

# Introduction to the Google Android Platform



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# Overview



- **Android Basics – What is it?**
- **Application Development 101**



# What is Android



- **OS**
  - Linux Kernel
  - Mobile Hardware support
- **Tools**
  - Libraries written in C/C++ (libc)
  - Java based Application Framework
    - ✦ Dalvik VM – DEX Executables
- **Complete, Open, Free platform**
- **Latest Version: 4.0**



# What is Android



- **Feature**

- **Integrated browser** based on the open source WebKit engine
- **SQLite** for relational data storage
- **Media support** for common audio, video, and still image formats (MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)
- **Dalvik Virtual Machine** optimized for mobile devices

- **Hardware Support**

- **Cellular networking** : GSM, EDGE, 3G, 4G (hardware dependent)
- **Bluetooth, Wi-Fi, NFC** (hardware dependent)
- **Graphics Hardware Acceleration**
- **Camera, GPS and Compass** (hardware dependent)
- **Touch screen and accelerometer** for motion sensing



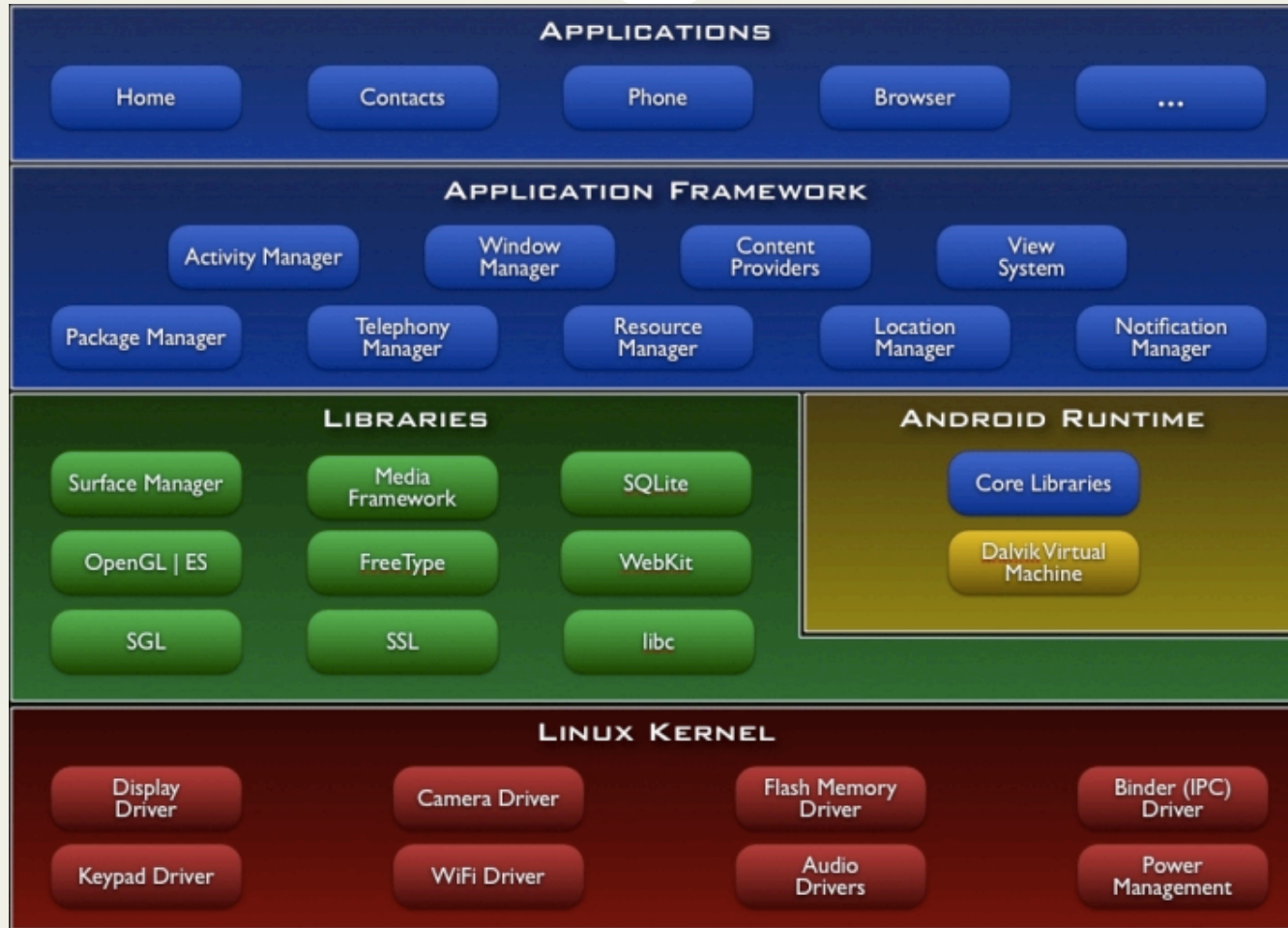
# What does it look like?



