

PROGRAMMING HANDHELD SYSTEMS

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PERMISSIONS

TODAY'S TOPICS

ANDROID PERMISSIONS

DEFINING & USING APPLICATION PERMISSIONS

COMPONENT PERMISSIONS & PERMISSIONS-
RELATED APIs

PERMISSIONS

ANDROID PROTECTS RESOURCES & DATA WITH PERMISSIONS

USED TO LIMIT ACCESS TO:

USER INFORMATION – E.G, CONTACTS

COST-SENSITIVE API'S – E.G., SMS/MMS

SYSTEM RESOURCES – E.G., CAMERA

PERMISSIONS

PERMISSIONS ARE REPRESENTED AS STRINGS

IN ANDROIDMANIFEST.XML, APPS DECLARE
THE PERMISSIONS

THEY USE THEMSELVES

THEY REQUIRE OF OTHER COMPONENTS

USING PERMISSIONS

APPLICATIONS SPECIFY PERMISSIONS THEY USE
THROUGH A <USES-PERMISSION> TAG

USERS MUST ACCEPT THESE PERMISSIONS
BEFORE AN APPLICATION CAN BE INSTALLED

USING PERMISSIONS

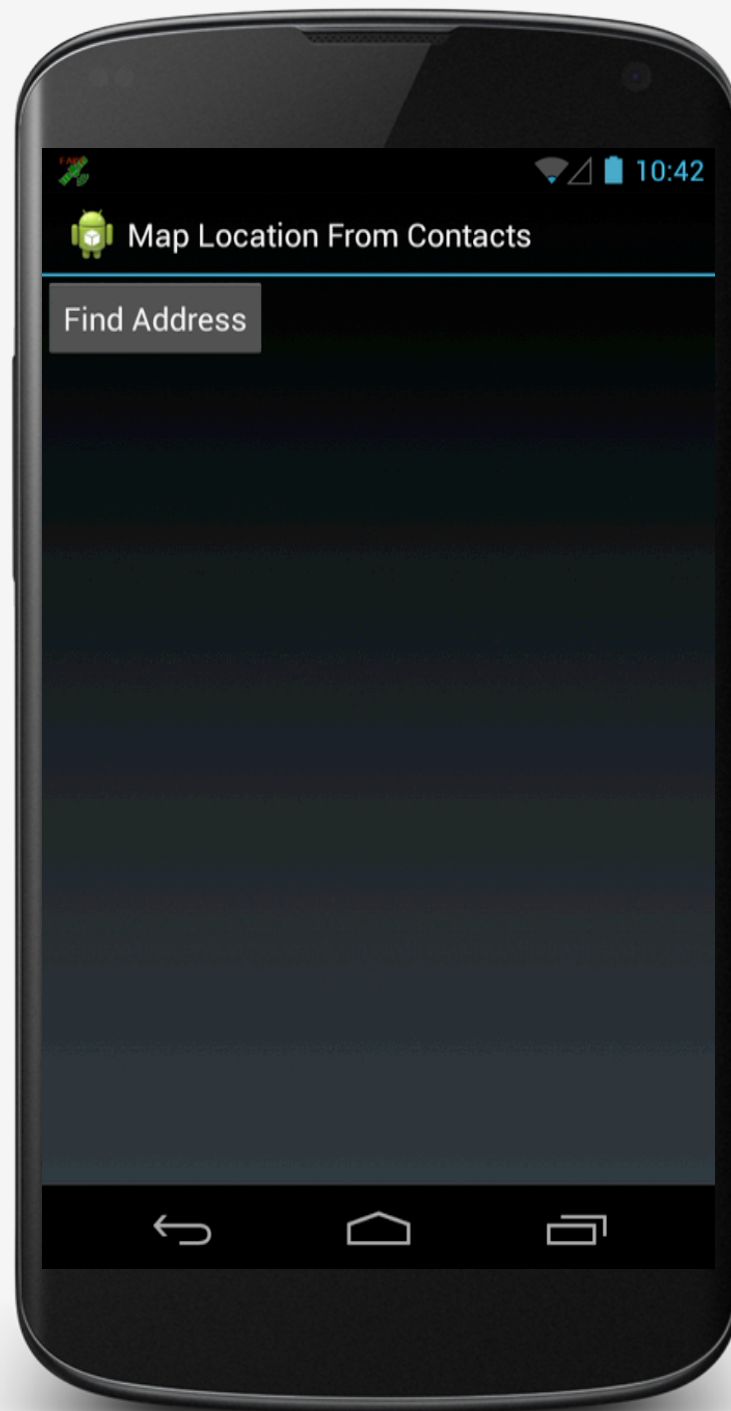
```
<manifest ... >
...
<uses-permission android:name=
                    "android.permission.CAMERA"/>
<uses-permission android:name=
                    "android.permission.INTERNET"/>
<uses-permission android:name=
    "android.permission.ACCESS_FINE_LOCATION"/>
...
</manifest >
```

