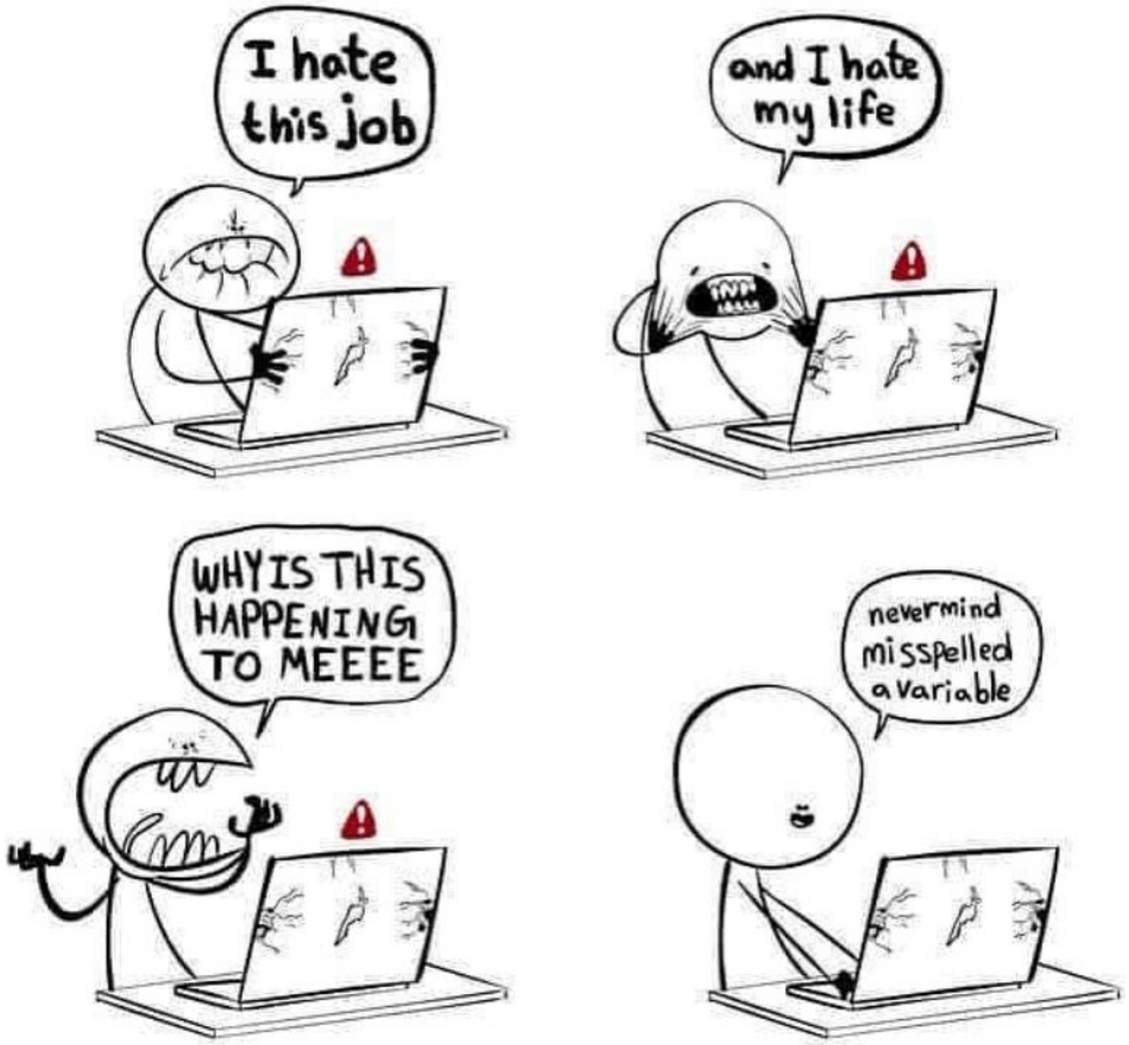
Enables directly access to native devices features with Native APIs



