

PROGRAMMING HANDHELD SYSTEMS

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THE INTENT CLASS

TODAY'S TOPICS

THE INTENT CLASS

STARTING ACTIVITIES WITH INTENTS

EXPLICIT ACTIVATION

IMPLICIT ACTIVATION VIA INTENT RESOLUTION

THE INTENT CLASS

A DATA STRUCTURE THAT REPRESENTS
AN OPERATION TO BE PERFORMED, OR
AN EVENT THAT HAS OCCURRED

TODAY'S FOCUS

USING INTENTS TO SPECIFY OPERATIONS TO BE PERFORMED, NOT FOR EVENT NOTIFICATION

I.E., INTENTS USED TO START A SINGLE ACTIVITY

WE'LL COVER USING INTENTS FOR EVENT NOTIFICATION WHEN WE TALK ABOUT BROADCASTRECEIVERS

INTENTS AS DESIRED OPERATIONS

INTENTS PROVIDE A FLEXIBLE LANGUAGE FOR
SPECIFYING OPERATIONS TO BE PERFORMED

E.G., PICK A CONTACT, TAKE A PHOTO, DIAL A PHONE
NUMBER

INTENTS AS DESIRED OPERATIONS

INTENT IS CONSTRUCTED BY ONE COMPONENT
THAT WANTS SOME WORK DONE

RECEIVED BY ONE ACTIVITY THAT CAN
PERFORM THAT WORK

INTENT FIELDS

ACTION

DATA

CATEGORY

TYPE

COMPONENT

EXTRAS

FLAGS

ACTION

STRING REPRESENTING DESIRED OPERATION

EXAMPLES

ACTION_DIAL – DIAL A NUMBER

ACTION_EDIT – DISPLAY DATA TO EDIT

ACTION_SYNC – SYNCHRONIZE DEVICE
DATA WITH SERVER

ACTION_MAIN – START AS INITIAL
ACTIVITY OF APP

SETTING THE INTENT ACTION

```
Intent newInt = new Intent(Intent.ACTION_DIAL);
```

OR

```
Intent newInt = new Intent();  
newInt.setAction(Intent.ACTION_DIAL);
```

DATA

DATA ASSOCIATED WITH THE INTENT

FORMATTED AS A UNIFORM RESOURCE
IDENTIFIER (URI)

EXAMPLES

DATA TO VIEW ON A MAP

```
Uri.parse("geo:0,0?q=1600+Pennsylvania  
+Ave+Washington+DC")
```

NUMBER TO DIAL IN THE PHONE DIALER

```
Uri.parse("tel:+15555555555")
```

SETTING INTENT DATA

```
Intent newInt = new Intent(Intent.ACTION_DIAL,  
                           Uri.parse("tel:+15555555555"));
```

OR

```
Intent newInt = new Intent(Intent.ACTION_DIAL);  
newInt.setData(Uri.parse("tel:+15555555555"));
```

CATEGORY

ADDITIONAL INFORMATION ABOUT THE
COMPONENTS THAT CAN HANDLE THE INTENT

EXAMPLES

CATEGORY_BROWSABLE – CAN BE INVOKED BY A BROWSER TO DISPLAY DATA REF'S BY A URI

CATEGORY_LAUNCHER – CAN BE THE INITIAL ACTIVITY OF A TASK & IS LISTED IN TOP-LEVEL APP LAUNCHER

TYPE

SPECIFIES THE MIME TYPE OF THE INTENT
DATA

EXAMPLES

IMAGE/*, IMAGE/PNG, IMAGE/JPG

TEXT/PLAIN, TEXT/HTML

IF UNSPECIFIED, ANDROID WILL INFER THE
TYPE

SETTING THE TYPE

`Intent.setType(String type)`

OR

`Intent.setDataAndType(Uri data, String type)`

COMPONENT

THE COMPONENT THAT SHOULD RECEIVE THIS
INTENT

USE THIS WHEN THERE'S EXACTLY ONE
COMPONENT THAT SHOULD RECEIVE THE INTENT

SETTING THE COMPONENT

```
Intent newInt =  
    Intent(Context packageContext, Class<?> cls);
```

