

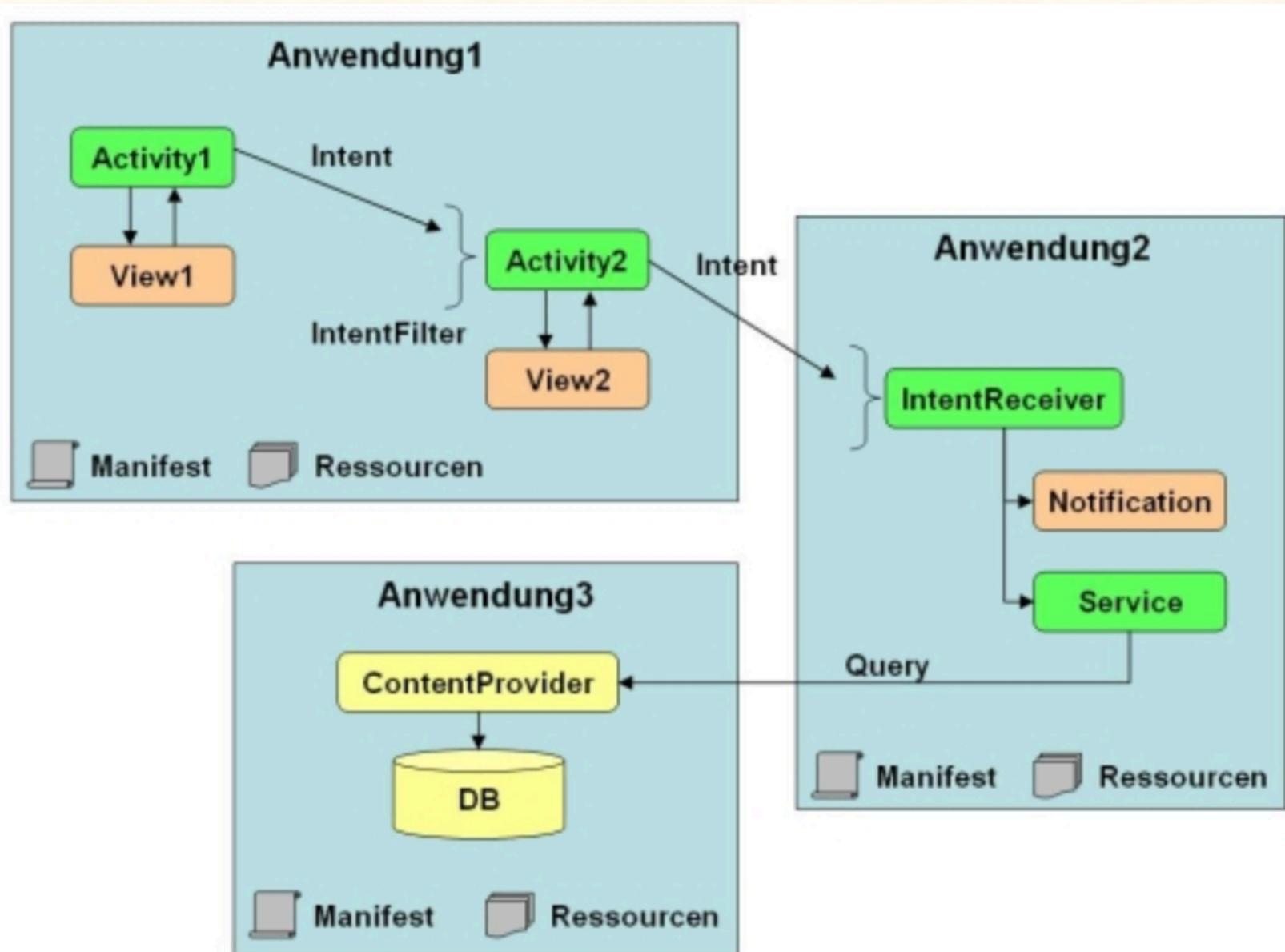
Multiscreen Apps. Intent. Activity LifeCycle.

<http://entwickler.de/zonen/portale/psecom,id,101,online,2177,neu,1.html>

<http://startandroid.ru/ru/uroki/vse-uroki-spiskom/58-urok-21-sozdanie-i-vyzov-activity.html>

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Apps Interaction



Multiscreen App

- Ein Touchscreen-Gerät hat meistens relativ kleine Abmessungen
 - keine echte Multiscreen-Technik, statt dessen ein Stapel von sichtbaren Fensters (Activities)
 - Problemstellung:
 - Eine App mit mehreren Activity Objekten
 - Intent
 - Start-Verfahren für einer Activity
 - Eine Datenübertragung Parent -> Child
 - Eine Datenübertragung Child -> Parent
 - Activity Life Zyclus
 - ...

