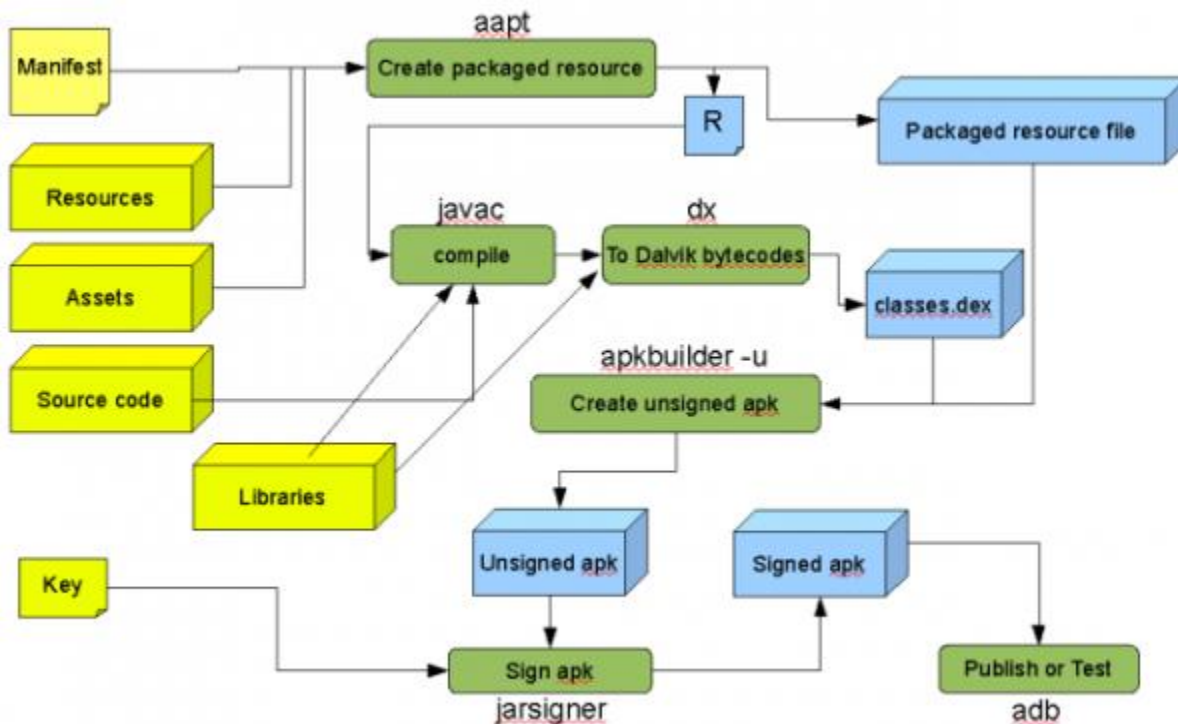


# How to build Android application package (.apk) from the command line using the SDK tools + continuously integrated using CruiseControl.

Hello all android developers, I just want to share my experience building android apk manually using sdk tools without using Eclipse. My original goal is motivated firstly by the desire to incorporate continuous integration aspect to Android development process and secondly to ditch the ADT eclipse plugin since the plugin auto-build process blocks Eclipse UI if you have large resources, assets in your Android project, and a slow computer like mine. I am using CruiseControl as my continuous integration tool.

Below is one of the many apk build processes:



## Build process

The good thing about building manually your apk is that you don't have to name your resources directory to res, you can name it anything you want.

You can find ant scripts in: `<SDK_HOME>\platforms\android-1.5\templates\android-rules.xml`

## Step 1: Generate Resource java code and packaged Resources

```
aapt package -f -M ${manifest.file} -F ${packaged.resource.file} -I ${path.to.android-jar.library} -S ${android-resource-directory} [-m -J ${folder.to.output.the.R.java}]
```

**Step 2: Compile java source codes + R.java**  
use **javac**

**Step 3: Convert classes to Dalvik bytecodes**  
use **dx.bat**

```
dx.bat -dex -output=${output.dex.file} ${compiled.classes.directory} ${jar files..}
```

**Step 4: Create unsigned APK**  
use **apkbuilder**

```
apkbuilder ${output.apk.file} -u -z ${packagedresource.file} -f ${dex.file}
```

**or**

```
apkbuilder ${output.apk.file} -u -z ${packagedresource.file} -f ${dex.file} -rf ${source.dir} -rj ${libraries.dir}
```

-rf = resources required for compiled source files?

-rj = resources required for jar files

**Step 6: Generate a key**  
use **keytool**

**Step 7: Sign APK**  
use **jarsigner**

```
jarsigner -keystore ${keystore} -storepass ${keystore.password} -keypass ${keypass} -signedjar ${signed.apkfile} ${unsigned.apkfile} ${keyalias}
```

**Step 8: Publish**  
use **adb**

```
adb -d install -r ${signed.apk}
```

**Inspecting your APK file:**

```
aapt list -v latest.apk
```

**Open questions:**

1. Can you include more than one dex file in the apk?
2. Can you have dex file named other than classes.dex in the apk?
3. Does an apk have to have a packaged resource?

Note: If upon installing your app using adb you see this error code **FAILED\_INSTALL\_DEXOPT** then most likely that either you don't have classes.dex or you don't have a packaged resource in the apk

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Hi, Really useful post. But I'm slightly unclear with a few issues. Please explain how to compile the R.java + Source files. An example for each command would be great. Thanks 😊

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tutorial is nice , i want to find how can i add my jar to project , i am adding it through eclipse but unsuccessful, plz rep

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