

Hybrid Mobile



Native Operations

COS216

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NATIVE API?

- Native? But you said it's hybrid?
 - Yes, you can still get native features with hybrid applications
 - Ionic has Cordova and Capacitor for this
 - This allows a developer to have native functionality (e.g. Open a file through your mobile file manager, open the camera, etc.)
 - These native plugins allow much more features at a fraction of the trouble

NATIVE PLUGINS

- In order to use a plugin you need to install it, there are numerous plugins available that are community-driven (<https://ionicframework.com/docs/native/community>)
- There are also enterprise versions which are paid for.
- In order to download a plugin and save it to your package.json file ensure you use the `--save` flag.
- For the remainder of the examples we will be using Cordova instead of Capacitor
- @Ionic/native plugins are wrappers around the Cordova plugins
- Always check what platforms are supported
- **NB!!! Native plugins will need you to run an emulator for iOS and Android.**
- **You will need to set the Android environment variables and Java Environment**

EMULATOR: ENVIRONMENT VARIABLES

- To get the emulator to work you need to define new environment variables:
 - ✓ ***ANDROID_HOME = C:\Users\<user>\AppData\Local\Android\Sdk***
 - ✓ ***JAVA_HOME = C:\Program Files\Java\jdk1.8.X_XX***

I suggest you also set the Following Path variables (**WARNING! DON'T MESS THIS UP OR YOU WILL DAMAGE YOUR SYSTEM**):

- ✓ C:\Program Files\Java\jdk1.8.0_77\bin
- ✓ C:\Program Files\Gradle\gradle-6.4.1\bin
- ✓ C:\Users\<user>\AppData\Local\Android\Sdk\build-tools\29.0.2
- ✓ C:\Users\<user>\AppData\Local\Android\Sdk\platform-tools
- ✓ C:\Users\<user>\AppData\Local\Android\Sdk\tools
- ✓ C:\Users\<user>\AppData\Local\Android\Sdk\tools\bin

<https://docs.oracle.com/en/database/oracle/r-enterprise/1.5.1/oread/creating-and-modifying-environment-variables-on-windows.html#GUID-DD6F9982-60D5-48F6-8270-A27EC53807D0>

FILE OPENER

<https://ionicframework.com/docs/native/file-opener>



```
$ ionic cordova plugin add cordova-plugin-file-opener2  
$ npm install @ionic-native/file-opener
```

Supported Platforms

- Android
- iOS
- Windows
- Windows Phone 8

FILE OPENER

<https://ionicframework.com/docs/native/file-opener>

```
import { FileOpener } from '@ionic-native/file-opener/ngx';

constructor(private fileOpener: FileOpener) { }

this.fileOpener.open('path/to/file.pdf', 'application/pdf')
  .then(() => console.log('File is opened'))
  .catch(e => console.log('Error opening file', e));

this.fileOpener.showOpenWithDialog('path/to/file.pdf', 'application/pdf')
  .then(() => console.log('File is opened'))
  .catch(e => console.log('Error opening file', e));
```


EMULATOR

To launch the ionic app, assuming you have the emulator installed run this command:

-> ionic cordova run android

ANDROID PERMISSIONS



```
$ ionic cordova plugin add cordova-plugin-android-permissions  
$ npm install @ionic-native/android-permissions
```

```
this.androidPermissions  
  .checkPermission(this.androidPermissions.PERMISSION.CAMERA)  
  .then(  
    (result) => console.log("Has permission?", result.hasPermission),  
    (err) =>  
      this.androidPermissions.requestPermission(  
        this.androidPermissions.PERMISSION.CAMERA  
      )  
  );  
this.androidPermissions.requestPermissions([  
  this.androidPermissions.PERMISSION.CAMERA,  
  this.androidPermissions.PERMISSION.GET_ACCOUNTS,  
  this.androidPermissions.PERMISSION.NETWORK,  
]);
```

