

Packing an Application

Introduction

"To compile" a program means translate it in another language (e.g. C to x86 assembly, Java to Java Bytecode).
When compiling an application for Android, our target-language is the Dalvik Bytecode.
The compiled program is stored in a file *.dex.

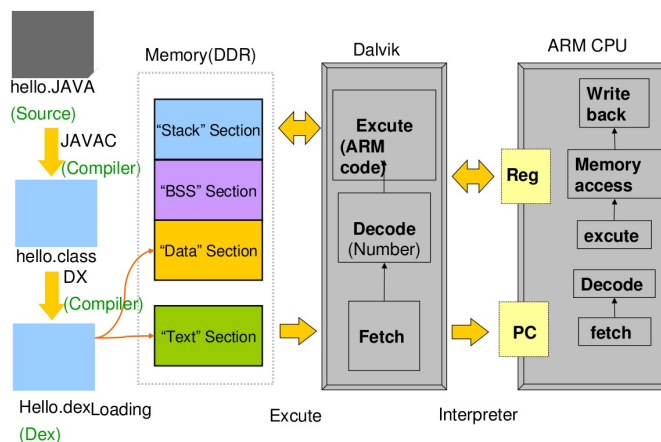
Structure of a DEX file

- **Header**
- **Constant Pool**
 - References to other classes
 - Method names
 - Numerical constants
- **Classes definition**
 - Access flags
 - Class names
- **Data**
 - Method code
 - Info related to methods
 - Variables

Building an APK file

Application Package File (APK) is the file format used to distribute and install application on Android.
Any program, to run on Android, needs to be packed in an apk file.
The apk file contains the application code, the dex file, and all the resources needed.
Those information are stored in a special JAR file (using ZIP), with ".apk" as file extensions.
The application can be compiled using the ADT plugin.
After this, the apk needs to be signed, using Jarsigner, and aligned, using Zipalign.

Runtime through the Dalvik Virtual Machine



A compiled program is loaded by the DVM and unpacked.
Application memory is divided in various sections (like the 8086 segments).

- Stack Section
- Data Section
- BSS Section
(A special Part of the data segment, for statically-allocated variables.)
- Text Section (A special segment for strings treatment)