

Computer Science S-76

Building Mobile Applications

Lecture 3: [Android] The SDK, Activities, and Views
July 11, 2011

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Android Development Tools (ADT) has reached r12.

Please be sure to install any updated packages!

Android SDK and AVD Manager -> Installed Packages -> "Update All..."

Also Check:

Help menu -> Check for Updates



Important News!

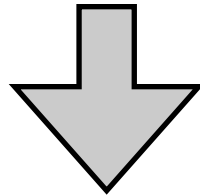


<http://developer.android.com>

Android

SDK and NDK

.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)

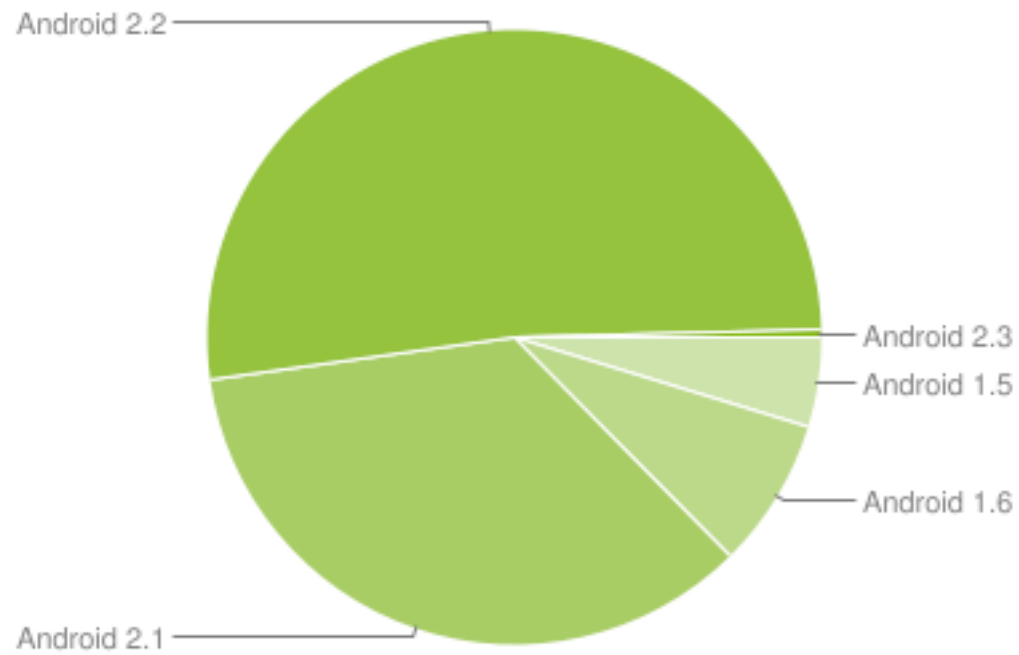
Use commands like:

redir, power, geo, network, gsm, sms



SDK

Emulator Console

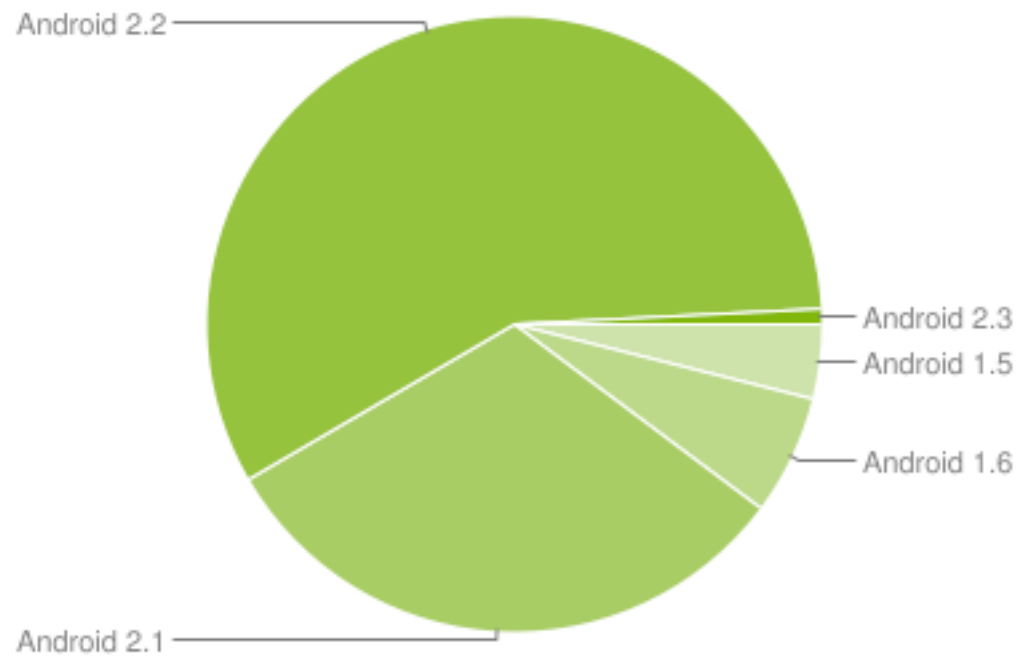


Data from 1/4/2011. From: <http://developer.android.com/resources/dashboard/platform-versions.html>



SDK

Platform Versions

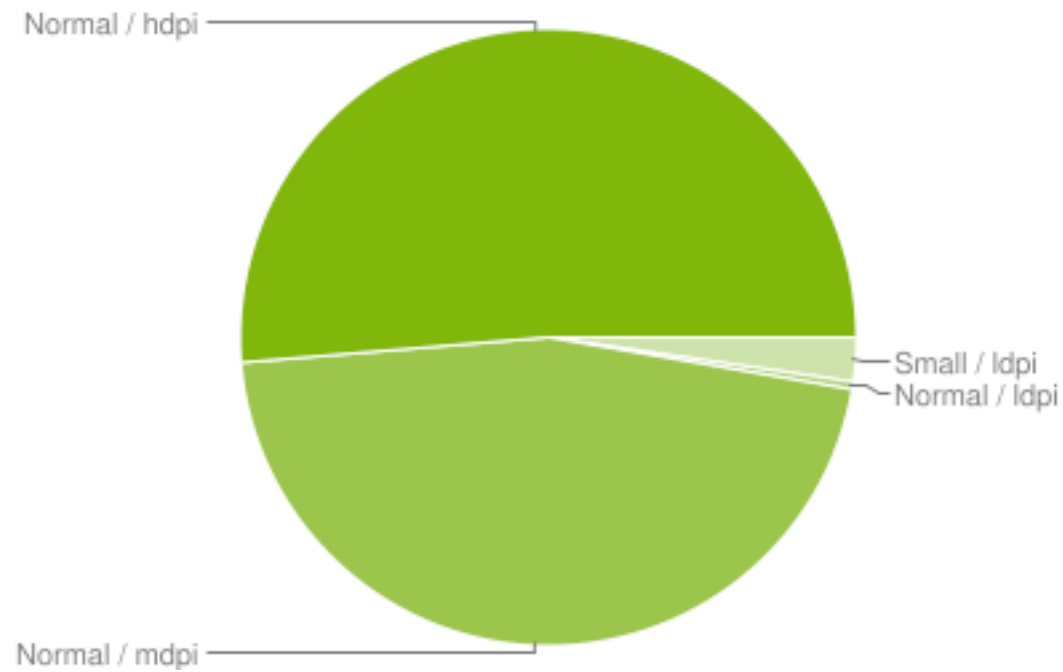


Current as of 2/2/2011. From: <http://developer.android.com/resources/dashboard/platform-versions.html>



