

# Android™

---



Eerste app

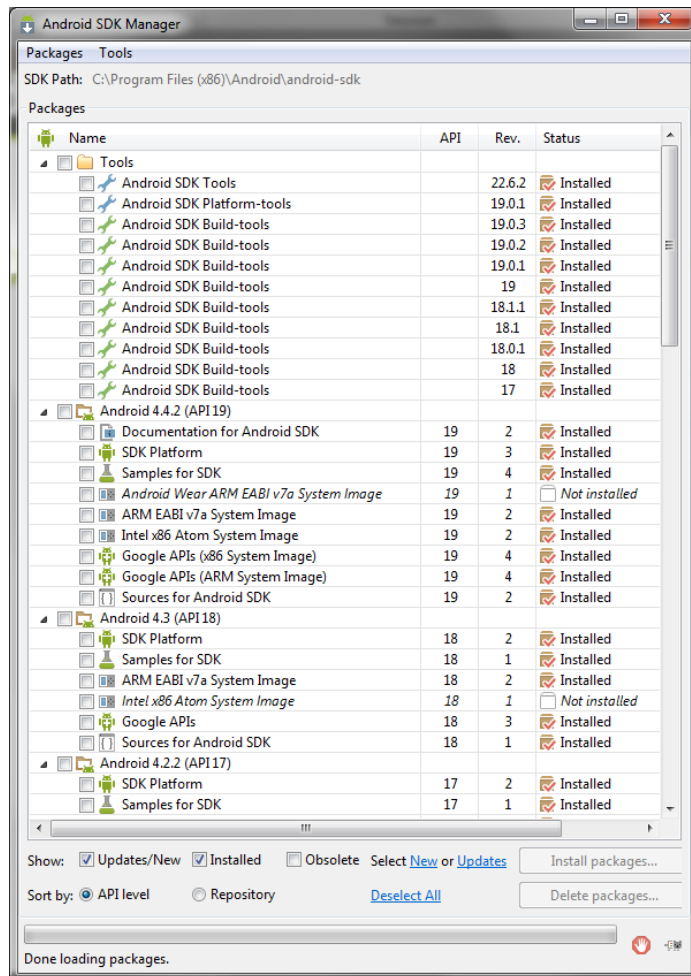
- **ADT**
  - *SDK*
  - *AVD*
  - *Overige Tools*
- **Opstarten**
- **De omgeving**
  - *Eclipse*
  - *Structuur*
- **De eerste stappen**
  - *Java*
  - *XML*
- **Testen**
  - *Log*

# Android

SDK | AVD | OVERIGE TOOLS

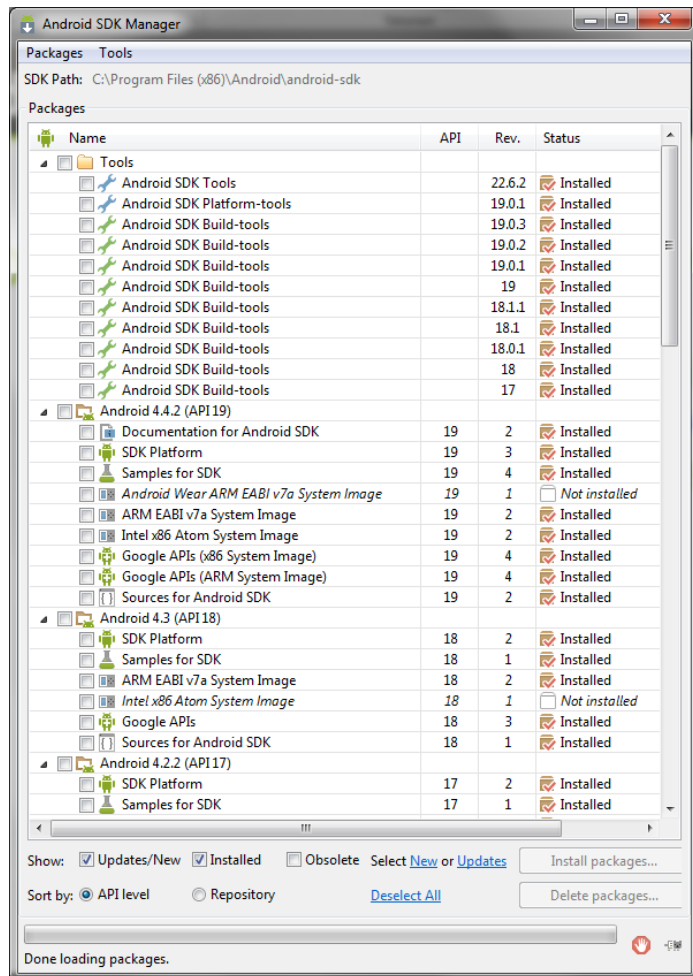
# ANDROID DEVELOPMENT TOOLKIT

## Software Development Kit



- Gratis te installeren
  - <http://developer.android.com/sdk/index.html>
- Bevat libraries en tools

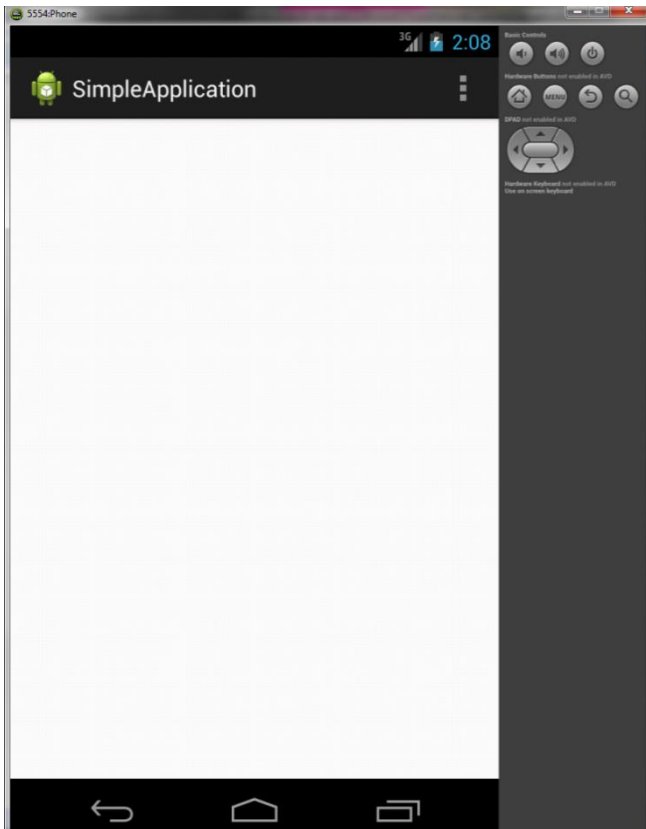
## Software Development Kit



### SDK manager

- Tool om SDK's voor verschillende versies te krijgen
- *Windows tip: Altijd uitvoeren als administrator*

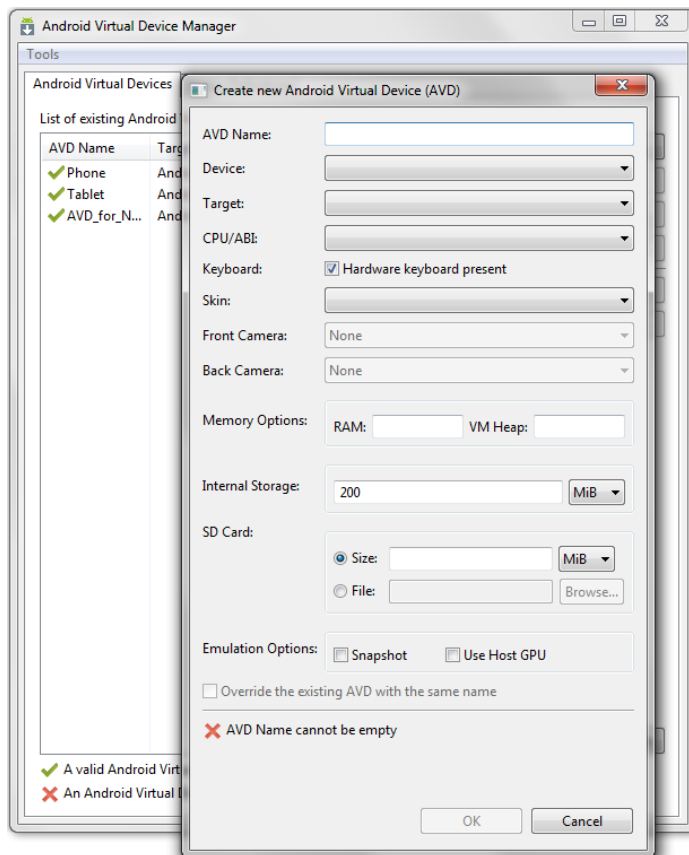
## Software Development Kit



### AVD

- **Android Virtual Device**
- Emuleert android toestel
- Gebruikt hardware van computer
  - WiFi, BlueTooth, Camera, etc
  - Kunt ook telefoon/sms emulere
- *Is traag!*

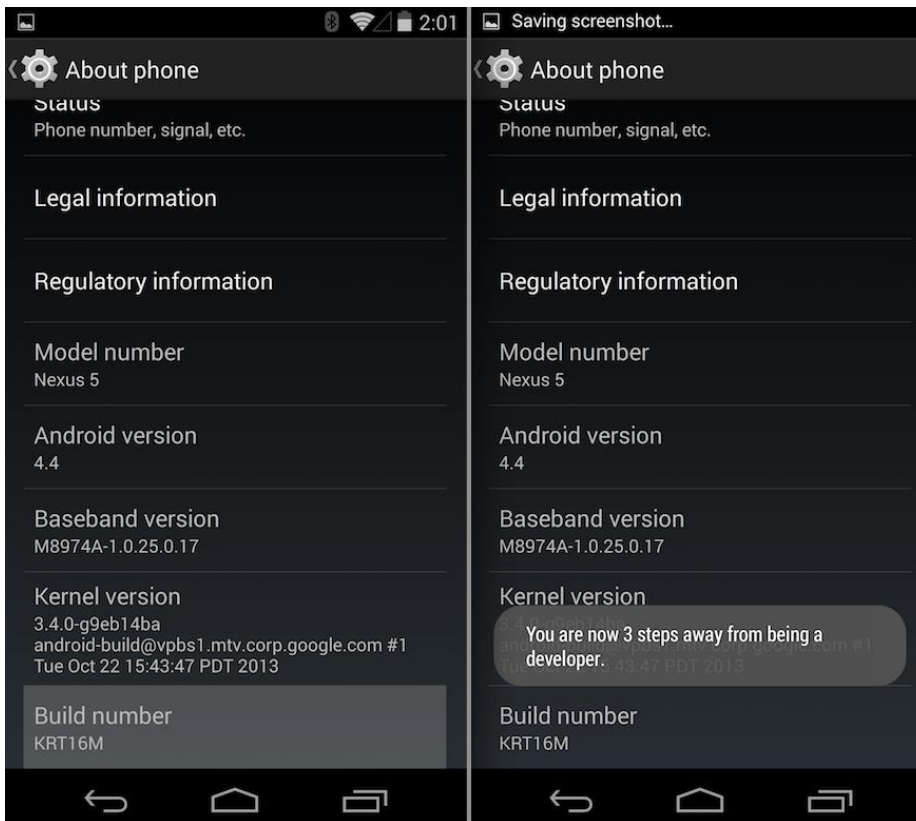
## Software Development Kit



### AVD Manager

- Tool om verschillende AVDs mee te maken
- Kunt verschillende eigenschappen instellen
  - Android versie
  - Scherm grootte
  - Geheugen

