Android predavanje

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- Android
- Ruby on Rails
- iPhone

Android OS

Android OS

- koristi se za tablet i smartphone uređaje
- trenutno postoji preko 300 različitih telefona
- 900 000 novih uređaja se aktivira **dnevno**
- 330 000 000 uređaja je trenutno aktivno

Samsung Galaxy SIII

Izgled sučelja

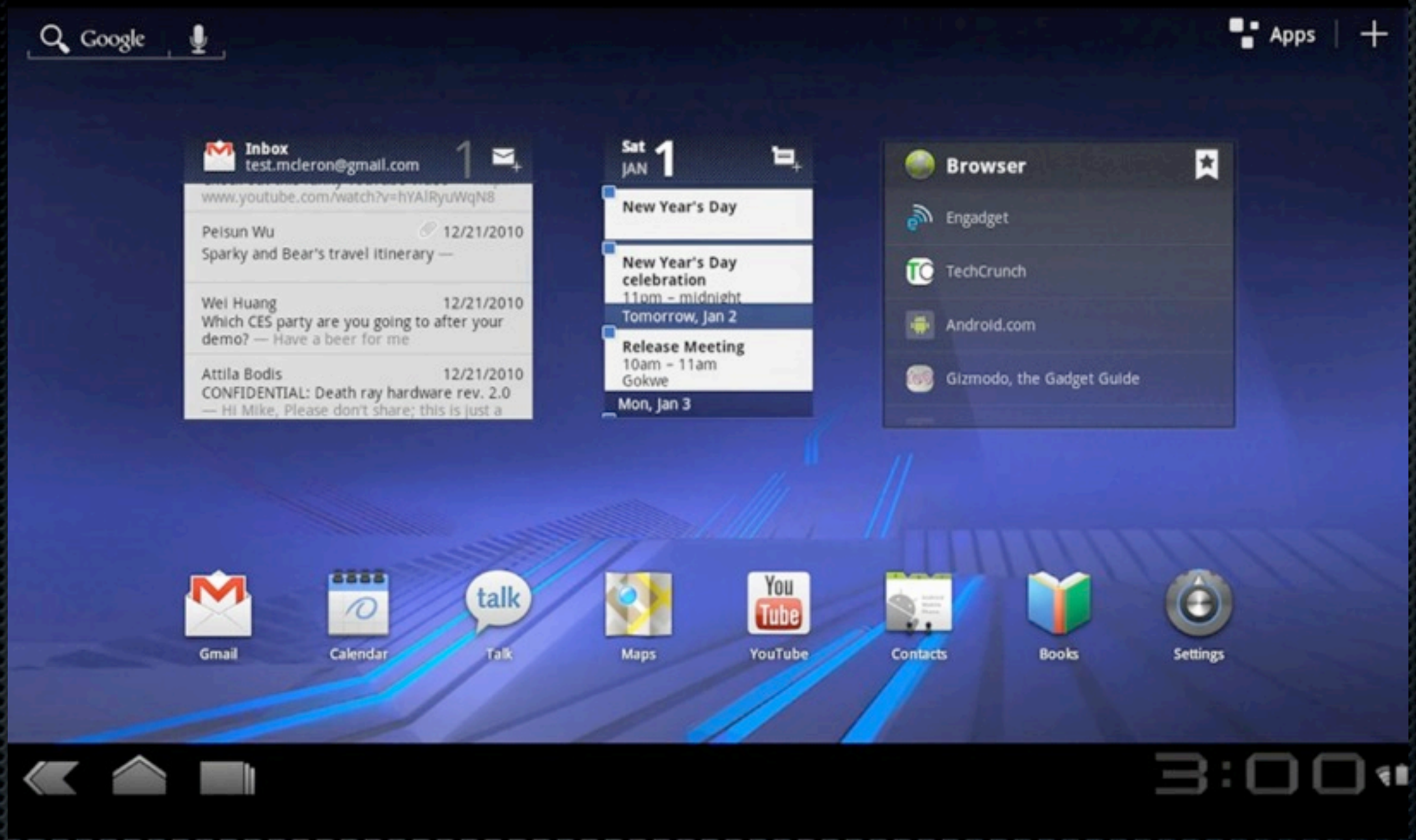
htc
htc
10:08 AM
10
08
AM
Barcelona
Mostly Sunny
Tue, Feb 15
12°
H: 16°
L: 10°
Tips
Market
Messages
Mail
Internet
Camera
Phone
WITH HTC SENSE