SETTING THE COMPONENT

OR

```
Intent newInt = new Intent ();
```

and one of:

```
setComponent(), setClass(), or setClassName()
```

EXTRAS

ADD'L INFORMATION ASSOCIATED WITH INTENT
TREATED AS A MAP (KEY-VALUE PAIRS)

EXAMPLES

Intent.EXTRA_EMAIL: EMAIL RECIPIENTS

```
Intent newInt = new Intent(Intent.ACTION_SEND);
newInt.putExtra(android.content.Intent.EXTRA_EMAIL,
    new String[]{
        "aporter@cs.umd.edu", "ceo@microsoft.com",
        "potus@whitehouse.gov", "mozart@musician.org"
    }
);
```


SETTING THE EXTRA ATTRIBUTE

SEVERAL FORMS DEPENDING ON DATA TYPES, E.G.,

```
putExtra(String name, String value);
```

```
putExtra(String name, float[] value);
```

...

FLAGS

SPECIFY HOW INTENT SHOULD BE HANDLED

EXAMPLES

FLAG_ACTIVITY_NO_HISTORY

DON'T PUT THIS ACTIVITY IN THE HISTORY STACK

FLAG_DEBUG_LOG_RESOLUTION

PRINT EXTRA LOGGING INFORMATION WHEN THIS
INTENT IS PROCESSED

SETTING FLAGS

```
Intent newInt = new Intent(Intent.ACTION_SEND);  
newInt.setFlags(Intent.FLAG_ACTIVITY_NO_HISTORY);
```

