

Computer Science E-76

Building Mobile Applications

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

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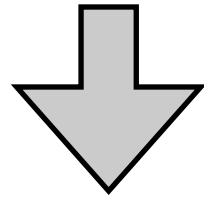


<http://developer.android.com>

Android

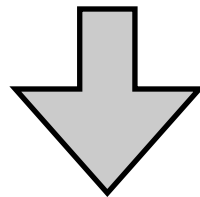
SDK and NDK

.java (code)



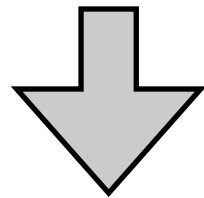
javac (compiler)

.class (bytecode)



dx (converter)

.dex (Dalvik executable)



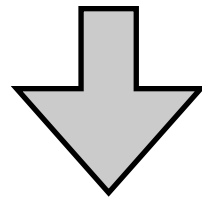
zip, aapt, etc. (archiver)

.apk (Android Package)



Building an App

.java (code)



Eclipse (IDE)

.apk (Android Package)



Building an App

android-sdk-mac_86

1 of 24 selected, 103.5 GB available

Name	Date Modified	Size	Kind
▶ add-ons	Nov 20, 2009 11:26 AM	--	Folder
▶ docs	Today, 9:32 AM	--	Folder
▶ platforms	Feb 12, 2010 1:59 PM	--	Folder
SDK Readme.txt	Nov 20, 2009 11:26 AM	4 KB	Plain Text
▶ temp	Feb 12, 2010 2:01 PM	--	Folder
▼ tools	Nov 19, 2009 11:35 AM	--	Folder
adb	Nov 19, 2009 11:34 AM	352 KB	Unix Executable File
android	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
apkbuilder	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
ddms	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
dmtracedump	Nov 19, 2009 11:34 AM	106 KB	Unix Executable File
draw9patch	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
emulator	Nov 19, 2009 11:35 AM	5.9 MB	Unix Executable File
hierarchyviewer	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
hprof-conv	Nov 19, 2009 11:34 AM	33 KB	Unix Executable File
▶ Jet	Nov 19, 2009 11:34 AM	--	Folder
layoutopt	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
▶ lib	Nov 19, 2009 11:35 AM	--	Folder
mkshcard	Nov 19, 2009 11:34 AM	29 KB	Unix Executable File
NOTICE.txt	Nov 19, 2009 11:35 AM	193 KB	Plain Text
source.properties	Nov 19, 2009 11:34 AM	4 KB	Document
sqlite3	Nov 19, 2009 11:34 AM	1.3 MB	Unix Executable File
traceview	Nov 19, 2009 11:35 AM	4 KB	Unix Executable File
zipalign	Nov 19, 2009 11:34 AM	229 KB	Unix Executable File



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)

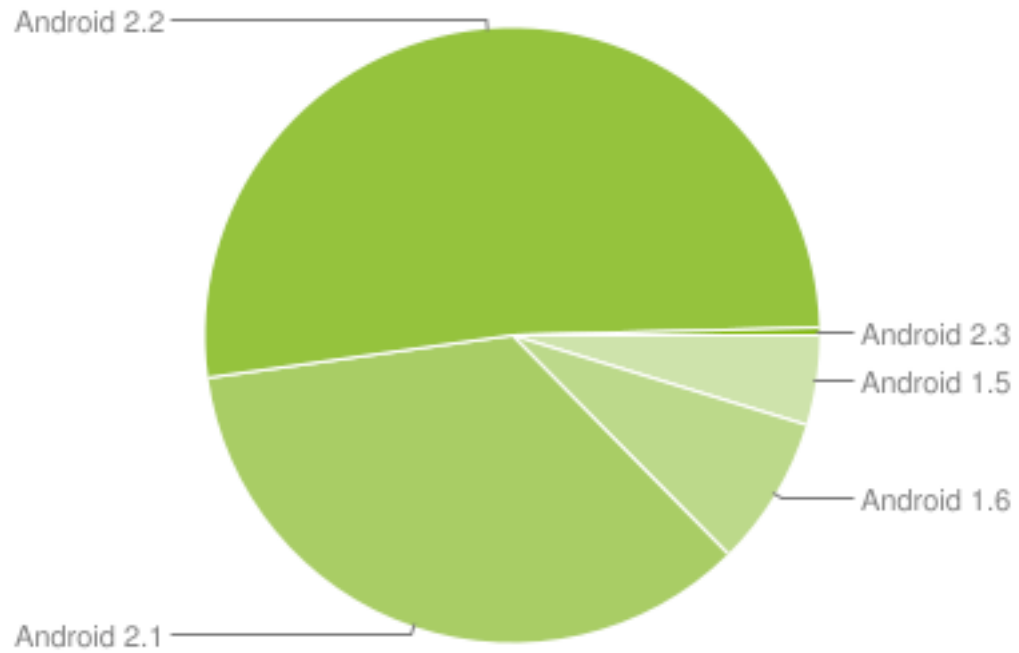
Use commands like:

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



SDK

Emulator Console

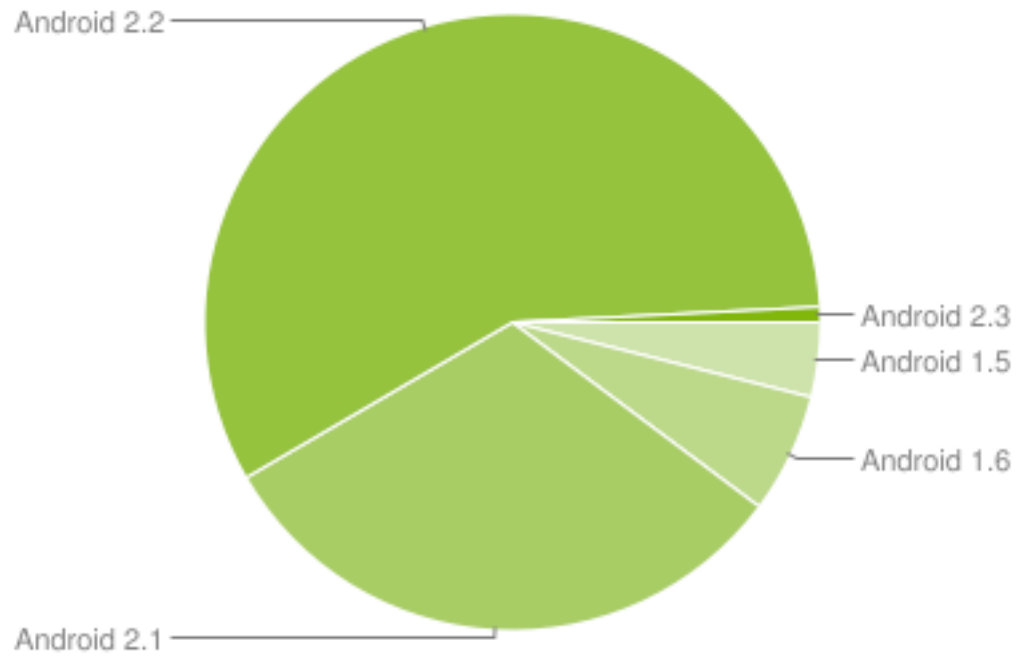


Data from 1/4/2011. From: <http://developer.android.com/resources/dashboard/platform-versions.html>



SDK

Platform Versions

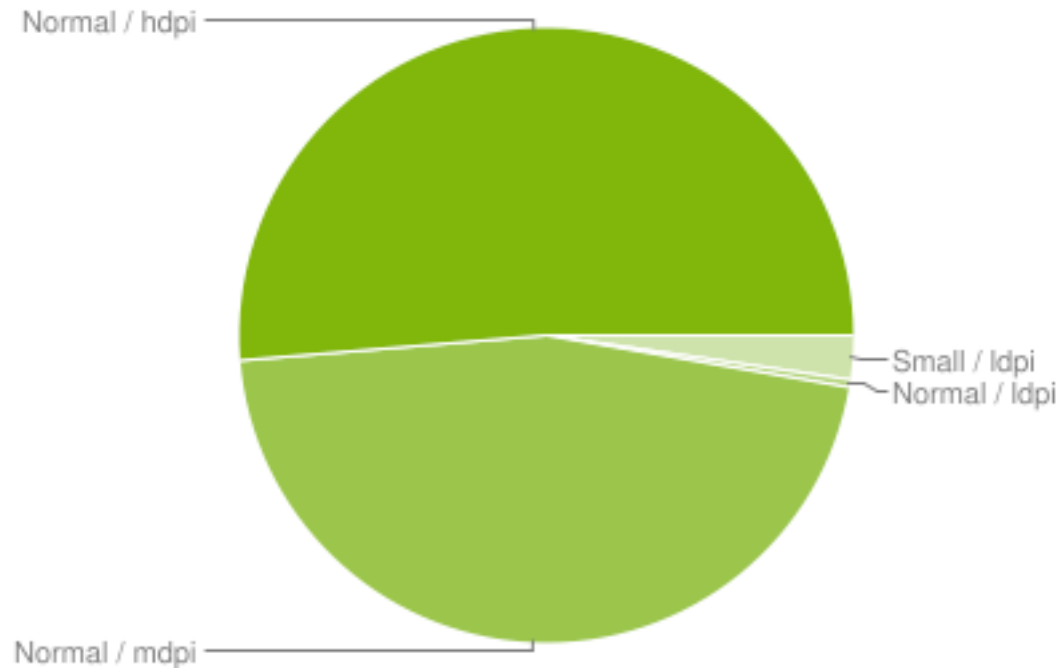


Current as of 2/2/2011. From: <http://developer.android.com/resources/dashboard/platform-versions.html>



SDK

Platform Versions



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!

