SCIENCES
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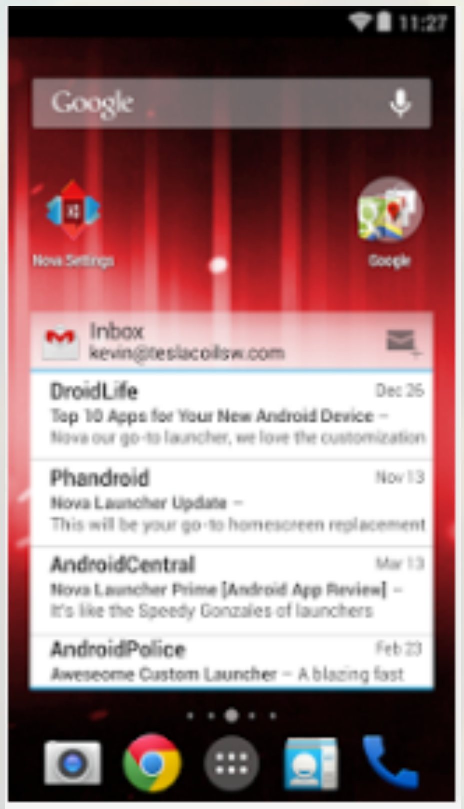
Packages and HomeScreen

Renault@lrde.epita.fr

LRDE

Home Screen



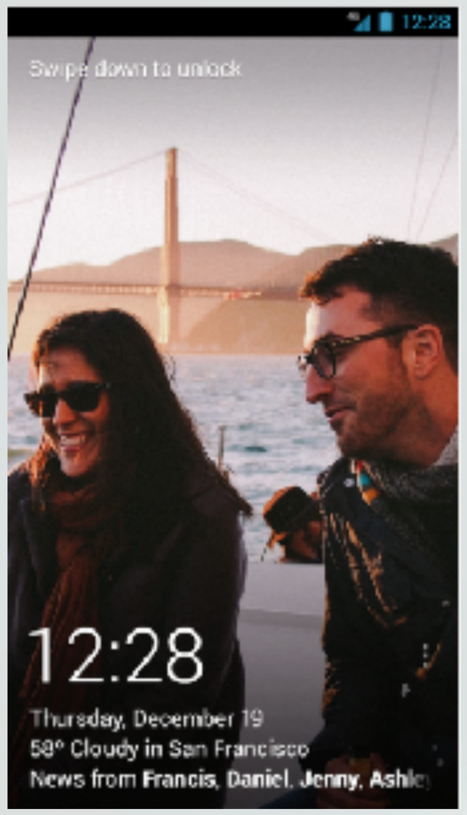
Inbox
kevin@teslacoilsw.com

DroidLife Dec 26
Top 10 Apps for Your New Android Device –
Nova our go-to launcher, we love the customization

Phandroid Nov 13
Nova Launcher Update –
This will be your go-to homescreen replacement

AndroidCentral Mar 13
Nova Launcher Prime [Android App Review] –
It's like the Speedy Gonzales of launchers

AndroidPolice Feb 23
Aweseome Custom Launcher – A blazing fast


12:28
Swipe down to unlock
12:28
Thursday, December 19
58° Cloudy in San Francisco
News from Francis, Daniel, Jenny, Ashle

Goals

- Displays Widgets
- Provides access to applications
- Configurable by the user

Offers a screen that display "important" informations

- An important information depend of the user

How to Access to Installed Application?