https://ionicframework.com/docs/native

Build for Platforms

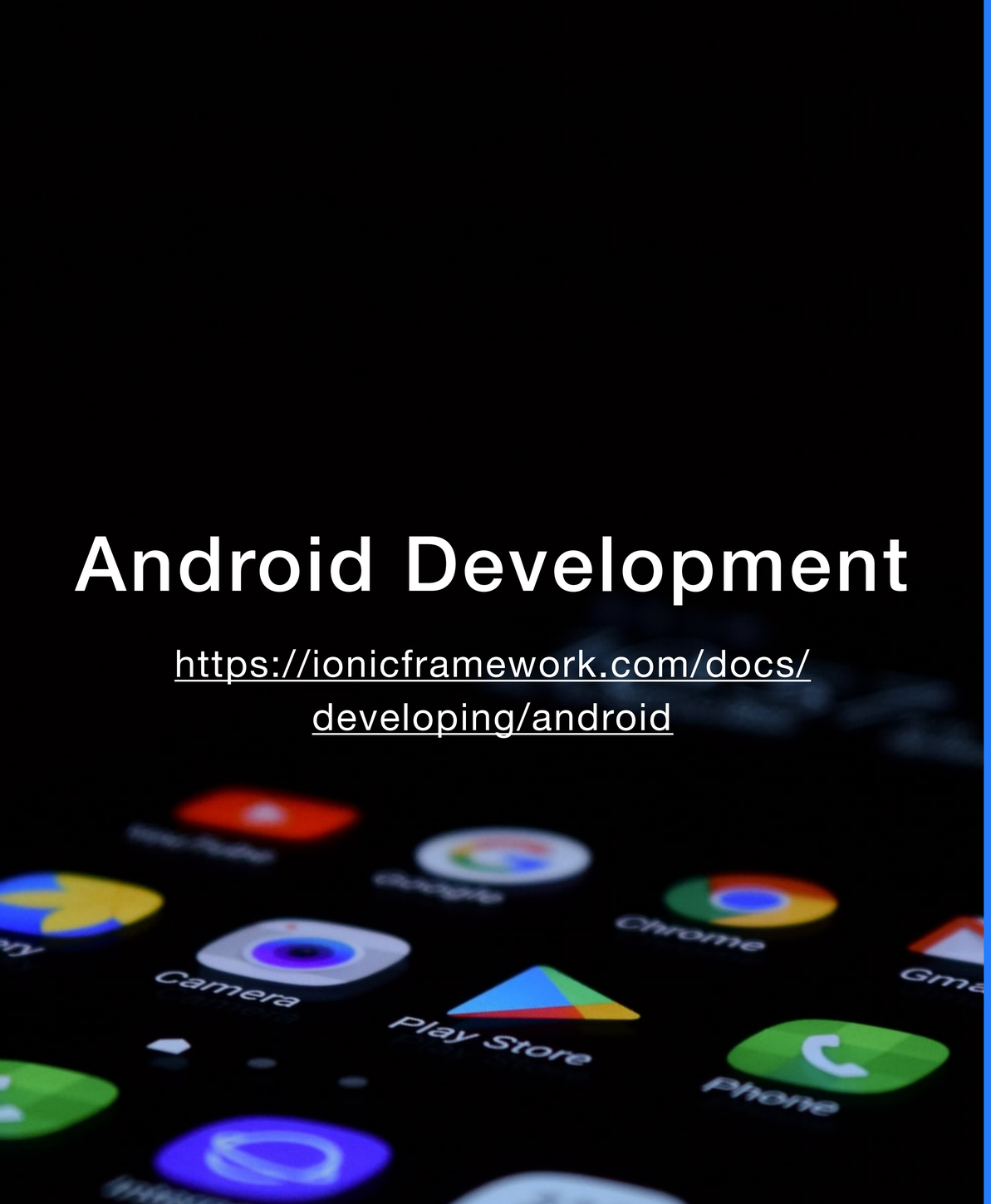
https://ionicframework.com/docs/react/your-first-app/deploying-mobile