App Components Interaction

- ANDROID-App Structure
 - Activity
 - View
 - Intent
 - IntentFilter
 - IntentReceiver
 - Notification
 - Service
 - ...

App Components Interaction

- Activity
 - The main App component.
 - Connected with a View.
 - Realizes a business logic.
 - Realizes an event handling.
 - Visualizes a data process results.

App Components Interaction

- View
 - a user interface.
 - a graphical user screen representation
 - layout management
 - ...

Intents

- Funktionen innerhalb der drei Kernanwendungskomponenten *Activities*, *Services* und *Broadcast-Receivers* werden über Nachrichten, sogenannte *Intents*, ausgelöst.
- Ein Intent
 - ermöglicht:
 - das Auslösen von Funktionen innerhalb der Anwendungen,
 - das Starten einer Anwendung (bzw. einer Aktivität innerhalb der Anwendung)
 - ist nur eine Absicht, ein Zweck unter vielen anderen Intents. Mit den *Intents* definiert man *Ereignisse*, auf die die Aktivität reagiert.

Intents

- Ein *Intent* wird durch ein *Intent-Objekt* repräsentiert. Das *Intent-Objekt*
 - beschreibt die Aktion, die ausgeführt werden soll,
 - transportiert ggf. weitere Informationen, die zur Erfüllung der Aufgabe benötigt werden.
- Die Basisklasse für Intent-Objekte ist die Klasse android.content.Intent. Mit dieser Klasse konstruiert man Intent-Objekte, um Aktionen auszulösen, bzw. man erhält ein solches Objekt, wenn eine Aktion unserer Anwendung ausgelöst wurde.

Intents

- Die Anwendungskomponenten definieren innerhalb des Manifests ihre *Intent-Filter*.
 - Mittels der *Intent-Filter* legt eine Komponente fest, auf welche *Intents* sie unter welchen Bedingungen reagiert.
 - Da diese Festlegung Bestandteil des Manifests ist, kann das Laufzeitsystem diese Informationen auswerten, ohne dass die Anwendung selbst läuft.

Intents

- Wenn eine Anwendung installiert wird vermerkt das Laufzeitsystem die entsprechenden *Intent-Filter* und die dazugehörige Anwendung.
- Wenn ein *Intent* ausgelöst wird, sucht das Laufzeitsystem über die *Intent-Filter* die entsprechende Anwendung bzw. Anwendungskomponente und bringt diese bei Bedarf zur Ausführung.
- Die Anwendungskomponente ist dann dafür verantwortlich, das *Intent-Objekt* auszuwerten und die entsprechende Funktion auszuführen.

Service

- Service
 - works in background without graphical interface
 - has a live cycle
 - will not stopped, runs in background

ContentProvider

- ContentProvider
 - provides access to data for
 - Activity
 - IntentReceiver
 - Services
 - common (shared) data access (address book)

Multiscreen App

- Create the main Activity
- Create the second Activity
- Create a call of the second Activity from the first one

Multiscreen App

- We will create a project with
 - Layout activity_main.xml
 - Button
 - Class MainActivity.java
 - OnClicklistener
 - Method onClick(View v)

Multiscreen App

- Add one more, the second Activity
 - a Layout
 - a class (an Activity extention)
 - register an Activity in AndroidManifest.xml

Multiscreen App

- in a folder layout we have already the main.xml.
- we will make the second file two.xml.
 - two.xml: a TextView object only

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Activity Two">
    </TextView>
</LinearLayout>
```

Multiscreen App

- The second Activity
 - New -> Class
 - class name ActivityTwo,
 - superclass android.app.Activity
 - method onCreate();

