Dalvik virtual machine

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Content:

Introduction:

The Dalvik Virtual Machine (DVM) is a virtual machine which executes android applications. Since everything in mobiles is very limited whether it would be battery life processing, and memory etc. It had been optimized so that it can fit in with low-powered devices. Dalvik is a discontinued (VM) in the android operating system that executes applications written for Android.

What is a Dalvik virtual machine?

Dalvik is the process virtual machine (VM) in Google's Android Operating System. It is software that runs apps on Android devices. Dalvik is an important part of Android, which is typically used on mobile devices such as mobile phones and tablet computers as well as more recently on embedded devices such as smart TVs and media streamers. Programs are commonly written in Java and compiled to byte code. They are then converted from Java virtual machine-compatible Java class files to Dalvik compatible. (Dalvik Executable) and odex (Optimized Dalvik Executable). The compact Dalvik Executable format is designed to be suitable for systems that are constrained in terms of memory and processor speed. Dalvik is open-source software. It was originally written by Dan Bornstein, who named it after the fishing village of Dalvík in Iceland. and Every Android application runs in its own process, with its own instance of the Dalvik virtual machine. Dalvik has been written so that a device can run multiple VMs efficiently. The Dalvik VM relies on the Linux kernel for underlying functionality such as threading and low-level memory management. Given every application runs in its own process within its own virtual machine.

Advantages:

- DVM supports the Android operating system only.
- In DVM executable is APK.
- Execution is faster.
- DVM has been designed so that a device can run multiple instances of the Virtual Machine effectively.
- Applications are given their own instances.
- memory management, high performance as well as battery life.

Disadvantages:

- DVM supports only Android Operating System.
- For DVM very few Re-Tools are available.
- Requires more instructions than register machines to implement the same high-level code.
- App Installation takes more time due to dex.
- More internal storage is required.

. Why did android drop Dalvik virtual machine?

Compilation Approach is the biggest reason to stop Dalvik virtual machine in android new versions and this is by far the biggest advantage of ART over Dalvik in which Dalvik worked on the principle of JIT, (Just in time Compilation) but ART handles the Android application execution in a fundamentally different way as against Dalvik. ART would do an Ahead of time compilation ((AOT) approach) at the time when the app gets installed on the device. This would make the installation process longer than before but since the byte code is already compiled to machine code, the performance would be significantly better than that of Dalvik.

And it is not the only reason to replace Dalvik by android virtual machine but also boot time, ART is extremely fast and smooth.

What is used instead of Dalvik?

With a newer android version, there is the concept of ART as an alternative to DVM.
ART (Android Run Time).

What is ART?

is the managed runtime used by applications and some system services on Android.
ART and its predecessor Dalvik were originally created specifically for the Android
project. ART and Dalvik are compatible runtimes running Dex bytecode, (but not . odex
files), with the succession aiming at performance improvements transparent to the end-
users. so, apps developed for Dalvik should work when running with ART. And here is
the concept of ART as an alternative to DVM and used instead of it.

The benefits of ART over Dalvik

- The application will run faster as compilation is done during installation only.
  Performance of the battery will be increased by using ART. As the native code is directly
  executed, ART reduces the startup time of applications.
- Works best for large storage devices.
- Extremely Faster and smoother Faster and app loading time and lower processor usage

- Reduced application lagging and better user experience.
  .
- It provides optimized battery performance as it consumes less power.
- Improving the garbage collection.
- Reduces the startup time of applications.

<u>conclusion</u>

It depends on the device and one's own device and preferences and Dalvik bytecode format is still used as a distribution format, but no longer at runtime in newer Android versions.