Well, ~~programming~~ configuration can be hard 🤷

Android Development

https://ionicframework.com/docs/developing/android

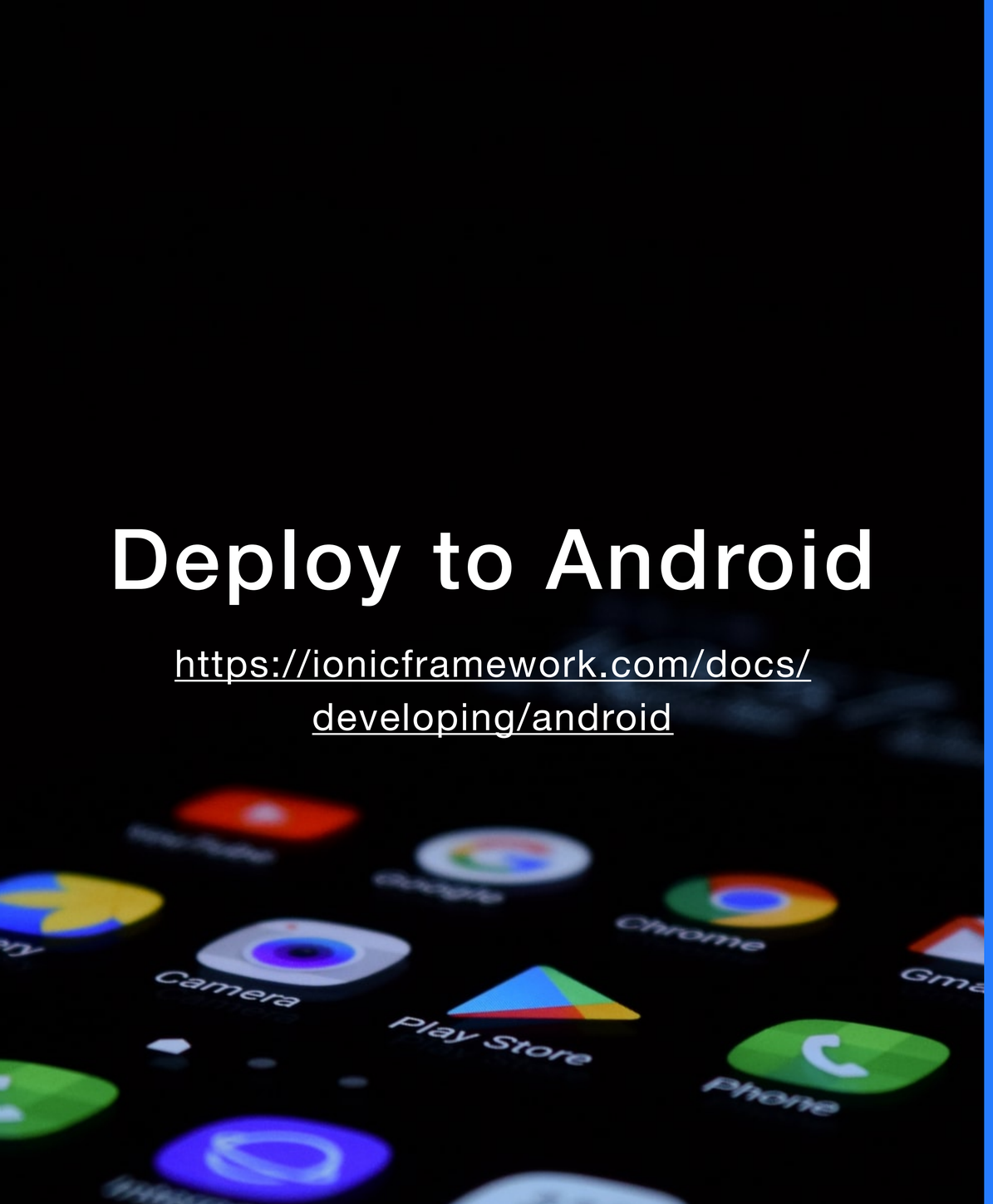


You need Android Studio to run on Android emulators & devices.

Android can be developed on Windows, macOS & Linux.

Deploy to Android

https://ionicframework.com/docs/developing/android



Follow instructions for Capacitor only and use your existing Ionic Post App.

1. Install Android Studio and Android SDK.
2. Configure Command Line Tools (some environment variables must be set).
3. Create a Virtual device and/or set up Android Device.
4. Skip “Cordova Setup” and go to “Project Setup”.
5. Run with Capacitor (and skip “Running with Cordova”).
6. Try out debugging using Chrome DevTools.
7. Move on with Ionic Post App and use live reload to develop and test your app.

Dev tips

https://ionicframework.com/docs/developing/tips

You need a Mac 🤷

Two main workflows:

1. Running with Xcode Xcode
2. Running with Ionic CLI

iOS Development

https://ionicframework.com/docs/developing/ios

Follow instructions for Capacitor only and use your existing Ionic Post App.