HTC Sense

Motorola MotoWiz

Samsung TouchWiz

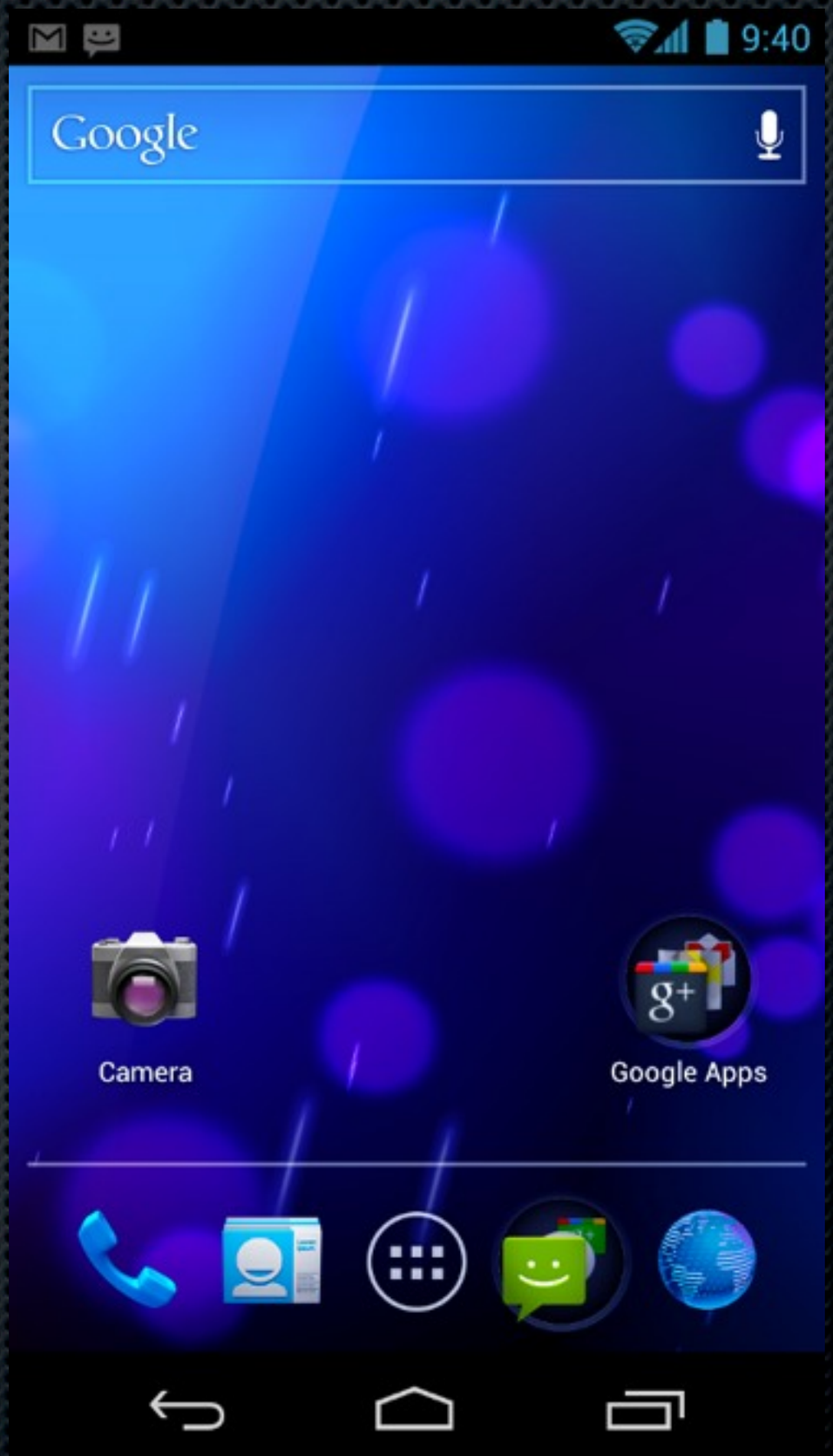
Sony Ericsson UX



Honeycomb 3.x

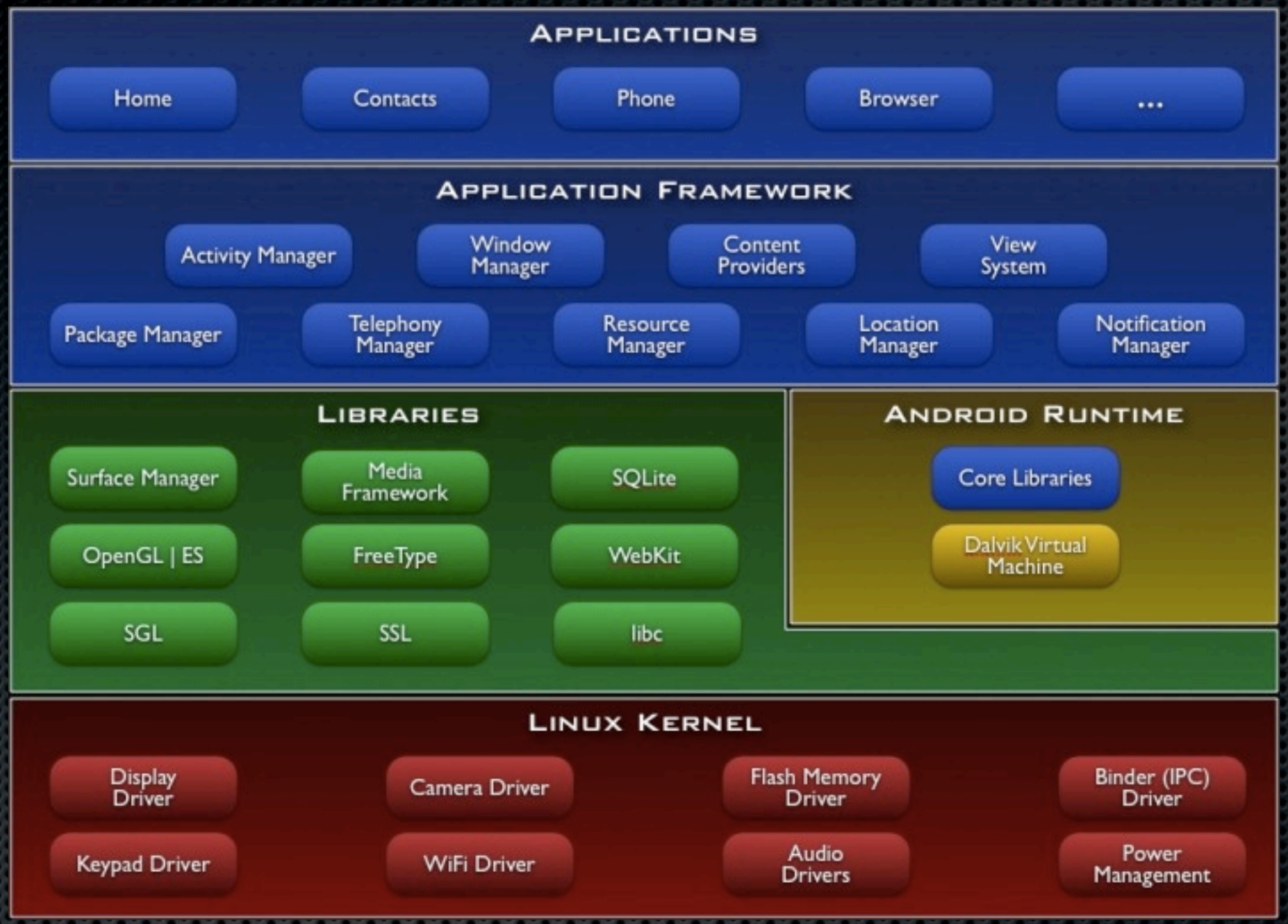
tablet računala

Android 4.0



@Arubin
Andy Rubin
the definition of open: "mkdir android ; cd android ; repo init -u git://android.git.kernel.org/platform/manifest.git ; repo sync ; make"
19 Oct via web
Favorite
Undo Retweet
Reply
Retweeted by iPadStoryNET and 100+ others

Open source...



Android Arhitecture

Android OS

- Linux based OS
- no **NIJE** Linux
- nema glibc
- nema X11
- nema konfiguracijske datoteke koje očekujemo
- nema ni sve alate koji dolaze s Linuxom

Application Framework

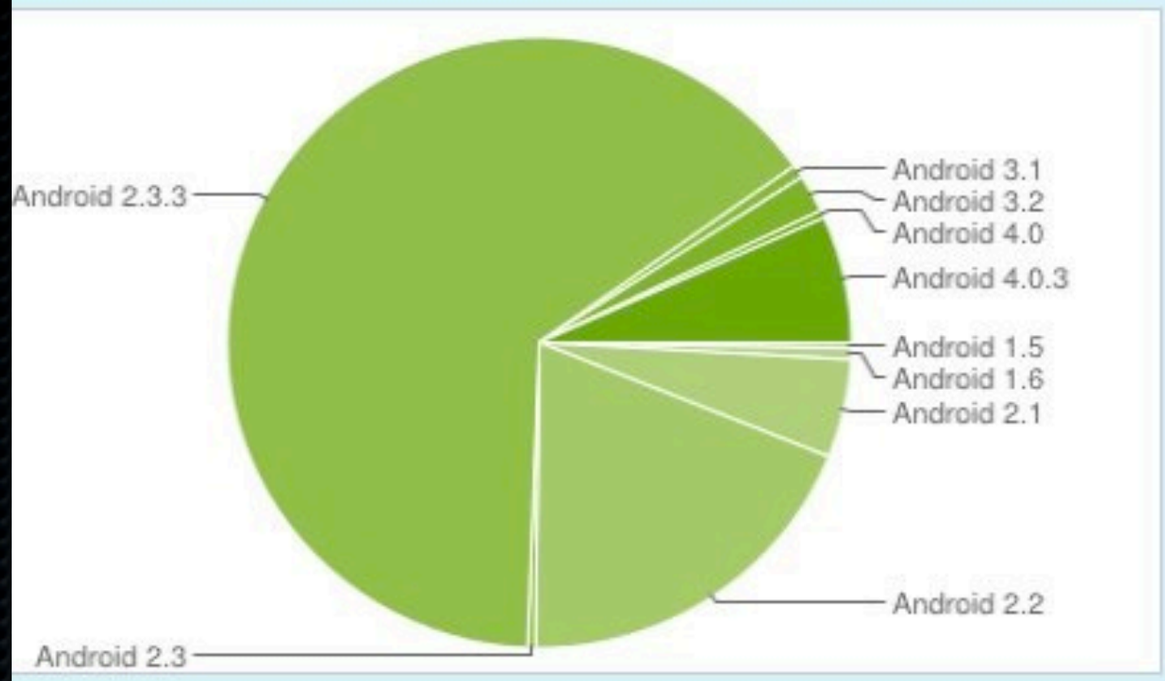
- Activity Manager
- Window Manager
- Content Providers
- View System
- Package Manager
- Telephony Manager
- Resource Manager
- Location Manager
- Notification Manager

Dalvik VM

- virtual machine koji izvršava Dalvik byte-code
- slično JVM, no **nije JVM**
- Java se kompajlira u **.dex** datoteke
- svaka aplikacija se izvršava u vlastitom sandboxu i na vlastitoj instanci VM-a
- Java SE 5

Applications

- uz OS dolazi i određeni set aplikacija
  - SMS
  - Calendar
  - Browser (Webkit)
  - Contacts
  - ....