- **Simple Navigation around the emulator...**
  - **Home screen**
    - ✦ **Widget**
    - ✦ **Shortcut**
    - ✦ **Folder**
  - **Notification Bar**
  - **Application List**
  - **Buttons**
    - ✦ **Home**
    - ✦ **Back**
    - ✦ **Menu**
      - **Setting**



# System Architecture



# SDK & IDE



- **Rich development environment**
  - **Device emulator (avd)**
  - **Tools for debugging**
    - ✦ **Android Debug Bridge (adb)**
    - ✦ **Dalvik Debug Monitor Server (ddms)**
  - **Plug-in for the Eclipse IDE**
    - ✦ **Android Development Tools (adt)**



# SDK & IDE Requirement



- **Requirement**

- **OS:**

- ✦ Linux
    - ✦ Windows
    - ✦ Mac

- **Pre install:**

- ✦ Eclipse
    - ✦ JDK



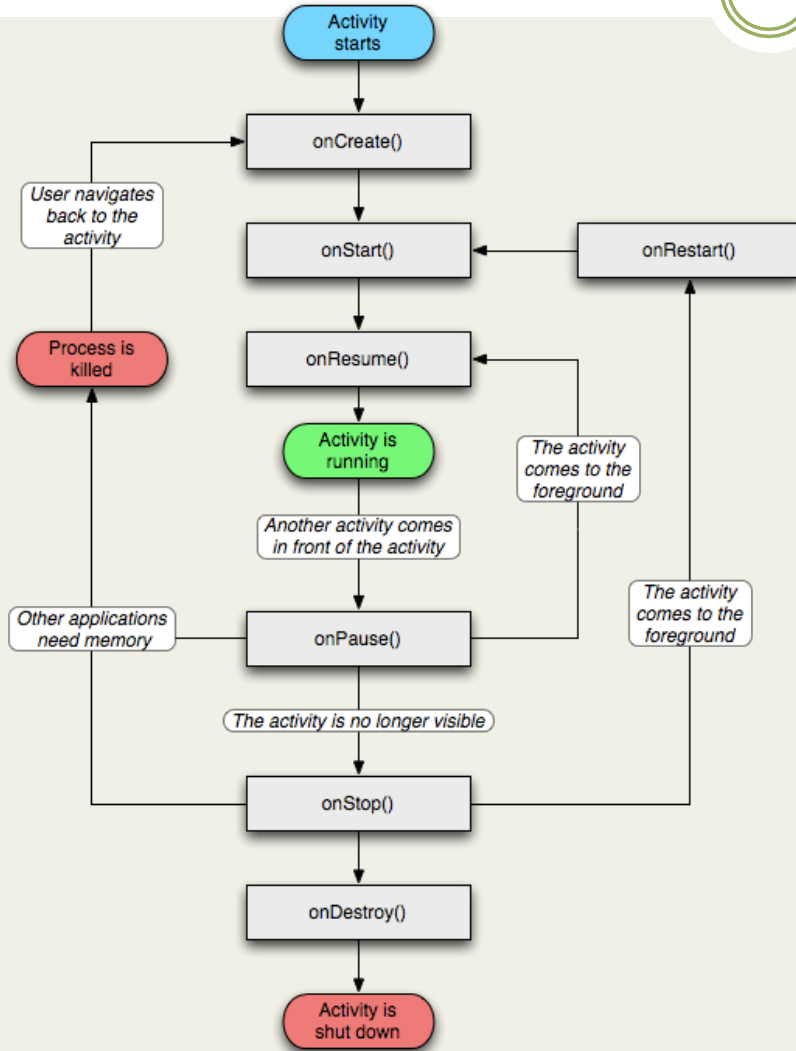
# Application Building Blocks



- **Layouts**
  - Contains UI components
- **Activity**
  - Typically correspond to one screen
- **Intent Receiver**
  - Respond to intent (notification)
  - Start your app.
- **Service**
  - Runs in the background
- **Content Provider**
  - Provide data to app.
  - Allow applications to share data