1. Download Xcode from AppStore. Make sure you have the latest version.

2. Make sure the command-line tools are selected for use:

```
$ xcode-select —install
```

3. Add iOS with

```
$ ionic capacitor add ios
```

4. Open in Xcode and run with Xcode

5. Run with CLI & Live-reload with Capacitor

6. Debug iOS with Safari

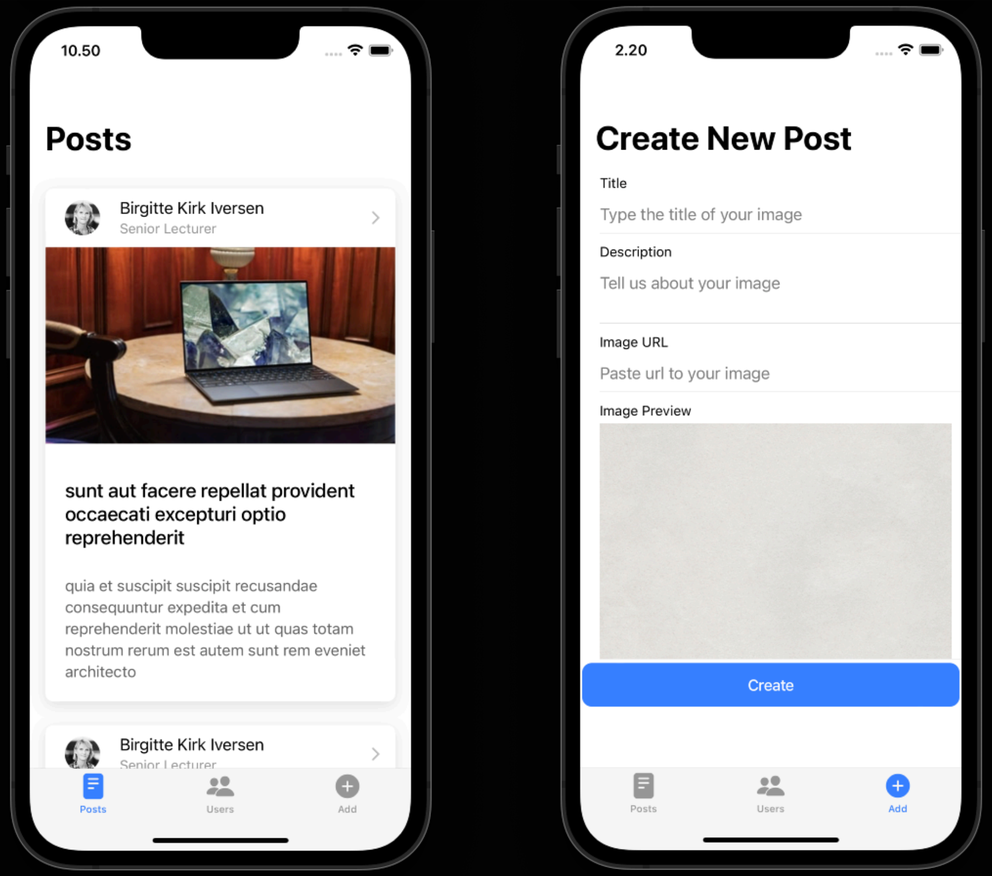
7. Move on with Ionic Post App and use live reload to develop and test your app.