Platform	Codename	API Level	Distribu
Android 1.5	Cupcake	3	0.3%
Android 1.6	Donut	4	0.6%
Android 2.1	Eclair	7	5.2%
Android 2.2	Froyo	8	19.1%
Android 2.3 - Android 2.3.2	Gingerbread	9	0.4%
Android 2.3.3 - Android 2.3.7		10	64.6%
Android 3.1	Honeycomb	12	0.7%
Android 3.2		13	2%
Android 4.0 - Android 4.0.2	Ice Cream Sandwich	14	0.4%
Android 4.0.3 - Android 4.0.4		15	6.7%

Raspodjela Android inačica

http://developer.android.com/resources/dashboard/platform-versions.html

	Low density (120), *ldpi*	Medium density (160), *mdpi*	High density (240), *hdpi*	Extra high density (320), *xhdpi*
Small screen	**QVGA (240x320)**		480x640	
Normal screen	**WQVGA400 (240x400)** **WQVGA432 (240x432)**	**HVGA (320x480)**	**WVGA800 (480x800)** **WVGA854 (480x854)** 600x1024	640x960
Large screen	**WVGA800** (480x800)** **WVGA854** (480x854)**	**WVGA800* (480x800)** **WVGA854* (480x854)** 600x1024		
Extra Large screen	1024x600	**WXGA (1280x800)**† 1024x768 1280x768	1536x1152 1920x1152 1920x1200	2048x1536 2560x1536 2560x1600

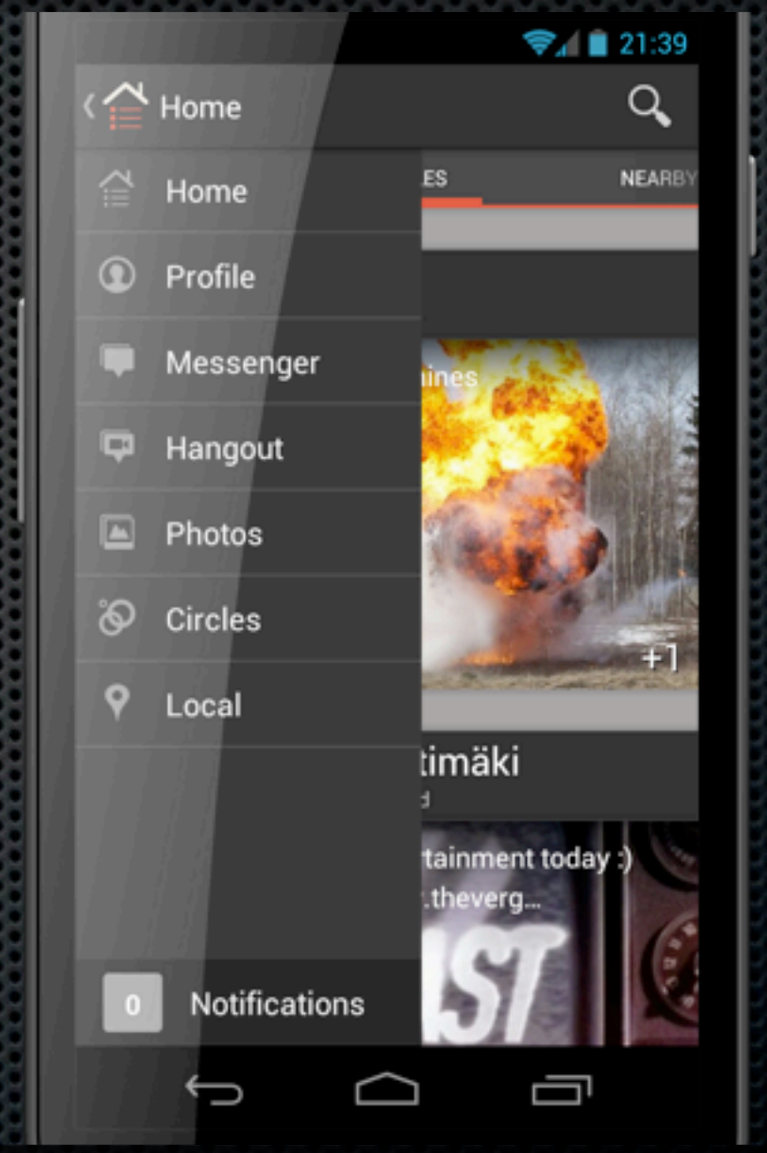
Različite rezolucije/orijentacije

```
res/layout/main_activity.xml            # For handsets
res/layout-land/main_activity.xml       # For landscape handsets
res/layout-sw600dp/main_activity.xml    # For tablets
```

Dashboard

most of the apps

Side navigation



Android Development

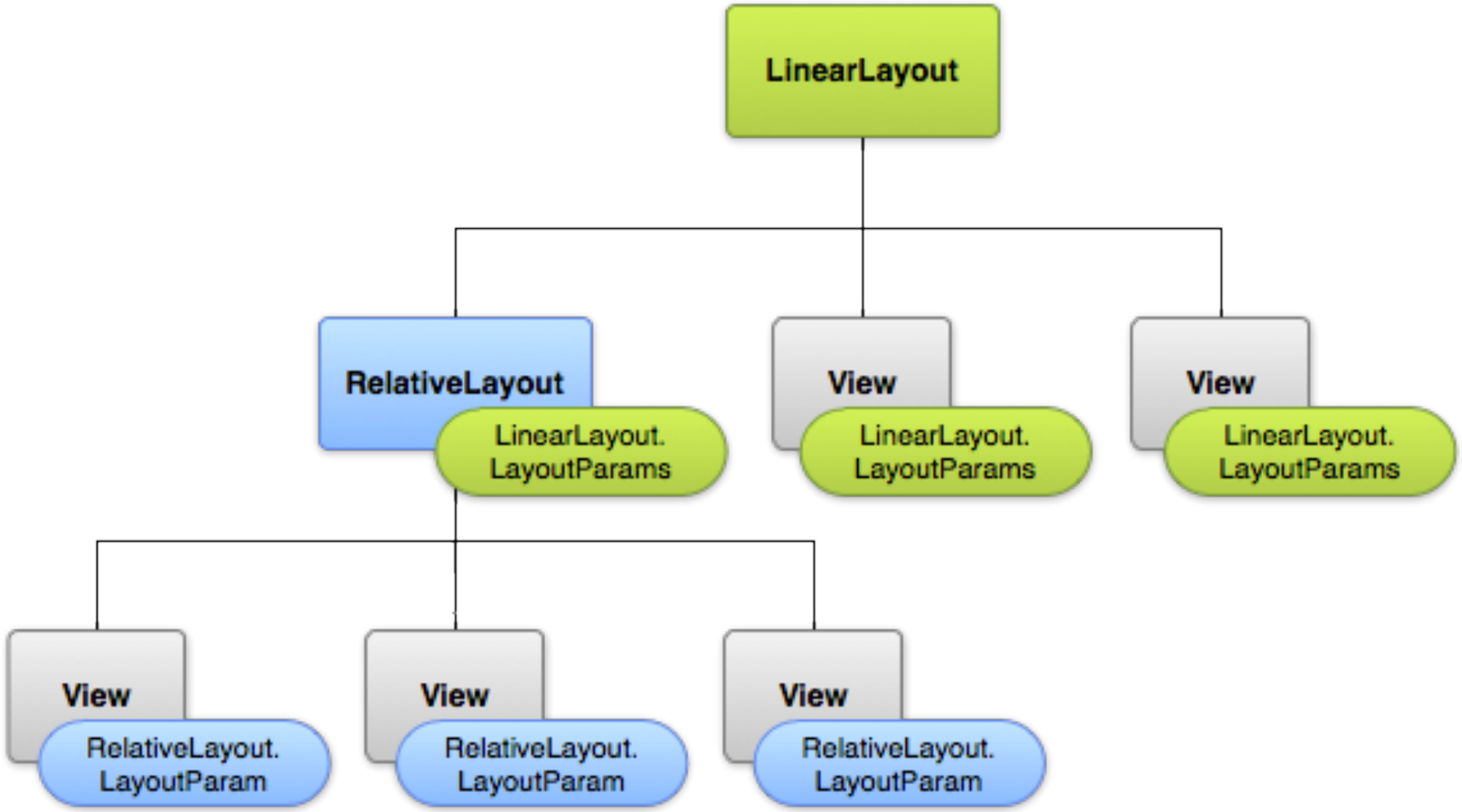
UI

layout.xml

- definiranje sučelja koristeći XML
- android:id="@+id/my_button”
- moguće učitavanje on runtime pomocu LayoutInflater servicea
  - super.onCreate(savedInstanceState);
  - setContentView(R.layout.main_layout);