STARTING ACTIVITIES WITH INTENTS

`startActivity(Intent intent,...)`

`startActivityForResult(Intent intent, ...)`

THE TARGET ACTIVITY

CAN BE NAMED EXPLICITLY BY SETTING THE
INTENT'S COMPONENT

CAN BE DETERMINED IMPLICITLY

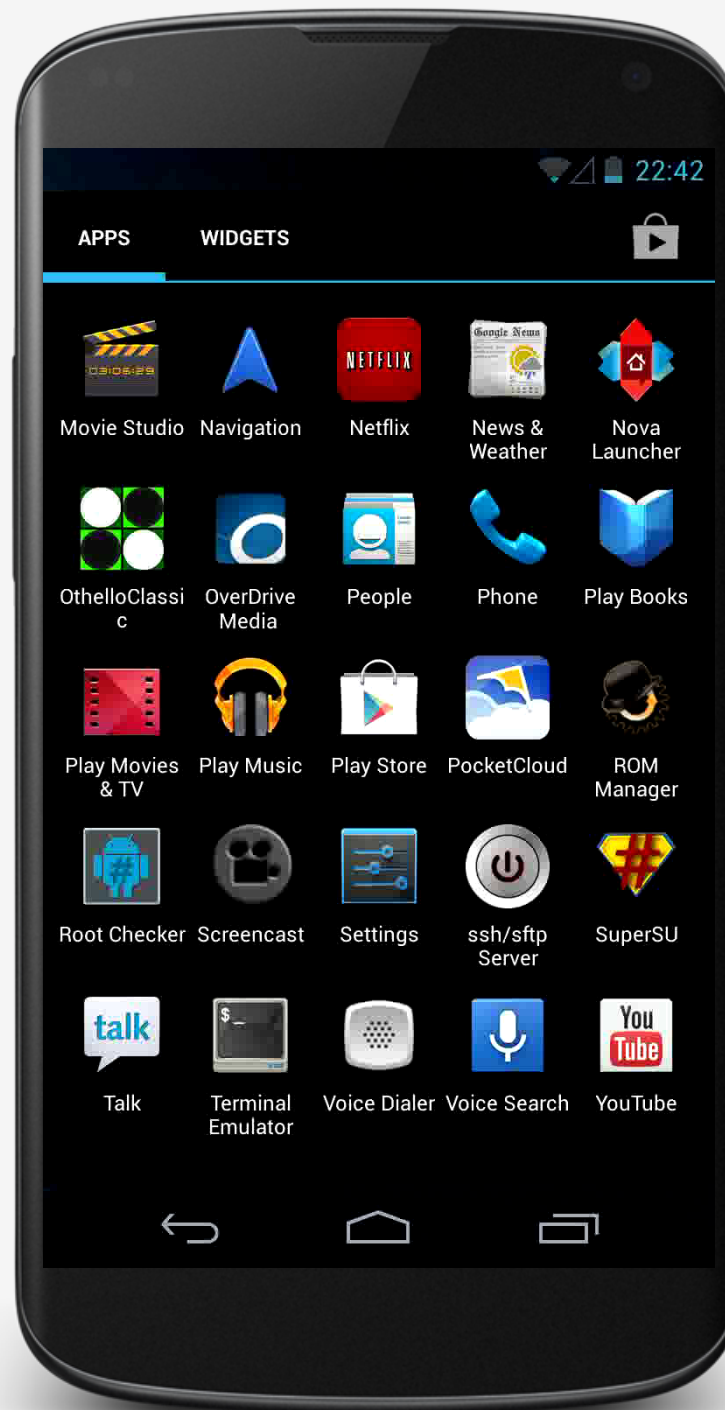
EXPLICIT ACTIVATION

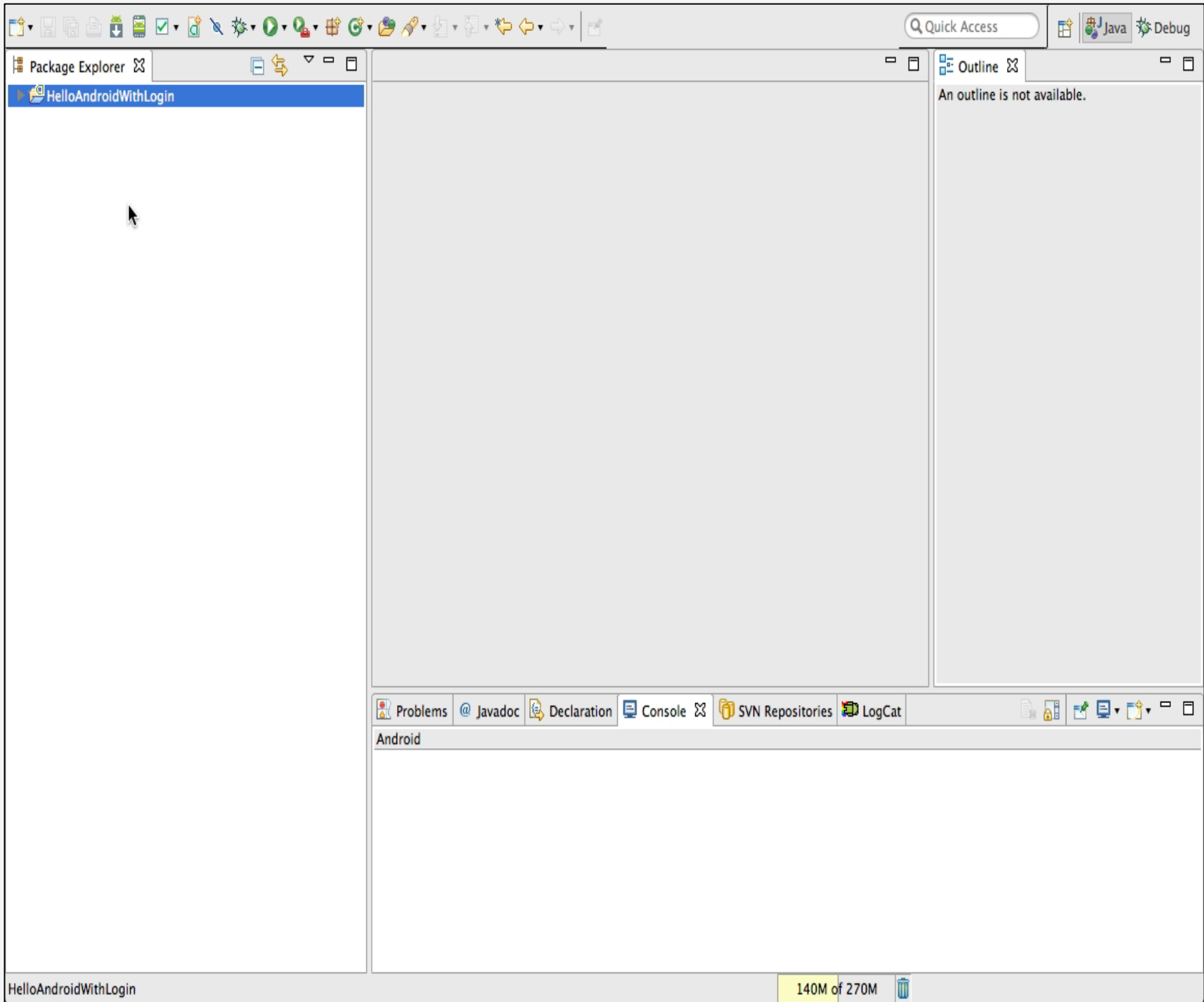
HELLOWORLDWITHLOGIN

TWO ACTIVITIES

LOGINACTIVITY CHECKS USERNAME & PASSWORD
AND THEN STARTS HELLOANDROIDACTIVITY

HELLOANDROIDACTIVITY SHOWS "HELLO ANDROID"
MESSAGE





IMPLICIT ACTIVATION

WHEN THE ACTIVITY TO BE ACTIVATED IS NOT EXPLICITLY NAMED, ANDROID TRIES TO FIND ACTIVITIES THAT MATCH THE INTENT

THIS PROCESS IS CALLED INTENT RESOLUTION

INTENT RESOLUTION PROCESS

AN INTENT DESCRIBING A DESIRED OPERATION

INTENTFILTERS WHICH DESCRIBE WHICH
OPERATIONS AN ACTIVITY CAN HANDLE

SPECIFIED EITHER IN ANDROIDMANIFEST.XML OR
PROGRAMMATICALLY

INTENT RESOLUTION DATA

ACTION

DATA (BOTH URI & TYPE)

CATEGORY

SPECIFYING INTENTFILTERS

```
<activity ...>
  <intent-filter ...>
    ...
    <action android:name="actionName" />
    ...
  </intent-filter>
  ...
</activity>
```

HANDLING INTENT.ACTION_DIAL

```
<activity ...>
  <intent-filter ...>
    ...
    <action android:name="android.intent.action.DIAL" />
    ...
  </intent-filter>
  ...
</activity>
```

ADDING DATA TO INTENTFILTER

```
<intent-filter ...>
  ...
  <data
    android:mimeType="string"
    android:scheme="string"
    android:host="string"