Deploy to iOS

https://ionicframework.com/docs/developing/ios

Live Reload

https://ionicframework.com/docs/react/your-first-app/live-reload



Deploy your Ionic Post App

Guides: Android & iOS

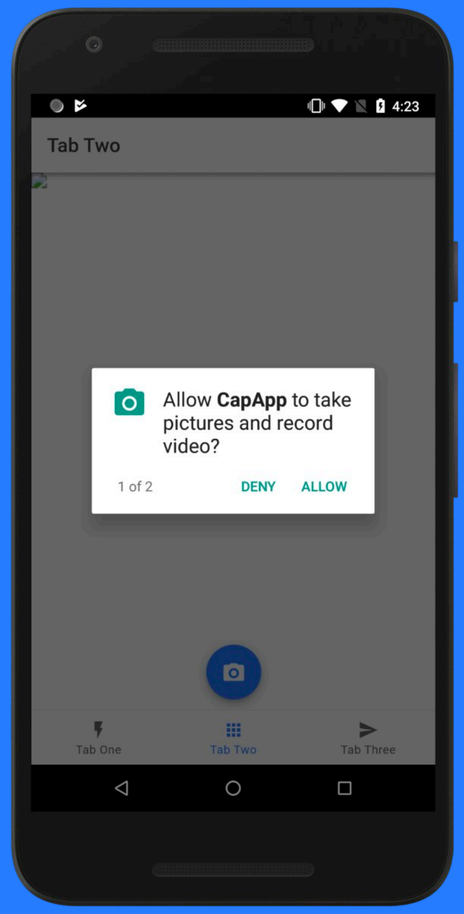
1. `$ ionic build`

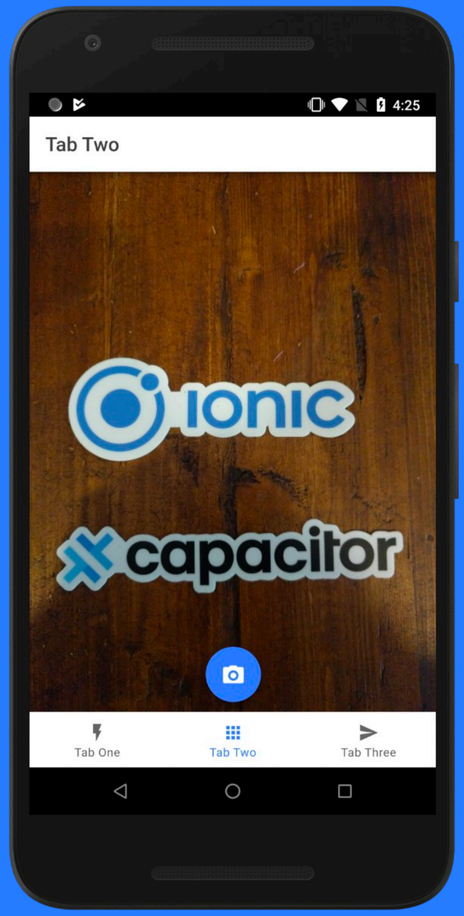
2. `$ ionic cap add iOS` or `ionic cap add android`

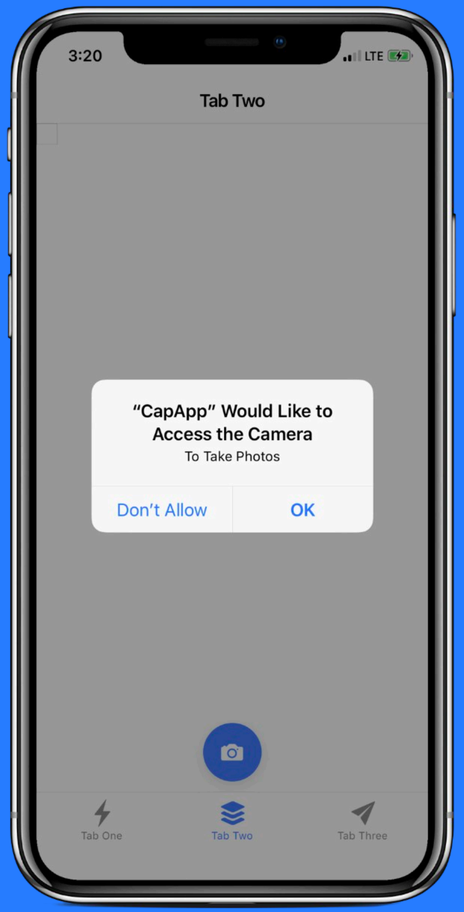
3. Run on platforms with Android Studio, Xcode or CLI.