Button

```
<Button android:id="@+id/my_button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/my_button_text"/>
```


LinearLayout
RelativeLayout
LinearLayout.
LayoutParams
View
LinearLayout.
LayoutParams
View
LinearLayout.
LayoutParams
View
RelativeLayout.
LayoutParam
View
RelativeLayout.
LayoutParam
View
RelativeLayout.
LayoutParam

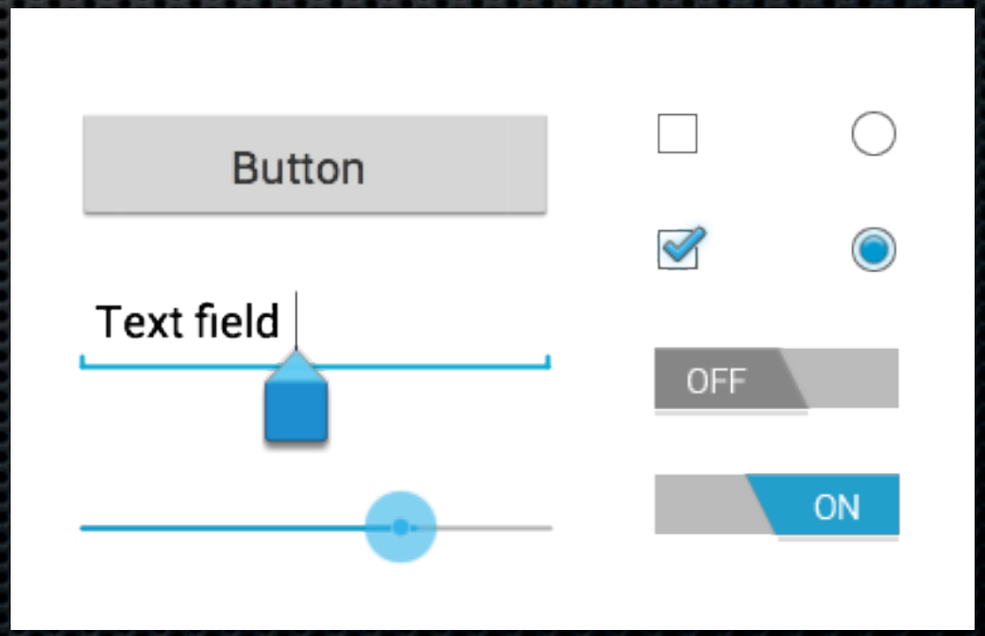
View system

Android Layouts

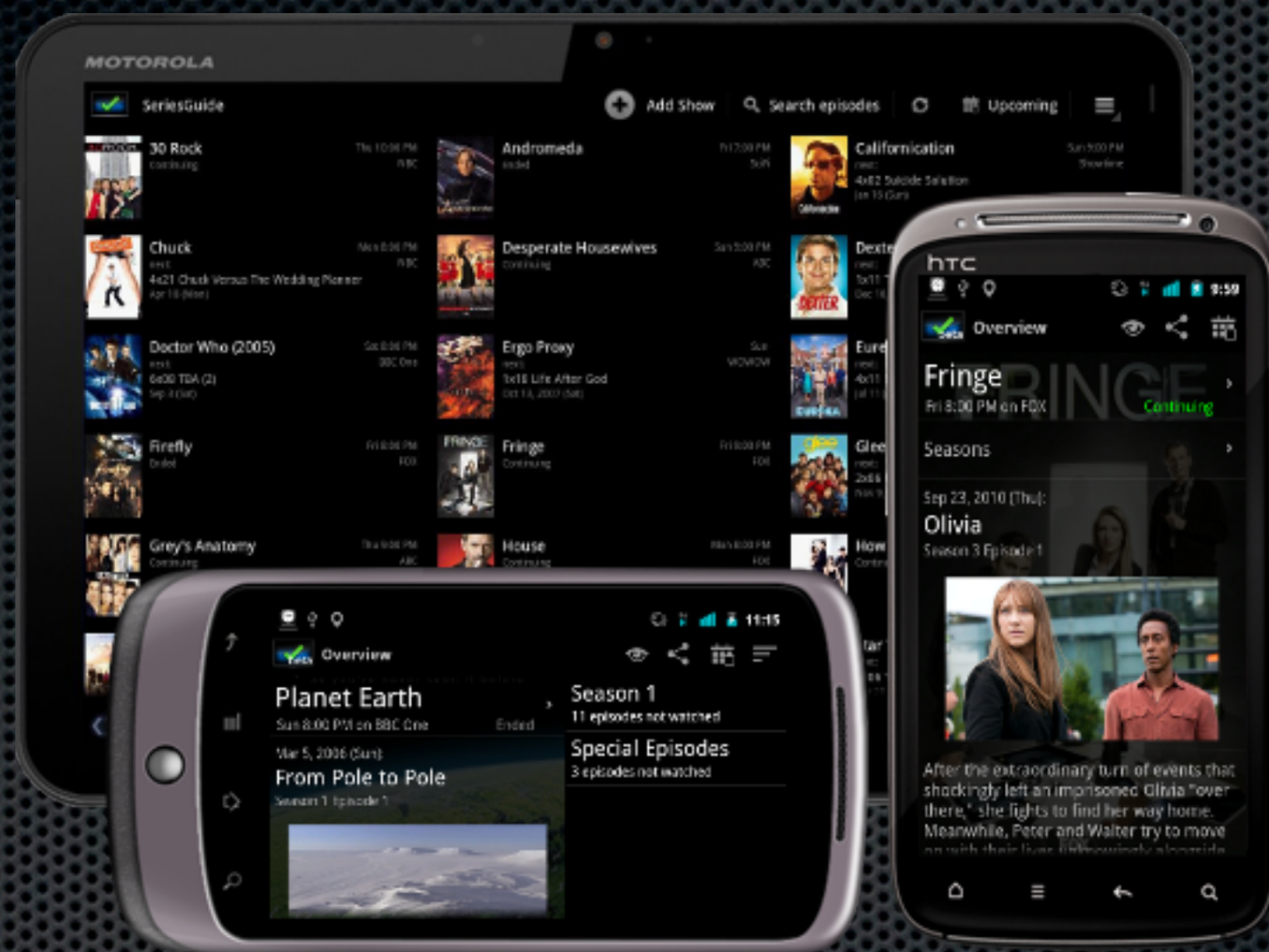
- FrameLayout
- LinearLayout
- RelativeLayout
- TableLayout
- Gallery

Android Widget Toolbox

- TextView
- EditText
- ListView
- Spinner
- Button
- CheckBox
- RadioButton
- http://developer.android.com/guide/tutorials/views/index.html



http://developer.android.com/design/index.html
http://www.androiduipatterns.com/



Actionbar Sherlock

http://actionbarsherlock.com/

Custom Components

- Extend an existing View class or subclass with your own class.
- Override some of the methods from the superclass. The superclass methods to override start with 'on', for example, onDraw(), onMeasure(), and onKeyDown(). This is similar to the on... events in Activity or ListActivity that you override for lifecycle and other functionality hooks.
- Use your new extension class. Once completed, your new extension class can be used in place of the view upon which it was based.
- example: extend ImageView and add some rounded border
- http://developer.android.com/guide/topics/ui/custom-components.html

