Dalvik Virtual Machine & Android Memory Management

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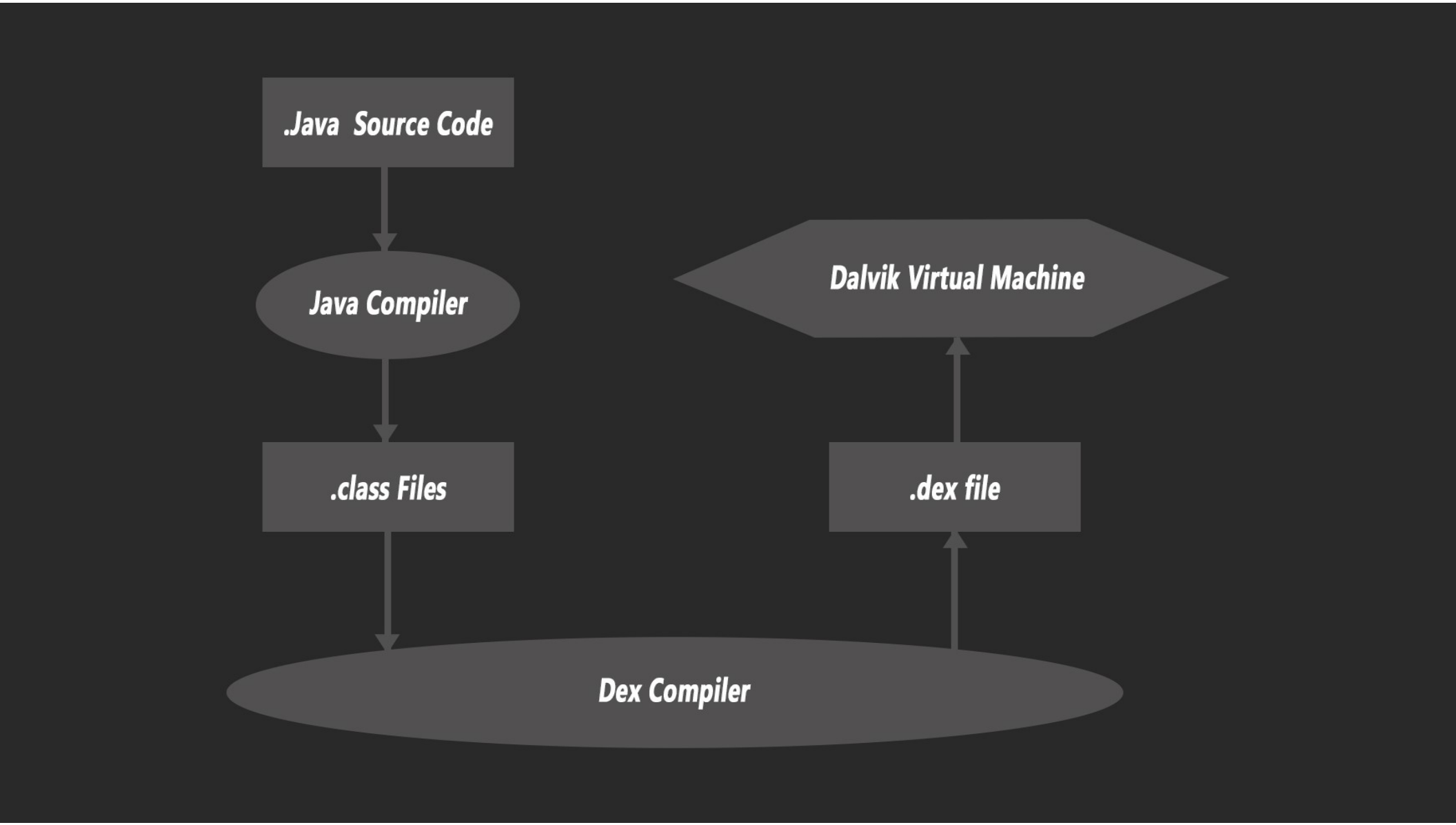
.Java Source Code
Java Compiler
.class Files
Dex Compiler
.dex file
Dalvik Virtual Machine

Paging

- Maps logical address to physical address
- Allows processes to access virtual memory address which is sometimes larger than actual or physical memory address

Memory Sharing

- Each app process is forked from an existing process called Zygote
- A Zygote is a process that loads common frameworks and resources
- Most static data mmapped across all the apps

Swapping Process

- Frequently accessed processes are swapped out to ZRAM area of the main memory
- Processes are compressed in the ZRAM area and inactive

Heap Size Restricted

- Implication of a hard limit on heap size for each app

Avoid of Thrashing

- Excessive amount of swapping in and swapping out between main and seconfary memory doesn't happen and hence thrashing can be avoided

Garbage Collector

- Mechanism that looks for idle memory spaces and frees them
- Vigorously killing of an idle app in order to make room for foreground app processes