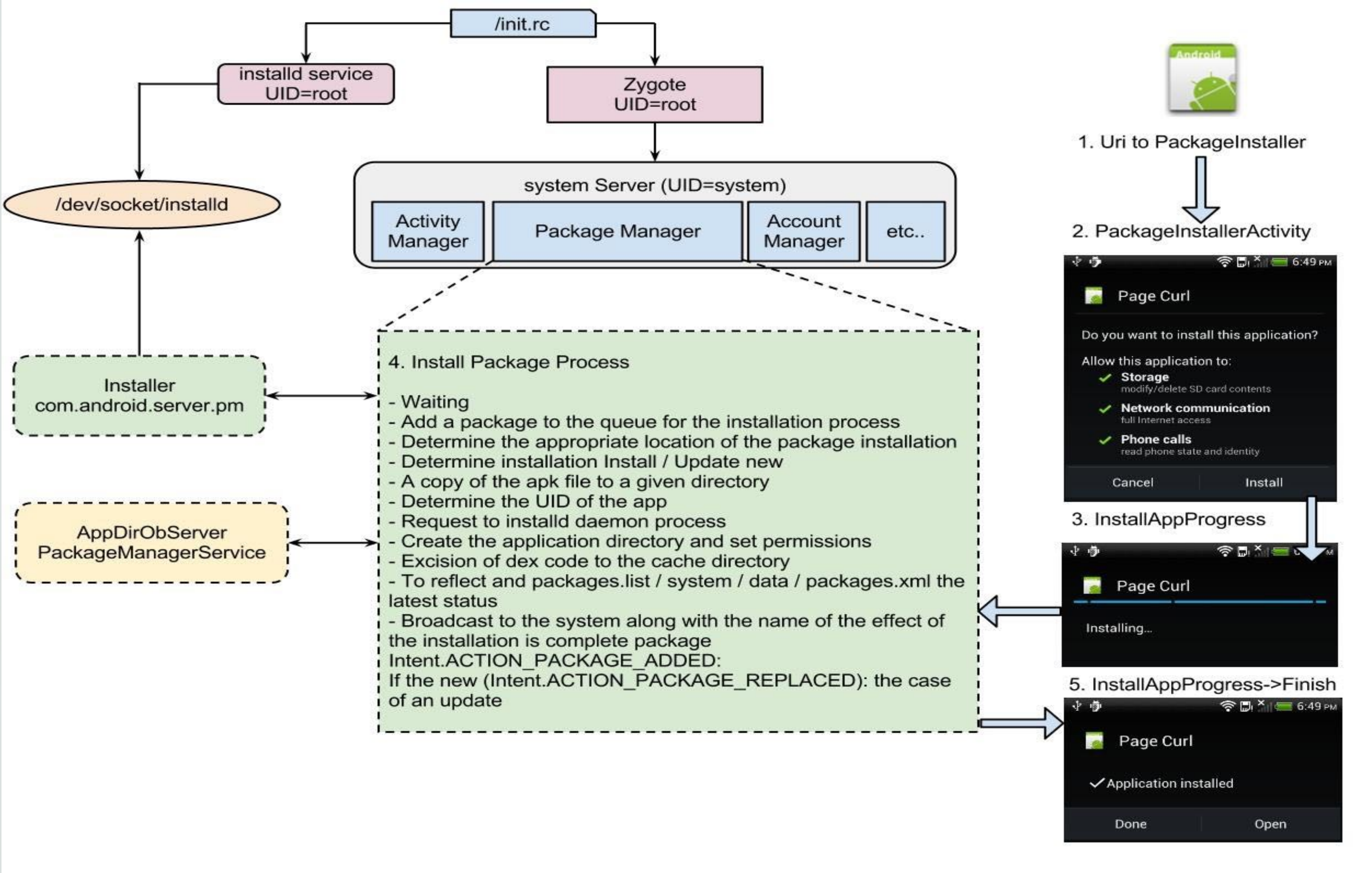
PackageInstaller

- Interface for installing applications
- Use PackageManager to manage applications

PackageManager

- Linux Daemon
- During the install of an application
  - **Open the APK**
  - **Grab all valuable information**
- Applications are installed in directories
  - **/system/app: the preinstalled applications**
  - **/data/app: user applications**
  - **/data/data/<app_name>: data of each application**

Lifecycle



1. Uri to PackageInstaller

2. PackageInstallerActivity

Page Curl

Do you want to install this application?

Allow this application to:

✓ **Storage**
modify/delete SD card contents

✓ **Network communication**
full Internet access

✓ **Phone calls**
read phone state and identity

3. InstallAppProgress

Page Curl

Installing...