New project example

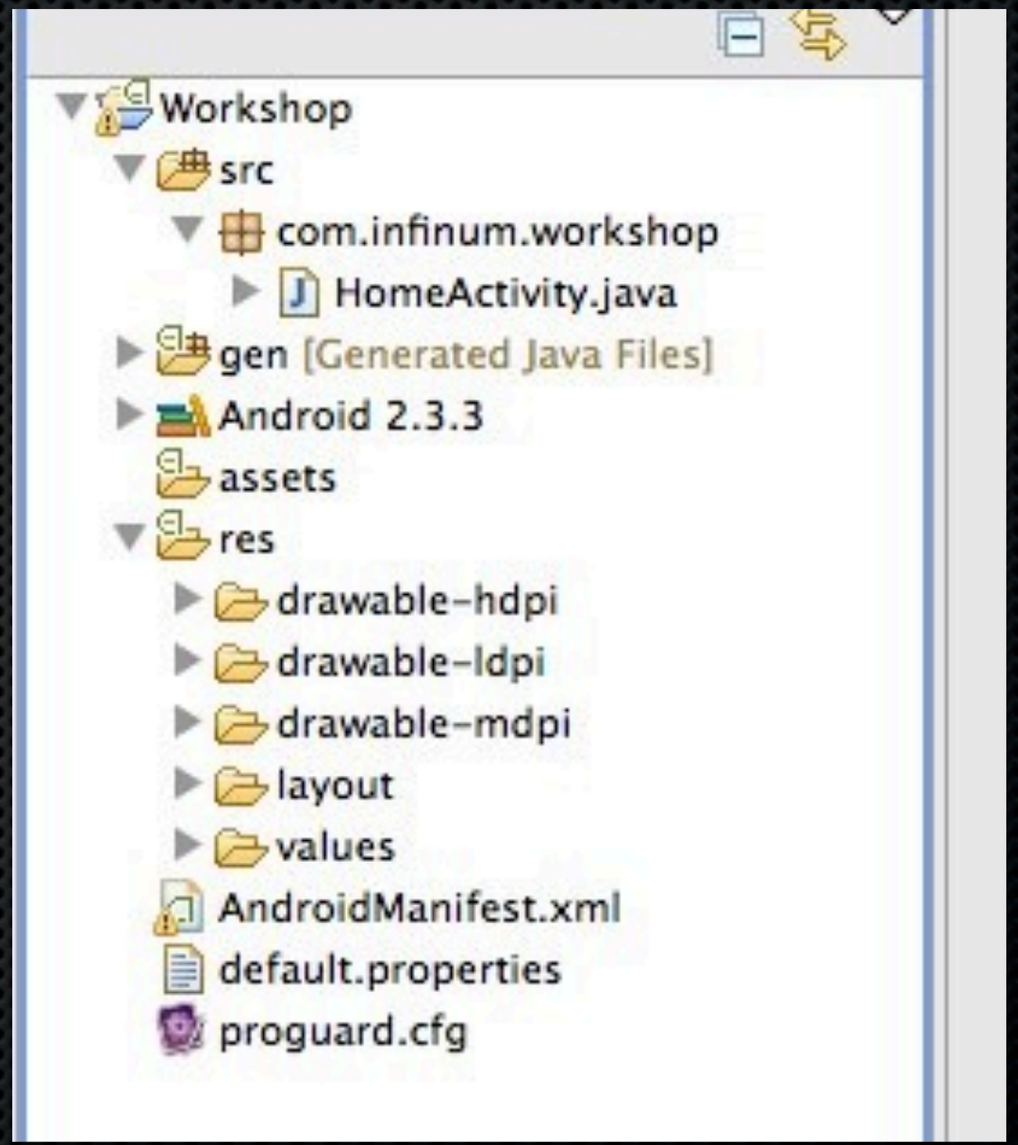
Project

src/

assets/

res/

AndroidManifest.xml



Workshop Manifest

Android Manifest Application

Application Toggle

The application tag describes application-level components contained in the package, as well as general application attributes.

Define an <application> tag in the AndroidManifest.xml

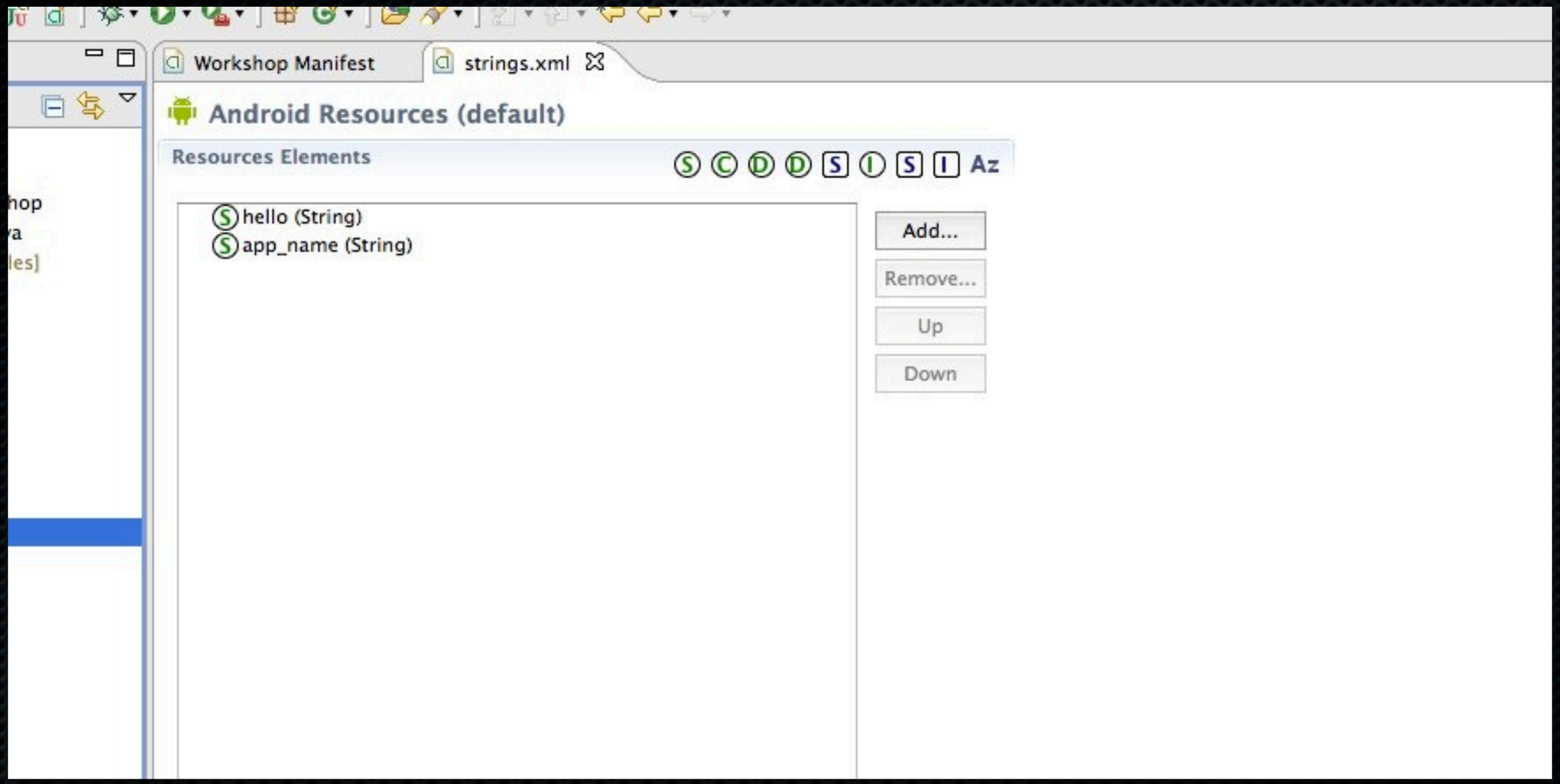
Application Attributes

Defines the attributes specific to the application.