## Software Development Kit

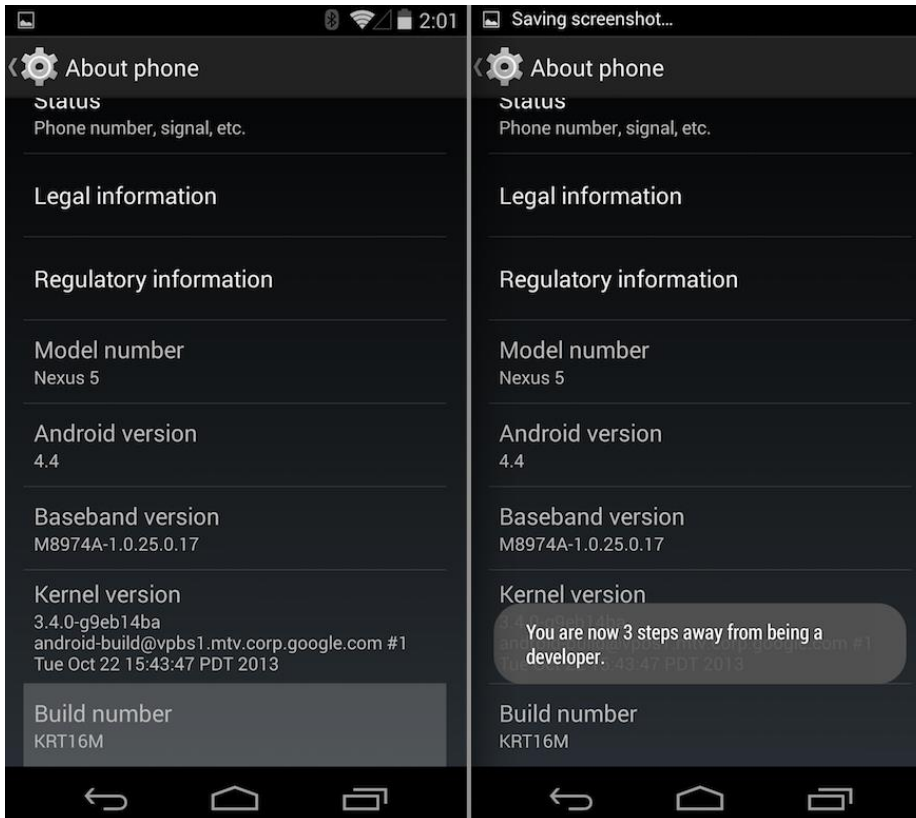


### Device

- Android toestellen hebben zelf ook debug opties
- Test apps kunnen worden geïnstalleerd.
- Je kunt dingen loggen



## Software Development Kit



### ADB

- **Android Debug Bridge**
- Maakt verbinding met aangesloten android toestel
- Gebruik commandline voor controle over toestel
- Gebruik je eigen android device om op te debuggen

## Software Development Kit

### Overige tools

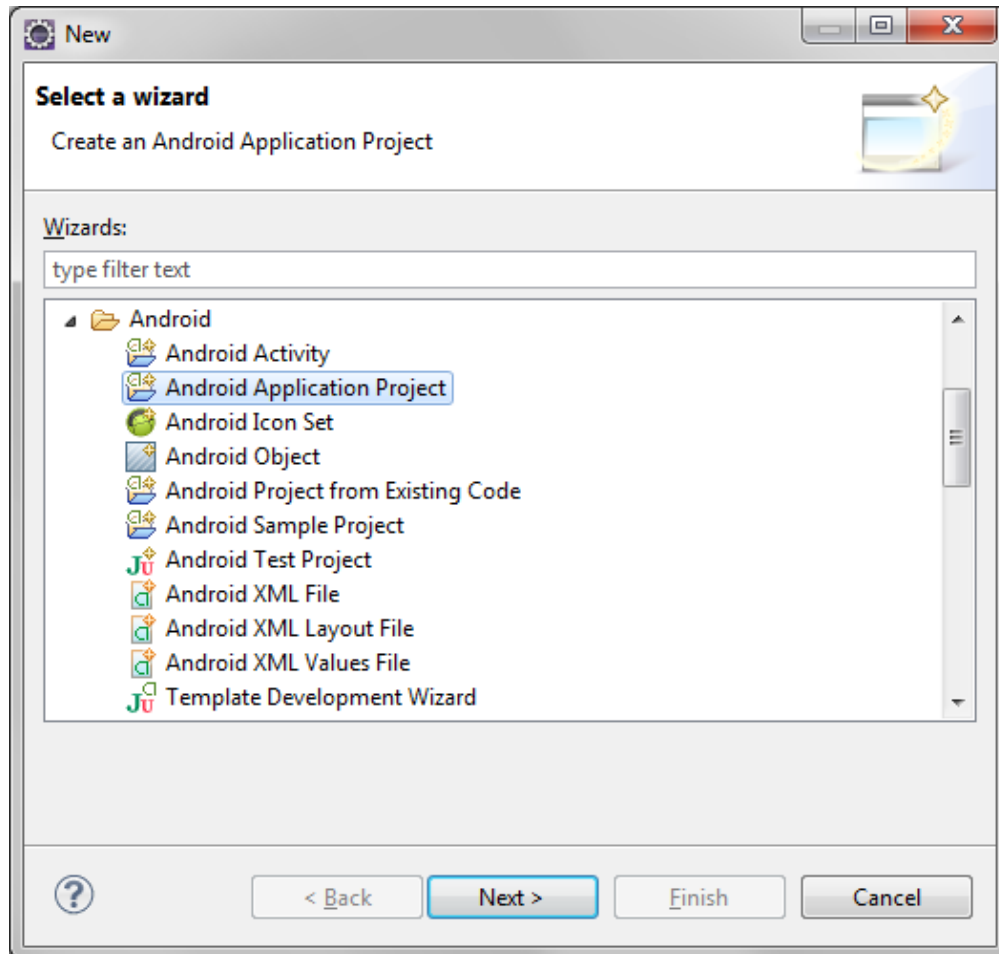
- Hierarchy viewer
  - *Bekijk hoe de layout in elkaar zit op een AVD of debug telefoon*
- Monkey
  - *Stress-test met behulp van willekeurige input. Zowel user input als systeem events*
- SQLite3
  - *Bekijk SQLite databases op een avd of debug telefoon*
- Draw9Patch
  - *Tool om schaalbare afbeeldingen mee te maken*
- ProGuard
  - *Maakt het moeilijker code te reverse-engineeren*

# Android

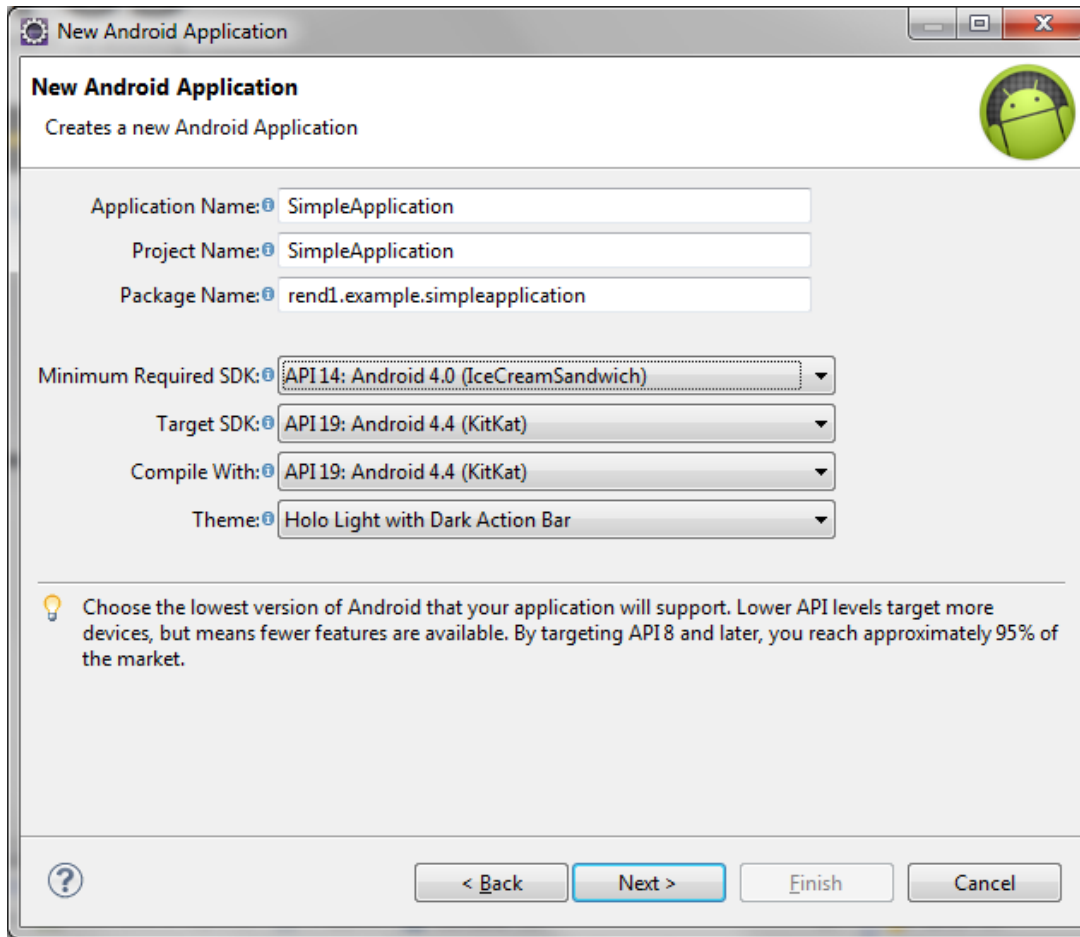
NIEUW PROJECT MAKEN

**OPSTARTEN**

## Nieuw project



## Nieuw project



**New Android Application**  
Creates a new Android Application

Application Name: SimpleApplication

Project Name: SimpleApplication

Package Name: rend1.example.simpleapplication

Minimum Required SDK: API 14: Android 4.0 (IceCreamSandwich)

Target SDK: API 19: Android 4.4 (KitKat)

Compile With: API 19: Android 4.4 (KitKat)

Theme: Holo Light with Dark Action Bar

Choose the lowest version of Android that your application will support. Lower API levels target more devices, but means fewer features are available. By targeting API 8 and later, you reach approximately 95% of the market.