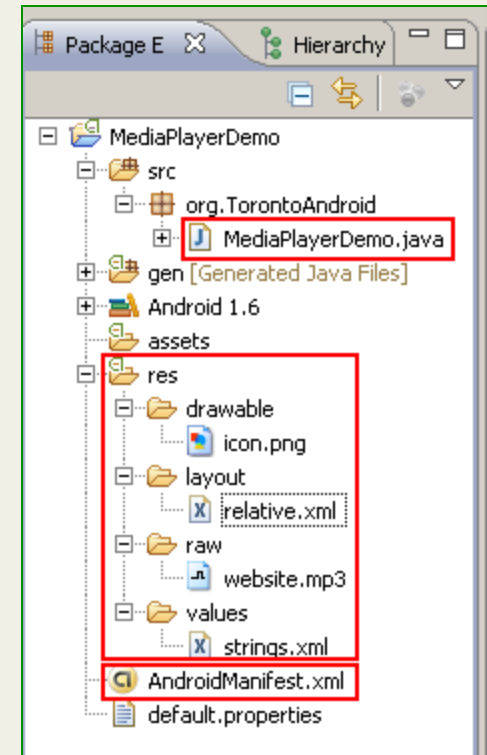
# Activity Lifecycle



# Android Project Structure



- Source (/src)
- Resource Directory (/res)
- AndroidManifest.xml



# AndroidManifest.xml



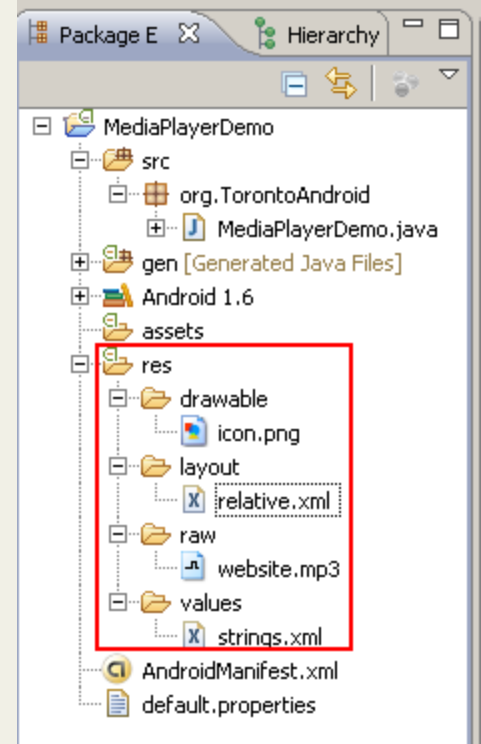
```
MediaPlayerDemo Manifest x MediaPlayerDemo.java
1<?xml version="1.0" encoding="utf-8"?>
2<manifest xmlns:android="http://schemas.android.com/apk/res/android"
3  package="org.TorontoAndroid" ← Package
4  android:versionCode="1"
5  android:versionName="1.0">
6  <application android:icon="@drawable/icon" android:label="@string/app_name">
7    <activity android:name=".MediaPlayerDemo" ← Class
8      android:label="@string/app_name">
9      <intent-filter>
10        <action android:name="android.intent.action.MAIN" />
11        <category android:name="android.intent.category.LAUNCHER" />
12      </intent-filter>
13    </activity> ← Application main entry point (e.g. launch from app. list)
14  </application>
15  <uses-sdk android:minSdkVersion="4" /> ← aka. Android 1.6
16</manifest>
```

- Required for each application (with precisely that name)
- Contains essential application info.
  - ✦ Package
  - ✦ Component(s) and intent it can handle
  - ✦ Permission
  - ✦ Min. API Level
  - ✦ Linked Library



# Resource Directory

- **Resources**
  - Are external elements referenced by your application
    - ✦ E.g. images, videos, audios, strings, layouts, themes... etc
  - Accessible by R class
    - ✦ E.g. R.layout.relative
- **Layout Files**
- **String Resources**



# Demo



# Conclusion



- **Android is**
  - **Open to all: industry, developers and users**
  - **As easy to build for as the web.**



# Resources



- **Install Android SDK**
  - <http://developer.android.com/sdk/installing.html>
- **Application Fundamentals**
  - <http://developer.android.com/guide/topics/fundamentals.html>
- **Developing in Eclipse (with ADT)**
  - <http://developer.android.com/guide/developing/projects/projects-eclipse.html>
  - <http://developer.android.com/resources/tutorials/hello-world.html>
  - <http://developer.android.com/resources/tutorials/views/index.html>
  - <http://developer.android.com/resources/tutorials/notepad/index.html>



# Contact Info



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