SIGGRAPH2015

Xroads of Discovery

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Beginning Native Android Apps

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About Me

Launched VC News Daily app on iOS and Android. Over 3000 downloads so far. Also, check out @wazareapp.

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About Me

All examples and sample code in this presentation can be found at:

http://conoa.com/hidden/sig2015examples.zip

Why?

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There are nearly 2 million mobile apps available today. http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats/e#lotsofapps

In 2013, there were approximately 60 billion app downloads. http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats/e#appdownloads

For many, interacting with software means interacting with mobile devices (or at least devices that run mobile software).

What we will do

Learn some basic Android concepts

Look at the structure of an Android app

Learn about widgets

Access the device

Some Android concepts

Android is open-source:
https://android.googlesource.com/

Principally maintained by Google

Some Android concepts

The android stack, from top to bottom:

- Applications: app built with the Java framework
- Android framework: com.android….
- Native framework: native code
- Linux kernal: C code built for the native platform

Android Versions

Android 2.0 – Eclair
Android 2.2 – Froyo, incorporated new sensors
Android 2.3 – Gingerbread, aimed at tablet
Android 3.0 – Honeycomb
Android 4.0 – Ice Cream Sandwich
Android 4.1 – Jelly Bean
Android 4.3 – KitKat
Android 5.0 – Lollipop

Android Development

Android SDK – provides the framework
Android NDK – for compiling to native code
Android ADB – (android debug bridge) the emulator and debugger
Android Eclipse Plug-in

The structure of an app

Activities and intents

- An Android activity maps to user screen. If you had an app with a splash screen, a menu and news reader, that app would have 3 activities. Activities are class that you subclass to modify.

- Intents connect activities. They allow control to flow from one screen to another.

The structure of an app

Views

- An Android activity contains a layout with one or more views.

Views allow presenting information to the user. Widgets are subclasses of views and have specialized behavior. Examples of widgets are:

- Lists
- Buttons
- Images
- Dialog boxes

The structure of an app

Manifest

- An Android app must list the set of permissions it needs and device capabilities it will use. This list is contained in the manifest file. The manifest file allows the user to understand what capabilities an app has when installing it.

The structure of an app

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```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.helloworld"
  android:versionCode="1"
  android:versionName="1.0" >
  <uses-sdk
    android:minSdkVersion="8"
    android:targetSdkVersion="15" />
  <application
     android:icon="@drawable/ic_launcher"
     android:label="@string/app_name"
     android:theme="@style/AppTheme" >
     <activity
        android:name=".MainActivity"
        android:label="@string/title_activity_main" >
        <intent-filter>
           <action android:name="android.intent.action.MAIN" />
           <category android:name="android.intent.category.LAUNCHER"/>
        </intent-filter>
     </activity>
  </application>
</manifest>
```

Example: Hello World

We'll create a single activity with an image and a button.

The button will connect to a single intent that will exit the app

Example: Contact Lists

We'll create an activity that accesses the device's contact list.

The activity will use a ListView widget to display the contact list and demonstrate how to create scrolling lists.

Example: Taking a Picture

We'll create an activity that accesses the device's camera, performs a simple image processing operation and saves a picture to the native file system.

The activities and views to preview the camera, display the picture for review and accept user input.

Example: Simple Twitter Client

We'll create a activities that accept a username and password, connect to Twitter, view Twitter history and post a Tweet. This will demonstrate making connections over the network, OAuth login, and various views and widget.

Submitting to the App Store

Version the manifest file

Build the .apk file

Digitally sign it

Create developer account

Upload to Google Play developer console