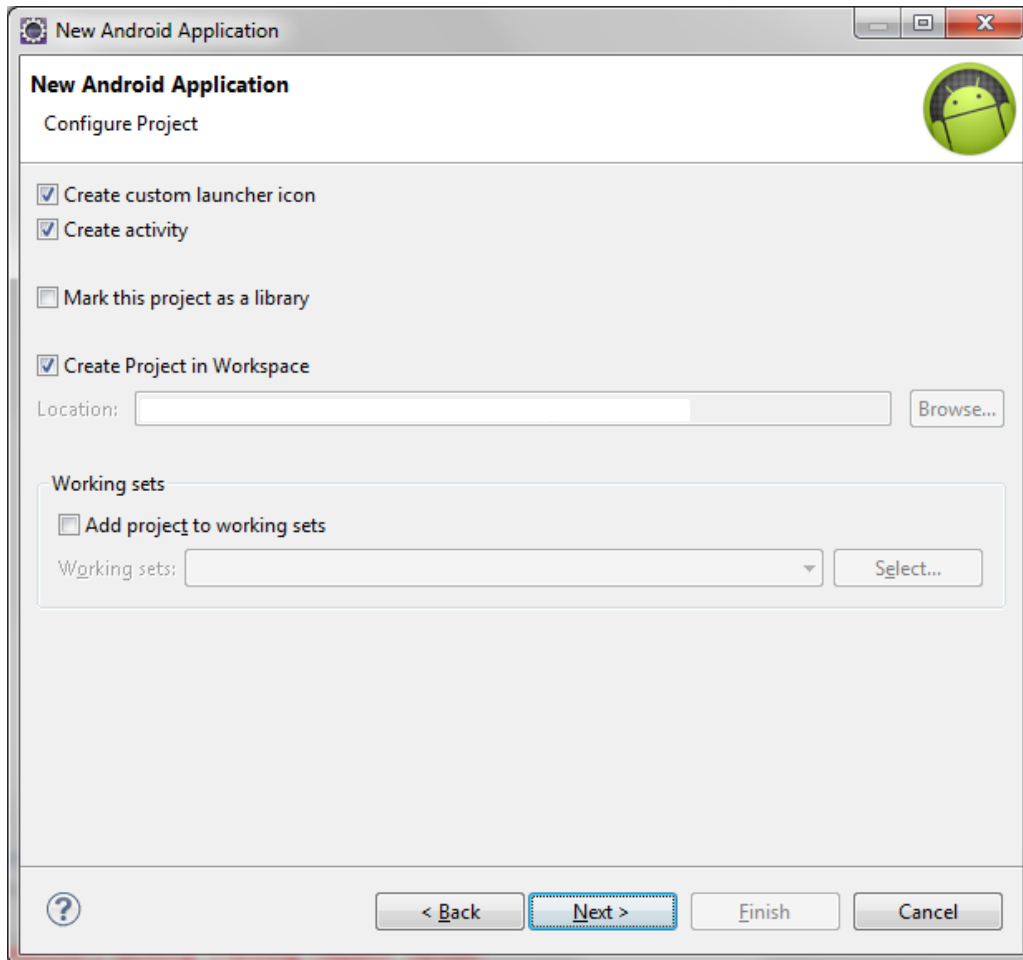
< Back Next > Finish Cancel

Kies naam

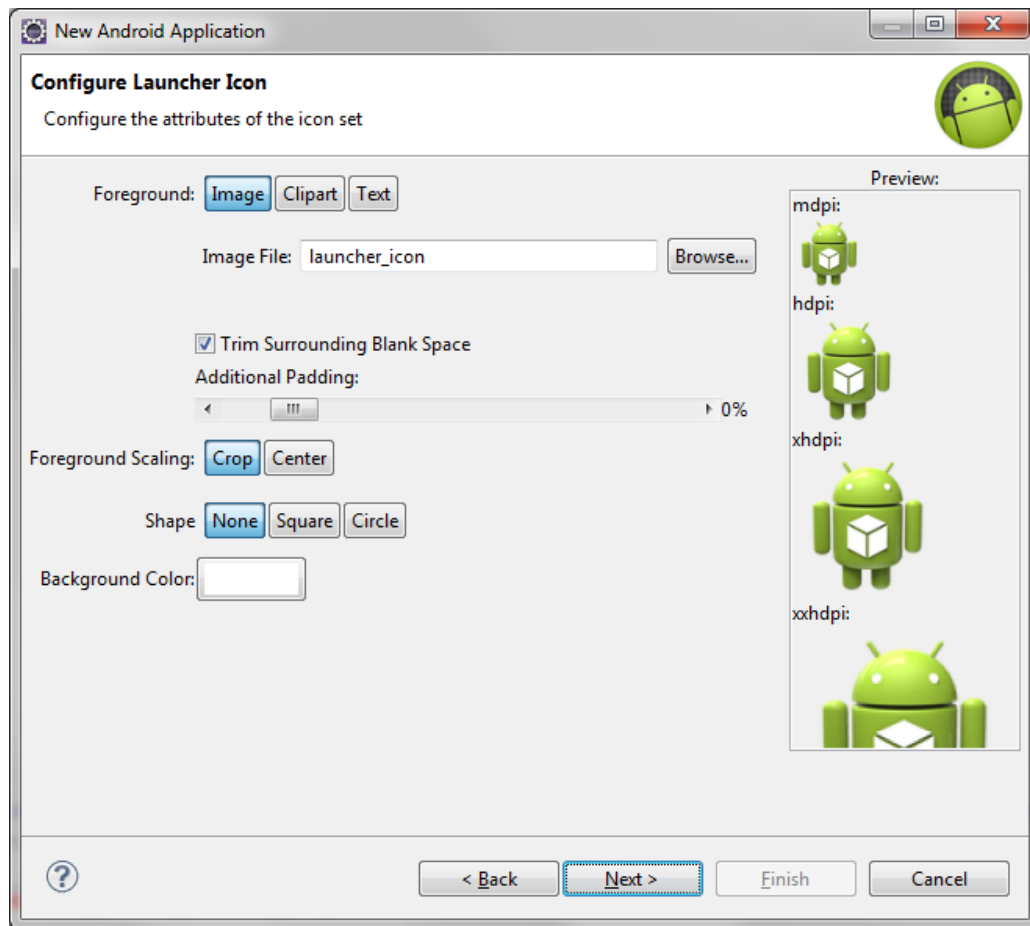
Kies minimale  
android versie

Kies versie  
waarvoor het  
geschreven  
wordt

## Nieuw project



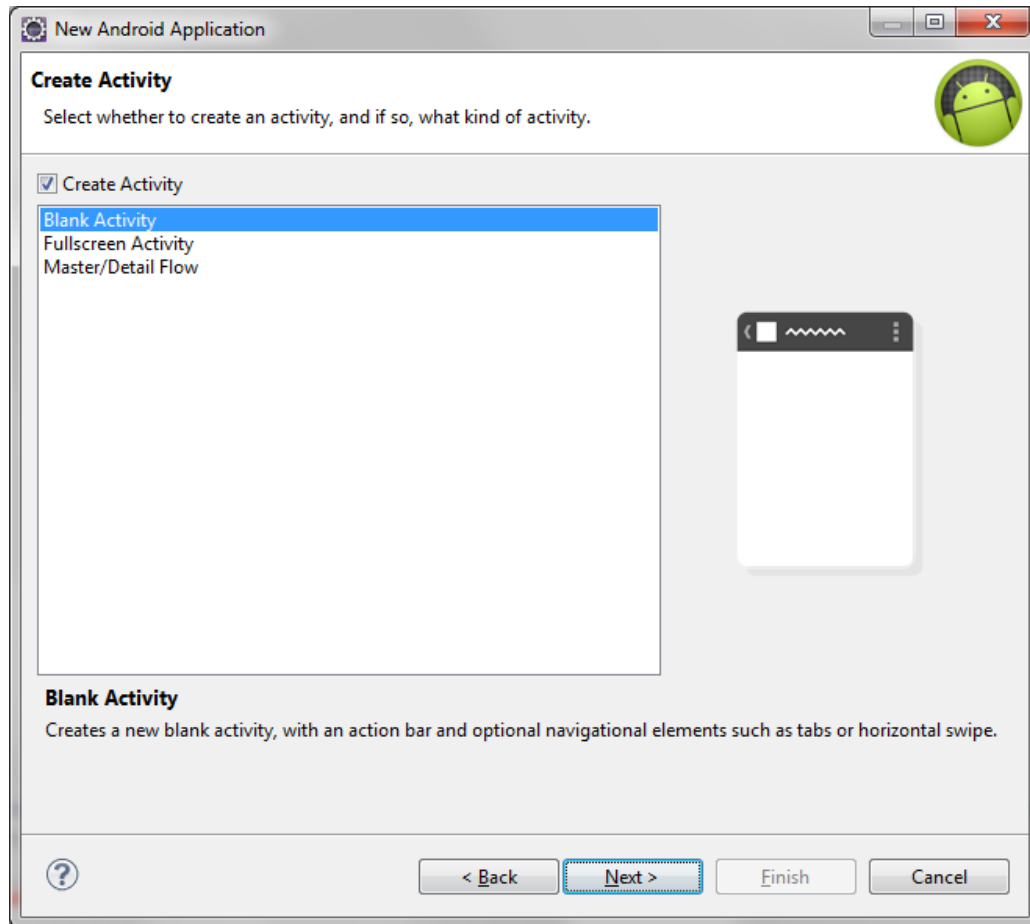
## Nieuw project



Kies een icon

Kan worden  
overgeslagen

## Nieuw project

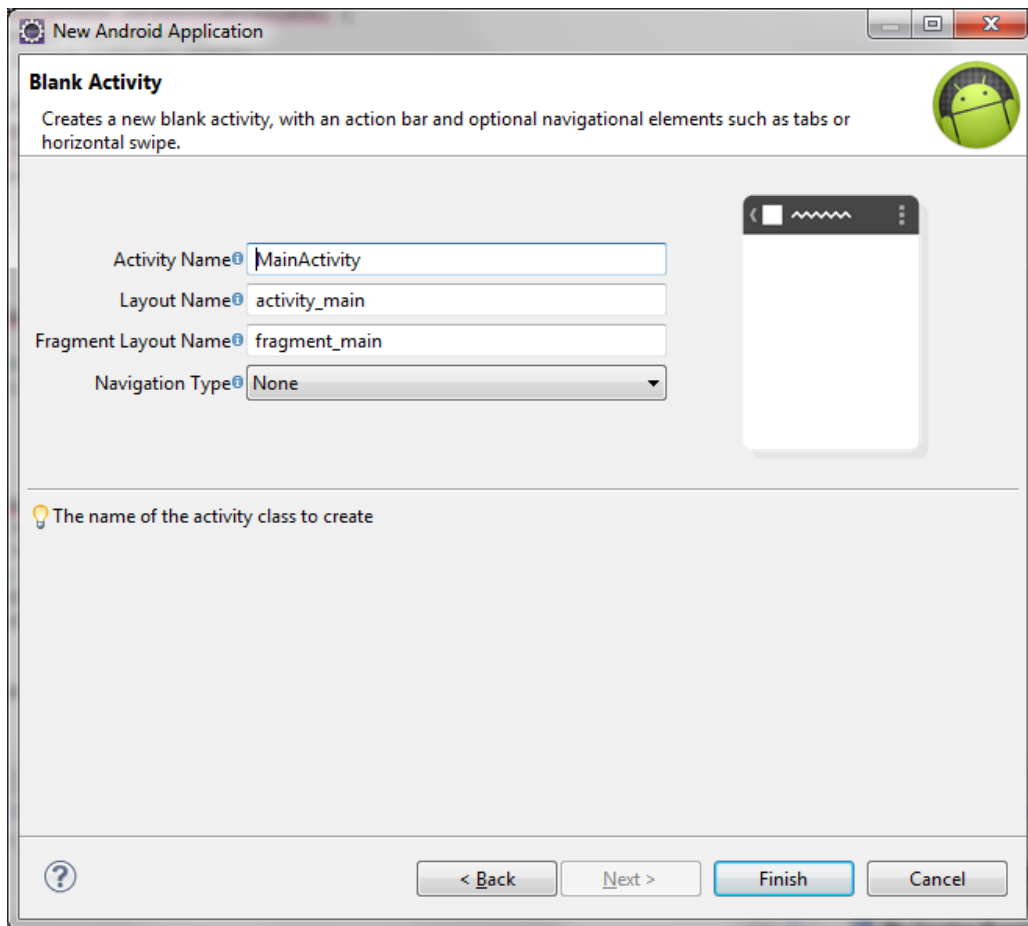


Kies activity *soort*

Kan worden  
overgeslagen



## Nieuw project



**New Android Application**


**Blank Activity**  
Creates a new blank activity, with an action bar and optional navigational elements such as tabs or horizontal swipe.


