

Google Android



ANDROID



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Oparty na Linuksie

- Android was built from the ground-up [...]. It was built to be truly open. For example, an application can call upon any of the phone's core functionality such as making calls, sending text messages, or using the camera [...]. **Android is built on the open Linux Kernel.** Furthermore, it utilizes a custom virtual machine that was designed to optimize memory and hardware resources in a mobile environment. **Android is open source** [...], the platform will continue to evolve as the developer community works together to build innovative mobile applications.

Oparty na Linuksie

- Android bazuje na jądrze Linux 2.6 dla zapewniania podstawowych usług systemu:
 - bezpieczeństwo
 - zarządzanie pamięcią i procesami
 - stos sieciowy
 - model sterowników
 - warstwa abstrakcji sprzętu

...Ale

- „Android uses a **Linux kernel**, but, according to Google, it is not a **GNU/Linux** distribution (it neither has a native **windowing system**, nor supports the full set of standard GNU libraries, including **GNU C Library**). This specific nature makes it difficult to reuse existing Linux applications or libraries.”
- Za: [http://en.wikipedia.org/wiki/Android_\(operating_system\)#Criticisms](http://en.wikipedia.org/wiki/Android_(operating_system)#Criticisms)

...Ale

- „Android wykorzystuje jądro Linuksa, ale wg Google, nie jest to wolna dystrybucja GNU/Linux (nie posiada natywnego systemu obrazowania, ani nie obsługuje wszystkich bibliotek GNU, włączając w to `glibc`). Prowadzi to do trudności w portowaniu linuksowych aplikacji.”
- Za: [http://en.wikipedia.org/wiki/Android_\(operating_system\)#Criticisms](http://en.wikipedia.org/wiki/Android_(operating_system)#Criticisms)

Technikalia

Handset layouts	The platform is adaptable to larger, VGA , 2D graphics library, 3D graphics library based on OpenGL ES 1.0 specifications, and traditional smartphone layouts.
Storage	The Database Software SQLite is used for data storage purposes
Connectivity	Android supports connectivity technologies including GSM/EDGE , CDMA , EV-DO , UMTS , Bluetooth , and Wi-Fi .
Messaging	SMS and MMS are available forms of messaging including threaded text messaging .
Web browser	Main article: WebKit
	The web browser available in Android is based on the open-source WebKit application framework .
Dalvik virtual machine	Software written in Java can be compiled to be executed in the Dalvik virtual machine, which is a specialized VM implementation designed for mobile device use, although not technically a standard Java Virtual Machine.
Media support	Android supports the following audio/video/still media formats: MPEG-4 , H.264 , MP3 , AAC , MIDI , OGG , AMR , JPEG , PNG , GIF .
Additional hardware support	Android can utilize video/still cameras, touchscreens , GPS , accelerometers , and accelerated 3D graphics.
Development environment	Includes a device emulator, tools for debugging , memory and performance profiling , a plugin for the Eclipse IDE .
Market	Main article: Android Market
	Similar to the App Store on the iPhone OS, The Android Market is a catalog of applications that can be downloaded and installed to target hardware over-the-air, without the use of a PC. Originally only freeware applications were supported. Paid-for apps have been available on the Android Market in the United States since 19 February 2009.[39]
Multi-touch	Android has native support for multi-touch but the feature is disabled at the kernel level (possibly to avoid infringing Apple patents on touch-screen technology[40]). An unofficial mod has been developed that enables multi-touch, but requires superuser access to the device to flash an unsigned kernel.[41]

Technikalia, cd.

- **Libraries**

Android includes a set of C/C++ libraries used by various components of the Android system. These capabilities are exposed to developers through the Android application framework. Some of the core libraries are listed below:

- **System C library** - a BSD-derived implementation of the standard C system library (libc), tuned for embedded Linux-based devices
- **Media Libraries** - based on PacketVideo's OpenCORE; the libraries support playback and recording of many popular audio and video formats, as well as static image files, including MPEG4, H.264, MP3, AAC, AMR, JPG, and PNG
- **Surface Manager** - manages access to the display subsystem and seamlessly composites 2D and 3D graphic layers from multiple applications
- **LibWebCore** - a modern web browser engine which powers both the Android browser and an embeddable web view
- **SGL** - the underlying 2D graphics engine
- **3D libraries** - an implementation based on OpenGL ES 1.0 APIs; the libraries use either hardware 3D acceleration (where available) or the included, highly optimized 3D software rasterizer
- **FreeType** - bitmap and vector font rendering
- **SQLite** - a powerful and lightweight relational database engine available to all applications

Dalvik JavaVM

- VM Javy w urządzeniach z Androidem
- Kompatybilny z Javą Suna na poziomie semantycznym
- Zoptymalizowana dla:
 - konkurencyjnego wykonywania kodu
 - ograniczonych zasobów pamięci i procesora
 - braku swap'a
 - rozmiarów pliku wykonywalnego (*.dex)

Jak to osiągnięto?

- Dalvik **nie ma** kompilatora JIT (ma zaś GC)
- Optymalizacje kodu są więc stosowane na etapie kompilacji i instalacji (byte order swapping in aggregates and literals, inline linkage to library function calls, empty class pruning)
- Używa własnego bytecode'u (wspiera JNI)
- Wykorzystuje jądro (Linux!) do niskopoziomowych operacji: zarządzania wątkami i pamięcią
- Każdy proces domyślnie to osobna instancja VM ale i osobny UID – co ma wspomagać bezpieczeństwo (mutually suspicious app security policy)
- Interpreter rejestrowy

Źródła i linki

- <http://www.androidal.pl/>
- <http://www.android.com.pl/>
- <http://www.androidlab.pl/>
- <http://www.android.com/> (Official Website)
- <http://www.androidcentral.com/>
- <http://feeds2.feedburner.com/AndroidCommunity>
- <http://android-developers.blogspot.com/>
- <http://www.openhandsetalliance.com/>
- <http://www.dalvikvm.com/>
- [http://en.wikipedia.org/wiki/Android_\(operating_system\)](http://en.wikipedia.org/wiki/Android_(operating_system))