```
public class ActivityTwo extends Activity {  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
    }  
}
```

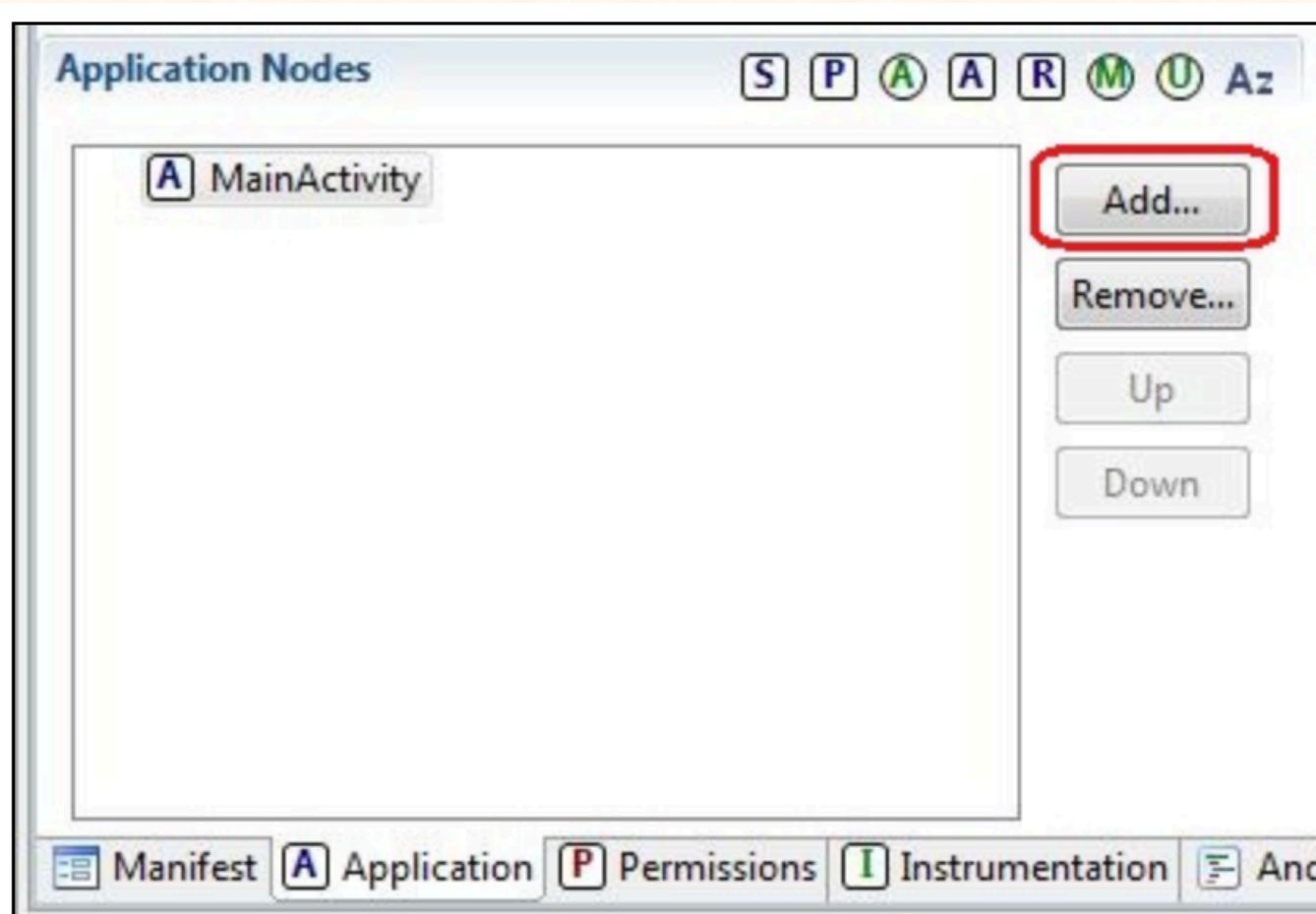
Multiscreen App

- in the second Activity
 - in the method onCreate() :
 - first: **super.onCreate();**
 - after this: **setContentView(...);**

