Computer Science E-76
Building Mobile Applications

Lecture 3: [Android] The SDK, Activities, and Views
February 15, 2011

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http://developer.android.com

Android | SDK and NDK

.java (code)
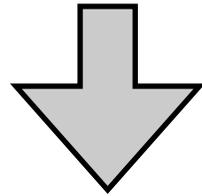
⬇ **javac** (compiler)

.class (bytecode)
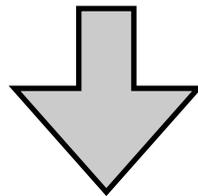
⬇ **dx** (converter)

.dex (Dalvik executable)
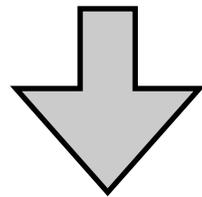
⬇ **zip**, **aapt**, etc. (archiver)

.apk (Android Package)

Building an App

.java (code)
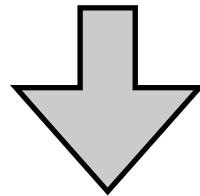
Eclipse (IDE)

.apk (Android Package)

Building an App

SDK

adb - Android Debug Bridge. A client/server program that manages the state of an emulated device. (*Now a platform tool)

android - Create/delete/view Android Virtual Devices and update the SDK with new platforms/add-ons.

SDK | Tools

emulator - The application responsible for opening AVDs instances.

sqlite3 - manage SQLite databases.

SDK | Tools

- No support for placing or receiving actual phone calls. You can simulate phone calls (placed and received) through the emulator console, however.
- No support for USB connections
- No support for camera/video capture (input).
- No support for device-attached headphones
- No support for determining connected state
- No support for determining battery charge level and AC charging state
- No support for determining SD card insert/eject
- No support for Bluetooth

SDK | Emulator Limitations

 # aapt - Android Asset Packaging Tool.

 # dx - The converter; converts .class files to Android bytecode.

SDK | Platform Tools

`telnet localhost <console-port>`

console-port: 5554+2n
where n is the emulator number (0th, 1st, 2nd)

Use commands like:

`redir, power, geo, network, gsm, sms`

SDK | Emulator Console

Data from 1/4/2011. From: http://developer.android.com/resources/dashboard/platform-versions.html

SDK | Platform Versions
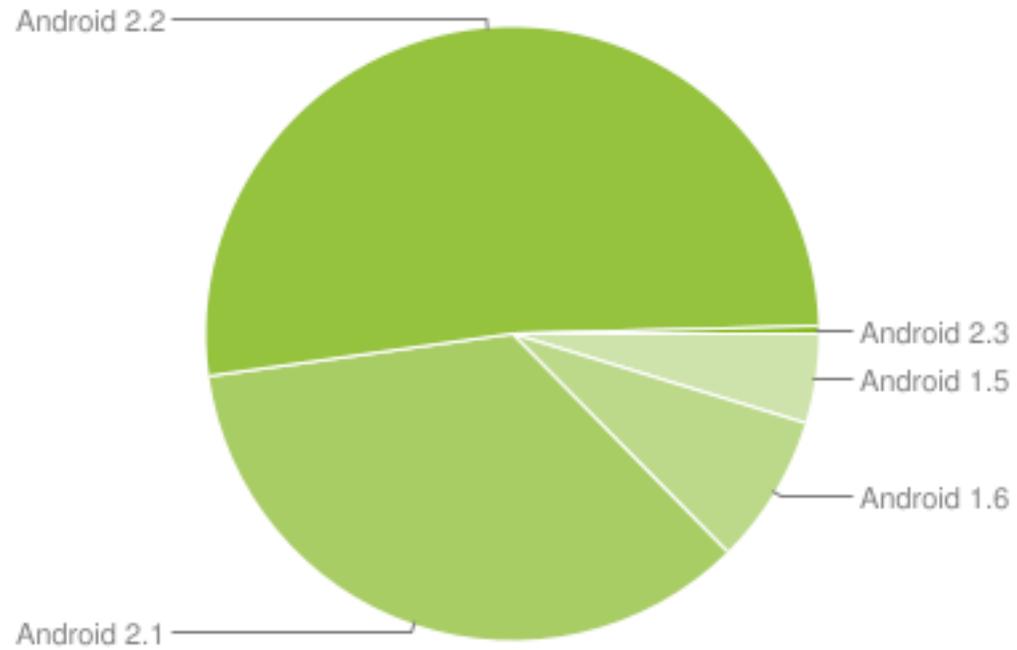
Android 2.2
Android 2.3
Android 1.5
Android 1.6
Android 2.1
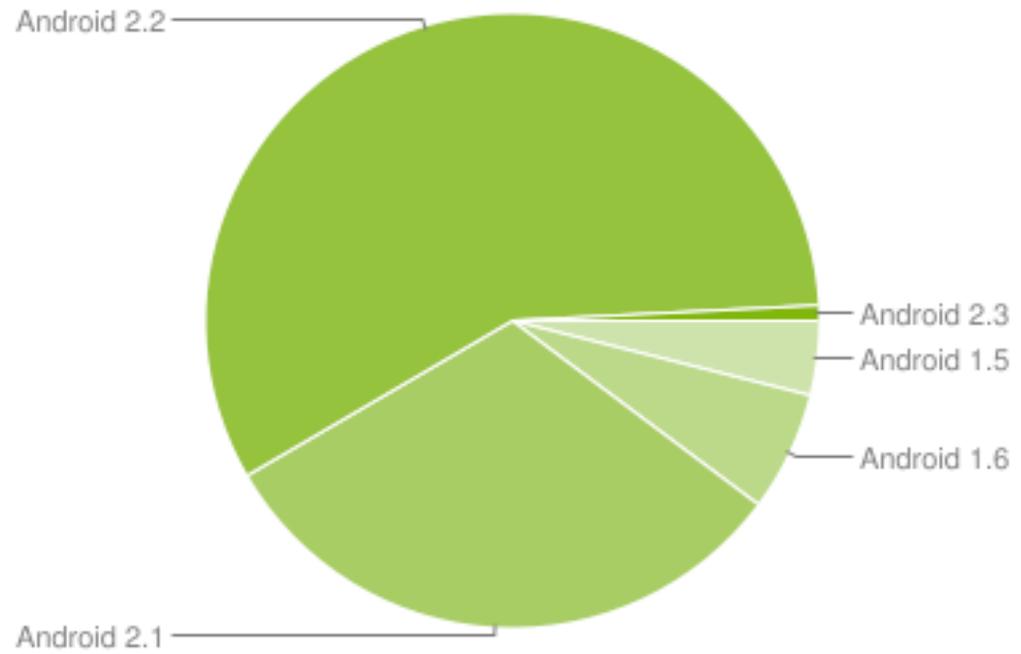
Current as of 2/2/2011. From: http://developer.android.com/resources/dashboard/platform-versions.html