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

    protected void onStart();

    protected void onRestart();

    protected void onResume();

    protected void onPause();

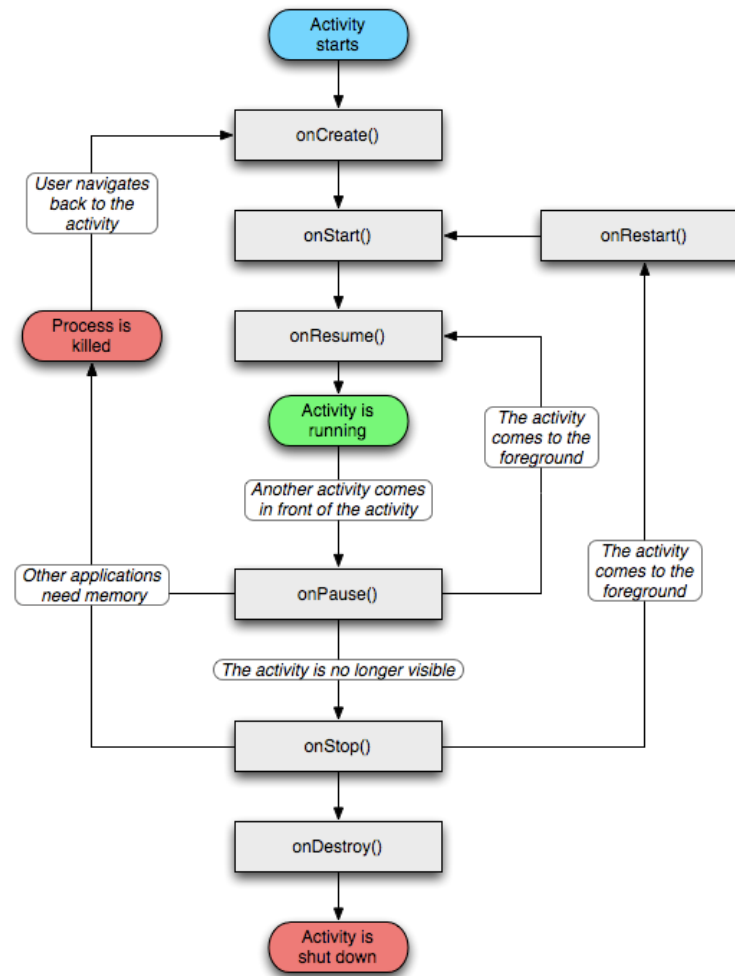
    protected void onStop();

    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


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

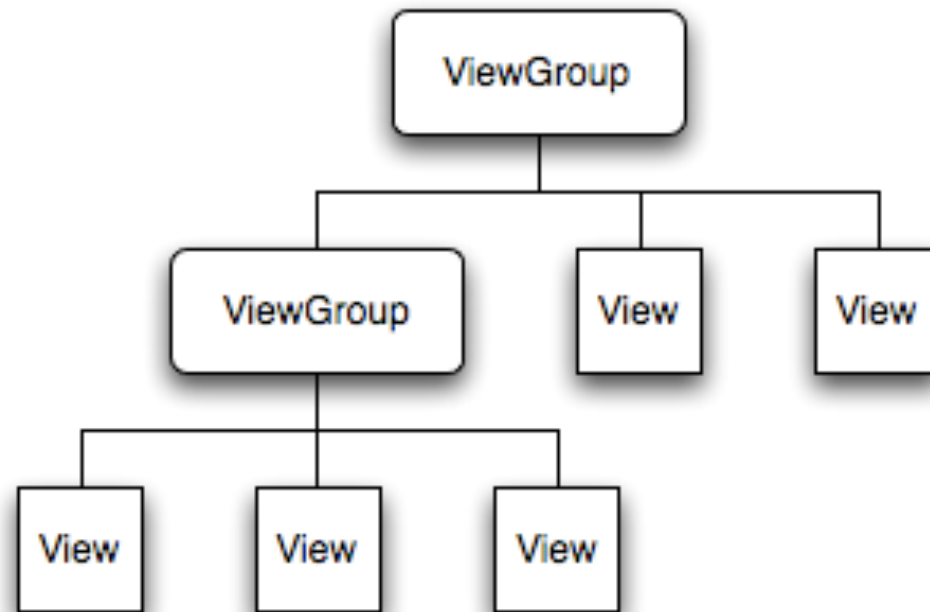
– Or –

```
<?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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