```
protected void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
    setContentView(R.layout.two);  
}
```

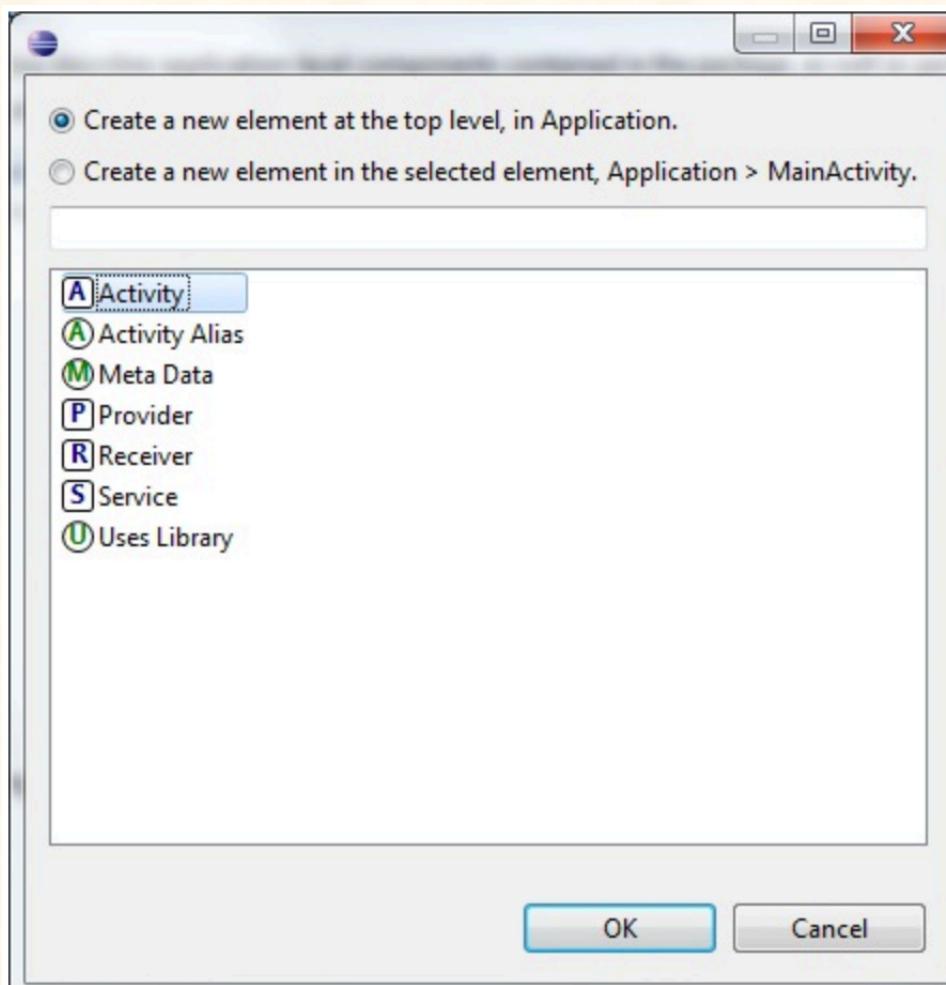
Multiscreen App

- The new Activity must be present in the AndroidManifest.xml (Application tab, Add):



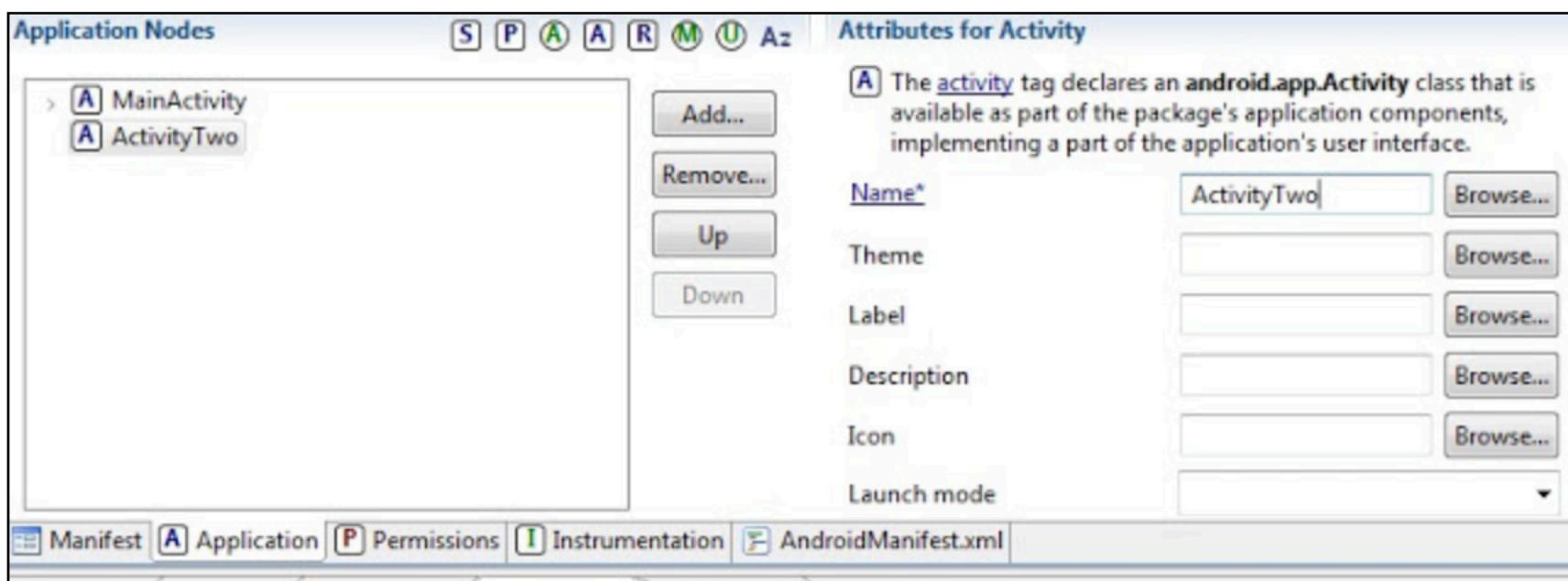
Multiscreen App

- «Create a new element at the top level ...»
- Activity
- OK



Multiscreen App

- in the Name window let us show the name ActivityTwo
- done.



Intent