SDK | Platform Versions

Normal / hdpi

Small / ldpi

Normal / ldpi

Normal / mdpi
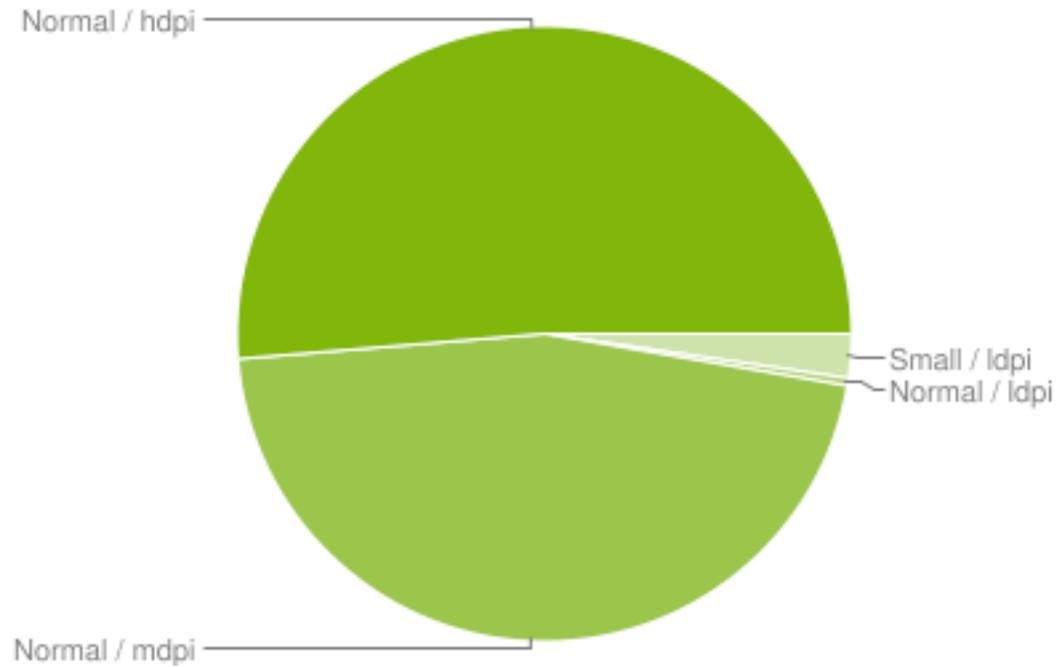
Data collected during 2 weeks in Jul 2010. From: http://developer.android.com/resources/dashboard/screens.html

SDK | Screen Sizes & Densities

```
package com.android.helloworld;

import android.app.Activity;
import android.os.Bundle;
import android.widget.TextView;

public class HelloWorld extends Activity {
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        TextView tv = new TextView(this);
        tv.setText("Hello, World!");
        setContentView(tv);
    }
}
```

Code adapted from: http://developer.android.com/resources/tutorials/hello-world.html