Activity Name


Layout Name


Fragment Layout Name

Navigation Type





 The name of the activity class to create



Kies namen

Kies navigatie  
soort

# Android

ECLIPSE | STRUCTUUR

**DE OMGEVING**

## Eclipse

The screenshot displays the Eclipse IDE interface for an Android project. The top menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, IDEOS NXJ, Saros, Run, Window, and Help. The toolbar contains various icons for file operations and development tools.

**Project Explorer:** Shows the project structure for 'SimpleApplication'. The 'src' folder contains 'rend1.example.simpleapplication', which includes 'MainActivity.java'. Other folders include 'gen', 'Android 4.4.2', 'Android Private Libraries', 'Android Dependencies', 'assets', 'bin', 'libs', 'res' (with sub-folders for different screen densities and 'layout'), 'menu', 'values', and 'AndroidManifest.xml'.

**MainActivity.java:** The code editor shows the following code:

```
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

**Outline:** Shows the class hierarchy for 'rend1.example.simpleapplication', including 'MainActivity' with methods like 'onCreate(Bundle): void', 'onCreateOptionsMenu(Menu): boolean', and 'onOptionsItemSelected(MenuItem): boolean'. It also lists 'PlaceholderFragment'.

**LogCat:** The bottom panel shows the LogCat window with a search bar and a table for log messages. The table has columns for Level, Time, PID, TID, Application, Tag, and Text. The current filter is 'All messages (no filters) (8107)'.

At the bottom of the IDE, there are status indicators for 'Writable', 'Smart Insert', '63 : 1', and 'Android SDK Content Loader'.

## Eclipse

The screenshot displays the Eclipse IDE interface for an Android project. The top-left pane shows the Project Explorer with a tree view of the project structure, including source files, generated files, and resources. The top-middle pane shows the Java code for MainActivity.java, with annotations for onCreate, onCreateOptionsMenu, and onOptionsItemSelected. The top-right pane shows the Outline view, listing the methods of the MainActivity class. The bottom pane shows the LogCat window, which is currently empty, with a search bar and a table header for logging messages.

Project overzicht

```
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
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        int id = item.getItemId();
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            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

Java / XML

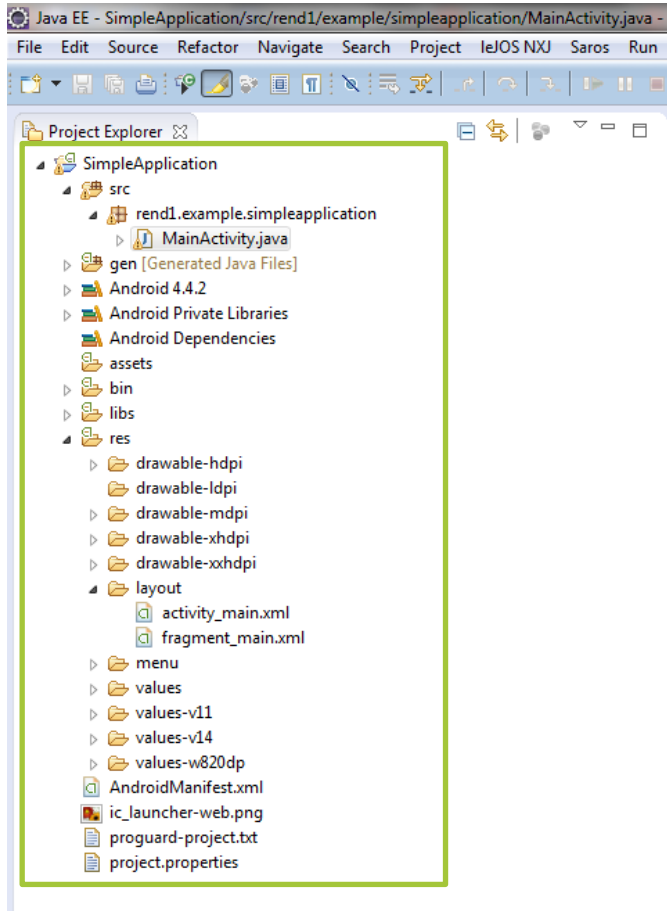
Funcctie overzicht

Level	Time	PID	TID	Application	Tag	Text
All messages (no filters) (8107)						
rend1.example.simpleapplication (S)						