```
public class MainActivity extends Activity implements OnClickListener {  
  
    Button btnActTwo;  
  
    /** Called when the activity is first created. */  
    @Override  
    public void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.main);  
  
        btnActTwo = (Button) findViewById(R.id.btnActTwo);  
        btnActTwo.setOnClickListener(this);  
    }  
  
    @Override  
    public void onClick(View v) {  
        switch (v.getId()) {  
            case R.id.btnActTwo:  
                // TODO Call second activity  
                break;  
            default:  
                case R.id.btnActTwo:  
                    Intent intent = new Intent(this, ActivityTwo.class);  
                    startActivityForResult(intent);  
                break;  
        }  
    }  
}
```

Intent

- Intent is an object with a definition, what a new activity must be created:

```
Intent intent = new Intent(this, ActivityTwo.class);
startActivity(intent);
```

- This Intent-object is activated using a `startActivity()` method.
- A required activity will be instantiated.

Intent

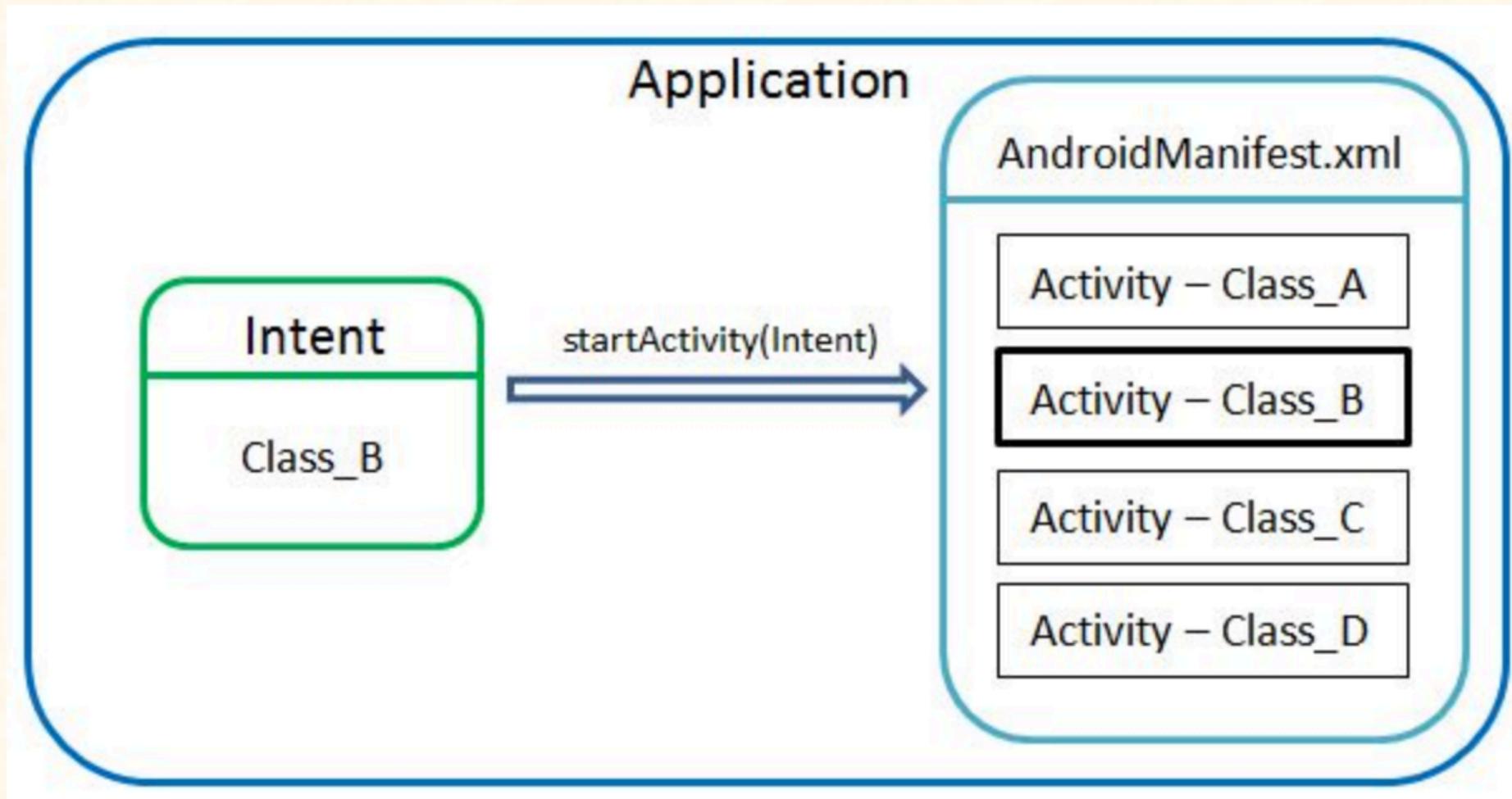
- To create the Intent we are using a constructor
`Intent(Context packageContext, Class cls)`