Hello, World!

```java
public class Activity extends ApplicationContext {
    protected void onCreate(Bundle savedInstanceState);

    protected void onStart();

    protected void onRestart();

    protected void onResume();

    protected void onPause();

    protected void onStop();

    protected void onDestroy();
}
```

http://developer.android.com/reference/android/app/Activity.html

Activity Methods

http://developer.android.com/reference/android/app/Activity.html
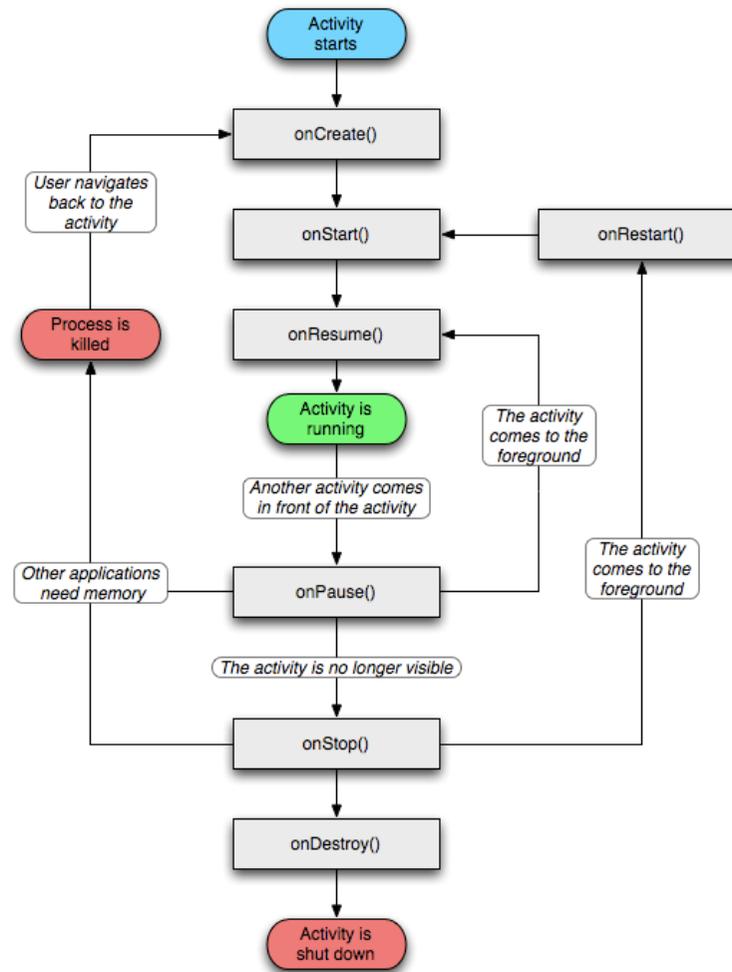
Activity Lifecycle

```java
TextView tv = new TextView(this);
tv.setText("Hello, Android");
```

– or –

```xml
<?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  android:text="@string/hello"/>
```

http://developer.android.com/resources/tutorials/hello-world.html

Creating a UI

http://developer.android.com/guide/topics/ui/index.html
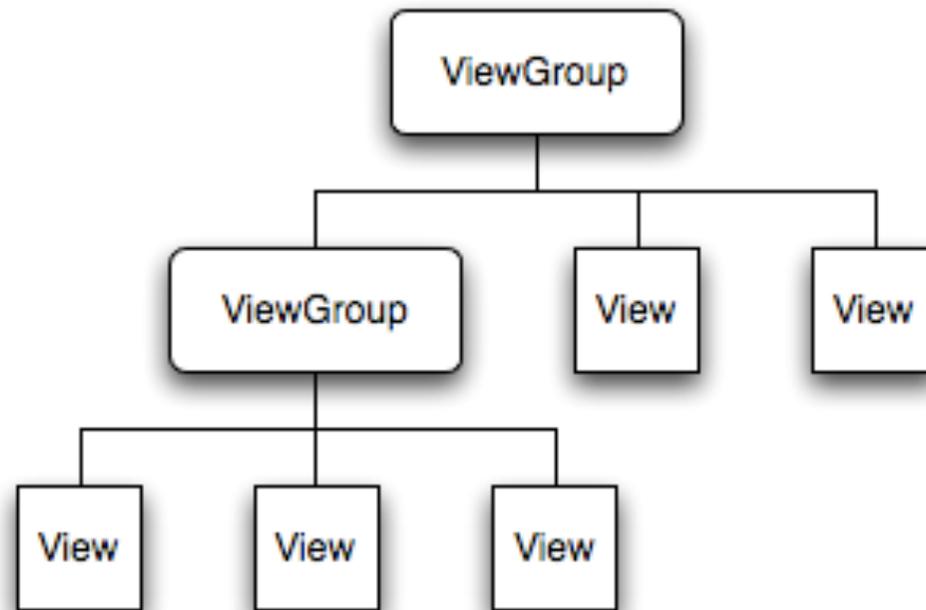
Views | Layouts

FrameLayout
Gallery
GridView
LinearLayout
ListView
RelativeLayout
ScrollView
Spinner
SurfaceView
TabHost
TableLayout
ViewFlipper
ViewSwitcher

More: http://developer.android.com/reference/android/widget/package-summary.html

Views | Common Layouts

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