<https://ionicframework.com/docs/native/android-permissions>

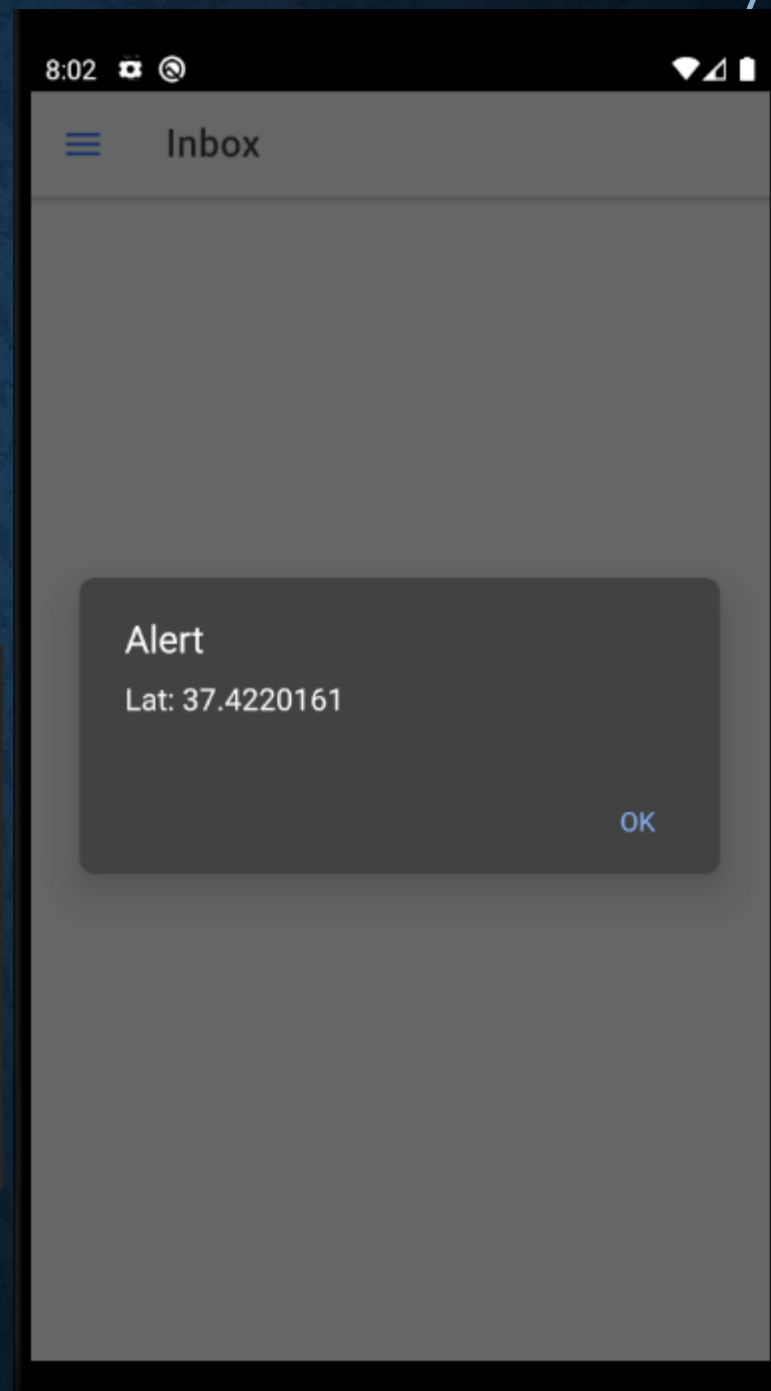
GEOLOCATION



```
$ ionic cordova plugin add cordova-plugin-geolocation  
$ npm install @ionic-native/geolocation
```

```
this.geolocation  
  .getCurrentPosition()  
  .then((resp) => {  
    alert("Lat: " + JSON.stringify(resp.coords.latitude));  
    alert("Lon: " + JSON.stringify(resp.coords.longitude));  
  }).catch((error) => {  
    alert("Error getting location " + JSON.stringify(error));  
  });
```

<https://ionicframework.com/docs/native/geolocation>



LOCAL NOTIFICATIONS



```
$ ionic cordova plugin add cordova-plugin-local-notification  
$ npm install @ionic-native/local-notifications
```

```
this.localNotifications.schedule({  
  text: "Scheduled COS216 Notification",  
  trigger: { at: new Date(new Date().getTime() + 1200) },  
  led: "FF0000",  
  sound: "file://sound.mp3",  
  icon: "http://example.com/icon.png",  
});
```

<https://ionicframework.com/docs/native/local-notifications>

8:26

Fri, Jun 5

100%



MyApp • now

MyApp

Scheduled COS216 Notification

Android Setup

Android SDK built for x86 setup in progress
Tap to finish Android SDK built for x86 setup