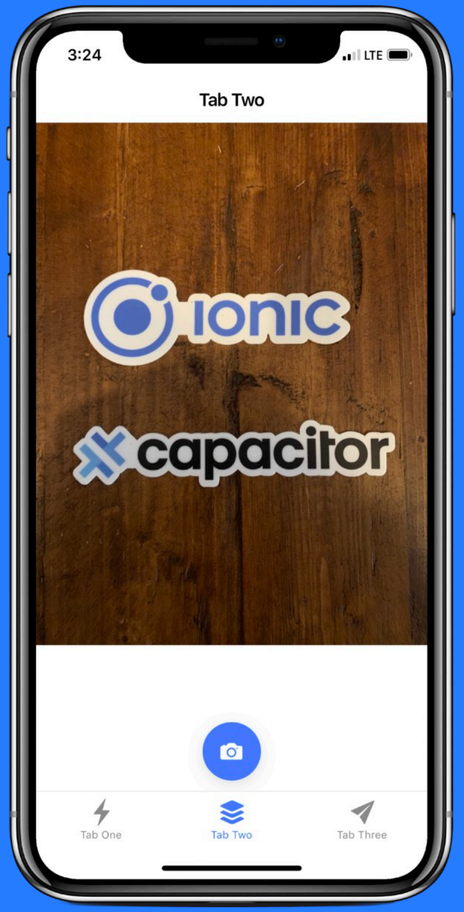
User Permissions

https://ionicframework.com/docs/react/your-first-app/deploying-mobile



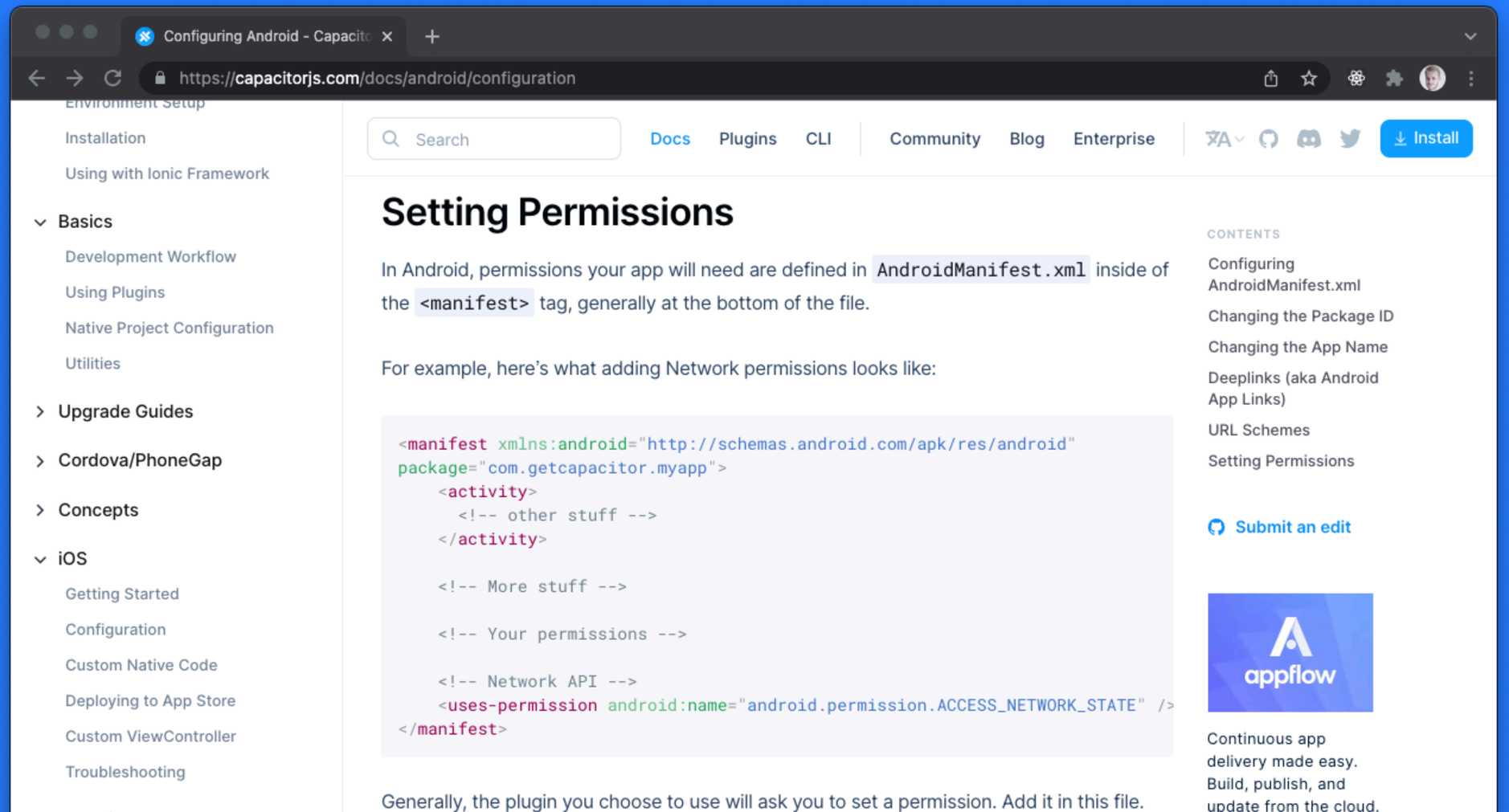






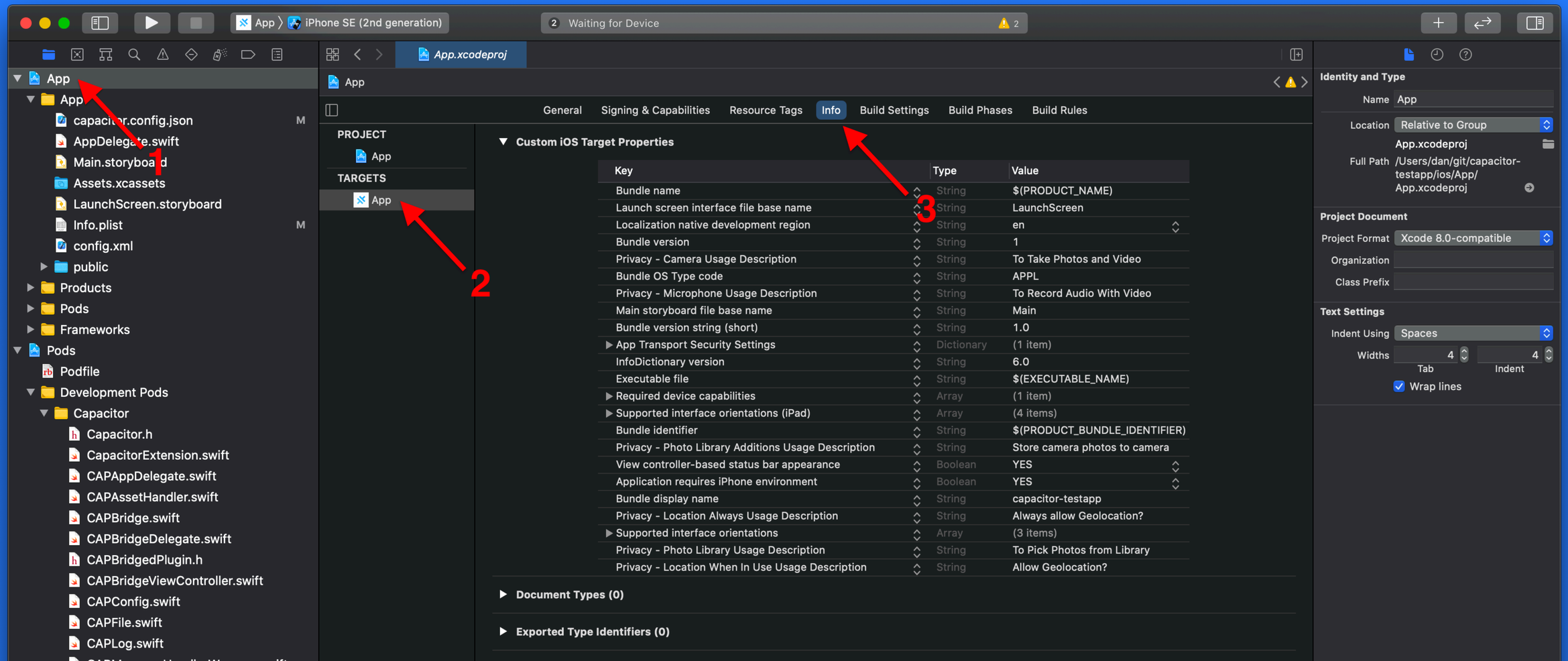
Configuring Android

https://capacitorjs.com/docs/android/configuration



Configuring iOS

https://capacitorjs.com/docs/ios/configuration

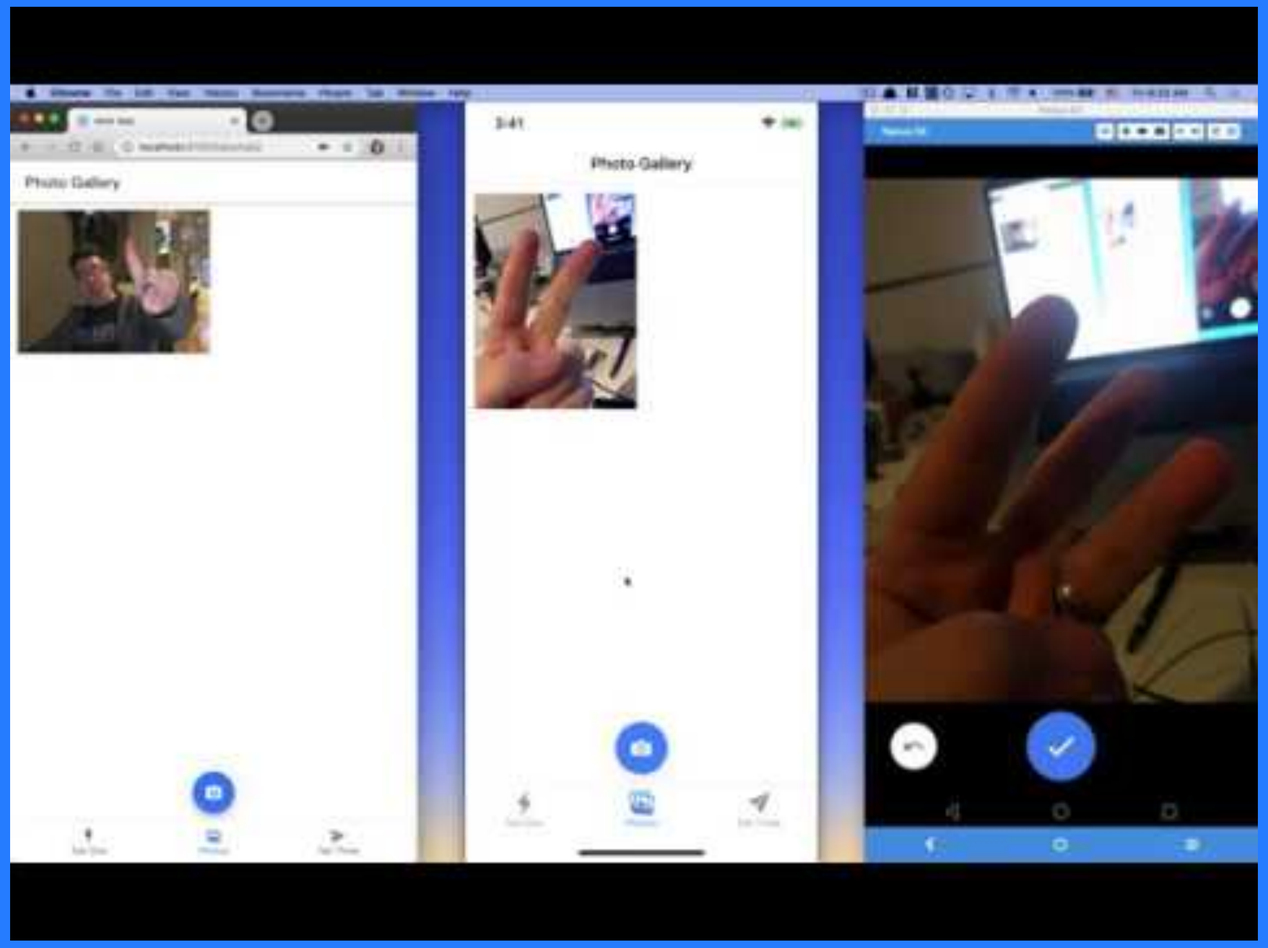


Native Device Features & Plugins

https://ionicframework.com/docs/native

Ionic Camera App

https://ionicframework.com/docs/react/your-first-app#create-an-app



```ts
import { Camera, CameraResultType } from '@capacitor/camera';

const takePicture = async () => {
  const image = await Camera.getPhoto({