 - The first parameter: Context.
 - Activity is a Context subclass; we can use **this**.
 - Context:
 - Interface to global information about an application environment.
 - This is an abstract class whose implementation is provided by the Android system.
 - It allows access to application-specific resources and classes, as well as up-calls for application-level operations such as launching activities, broadcasting and receiving intents, etc.

Intent

- To create the Intent we are using a constructor Intent (Context packageContext, Class cls)
 - The second parameter is the new activity class name.
 - we have registered a class name in the manifest file
 - the same name must be as the second parameter specified
 - The Activity to be created in the such art must be defined **in the same project** as an Intent object!

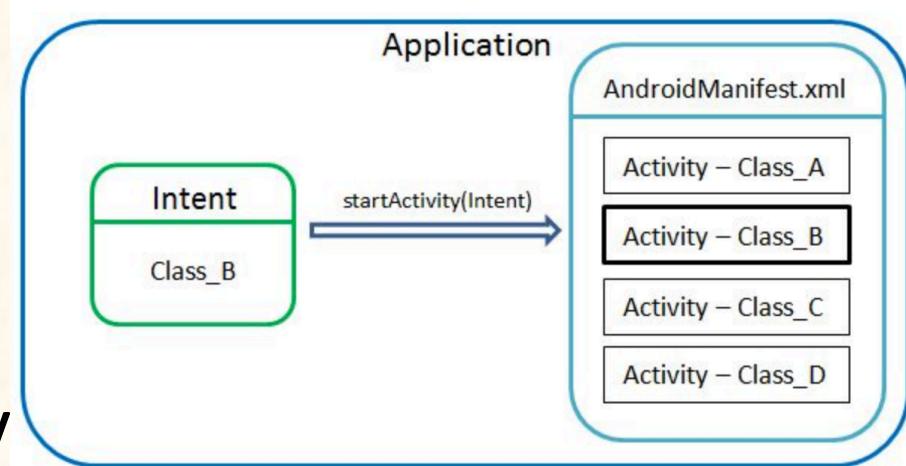
Intent

- Diagramm:



Intent

- We create an Intent with the parameter Class_B.
- The method startActivity uses the Intent as a parameter.
- OS looks an AndroidManifest on the Class_B Activity and starts it.
- This is a direct Activity call.



Intent

- Indirect Activity call:
 - An Intent uses a specified parameters such as:
 - action,