Name		Browse...	Debuggable		
Theme		Browse...	Vm safe mode		
Label	@string/app_name	Browse...	Manage space activity		Browse...
Icon	@drawable/icon	Browse...	Allow clear user data		
Description		Browse...	Test only		
Permission			Backup agent		Browse...
Process		Browse...	Allow backup		
Task affinity		Browse...	Kill after restore		
Allow task reparenting			Restore needs application		
Has code			Restore any version		

AndroidManifest.xml

permissions, activity, name, icon


Workshop Manifest
strings.xml
Android Resources (default)
Resources Elements
hello (String)
app_name (String)
Add...
Remove...
Up
Down

strings.xml

Overriding resources

- res/values-en/strings.xml
- res/layout-land/main.xml
- res/drawable-ldpi/slika.png
- res/drawable-hdpi/slika.png

- http://developer.android.com/guide/topics/resources/providing-resources.html

Workshop Manifest | strings.xml | main.xml | R.java

```
/* AUTO-GENERATED FILE.  DO NOT MODIFY.

package com.infinum.workshop;

public final class R {
    public static final class attr {
    }
    public static final class drawable {
        public static final int icon=0x7f020000;
    }
    public static final class layout {
        public static final int main=0x7f030000;
    }
    public static final class string {
        public static final int app_name=0x7f040001;
        public static final int hello=0x7f040000;
    }
}
```

R.java

pointers from java to resources

R.java

- R.layout
- R.string
- R.drawable
- R.anim
- R.color

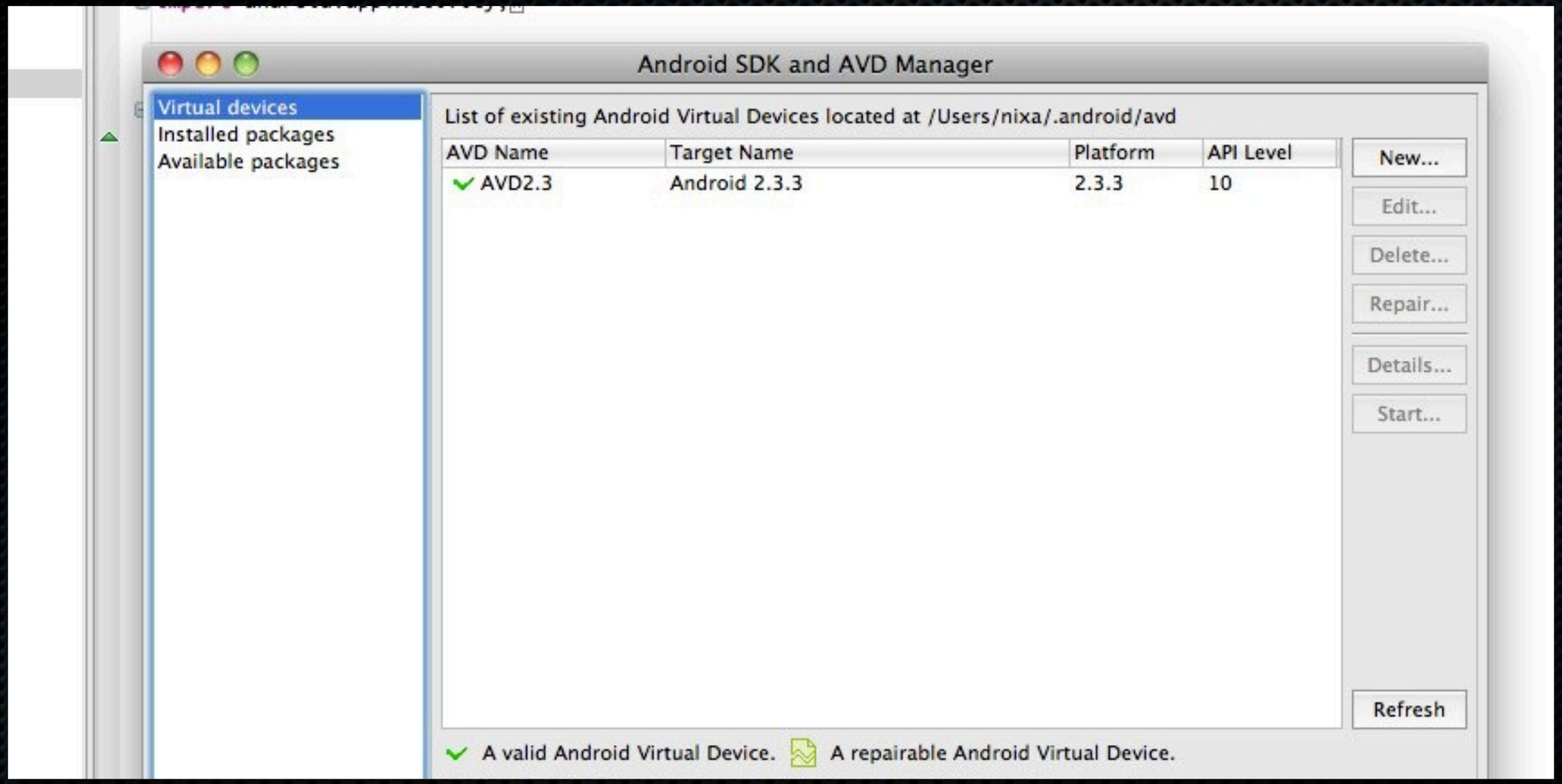
Workshop Manifest | strings.xml | main.xml | R.java | HomeActi

```java
package com.infinum.workshop;

import android.app.Activity;

public class HomeActivity extends Activity {
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
    }
}
```

HomeActivity.java



Android Emulator

napraviti ćemo novi AVD, koristite x86 ako mozete

```
nixa-macbook:tools nixa$ telnet localhost 5554
Trying ::1...
telnet: connect to address ::1: Connection refused
Trying fe80::1...
telnet: connect to address fe80::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Android Console: type 'help' for a list of commands
OK
help
Android console command help:

    help|h|?         print a list of commands
    event            simulate hardware events
    geo              Geo-location commands
    gsm              GSM related commands
    cdma             CDMA related commands
    kill             kill the emulator instance
    network          manage network settings
    power            power related commands
    quit|exit        quit control session
    redir            manage port redirections
    sms              SMS related commands
    avd              control virtual device execution
    window           manage emulator window
    qemu             QEMU-specific commands

try 'help <command>' for command-specific help
OK
```