Logging

Writable | Smart Insert | 63 : 1 | Android SDK Content Loader

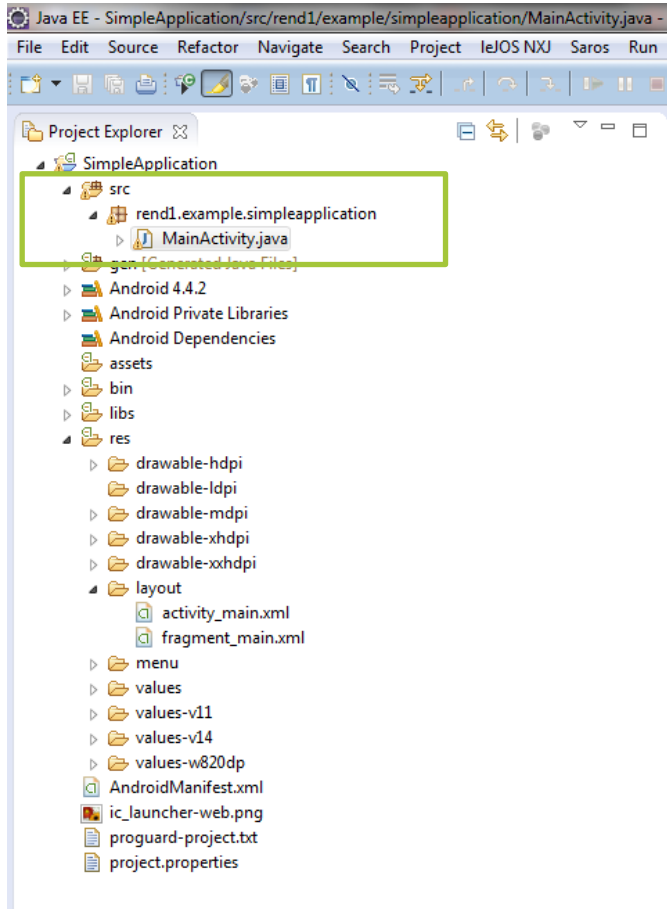
## Structuur



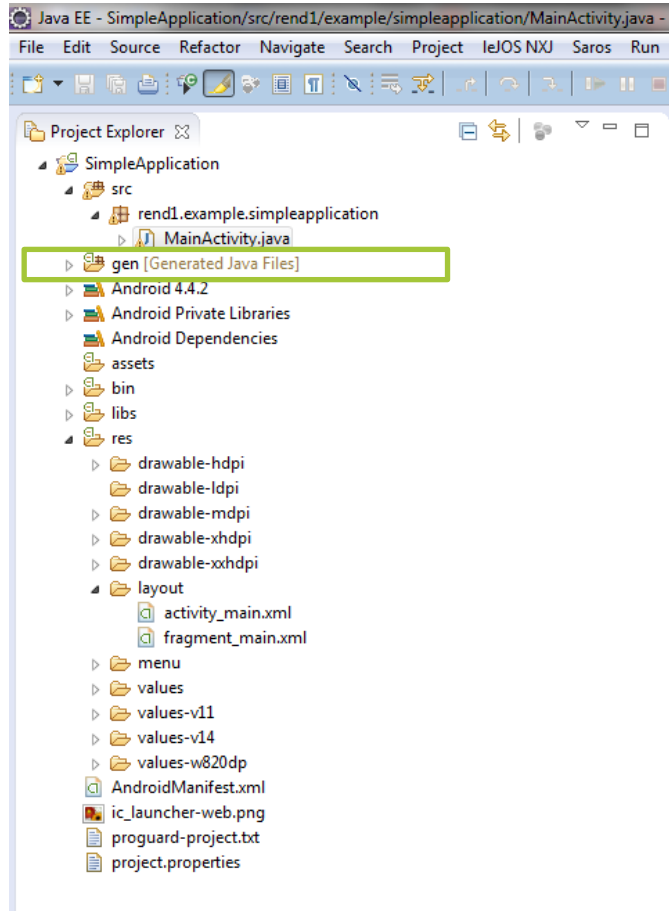
- Hele project

## Structuur

- Alle Java code

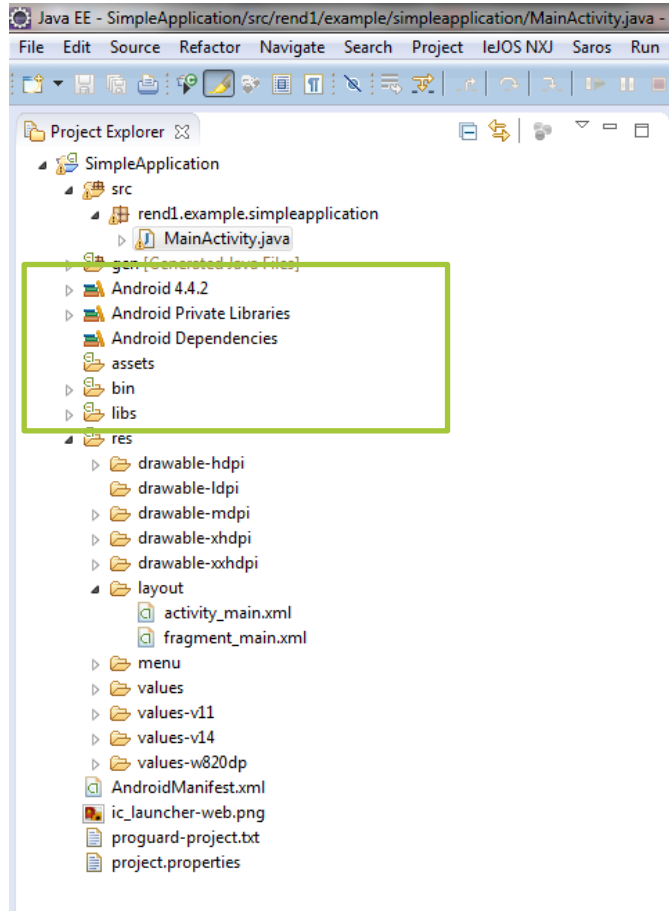


## Structuur



- Gegeneerd R bestand

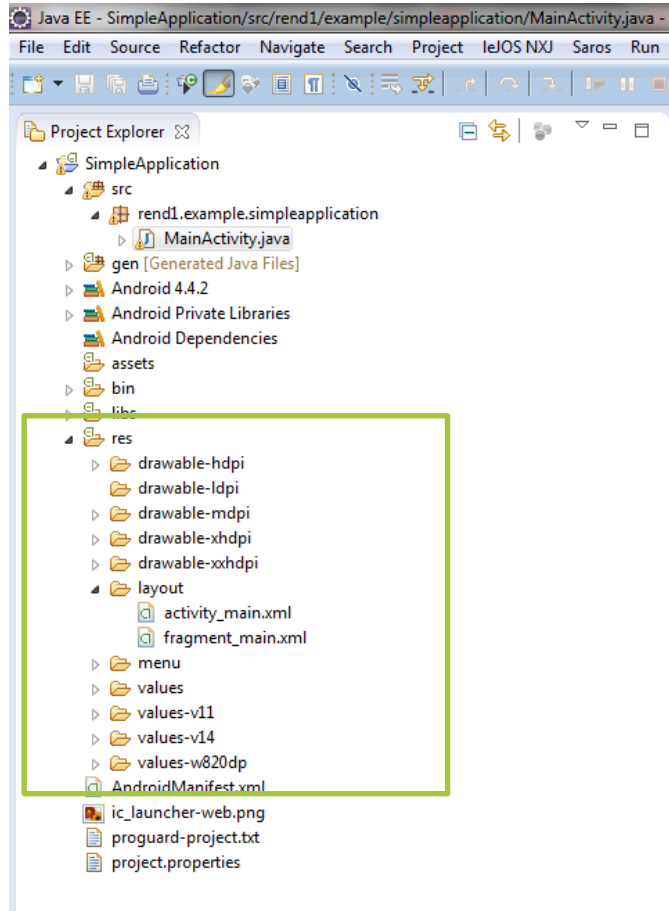
## Structuur



- Libraries e.d.
- Hoef je niks mee te doen

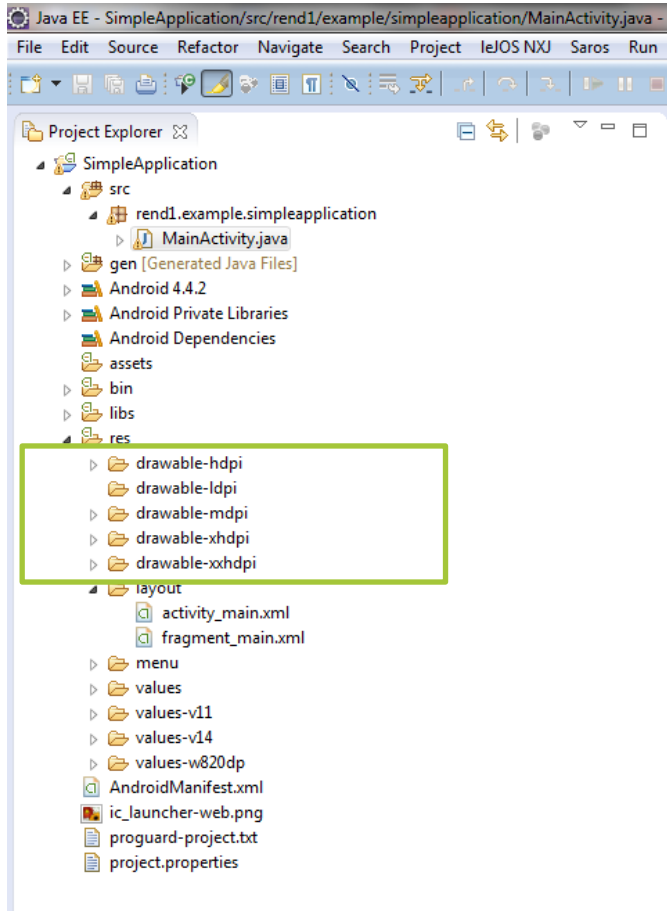


## Structuur

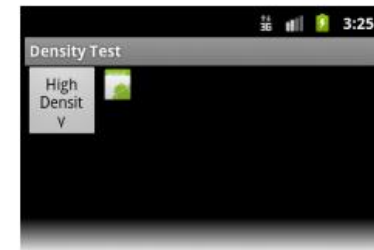
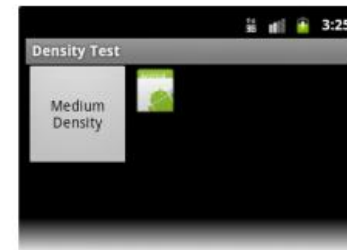
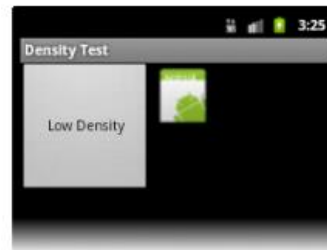


- Resources
- Default waarden
- Specifieke waarden in mappen
- Vrijwel alleen XML

## Structuur

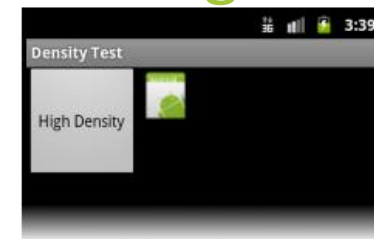
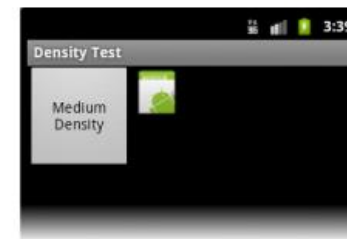


- Afbeeldingen voor verschillende resoluties

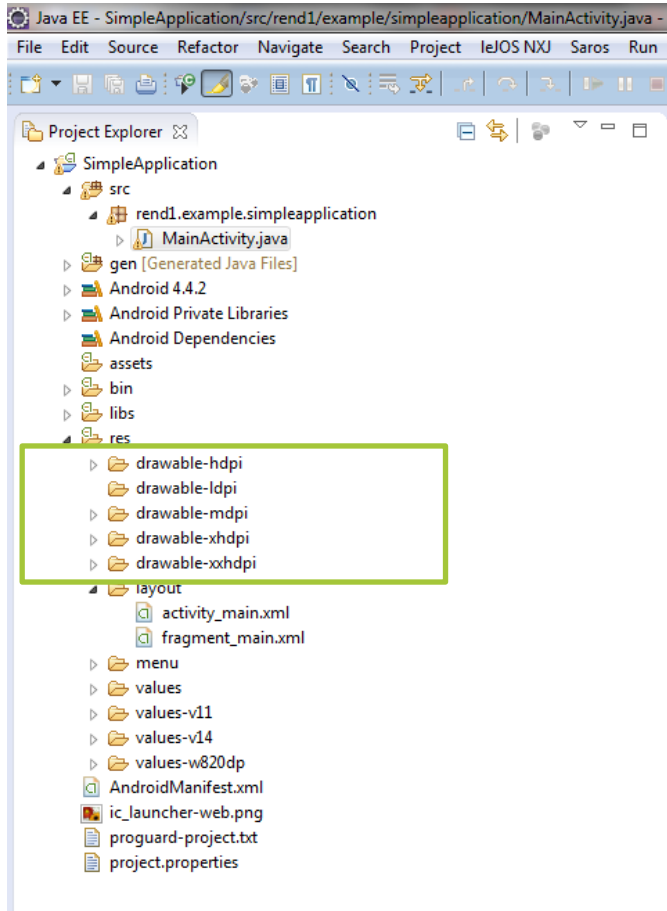


↑ één afbeelding

↓ verschillende afbeeldingen

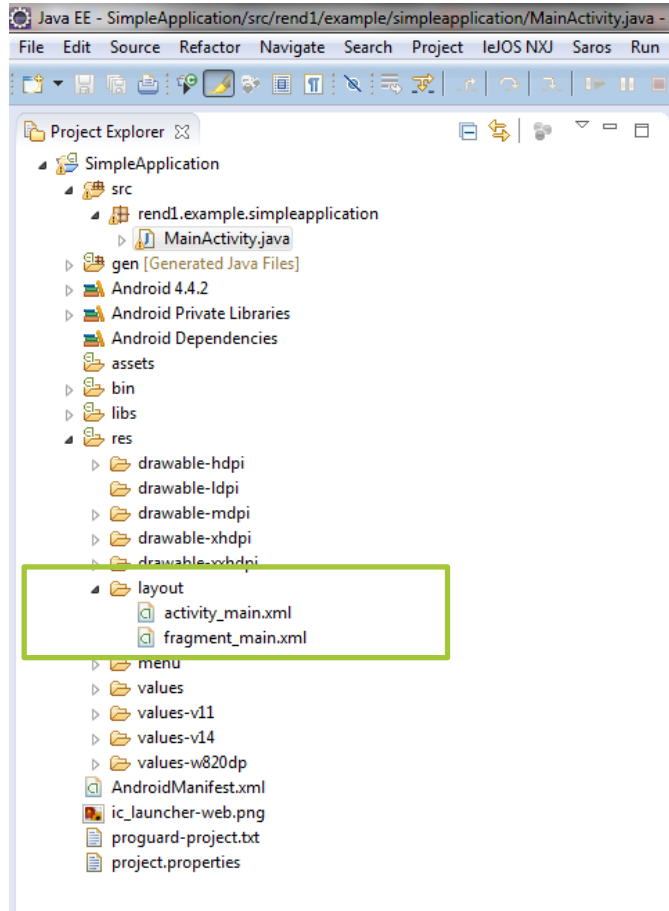


## Structuur



- Resolutie onafhankelijk ook mogelijk
- Voorbeelden
  - XML (Shapes, Gradient)
  - Nine Patch (.9.png)