 - data,
 - category.
 - These parameters define our needs
 - email,
 - link,
 - text edit,
 - picture visualisation,
 - phone number call
 - etc.

Intent

- Indirect Activity call:
 - An Activity has an Intent Filter – a parameter set describing our Activity capabilities:
 - action,
 - data,
 - category
 - If the Intent parameters are corresponding with the Intent filter parameters, the Activity will be created.
 - All Activities in a System will be checked.
 - If more than one Activity will be found, the user will prompted to select one of the activities.

Intent

Android

Application_1

Intent

Param_C
action
data
category

startActivity(Intent)

Выбор

Activity_23
Activity_42

Application_2 - AndroidManifest

Activity_21 – IntentFilter: Param_A

Activity_22 – IntentFilter: Param_B

Activity_23 – IntentFilter: Param_C

Activity_24 – IntentFilter: не задан

Application_3 - AndroidManifest

Activity_31 – IntentFilter: Param_A

Activity_32 – IntentFilter: Param_F

Application_4 - AndroidManifest

Activity_41 – IntentFilter: Param_A

Activity_42 – IntentFilter: Param_C

Activity_43 – IntentFilter: Param_G

Intent

- Indirect Activity call:
 - Application_1 creates an Intent with the action, data, category parameters (Param_C).
 - startActivity (Intent)
 - There are some Apps with some Activities.
 - Some Activities have an Intent Filter (Param_A, Param_B, etc.).
 - The Intent parameters and each Activity Intent Filter parameters to be compared.
 - The Activities with the same parameter (Param_C) will be selected.

Activity LifeCycle

- An Activity can be set into one of three states:
 - Resumed
 - is on the screen,
 - has a focus,
 - the user can interact with the Activity.
 - The another state name is Running.

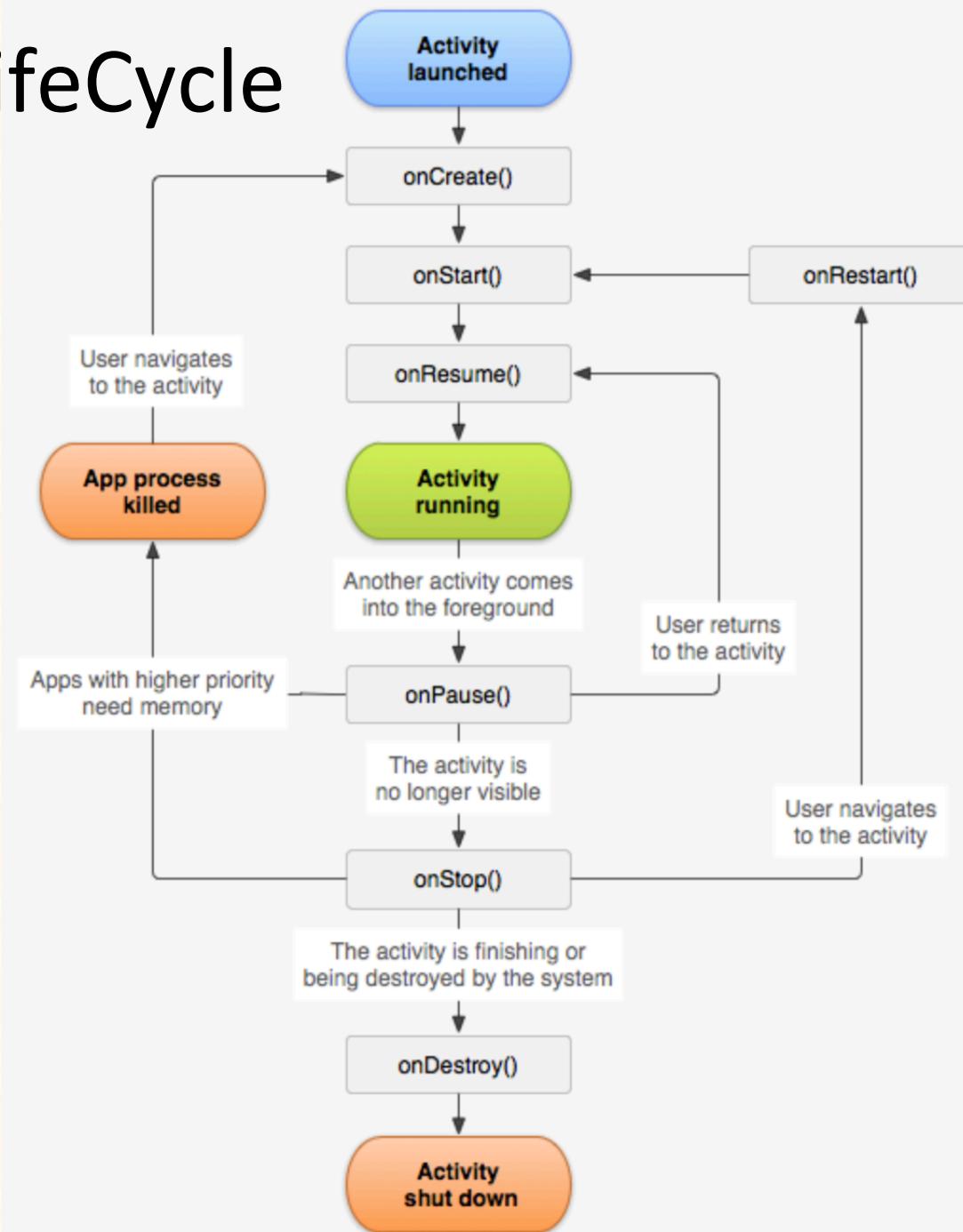
Activity LifeCycle

- An Activity can be set into one of three states:
 - Paused
 - Activity has no focus,
 - the user can not interact with the activity,
 - the activity is not fully on the screen.

Activity LifeCycle

- An Activity can be set into one of three states:
 - Stopped
 - Activity is fully hidden on the screen,
 - Activity has no focus,
 - the user can not interact with the activity.

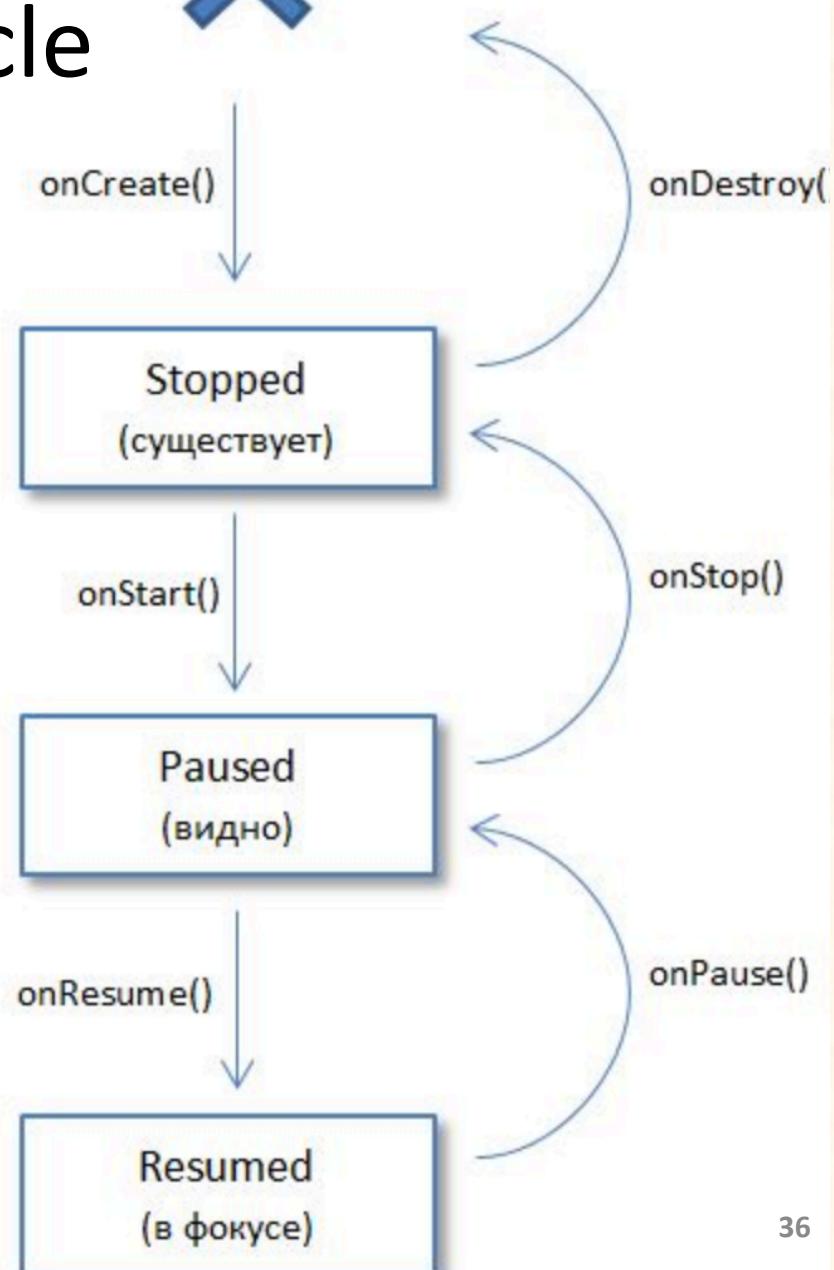
Activity LifeCycle



Activity LifeCycle



- The Activity state changes are supported with a corresponding methods.
- We can use these methods to involve our code.



Questions?

Multiscreen Apps.
Intent. Activity LifeCycle.