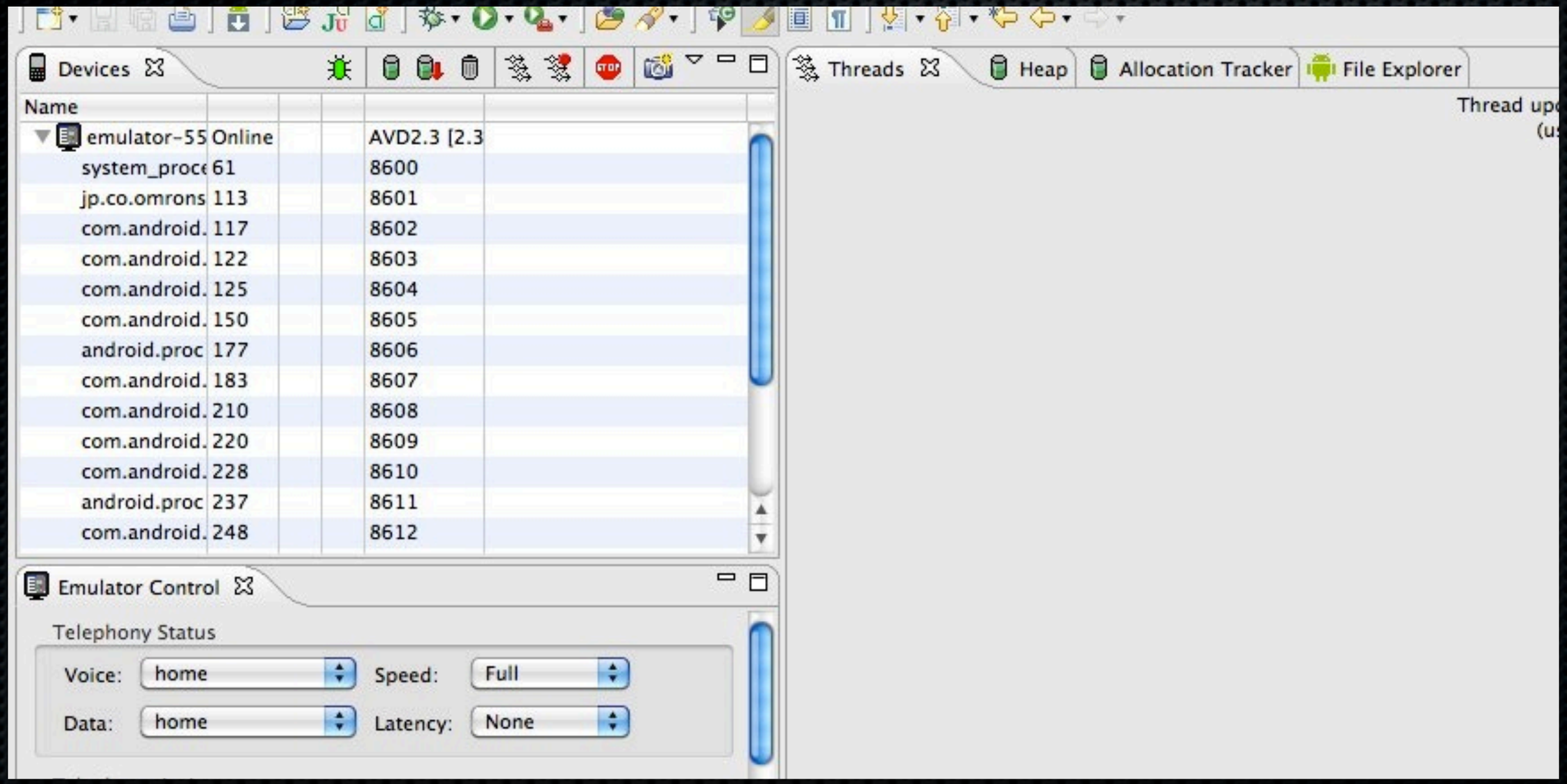
telnet localhost port

Terminal — ⌘1

bash | emulator | adb

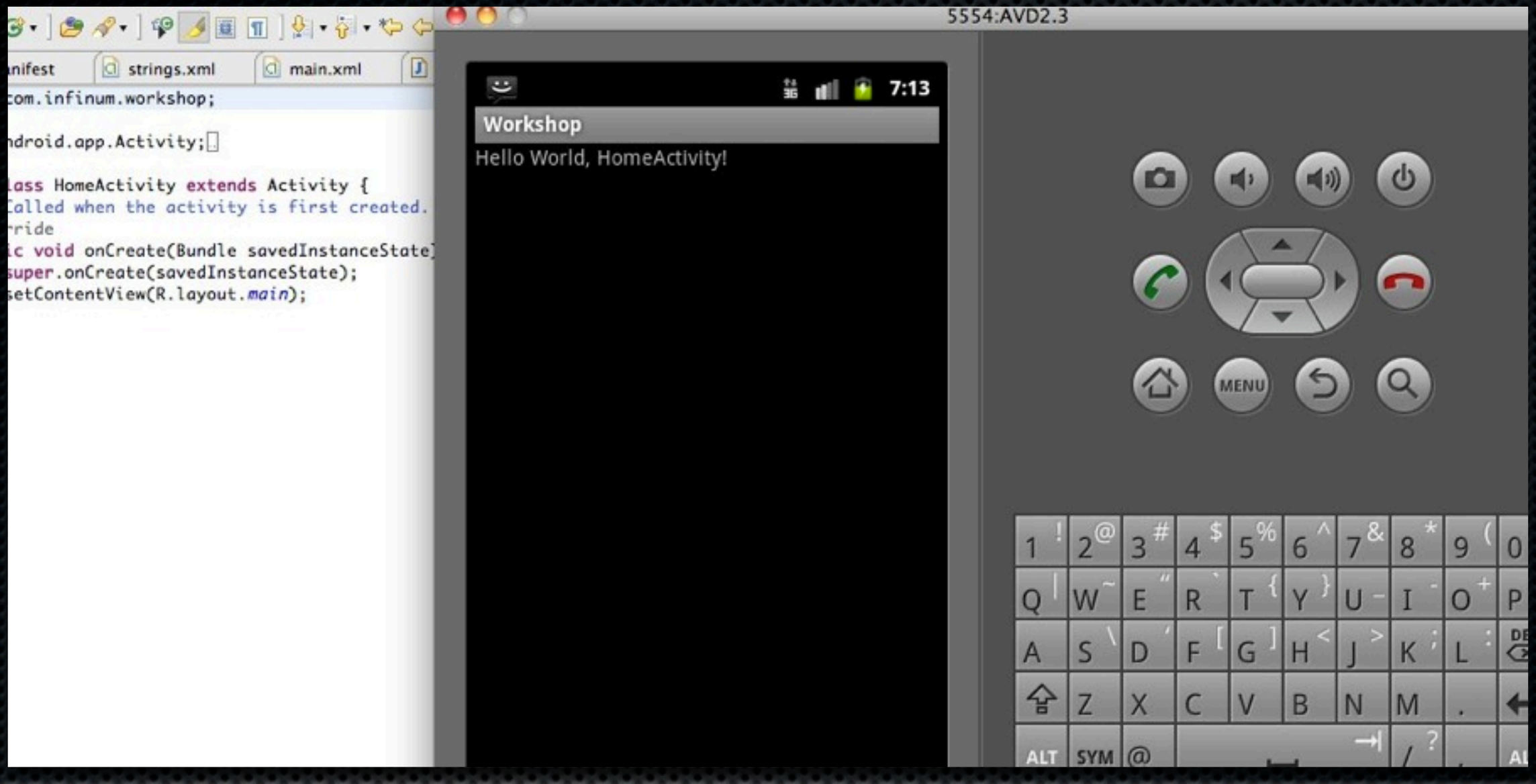
```
nixa-macbook:avd nixa$ ll
total 8
drwxrwxr-x   4 nixa  staff  136 15 Svi 15:45 .
drwxrwxr-x  10 nixa  staff  340 11 Tra 08:47 ..
drwxr-xr-x  11 nixa  staff  374 15 Svi 16:15 AVD2.3.avd
-rw-r--r--   1 nixa  staff   59 15 Svi 15:45 AVD2.3.ini
nixa-macbook:avd nixa$ cd AVD2.3.avd/
nixa-macbook:AVD2.3.avd nixa$ ls
cache.img              config.ini             sdcard.img             userdata-qemu.img      userdata.img
cache.img.lock         emulator-user.ini      sdcard.img.lock        userdata-qemu.img.lock
nixa-macbook:AVD2.3.avd nixa$
```

~/.android/avd



DDMS perspective

pozivi, sms, network speed



Pokretanje aplikacije

compiling, signing, deploying, running

ANT

- building from command line
- android update project -p .
- ant help :)

Android Debug Bridge

SDK/tools/adb

Command line install

adb install bin/Workshop.apk
adb uninstall com.infinum.workshop

Application components

- Activities
- Services
- ContentProviders
- Broadcast receivers

Activity lifecycle

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

Android Intents

- Intents are used as a message-passing mechanism that works both within your application, and between applications.
  - Declare your intention that an Activity or Service be started to perform an action, usually with (or on) a particular piece of data
  - Broadcast that an event (or action) has occurred
  - Explicitly start a particular Service or Activity

Explicit intents

- startActivity
  - Intent intent = new Intent(this, MyActivity.class);
  - startActivity(intent);
- startActivityForResults
  - Intent intent = new Intent(this, MyActivity.class);
  - startActivity(intent);

Implicit intents

- trazimo od OS-a da izabere pomocu cega ce izvrsiti Intent
  - Intent intent = new Intent(Intent.ACTION_CALL, Uri.parse(‘tel:0959115614’);
  - startActivity(intent);

DetailsActivity example

prenosenje i vracanje parametara s activitya na activity

Broadcasts

- Broadcasting intents
  - napravite intent i pozoveze nad njim
    - sendBroadcast(intent);
- Receiving intents
  - extend BroadcastReceiver
  - register in android manifest
    - <receiver android:name=".MyBroadcastReciver">
    - <intent-filter>
    - <action android:name="hr.infinum.fer.LECTURE_DONE"/>
    - </intent-filter>
    - </receiver>

Phone call

example

```
String url = "tel:0959115614";
Intent intent = new Intent(Intent.ACTION_CALL, Uri.parse(url));
```

Permissions

```
<uses-permission
android:name="android.permission.CALL_PHONE"></
uses-permission>
```

Možemo li znati kad je poziv gotov?

```
public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.main);

    Button btnCall = (Button) findViewById(R.id.btnCall);
    btnCall.setOnClickListener(new OnClickListener() {

        @Override
        public void onClick(View v) {
            Intent intent = new Intent(Intent.ACTION_CALL, Uri.parse("tel:0917700"));
            startActivity(intent);
        }
    });

    TelephonyManager tm = (TelephonyManager) getSystemService(TELEPHONY_SERVICE);
    tm.listen(new EndCallListener(), PhoneStateListener.LISTEN_CALL_STATE);
}

private class EndCallListener extends PhoneStateListener {

    @Override
    public void onCallStateChanged(int state, String incomingNumber) {
        Log.d("NIXA", "Phone state is " + state + " " + incomingNumber);
    }
}
```

