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Native Pthread on Android Platform using Android NDK

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Abstract: The Android NDK libraries authorize us to implement fractions of our Android applications via native code such as C/C++. The Android NDK provides platform specific features and relies on JNI technology to glue the native code to the Android applications. The primary motivation for considering the use of Pthreads on mobile architecture can achieve optimum performances on multi-core mobile architectures. In order for a program to get benefit of Pthreads, it must be capable to be structured into separate, individual tasks that can perform concurrently. This research finding focuses on how android applications can facilitate Pthreads through android NDK that can adventure Pthreads to execute in hybrid mode with Java threads.

Key words: Android, Applications, Android NDK, Java, JNI, Pthread.

1. INTRODUCTION

Android [14] Inc was originated in Silicon Valley, California in October 2003, with the thought of providing a mobile platform [14] that is more conscious of the user's location and preferences. Google purchased Android Inc in August 2005 as it entirely possessed subsidiary of Google Inc. Google main aim take place to present a fully open platform backed by Google technologies for application developers. In November 2007, the Open Handset Alliance [13], [14] was established as a consortium to develop an open standard for mobile devices. Open Handset Alliance began its expedition by announcing the Android platform.

1.1 What is an Android?

Android [14] is a mobile operating system (OS), is based on a personalized version of Linux. Google required Android to be open and free; therefore, generally the Android code was released under the open source Apache License. The main benefit of implementing Android is that it proposes a unified approach to application development. Developers need only to create for Android applications (Android apps), has to be run on several different devices, as long as the devices are using Android.

Google repeats the standard Java Virtual Machine (JVM) implementation in a lot of compliments. The key figure in Google's implementation of this JVM is Dan Bornstein, who composes the Dalvik Virtual Machine (DVM) - Dalvik is the name of a town in Iceland. DVM [13], [14] obtains the produced Java class files and joins them into one or more Dalvik Executable (.dex) files. The goal of the DVM is to discover every likely way to optimize the JVM for space, performance and battery life. The final executable code in an Android, as an effect of the DVM is stand not on Java byte code but on .dex files as an alternative.

1.2 Android Platform Architecture

Android [13]-[15] is more about using or developing Android apps for mobile devices than an Android OS. Android depends on Linux kernel in order to afford its OS functions. For the user application, Android depends on the JVM technology by employing the DVM. The Android OS is generally divided into five sections [13], [14].

Linux kernel: This is the bottom of layer. It is the kernel based on Android. This layer holds all the low level device drivers for the numerous hardware mechanism of an Android device.

Libraries: These contain all the code that provides the main features of an Android OS.

Android runtime: At the same layer as the libraries, the Android runtime afford a set of core libraries. Android runtime system contains DVM.

Application framework: Describes the ability of the Android OS to an application developer, can create use of them in their applications.

Applications: At this top layer, we will locate applications that we download and install from the Android play store. Any applications that we write are located at this layer.