Silent notifications

Android System

USB debugging connected
Tap to turn off USB debugging

Android System • Charging this device via USB

Manage

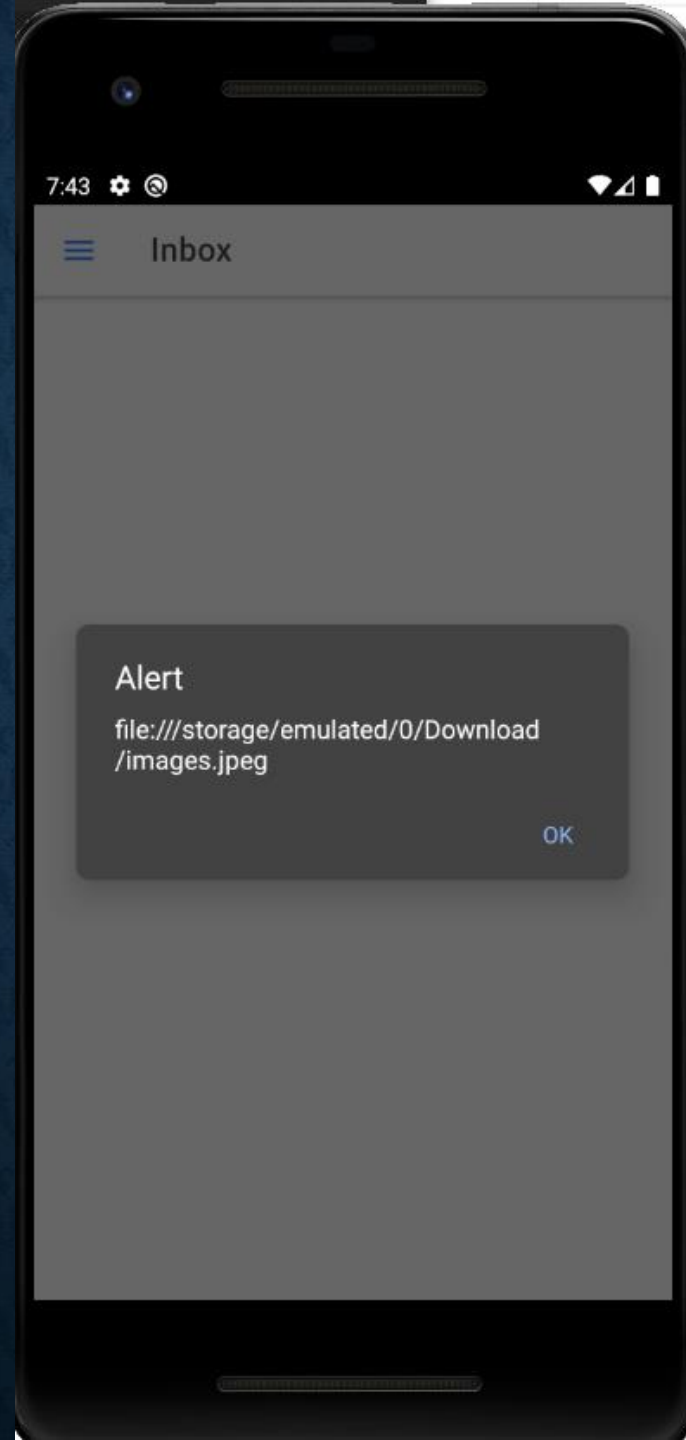
Clear all

FILE CHOOSER

```
$ ionic cordova plugin add cordova-plugin-chooser  
$ npm install @ionic-native/chooser
```

```
this.fileChooser.open().then((url) => {  
  alert(JSON.stringify(url));  
  this.filePath  
    .resolveNativePath(url)  
    .then((filePath) => {  
      alert(filePath);  
    })  
    .catch((err) => alert(JSON.stringify(err)));  
})  
.catch((e) => {  
  alert(JSON.stringify(e));  
});
```

<https://ionicframework.com/docs/native/file-chooser>



NATIVE STORAGE



```
$ ionic cordova plugin add cordova-plugin-nativestorage  
$ npm install @ionic-native/native-storage
```

```
this.nativeStorage.setItem("myitem", {  
  property: "value",  
  anotherProperty: "anotherValue",  
}).then(() => alert("Stored item!"),  
  (error) => console.error("Error storing item", error)  
);
```

```
this.nativeStorage.getItem("myitem").then(  
  (data) => alert(JSON.stringify(data)),  
  (error) => console.error(error)  
);
```