4. Install Package Process

- Waiting
- Add a package to the queue for the installation process
- Determine the appropriate location of the package installation
- Determine installation Install / Update new
- A copy of the apk file to a given directory
- Determine the UID of the app
- Request to installd daemon process
- Create the application directory and set permissions
- Excision of dex code to the cache directory
- To reflect and packages.list / system / data / packages.xml the latest status
- Broadcast to the system along with the name of the effect of the installation is complete package Intent.ACTION_PACKAGE_ADDED:
If the new (Intent.ACTION_PACKAGE_REPLACED): the case of an update

5. InstallAppProgress->Finish

Page Curl

✓Application installed

PackageManager Details

Access to a lot of informations

- QueryBroadcastReceiver:
  - **What are the BroadcastReceiver that can reply to an Intent?**
- QueryIntentActivities:
  - **What are the Activities that can reply to an Intent?**
- QueryIntentService:
  - **What are the Servic that can reply to an Intent?**
- GetApplicationEnabled Settings:
  - **Read permission of an Application**
- SetApplicationSettings:
  - **Modify existing permissions**
- ...

Accessing to Application's Basic Informations

```
public class AppDetail {
  CharSequence label;  CharSequence name; Drawable icon;
}
private PackageManager manager;
private List<AppDetail> apps;

private void loadApps(){
  manager = getPackageManager();
  apps = new ArrayList<AppDetail>();
  Intent i = new Intent(Intent.ACTION_MAIN, null);
  i.addCategory(Intent.CATEGORY_LAUNCHER);
  List<ResolveInfo> availableActivities =
                    manager.queryIntentActivities(i, 0);
  for(ResolveInfo ri:availableActivities){
     AppDetail app = new AppDetail();
     app.label = ri.loadLabel(manager);
     app.name = ri.activityInfo.packageName;
     app.icon = ri.activityInfo.loadIcon(manager);
     apps.add(app);
  }
```