SEE: [http://developer.android.com/reference/
android/Manifest.permission.html](http://developer.android.com/reference/android/Manifest.permission.html)

MAPLOCATIONFROMCONTACTS

SELECT A CONTACT FROM CONTACTS
DATABASE

DISPLAY A MAP CENTERED ON SELECTED
CONTACT'S ADDRESS



MAPLOCATIONFROMCONTACTS

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="course.examples.MapLocationFromContacts"
    android:versionCode="1"
    android:versionName="1.0" >

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

    <uses-sdk
        android:minSdkVersion="13"
```

DEFINING PERMISSIONS

APPS CAN ALSO DEFINE AND ENFORCE THEIR
OWN PERMISSIONS

DEFINING PERMISSIONS

SUPPOSE YOUR APPLICATION PERFORMS A
PRIVILEGED/DANGEROUS OPERATION

YOU MIGHT NOT WANT TO ALLOW JUST ANY
APPLICATION TO INVOKE YOURS

SO YOU CAN DEFINE & ENFORCE YOUR OWN
PERMISSION

PERMISSIONEXAMPLEBOOM

SIMPLE APPLICATION THAT PERFORMS A
(JUST PRETEND) DANGEROUS ACTION



DEFINE & ENFORCING PERMISSIONS

IF YOU DON'T WANT JUST ANYONE TO RUN
PERMISSIONEXAMPLEBOOM

DEFINE & ENFORCE AN APPLICATION-SPECIFIC
PERMISSION

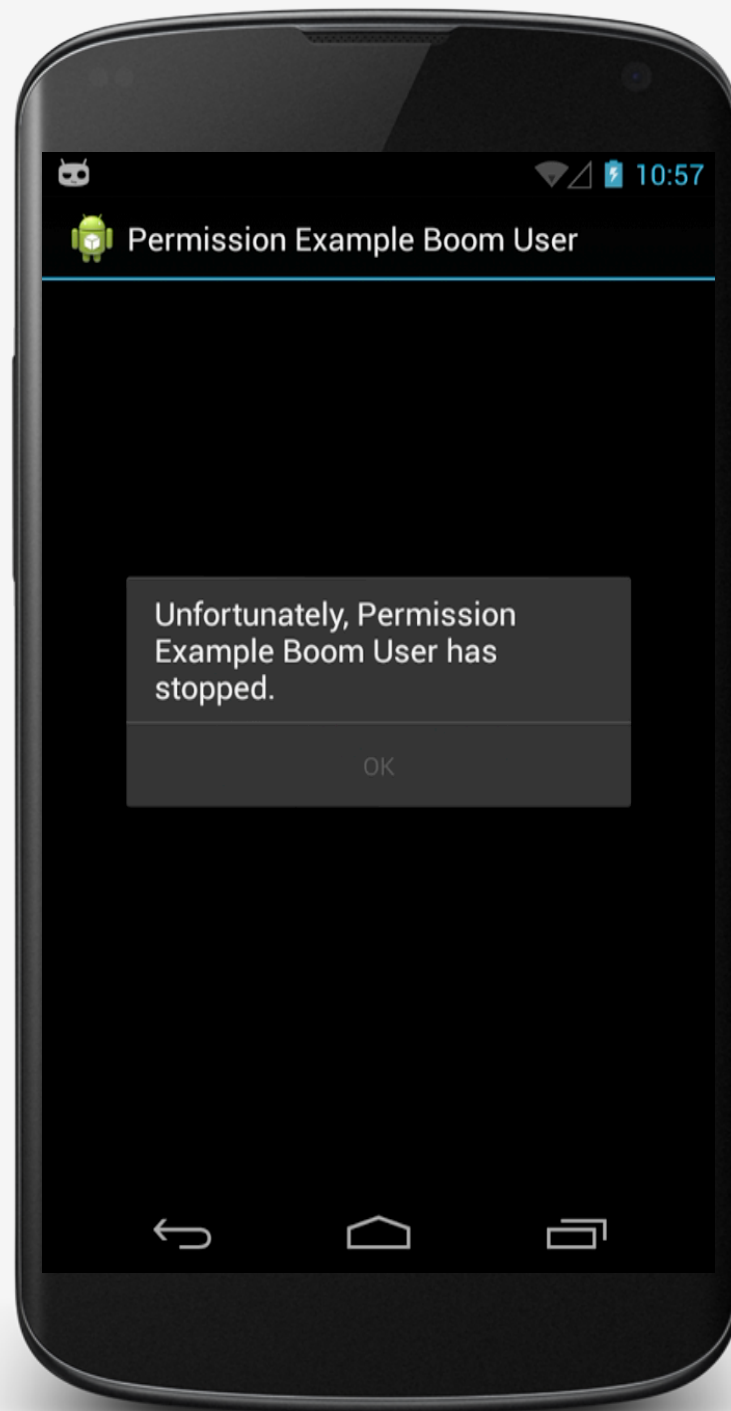
PERMISSIONEXAMPLEBOOM