<https://ionicframework.com/docs/native/native-storage>

9:11



Alert

{"property":"value","anotherProperty":"anotherValue"}

OK

SQLITE

```
$ ionic cordova plugin add cordova-sqlite-storage  
$ npm install @ionic-native/sqlite
```

```
this.sqlite  
  .create({  
    name: "data.db",  
    location: "default",  
  })  
  .then((db: SQLiteObject) => {  
    db.executeSql("create table danceMoves(name VARCHAR(32))", [])  
      .then(() => alert("Executed SQL"))  
      .catch((e) => console.log(e));  
  })  
  .catch((e) => console.log(e));
```

<https://ionicframework.com/docs/native/sqlite>

9:19



Alert

Executed SQL

OK

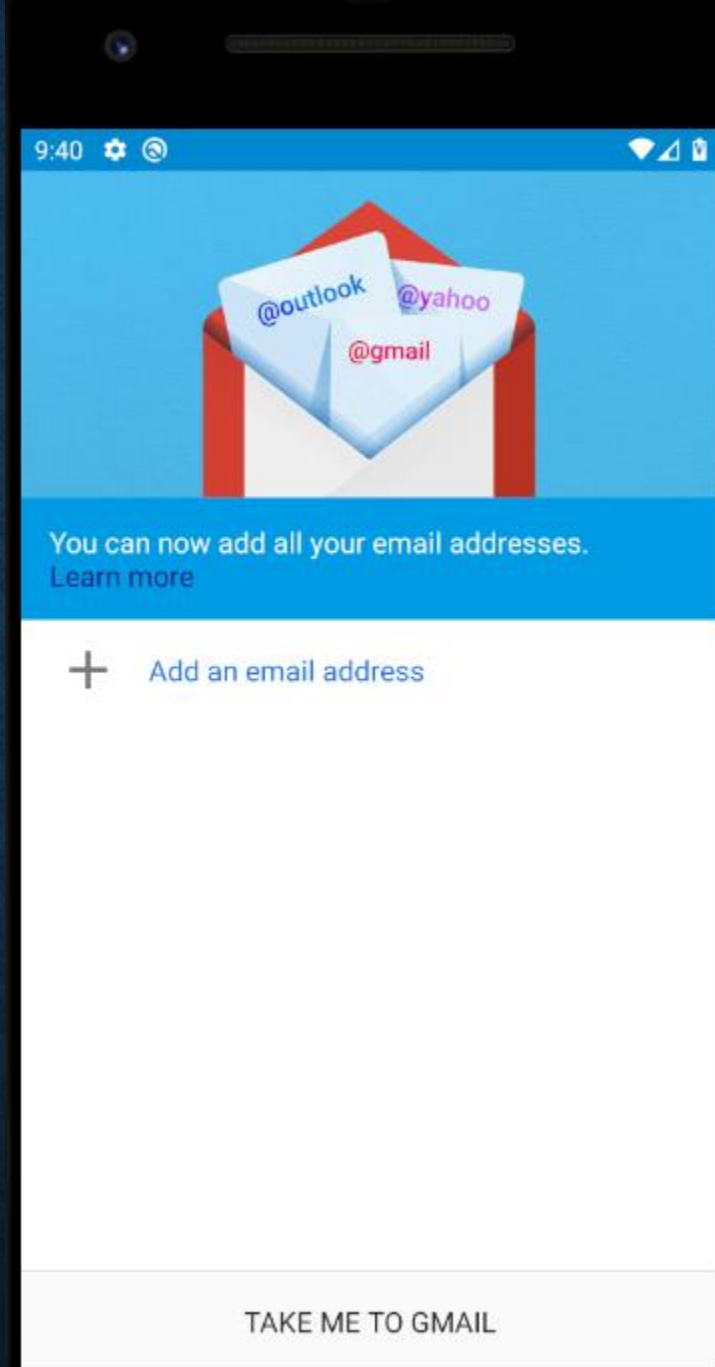
SOCIAL SHARING



```
$ ionic cordova plugin add cordova-plugin-x-socialsharing  
$ npm install @ionic-native/social-sharing
```

```
this.socialSharing.shareViaEmail("This is a message  
from 216", "COS216 -  
Subject", ["recipient@example.org"])  
  .then(() => {  
    alert("Shared Successfully");  
  })  
  .catch(() => {  
    // Error!  
  });
```