    android:port="string"
    android:path="string"
    android:pathPattern="string"
    android:pathPrefix="string"
  />
  ...
</intent-filter>
```

See: <http://developer.android.com/guide/components/intents-filters.html>

HANDLING GEO: SCHEME INTENTS

```
<intent-filter ...>
```

```
...
```

```
<data android:scheme="geo" />
```

```
...
```

```
</intent-filter>
```


ADDING A CATEGORY TO INTENTFILTER

```
<intent-filter ...>
```

```
...
```

```
<category android:name="string" />
```

```
...
```

```
</intent-filter>
```

EXAMPLE: MAPS APPLICATION

EXAMPLE: MAPS APPLICATION

```
<intent-filter ...>
```

```
  <action android:name = "android.intent.action.VIEW" />
```

```
  <category android:name = "android.intent.category.DEFAULT" />
```

```
  <category android:name =  
              "android.intent.category.BROWSABLE"/>
```

```
  <data android:scheme = "geo"/>
```

```
</intent-filter>
```

RECEIVING IMPLICIT INTENTS

NOTE: TO RECEIVE IMPLICIT INTENTS AN
ACTIVITY SHOULD SPECIFY AN INTENTFILTER
WITH THE CATEGORY

"ANDROID.INTENT.CATEGORY.DEFAULT" CATEGORY

PRIORITY

ANDROID:PRIORITY – PRIORITY GIVEN TO THE PARENT COMPONENT WHEN HANDLING MATCHING INTENTS

CAUSES ANDROID TO PREFER ONE ACTIVITY OVER ANOTHER

VALUE SHOULD BE GREATER THAN -1000 & LESS THAN 1000

HIGHER VALUES REPRESENT HIGHER PRIORITIES

INVESTIGATE INTENT FILTERS

```
% adb shell dumpsys package
```

% a

NEXT TIME

PERMISSIONS