Define a GUI for displaying this information

Build a simple View

- Here a button that will launch a listView on click

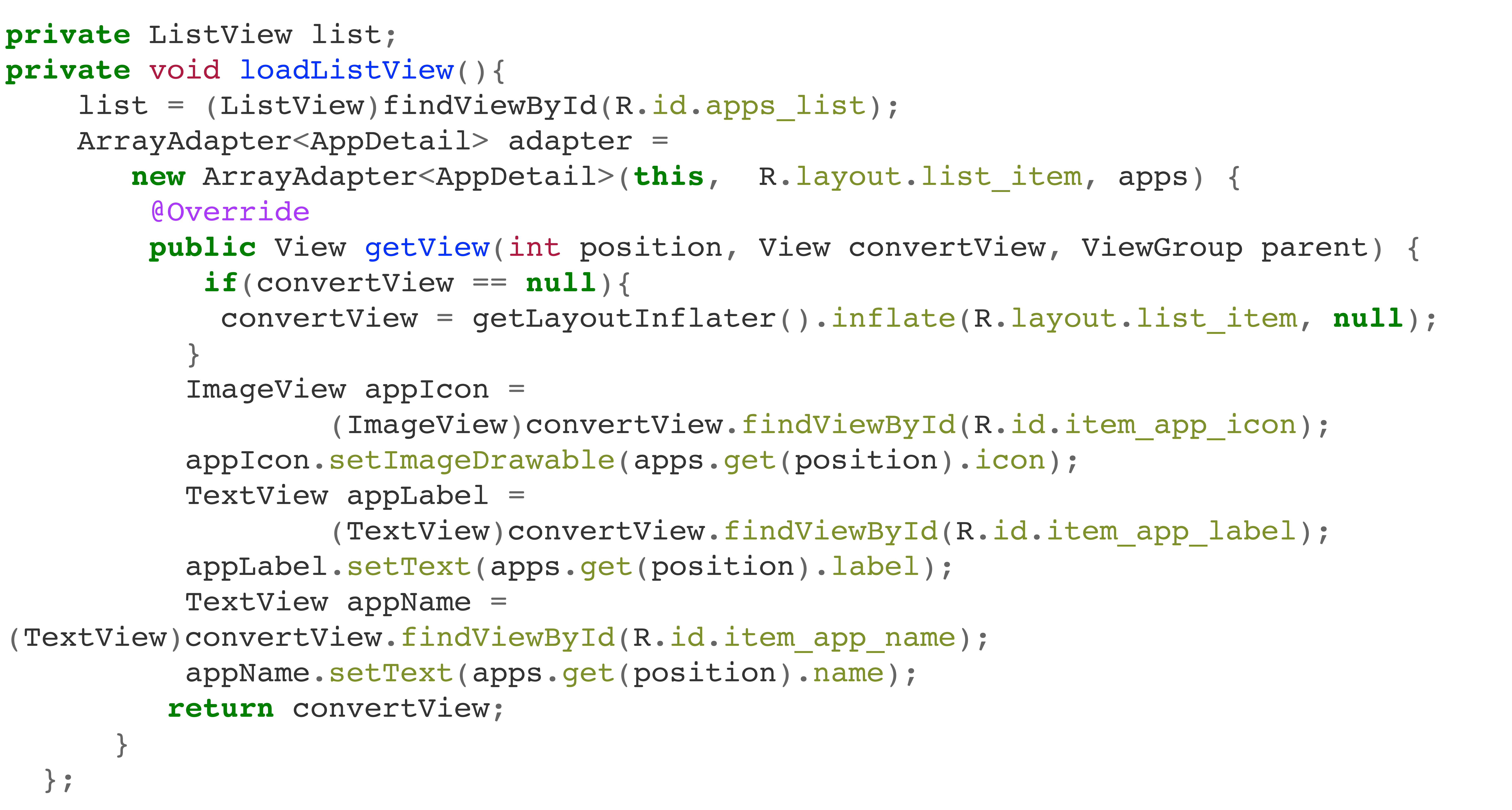
… and modify AndroidManifest.xml

```
<activity
   android:name=".MainActivity"
   android:label="@string/app_name"
   android:theme=
       "@android:style/Theme.Wallpaper.NoTitleBar.Fullscreen"
   android:launchMode="singleTask"
   android:stateNotNeeded="true" >
<intent-filter>
   <action android:name="android.intent.action.MAIN" />
   <category android:name="android.intent.category.HOME" />
   <category android:name=
             "android.intent.category.DEFAULT" />
   <category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
```

