Introduction to Android Programming

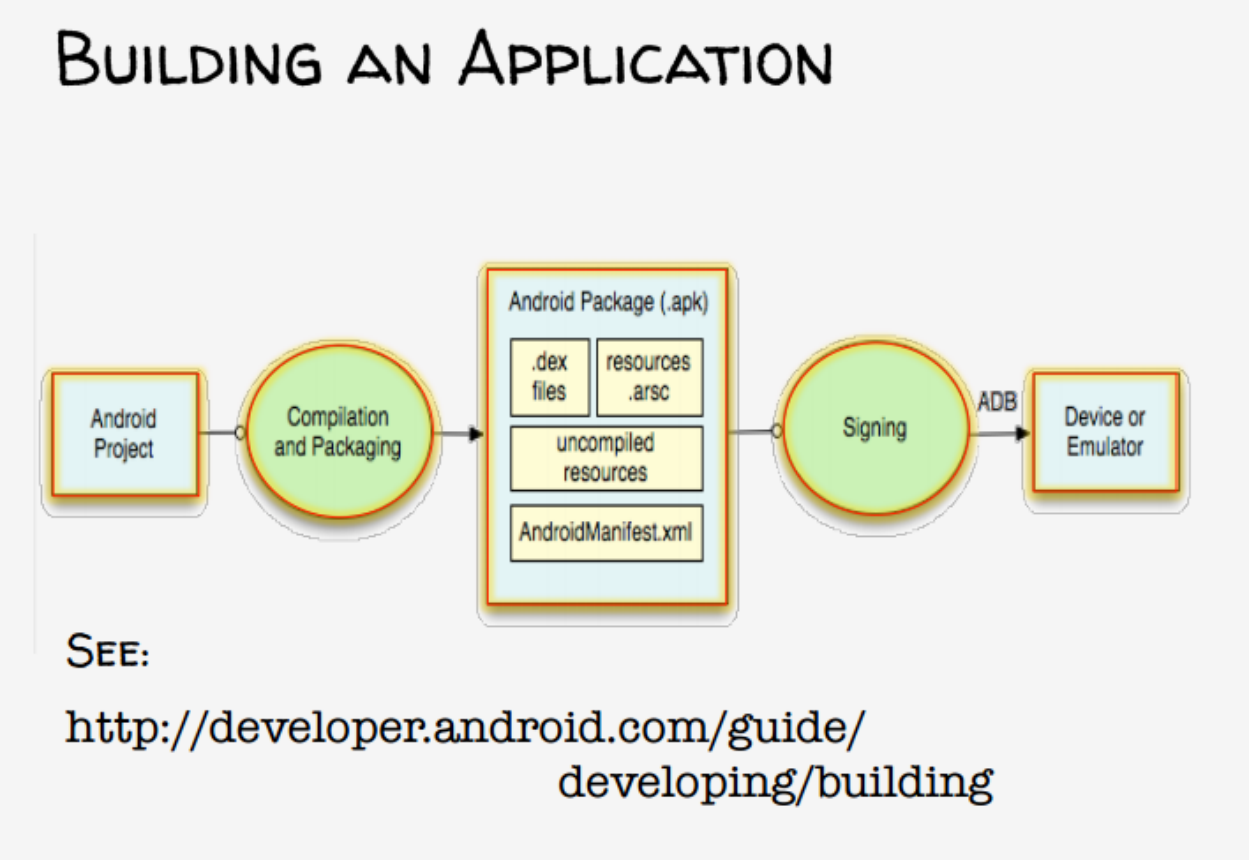
Application fundatamentals

Four main building blocks (Application components):

1) **Activity** class
   - the main class the user see when they run the applications. Activities provide GUI to the user. This enables to give and receive information to and from an application.
   - Each activity typically supports a single focus thing that the user can do to your applicaiton

The remaining three components work behind the scene:

2) **Service**
   - for supporting long running or in the background operations
3) **Broadcast receivers**
   - listen to and respond to events that happen on a device
4) **Content providers**
   - allow multiple applications to store and share data



Creating an android app

1) Define resources (see: http://developer.android.com/guide/ topics/resources)
2) Implement application classes
   - usually at least one Activity
   - Activity initialization code in the method **onCreate**()
3) Package application
   - Required application information is specifies in the file **AndoidManifest.xml**
   - System packages application components & resources into a .apk file
4) Install & run application

AndroidManifest.xml

Information includes:

- Application Name
- Components

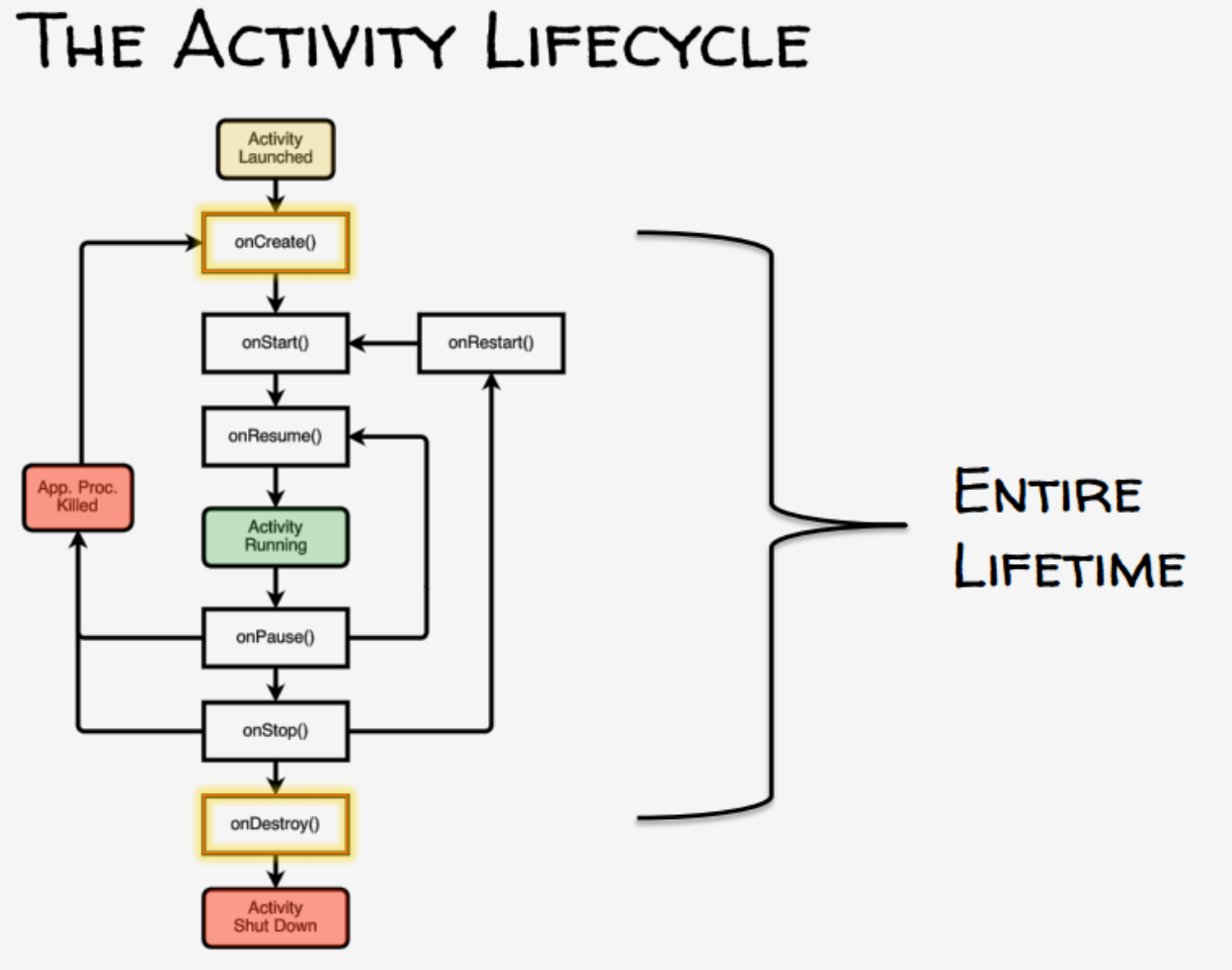
As well:

- Required permissions
- Application features
- Minimum API level

Strings

Accessed by other resources as: @string/string_name

Accessed in Java as: R.string.string_name



onRestart() - called if the Activity has been stopped and it is about to be started again

onStart() - Activity is about to become visible

onResume() – Activity is visible and about to start interacting with user

onPause() – Focus about to switch to another Activity

onStop() – Activity is no longer visible to the user

onDestroy() – Activity is about to be destroyed

Intent class

Usage: Intents to specify operations to be performed.

- Intents provide a flexible language for specifying operations to be performed.

Intent fields:

- Action
- Data
- Category
- Type
- Component
- Extras
- Flags

Starting Activities with Intents

- startActivity(Intent intent,…)
- startActivityForResult(Intent intent,…)

Permissions

- Android protects resources & data with permissions
- Represented as strings
- Declared in AndroidManifest.xml

Used to limit access to:

- user information
- cost
- system resources

Using permission:

- Applications specify permission through a <uses – permission> tag
- Users must accept these permissions before an app can be installed

Component Permissions

- Individual components can set their own permissions, restricting which other components can access them

Activity Permission

- Restricts which components can start associated activity

Service Permissions

- Restricts which components can start or bind to the associated service

BroadcastReceiver Permissions

- Restricts which components can send & receive broadcasts

ContentProvider Permissions

- Restrict which components can read & write data in a ContentProvider

Fragment

- Represents a behavior / portion of UI within an Activity
- To better support user interfaces for devices with large screens such as tablets (added to Android 3.0)

Fragment lifecycle states:

- Resumed - fragment is visible in the running activity
- Paused – Another activity is in the foreground and has focus, containing activity is visible
- Stopped – The fragment is not visible