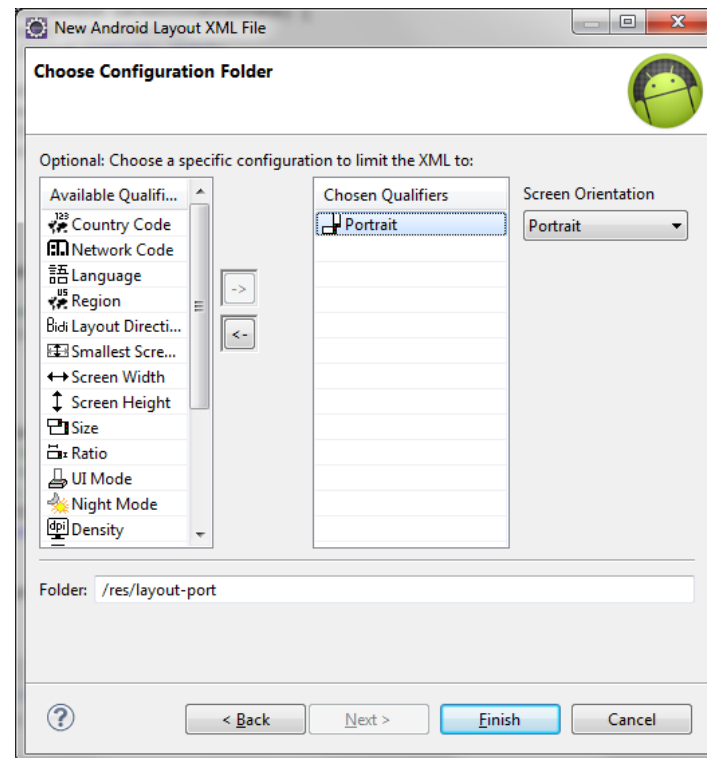
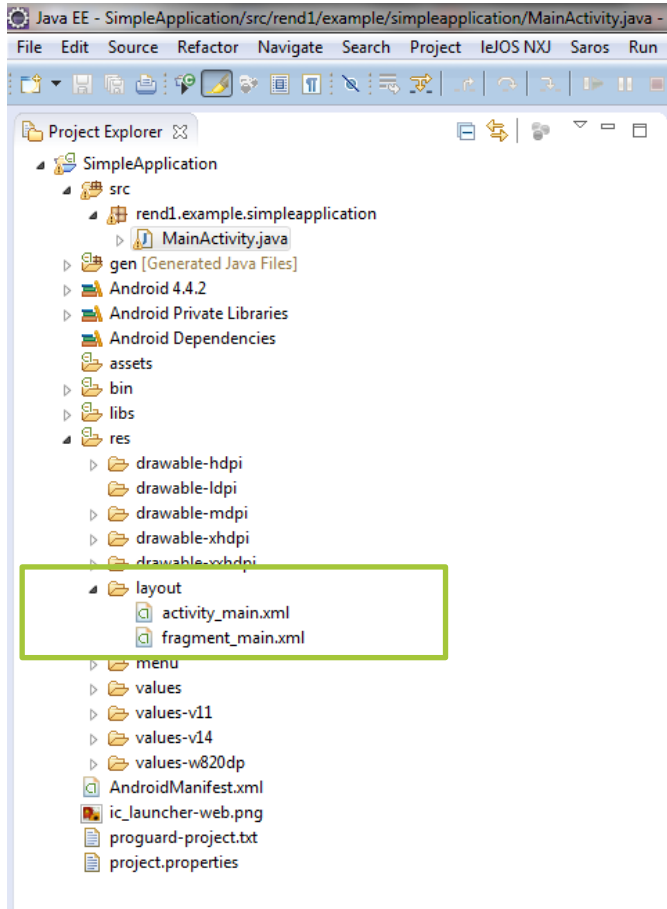
## Structuur



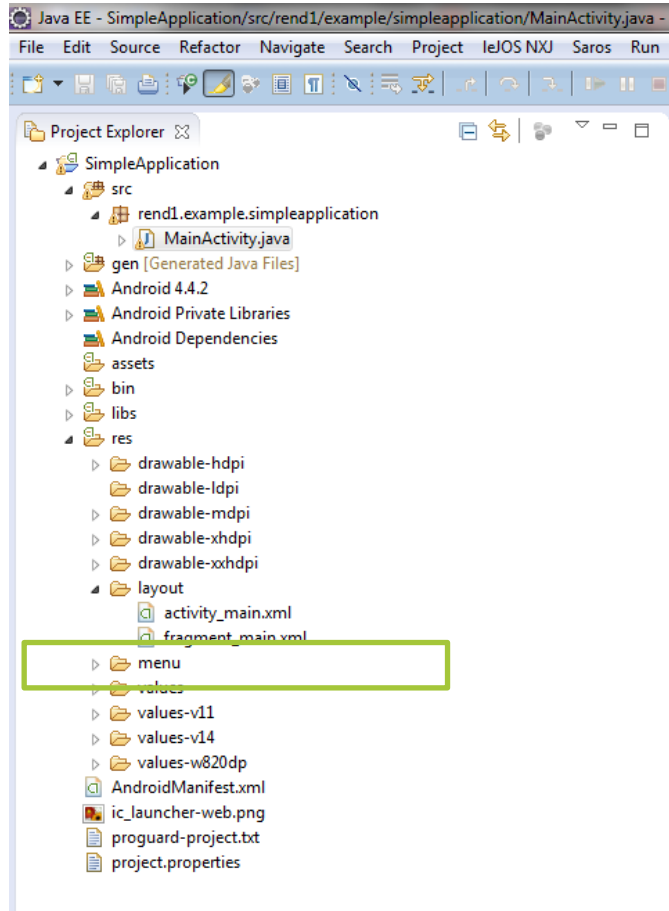
- Standaard layout
- Specifieke layouts in specifieke mappen
- XML

## Structuur

## Specifieke eigenschappen

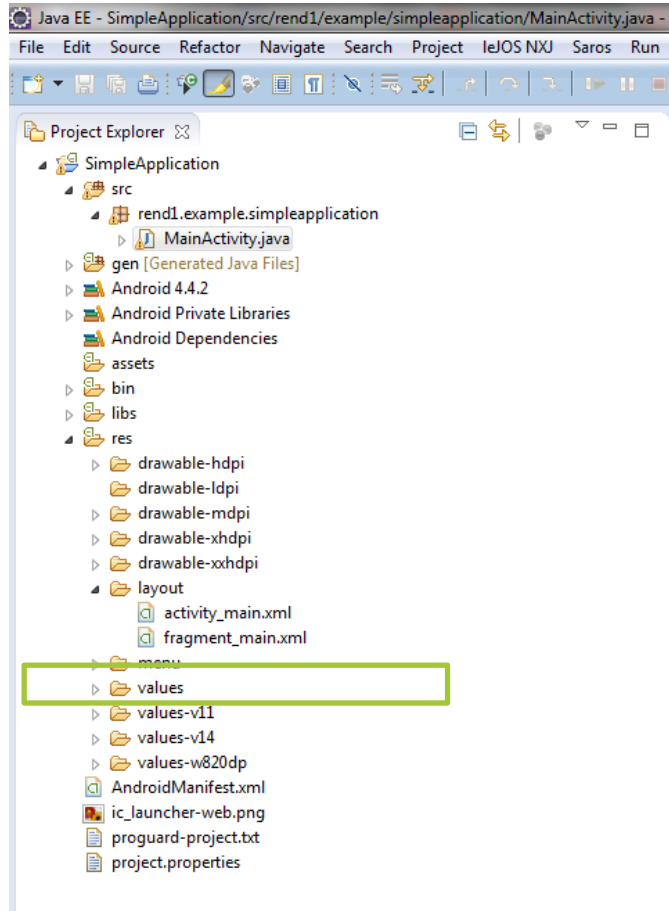


## Structuur



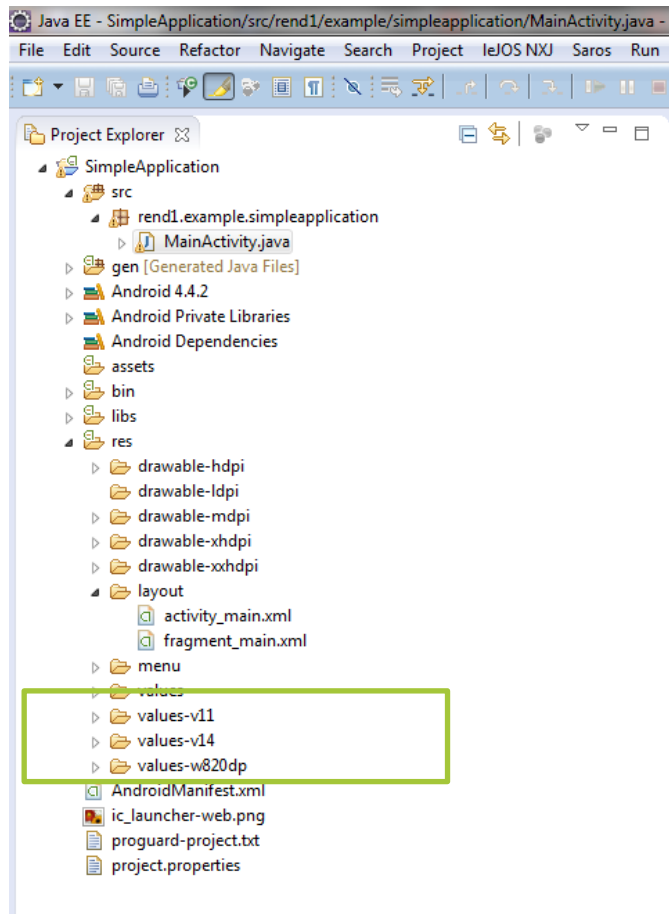
- Menu waardes
- Voor ActionBar
- XML

## Structuur



- Overige waarden
- XML
- Voorbeelden
  - Strings
  - Colors
  - Dimens(ions)

