

# Android Intents and Interoperability



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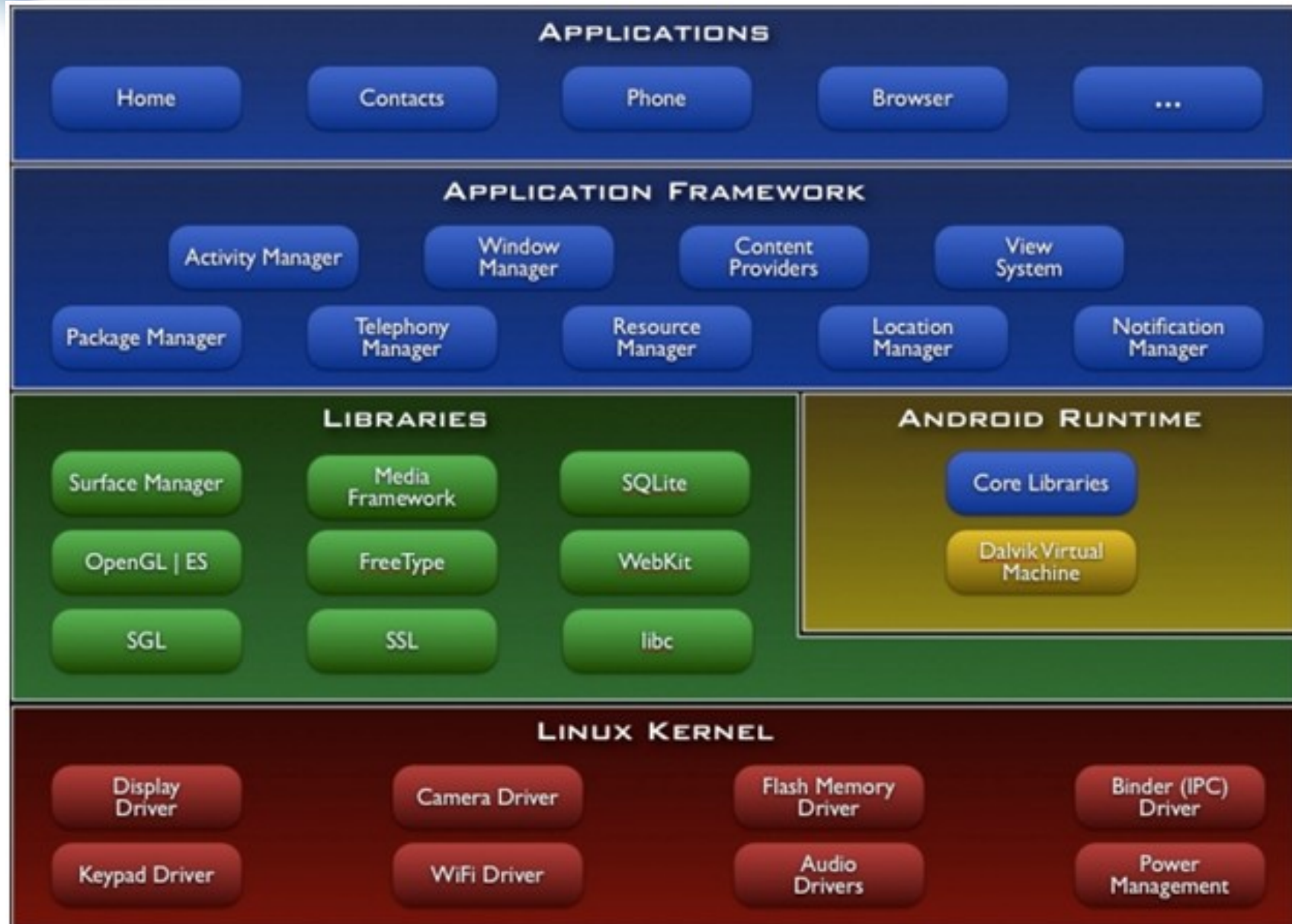
@fmdroid  
#openintents



**OpenIntents**

Where Applications Unite!

# Android Platform





**OpenIntents**

Where Applications Unite!

No monoliths ..



but interconnected  
components

All apps are equal!