<https://ionicframework.com/docs/native/social-sharing>



NETWORKING



```
$ ionic cordova plugin add cordova-plugin-network-information  
$ npm install @ionic-native/network
```

```
// watch network for a connection  
let connectSubscription = this.network.onConnect().subscribe(() => {  
  console.log('network connected!');  
  // We just got a connection but we need to wait briefly  
  // before we determine the connection type. Might need to wait.  
  // prior to doing any api requests as well.  
  setTimeout(() => {  
    if (this.network.type === 'wifi') {  
      console.log('we got a wifi connection, woohoo!');  
    }  
  }, 3000);  
});
```

<https://ionicframework.com/docs/native/network>

10:13



Inbox

Alert

we got a wifi connection, woohoo!

OK

HTTP

```
$ ionic cordova plugin add cordova-plugin-advanced-http
$ npm install @ionic-native/http
```

this.http

```
.get("https://cs.up.ac.za", {}, {})
.then((data) => {
  console.log(data.status);
  alert(JSON.stringify(data.data)); // data received by server
  console.log(data.headers);
})
.catch((error) => {
  console.log(error.status);
  console.log(error.error); // error message as string
  console.log(error.headers);
});
```

<https://ionicframework.com/docs/native/http>

11:03

Alert

```
<!DOCTYPE html>\n<html xmlns=\"http://www.w3.org/1999/xhtml\">\n<head>\n<meta http-equiv=\"Content-Type\" content=\"text/html; charset=utf-8\"/\n>\n<title> - Department of Computer Science - University of Pretoria</title>\n<link href=\"/static/css/layout.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/content.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/forms.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/static.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/tables.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/notifications.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/box.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<link href=\"/static/css/links.css\" rel=\"stylesheet\" type=\"text/css\"/\n>\n<script src=\"/static/scripts/jquery-1.10.2.min.js\"></script>\n<script src=\"/static/
```

OK

HTTP

```
$ ionic cordova plugin add cordova-plugin-advanced-http
$ npm install @ionic-native/http
```

this.http

```
.get("https://cs.up.ac.za", {}, {})
.then((data) => {
  console.log(data.status);
  alert(JSON.stringify(data.data)); // data received by server
  console.log(data.headers);
})
.catch((error) => {
  console.log(error.status);
  console.log(error.error); // error message as string
  console.log(error.headers);
});
```

<https://ionicframework.com/docs/native/http>

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HTTP

```
$ ionic cordova plugin add cordova-plugin-advanced-http
$ npm install @ionic-native/http
```

```
this.http
  .post("https://postman-echo.com/post",{ "id": 21, "name": "Jhon"},
    { "Content-Type": "applications/json" })
  .then((data) => {
    console.log(data.status);
    alert(JSON.stringify(data.data)); // data received by server
    this.image = data.data;
    console.log(data.headers);
  })
  .catch((error) => {
    console.log(error.status);
    console.log(error.error); // error message as string
    console.log(error.headers);
  });
```

<https://ionicframework.com/docs/native/http>

11:26

Inbox

Alert

```
{\args\:{},\data\:{},\files\:{},
\form\:{\name\:\Jhon\,\id\:\21\},
\headers\:{\x-forwarded-proto\:\
\https\,\x-forwarded-port\:\443\,
\host\:\postman-echo.com\,
\x-amzn-trace-id\:\Root=1-5edc0a
16-e9193aa00b912b10c5e23208\,
\content-length\:\15\,
\accept-charset\:\UTF-8\,
\content-type\:\application/
x-www-form-urlencoded;
charset=UTF-8\,\user-agent\:\Dalvik/
2.1.0 (Linux; U; Android 10; Android SDK
built for x86 Build/QSR1.190920.001)\}
,\accept-encoding\:\gzip\,\cookie\:\
\sails.sid=s%3ArplgHWhfapf6KB7qYvF
TTNnc0sQLGN4T.EK02SQikZr2OR8zv
n3OpDJFS6pBLKCcaGqtWy3dJQmA\}
,\json\:{\name\:\Jhon\,\id\:\21\}
,\url\:\https://postman-echo.com
/post\}
```

OK

Favorites

IONIC - DOCUMENTATION

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