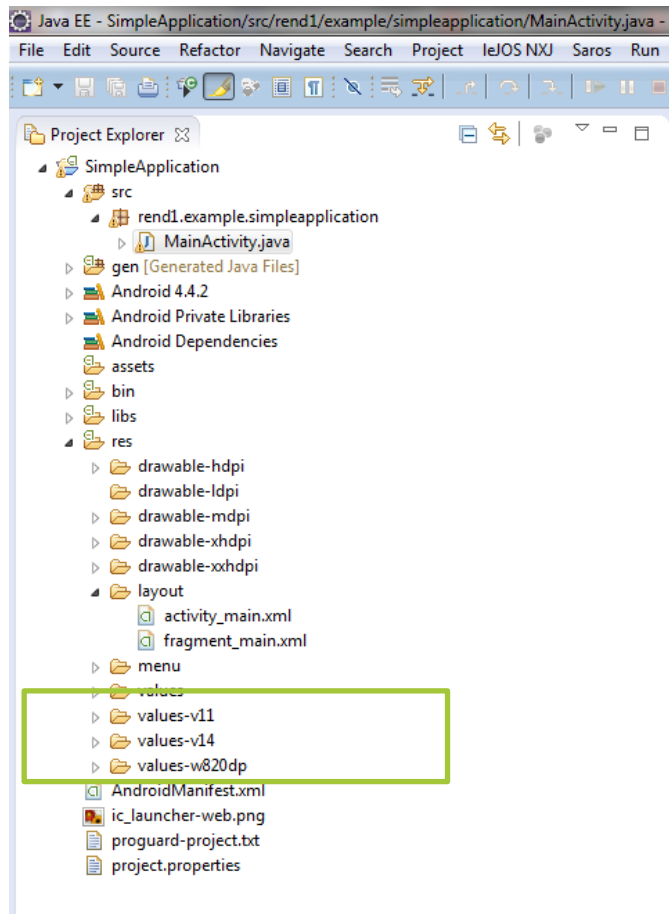
## Structuur



- Specifieke waarden
- Onderscheid op
  - taal, versie, formaat, etc

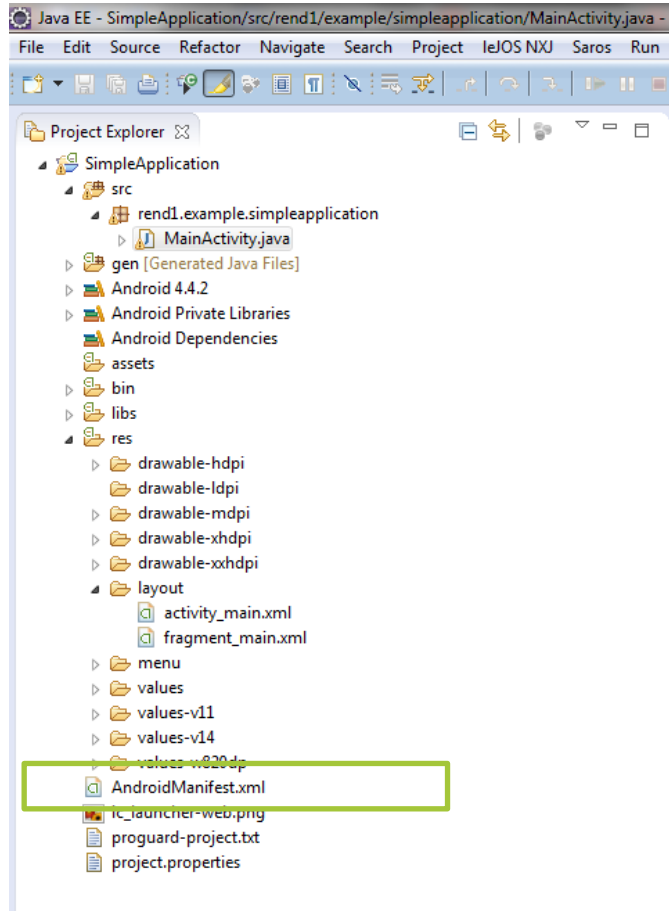


## Structuur



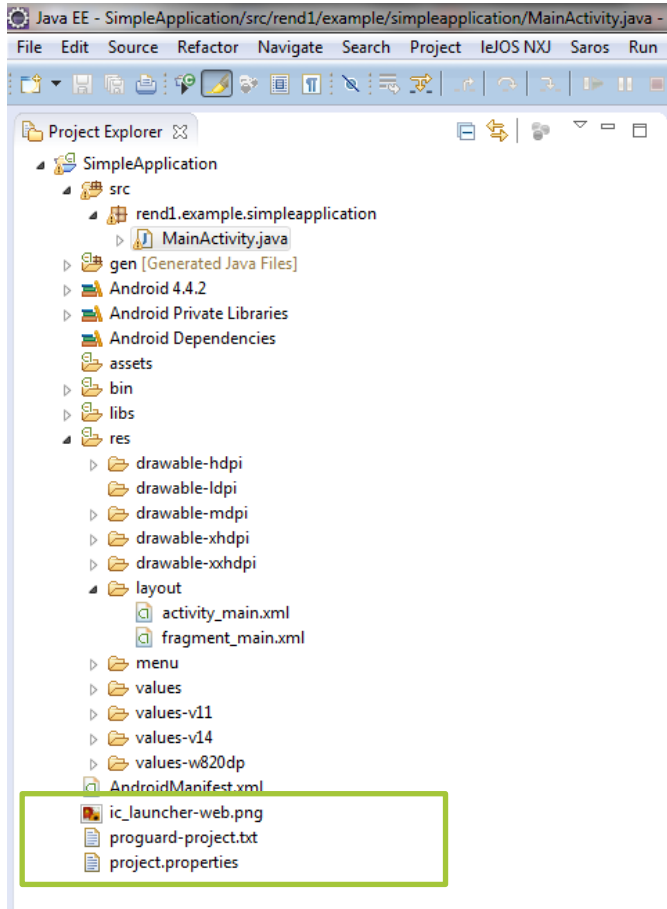
- Specifieke waarden
- Onderscheid op
  - taal, versie, formaat, etc

## Structuur



- App eigenschappen
- Voorbeelden
  - Permissies
  - Intent filters
  - Activity definities
- (Zie eerste college)

## Structuur



- Niet belangrijk

JAVA | LAYOUT | MANIFEST

## DE EERSTE STAPPEN

## Java

```
*MainActivity.java  fragment_main.xml  SimpleApplication Manifest  SecondActivity.java
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            return true;
        }
        return super.onOptionsItemSelected(item);
    }

    /**
     * A placeholder fragment containing a simple view.
     */
    public static class PlaceholderFragment extends Fragment {
        public PlaceholderFragment() {
        }

        @Override
        public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
            View rootView = inflater.inflate(R.layout.fragment_main, container, false);
            return rootView;
        }
    }
}
```

- Voorbeeld is automatisch gegenereerd.
- Als je het zelf schrijft, zorg dat je
  - Activity extend
  - onCreate implementeert

## Java

```
*MainActivity.java  fragment_main.xml  SimpleApplication Manifest  SecondActivity.java
package rend1.example.simpleapplication;

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public class MainActivity extends Activity {
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            Bundle savedInstanceState) {
            View rootView = inflater.inflate(R.layout.fragment_main, container, false);
            return rootView;
        }
    }
}
```

- Eerste aangeroepen functie in Activity
- Gebruik dit voor de content view
- **Moet** super.onCreate aanroepen
- savedInstanceState kan data bevatten van toen de activity werd afgesloten

# Android | De eerste stappen

## Java

```
*MainActivity.java  fragment_main.xml  SimpleApplication Manifest  SecondActivity.java
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

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    }

    /**
     * A placeholder fragment containing a simple view.
     */
    public static class PlaceholderFragment extends Fragment {

        public PlaceholderFragment() {
        }

        @Override
        public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
            View rootView = inflater.inflate(R.layout.fragment_main, container, false);
            return rootView;
        }
    }
}
```



- Menu in ActionBar [2,3]
- Geen menu?
  - gooi functie weg (of return false)
- Aanpassen?
  - Bewerk *main.xml* in *res/menu*

## Java

```
*MainActivity.java  fragment_main.xml  SimpleApplication Manifest  SecondActivity.java
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
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        return super.onOptionsItemSelected(item);
    }

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     */
    public static class PlaceholderFragment extends Fragment {

        public PlaceholderFragment() {
        }

        @Override
        public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
            View rootView = inflater.inflate(R.layout.fragment_main, container, false);
            return rootView;
        }
    }
}
```

- Aangeropen als iets uit het menu wordt geselecteerd
- Geselecteerde item wordt meegegeven
- Return true als je de selectie hebt “afgehandeld”
  - D.W.Z., als je niet wil dat het systeem of een ander onderdeel nog iets doet met de actie. Deze constructie komt vaker terug



## Java

```
*MainActivity.java  fragment_main.xml  SimpleApplication Manifest  SecondActivity.java
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

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    /**
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     */
    public static class PlaceholderFragment extends Fragment {

        public PlaceholderFragment() {
        }

        @Override
        public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
            View rootView = inflater.inflate(R.layout.fragment_main, container, false);
            return rootView;
        }
    }
}
```

- De inhoud als Fragment
- Mag in apart bestand
- Geen Fragment?
  - Laat dit weg
  - Gooi *fragment\_main.xml* ook weg

## Layout

### activity\_main.xml

```
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/container"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="rend1.example.simpleapplication.MainActivity"
    tools:ignore="MergeRootFrame" />
```

### fragment\_main.xml

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="rend1.example.simpleapplication.MainActivity$PlaceholderFragment" >

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello_world" />

</RelativeLayout>
```

- Ook automatisch gegenereerd
- Gebruik grafische interface om dingen toe te voegen
- Gebruik XML weergave voornamelijk om fouten op te lossen

## Manifest

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="rend1.example.simpleapplication"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="14"
        android:targetSdkVersion="19" />

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

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="rend1.example.simpleapplication.MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

- Ook automatisch gegenereerd
- Bewerken kan ook via grafische interface

## Manifest

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="rend1.example.simpleapplication"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="14"
        android:targetSdkVersion="19" />

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

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="rend1.example.simpleapplication.MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

## Activities

- Zorg dat al je Activities zijn genoemd

## Manifest

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="rend1.example.simpleapplication"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="14"
        android:targetSdkVersion="19" />

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

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="rend1.example.simpleapplication.MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

### Intent filters

- Zorg dat de intent filters goed zijn
  - *action.MAIN*
    - Standaard intent voor openen
  - *category.LAUNCHER*
    - Voor als op launch icon is gedrukt
- Intent filters staan binnen activity waar ze naar leiden

## Manifest

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="rend1.example.simpleapplication"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="14"
        android:targetSdkVersion="19" />

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

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="rend1.example.simpleapplication.MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

## Permissions

- Zorg dat alle permissions zijn genoemd

# Android

UITVOEREN | LOG | AVD

**TESTEN**

## Uitvoeren

The screenshot displays the Eclipse IDE interface for an Android project. The main editor shows the `MainActivity.java` file with the following code:

```
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        if (savedInstanceState == null) {
            getSupportFragmentManager().beginTransaction()
                .add(R.id.container, new PlaceholderFragment())
                .commit();
        }
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