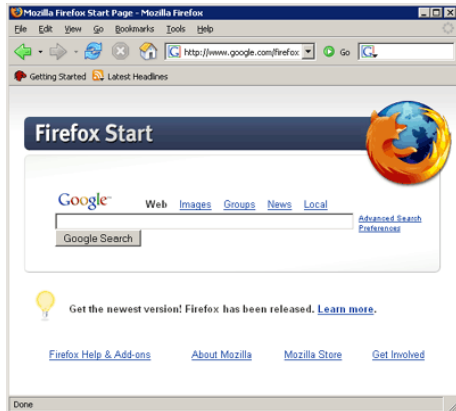
# Modular Apps

- **Activity** UI for one focused endeavor
- **Service** no UI, used for long running processes
- **Broadcast receiver** receives announcements
- **Content provider** makes data available

## Web browser

Intents:

VIEW + [www.google.com](http://www.google.com)



# Intents (1)

## Android

Intents:

VIEW + [www.google.com](http://www.google.com)

VIEW + Contact

VIEW + Image

DIAL + 123

PICK + Image

EDIT + Contact

SEND + Note

.....



Intent = Action + Data (+ Extras + Categories + Flags)



# Intents (2)

- Transition and messaging between components within application and beyond
- Source component + target component + data
- Expected behaviour, e.g. TAKE\_PICTURE
- Used throughout the system
- Explicit vs. implicit intents
  - Named target
  - or Tests against intent filters



# Intent filters (1)

- Advertising functionality of component
- Registered at install / start up time  
part of Manifest.xml
- Define tests for implicit intents
- Multiple filters of component are ORed



## Intent filters (2)

- Action test
- Data / Mime-type test
- Category test
  
- User can choose if more than one target found
- Exception if no target found



# Manifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest . . . >
<application . . . >
    <activity
        android:name="org.openintents.shopping.ShoppingActivity"
        android:icon="@drawable/small_pic.png"
        android:label="@string/shopping" . . . >
        <intent-filter>
            <action android:name="android.intent.action.VIEW" />
            <action android:name="android.intent.action.INSERT" />
            <category
                android:name="android.intent.category.DEFAULT" />
            <data android:mimeType =
                "vnd.android.cursor.dir/vnd.openintents.shopping.item" />
        </intent-filter>
    </activity>

    <service . . . />
    . . .
    <uses-permission . . . />
    <uses-library . . . />
</application>
</manifest>
```



# In Practice

e.g. in Activity

```
Intent i = new  
Intent(Intent.ACTION_VIEW);  
i.setData („http://www.openintents.org“);  
  
this.startActivity(i);  
this.startActivityForResult(i, RESCODE);  
this.startService(i);  
this.bindService(i, con, 0);  
this.sendBroadcast(i);
```



# Barcode scanner

`com.google.zxing.client.android.SCAN`

`extra: SCAN_MODE`

`extra in result: SCAN_RESULT`

**Exercise: Button in OI Shopping list**

<http://openintents.googlecode.com/svn/trunk/ShoppingList>



# Platform Intents

- Widgets
- Live Folders
- SMS Receiver



# Mime-type intents

## Example:

Add items to a shopping list from a recipe apps

"Bites" (<http://code.google.com/p/bites-android/>)

```
Intent intent = new Intent  
    ("org.openintents.action.INSERT_FROM_EXTRAS");  
intent.setType("org.openintents.types/string.array.shopping");  
intent.putStringArrayListExtra("items", getListExtra());
```

```
<intent-filter>  
    <action android:name="org.openintents.action.INSERT_FROM_EXTRAS" />  
    <category android:name="android.intent.category.DEFAULT" />  
    <data android:mimeType="org.openintents.types/string.array.shopping" />  
</intent-filter>
```

Intent without data.

Type does NOT describe data, but extras



# Mime-type intents (2)

**[androidmashup.org](http://androidmashup.org)**

- Project by Falko Richter
- Intent without data,  
but action name contains type
- Idea: Add functionality around data
- Android Mashup Organizer



# Adding 3<sup>rd</sup> party menus

```
intent.addCategory(  
    Intent.CATEGORY_ALTERNATIVE);  
menu.addIntentOptions  
    (Menu.CATEGORY_ALTERNATIVE, ...,  
     intent, ...);  
  
Menu.CATEGORY_SELECTED_ALTERNATIVE
```



# Interaction through PackageManager and meta data

- Check for installed application (e.g. license app)
- Utility apps (e.g. OI About, aTrackdog)
- External themes

```
pm = context.getPackageManager()  
pm.getApplicationInfo(  
    packagename, PackageManager.GET_META_DATA).metaData;  
  
pm.getPackageInfo(packagename).signatures;
```

# Broadcast for plug-ins

- Examples: Locale, Astrid 3.0
- Process responses and hope for the best
- Integration through guide lines



```
<receiver android:name=".FireReceiver" >
  <intent-filter>
    <action android:name="FIRE_SETTING" />
  </intent-filter>
</receiver>
```



# More info

- Web site:

[www.openintents.org](http://www.openintents.org)

- Developer group:  
<http://groups.google.com/group/openintents>
- Code repository:  
<http://openintents.googlecode.com>
- Twitter:  
<http://twitter.com/openintents>