    quality: 90,
    allowEditing: true,
    resultType: CameraResultType.Uri
  });

  // image.webPath will contain a path that can be set as an image src.
  // You can access the original file using image.path, which can be
  // passed to the Filesystem API to read the raw data of the image,
  // if desired (or pass resultType: CameraResultType.Base64 to getPhoto)
  var imageUrl = image.webPath;

  // Can be set to the src of an image now
  imageElement.src = imageUrl;
};
```

Ionic Post App w/ @capacitor/camera API

1. On the Add Page, replace the URL input with the ability to take a photo with the camera or choose an existing one from the photo album.

2. Explore the @capacitor/camera and get inspired by the Ionic Camera App as well.

3. Install the @capacitor/camera.

4. Use `CameraResultType.Base64` and save the output in the image property.

```
import { Storage } from '@capacitor/storage';

const setName = async () => {
  await Storage.set({
    key: 'name',
    value: 'Max',
  });
};

const checkName = async () => {
  const { value } = await Storage.get({ key: 'name' });

  alert(`Hello ${value}!`);
};

const removeName = async () => {
  await Storage.remove({ key: 'name' });
};
```

Ionic Post App w/ @capacitor/storage

1. Explore and install the @capacitor/storage plugin.

2. Reimplement the `services` with @capacitor/storage. Use the docs to explore how to get and set data.

Next Thursday