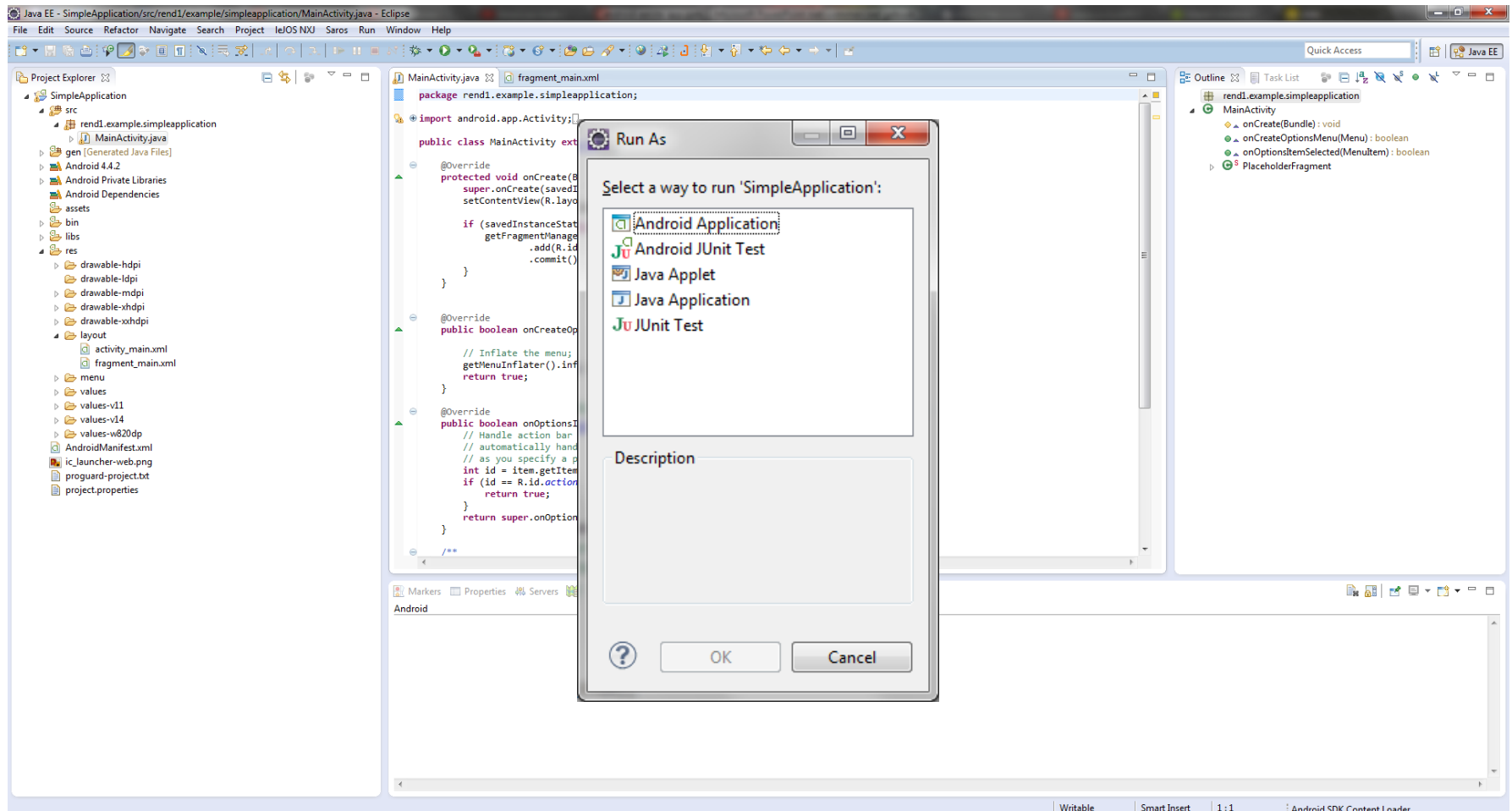
The Project Explorer on the left shows the project structure, including the `src` directory with `MainActivity.java` and `fragment_main.xml`, and the `res` directory with `layout` containing `activity_main.xml` and `fragment_main.xml`. The Outline view on the right shows the class hierarchy and methods for `MainActivity`.

The Console at the bottom is currently empty, showing the text "Android".



## Uitvoeren kies type

*eenmalig*



## Uitvoeren gebruik logcat *eenmalig*

The screenshot shows the Eclipse IDE interface. The main editor displays the `MainActivity.java` file with the following code:

```
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        if (savedInstanceState == null) {
            getSupportFragmentManager().beginTransaction()
                .add(R.id.container, new PlaceholderFragment())
                .commit();
        }
    }

    @Override
    public boolean onCreateOptionsMenu() {
        // Inflate the menu; this adds items to the about action bar.
        getMenuInflater().inflate(R.menu.menu, this.supportFragmentManager);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected() {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = getItem().getItemId();
        if (id == R.id.action_settings)
            return true;
        return super.onOptionsItemSelected(item);
    }
}
```

A dialog box titled "Auto Monitor Logcat" is overlaid on the code, asking: "Would you like ADT to automatically monitor logcat output for messages from applications in the workspace?". The "Yes" option is selected, and the priority is set to "error".

The console output at the bottom shows the following log messages:

```
Android
[2014-04-08 15:06:46 - SimpleApplication] Success!
[2014-04-08 15:06:46 - SimpleApplication] Starting activity rend1.example.simpleapplication.MainActivity on device R32D800C5LY
[2014-04-08 15:06:46 - SimpleApplication] ActivityManager: Starting: Intent { act=android.intent.action.MAIN cat=[android.intent.category.LAUNCHER] cmp=rend1.example.simpleapplication/.MainActivity }
[2014-04-08 15:06:48 - SimpleApplication] -----
[2014-04-08 15:06:48 - SimpleApplication] Android Launch!
[2014-04-08 15:06:48 - SimpleApplication] adb is running normally.
[2014-04-08 15:06:48 - SimpleApplication] Performing rend1.example.simpleapplication.MainActivity activity launch
[2014-04-08 15:06:49 - SimpleApplication] Automatic Target Mode: using device 'R32D800C5LY'
[2014-04-08 15:06:50 - SimpleApplication] Application already deployed. No need to reinstall.
[2014-04-08 15:06:50 - SimpleApplication] Starting activity rend1.example.simpleapplication.MainActivity on device R32D800C5LY
[2014-04-08 15:06:50 - SimpleApplication] ActivityManager: Starting: Intent { act=android.intent.action.MAIN cat=[android.intent.category.LAUNCHER] cmp=rend1.example.simpleapplication/.MainActivity }
[2014-04-08 15:06:50 - SimpleApplication] ActivityManager: Warning: Activity not started, its current task has been brought to the front
```

# Android Testen

## Uitvoeren kies device om op te draaien *evt eenmalig*

The screenshot shows the Eclipse IDE interface with the 'Android Device Chooser' dialog box open. The dialog is titled 'Android Device Chooser' and contains the following information:

Select a device with min API level 14.  
 Choose a running Android device

Serial Number	AVD Name	Target	Debug	State
samsung-nexus_10-R32D800...	N/A	4.4.2		Online

Launch a new Android Virtual Device

AVD Name	Target Name	Platfo...	API Le...	CPU/ABI	Details...
Phone	Android 4.2.2	4.2.2	17	ARM (armeabi-v7a)	Start...
Tablet	Android 4.2.2	4.2.2	17	ARM (armeabi-v7a)	
AVD_for_Nexus...	Android 4.4.2	4.4.2	19	ARM (armeabi-v7a)	

Use same device for future launches

Buttons: OK, Cancel, Refresh, Manager...

# Android Testen

## Uitvoeren app draait nu op device

The screenshot shows the Eclipse IDE interface with the following components:

- Project Explorer:** Shows the project structure for 'SimpleApplication', including 'src', 'gen', 'Android 4.4.2', 'Android Private Libraries', 'Android Dependencies', 'assets', 'bin', 'libs', 'res', and 'layout'.
- MainActivity.java:** Displays the following code:

```
package rend1.example.simpleapplication;

import android.app.Activity;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        if (savedInstanceState == null) {
            getSupportFragmentManager().beginTransaction()
                .add(R.id.container, new PlaceholderFragment())
                .commit();
        }
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

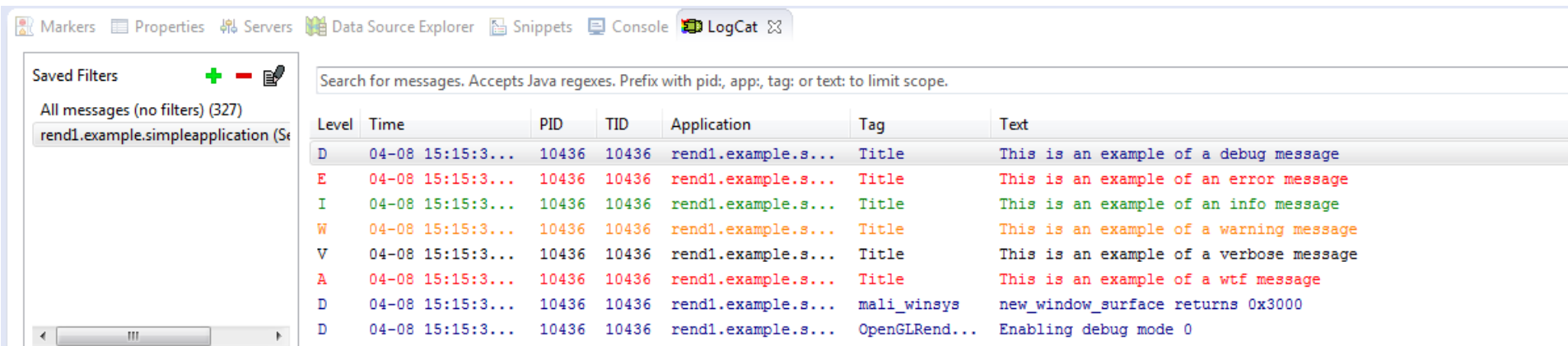
    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        // Handle action bar item clicks here. The action bar will
        // automatically handle clicks on the Home/Up button, so long
        // as you specify a parent activity in AndroidManifest.xml.
        int id = item.getItemId();
        if (id == R.id.action_settings) {
            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```
- LogCat:** Shows the following log messages:

L...	Time	PID	TID	Application
D	04-08 15:06:5...	10077	10077	rend1.example.s...
D	04-08 15:06:5...	10077	10077	rend1.example.s...
- Virtual Device:** Shows a virtual phone with the text 'SimpleApplication' displayed on the screen.

## Log

```
Log.d("Title", "This is an example of a debug message");  
Log.e("Title", "This is an example of an error message");  
  
Log.i("Title", "This is an example of an info message");  
Log.w("Title", "This is an example of a warning message");  
Log.v("Title", "This is an example of a verbose message");  
Log.wtf("Title", "This is an example of a wtf message");
```

- Vervangt  
System.out.println



The screenshot shows the LogCat window in Android Studio. The interface includes a search bar at the top, a list of saved filters on the left, and a table of log messages. The messages are color-coded by level: Debug (D), Error (E), Info (I), Warning (W), Verbose (V), and Assert (A). The messages include timestamps, PID, TID, application name, tag, and the message text.

Level	Time	PID	TID	Application	Tag	Text
D	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of a debug message
E	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of an error message
I	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of an info message
W	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of a warning message
V	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of a verbose message
A	04-08 15:15:3...	10436	10436	rend1.example.s...	Title	This is an example of a wtf message
D	04-08 15:15:3...	10436	10436	rend1.example.s...	mali_winsys	new_window_surface returns 0x3000
D	04-08 15:15:3...	10436	10436	rend1.example.s...	OpenGLRend...	Enabling debug mode 0

# Android | Handige links

- **Uitleg**

- <http://developer.android.com>
- <http://developer.android.com/training/>
- <http://developer.android.com/guide/>

- **API**

- <http://developer.android.com/reference/>

- **Specifieke problemen**

- *stackoverflow.com (via google)*

[1] *Density tests*

[http://developer.android.com/guide/practices/screens\\_support.html#density-independence](http://developer.android.com/guide/practices/screens_support.html#density-independence)

[2] *You are now 3 steps away from being a developer*

<http://cdn.gottabemobile.com/wp-content/uploads/2013/11/Screen-Shot-2013-11-08-at-3.51.58-PM.png>