```
<!-- Defines a custom permission -->
<permission
    android:name="course.examples.permissionexample.BOOM_PERM"
    android:description="@string/boom_perm_string"
    android:label="@string/boom_permission_label_string" >
</permission>

<!-- Enforces the BOOM_PERM permission on users of this application -->
<application
    android:allowBackup="true"
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name"
    android:permission="course.examples.permissionexample.BOOM_PERM" >
    <activity
        android:name=".BoomActivity"
        android:label="@string/app_name" >
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />
```

USING THE NEW PERMISSION

APPS THAT WANT TO USE
PERMISSIONEXAMPLEBOOM MUST NOW
ACQUIRE THE CORRECT PERMISSION



USES-PERMISSION

AN APPLICATION CAN DECLARE/ACCEPT THE PERMISSIONS OF THE APPLICATIONS IT USES

PERMISSIONEXAMPLEBOOMUSER

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="course.examples.permissionexample.boomUser"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="13"
        android:targetSdkVersion="20" />

    <!-- grant the "...BOOM_PERM permission to this application -->
    <uses-permission android:name="course.examples.permissionexample.BOOM_PERM" />
```



COMPONENT PERMISSIONS

INDIVIDUAL COMPONENTS CAN SET THEIR OWN PERMISSIONS, RESTRICTING WHICH OTHER COMPONENTS CAN ACCESS THEM

COMPONENT PERMISSIONS TAKE PRECEDENCE OVER APPLICATION-LEVEL PERMISSIONS

ACTIVITY PERMISSIONS

RESTRICTS WHICH COMPONENTS CAN
START THE ASSOCIATED ACTIVITY

CHECKED WITHIN EXECUTION OF

`startActivity()`

`startActivityForResult()`

THROWS `SecurityException` ON
PERMISSIONS FAILURE

SERVICE PERMISSIONS

RESTRICTS WHICH COMPONENTS CAN
START OR BIND TO THE ASSOCIATED
SERVICE

CHECKED WITHIN EXECUTION OF

`Context.startService()`

`Context.stopService()`

`Context.bindService()`

THROWS `SecurityException` ON
PERMISSIONS FAILURE

BROADCASTRECEIVER PERMISSIONS

RESTRICTS WHICH COMPONENTS CAN
SEND & RECEIVE BROADCASTS

PERMISSIONS CHECKED IN MULTIPLE
PLACES

MORE ON THIS WHEN WE DISCUSS
BROADCASTRECEIVERS

CONTENTPROVIDER PERMISSIONS

RESTRICT WHICH COMPONENTS CAN
READ & WRITE THE DATA IN A
CONTENTPROVIDER

MORE ON THIS WHEN WE DISCUSS
CONTENTPROVIDERS

NEXT TIME

THE FRAGMENT CLASS