Permissions

```
<uses-permission
android:name="android.permission.READ_PHONE_STA
TE"></uses-permission>
```

ListView

List adapters

- ArrayAdapter
- CursorAdapter
- SimpleCursorAdapter

ListView example

Storage

- Shared Preferences
- Internal Storage
- External Storage
- SQLite Databases
- Network Connection

Media and Camera

- take photo
- record video
- pick photo/video from gallery
- MediaStore.ACTION_IMAGE_CAPTURE
- MediaStore.ACTION_VIDEO_CAPTURE

Camera example

Paziti na

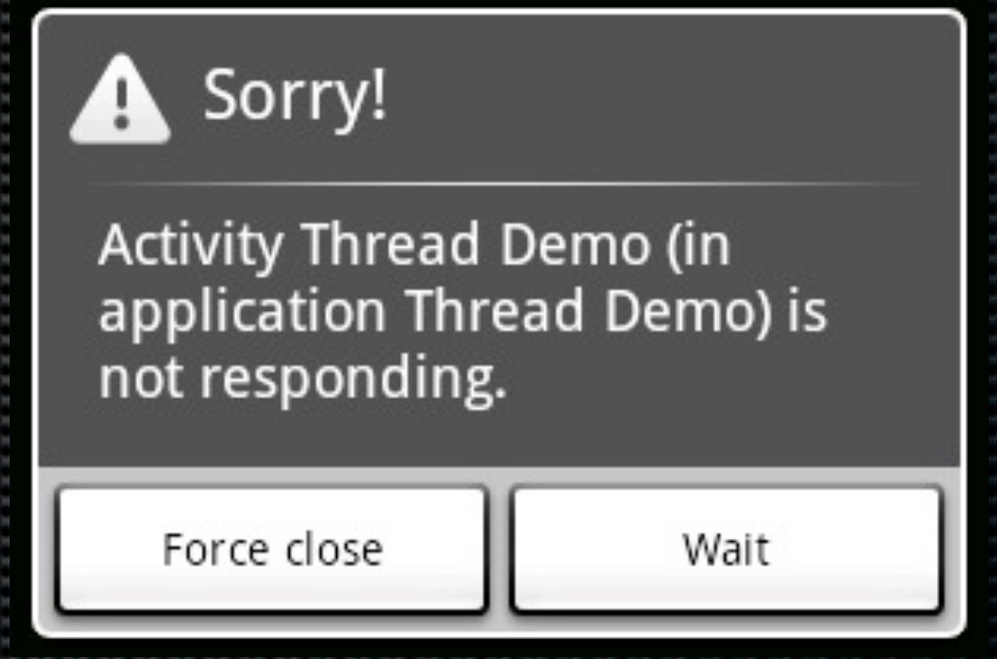
- Low processing power
- Limited RAM
- Limited permanent storage capacity
- Small screens with low resolution
- High costs associated with data transfer
- Slow data transfer rates with high latency
- Unreliable data connections
- Limited battery life

ANR

application not responding

services 10s

activities 5s



Support Library

- Fragment
- FragmentManager
- FragmentTransaction
- ListFragment
- DialogFragment
- LoaderManager
- Loader
- AsyncTaskLoader
- CursorLoader

coloredlogcat

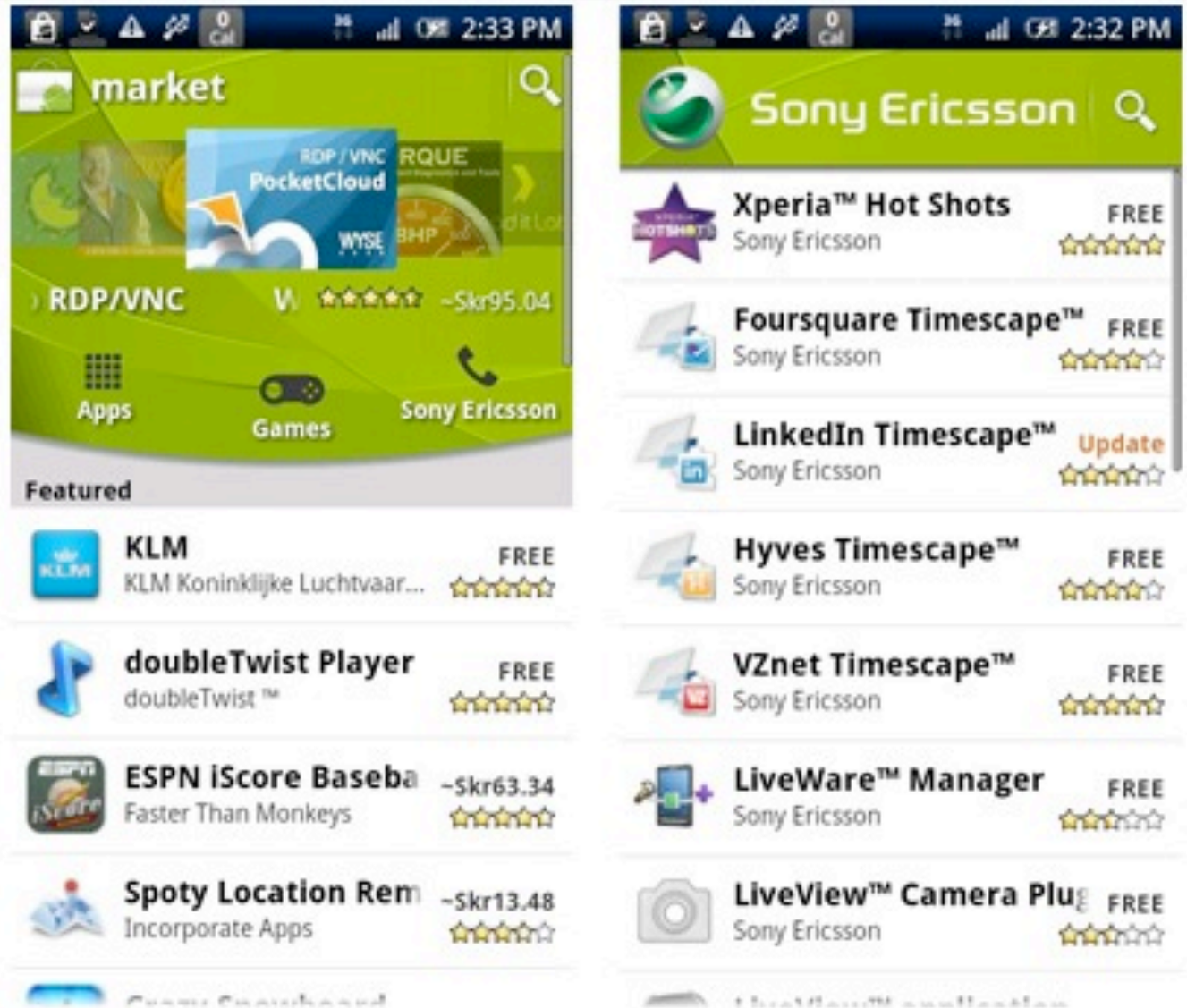
https://bitbucket.org/GBouerat/colored-logcat-pid

Flurry

ako vas zanima tko i kako koristi aplikaciju

AdMob

ako hocete nesto zaraditi, ali vjerovatno necete



Android Market

Android Market Developer Console

- pratite komentare
- exceptioni
- Active Install Rate

Android Market

- 25$ account
- kad krenete razvijati applikaciju nije loše uploadat ju odmah na početku developmenta kako bi si rezervirali namespace (hr.infinum.nixa...)
- “od sljedećeg tjedna izgleda da ćemo moći kupovati/prodavati aplikacije i iz Hrvatske” DORS/CLUC 2011 - ovo jos uvijek ne radi :-)

Lamborgini Aventador

700hp V12, 2.9s do 100km/h

Pitanja ...

Hvala!

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