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>



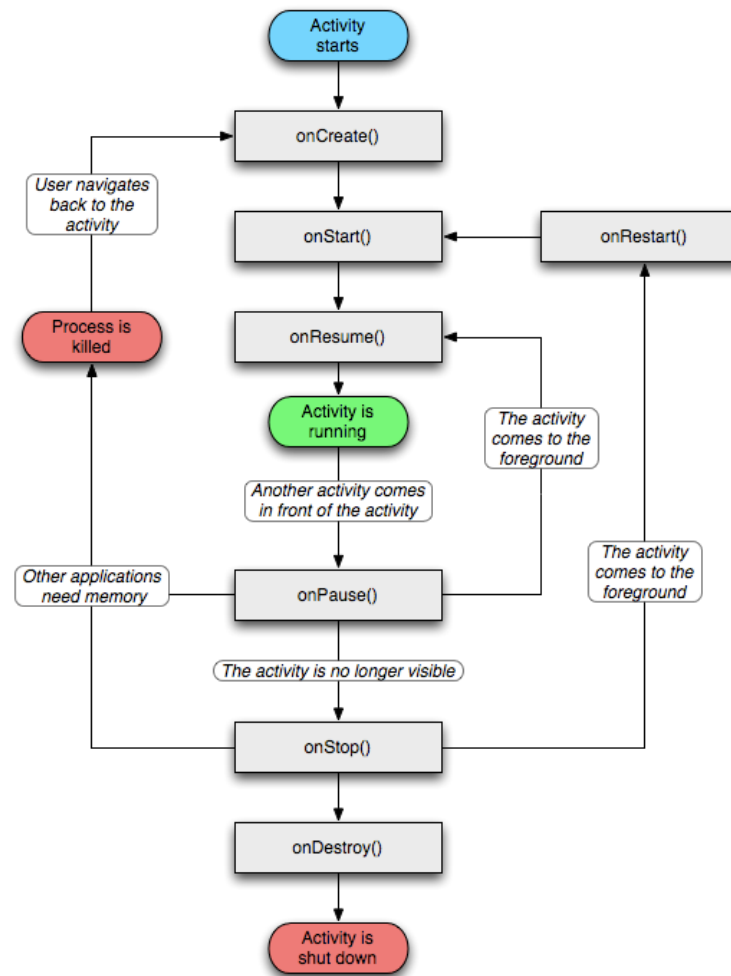
Hello, World!

```
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");
```

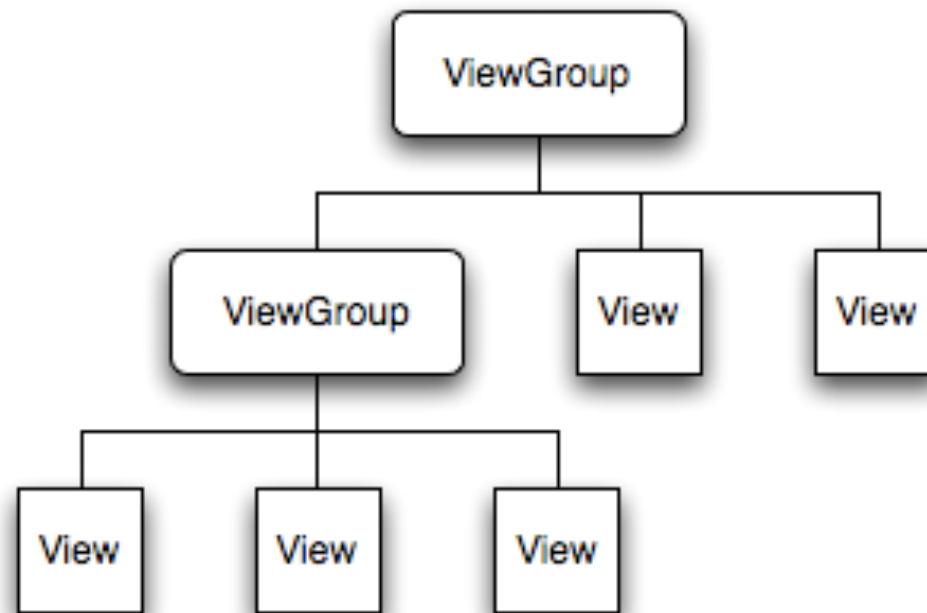
– Or –

```
<?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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