The "Activity" HomeScreen

Build a simple App to access all existing Apps

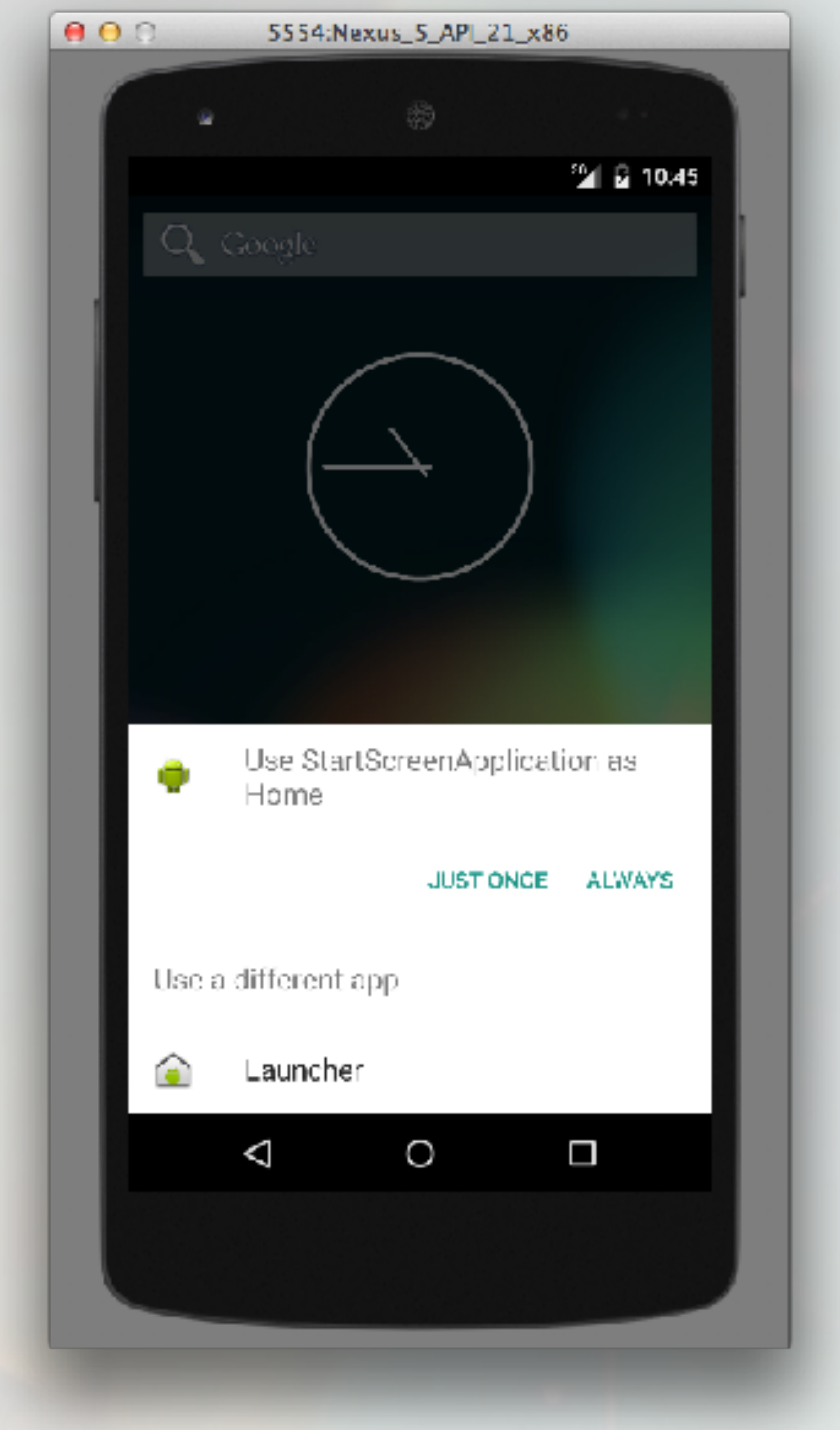
- Fill the list view with some information



```java
private ListView list;
private void loadListView(){
    list = (ListView)findViewById(R.id.apps_list);
    ArrayAdapter<AppDetail> adapter =
       new ArrayAdapter<AppDetail>(this,  R.layout.list_item, apps) {
        @Override
        public View getView(int position, View convertView, ViewGroup parent) {
           if(convertView == null){
            convertView = getLayoutInflater().inflate(R.layout.list_item, null);
          }
          ImageView appIcon =
                  (ImageView)convertView.findViewById(R.id.item_app_icon);
          appIcon.setImageDrawable(apps.get(position).icon);
          TextView appLabel =
                  (TextView)convertView.findViewById(R.id.item_app_label);
          appLabel.setText(apps.get(position).label);
          TextView appName =
(TextView)convertView.findViewById(R.id.item_app_name);
          appName.setText(apps.get(position).name);
         return convertView;
      }
  };
```

Setup the Home Screen

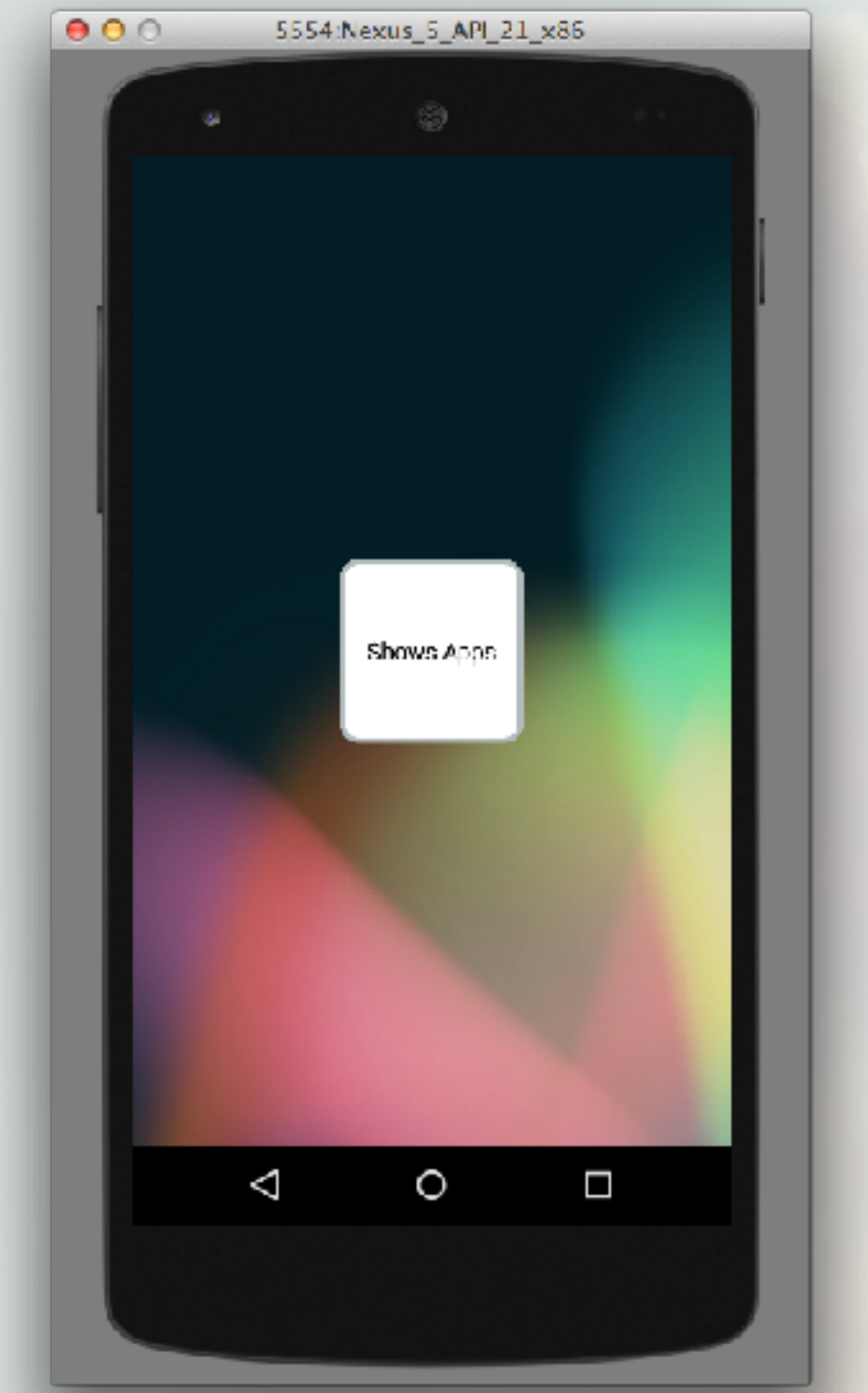
- When you launch the Application, you are asked to decide if you want to change your default home screen


5554:Nexus_5_API_21_x86

10:45

Use StartScreenApplication as Home

Use a different app


5554:Nexus_5_API_21_x86

Summary

- PackageManager helps to get informations about installed applications

- This informations are useful when we want to build an HomeScreen

- Defining Lock-Screen is possible
  - Same mechanism
  - Register to Events:
    - BOOT_COMPLETED: to trigger lock-screen after a reboot
    - ACTION_SCREEN_OFF, ACTION_SCREEN_ON: to trigger lock-screen activation
    - ... other events
  - Be careful with security
    - You have to propose security schemes

F. Kordon - Sorbonne Université - CC2018