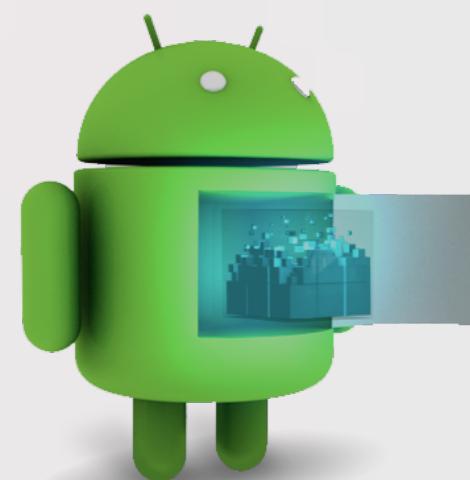


Inside Android

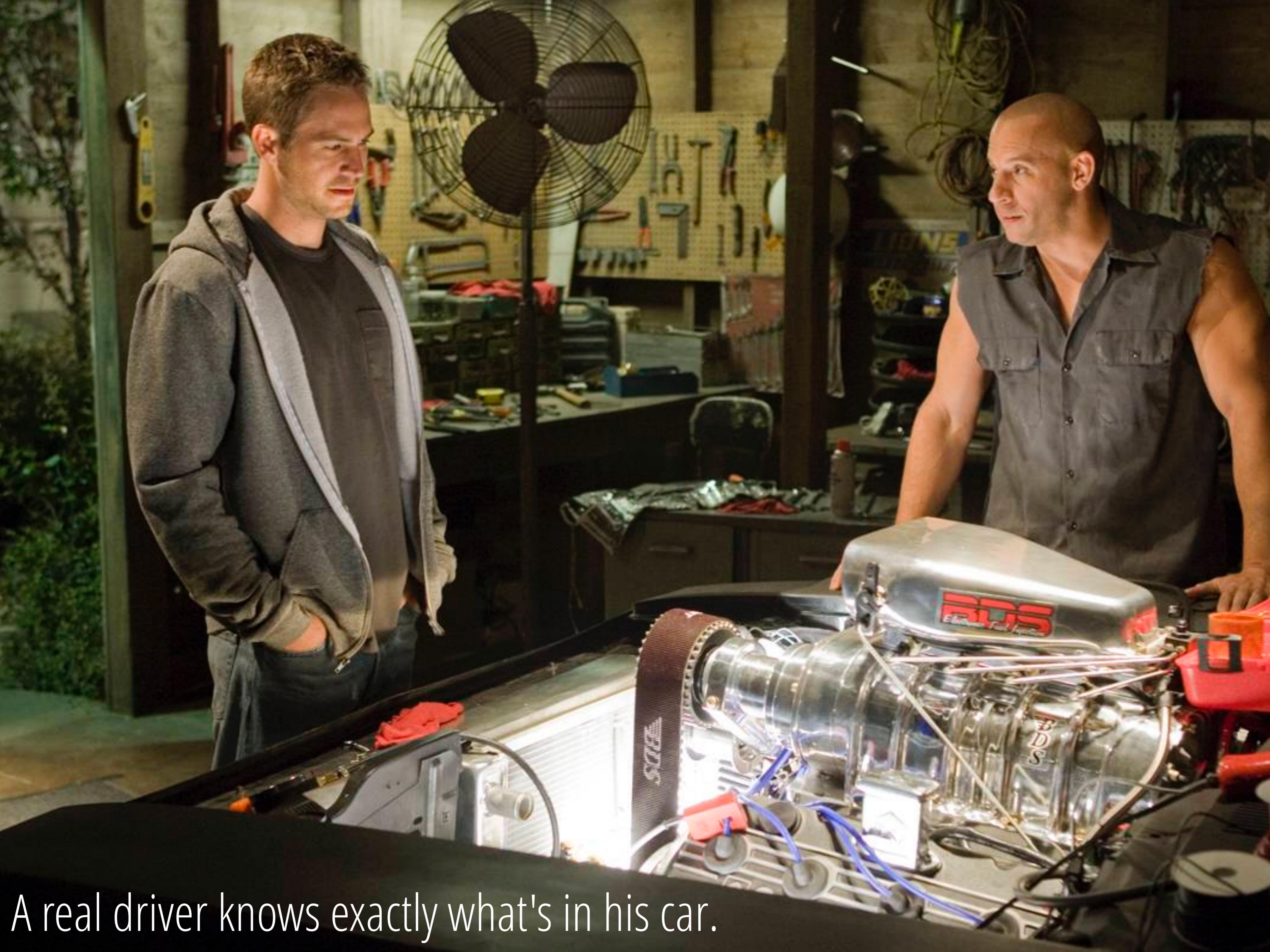


An Introduction to Android Internals

Anjana Somathilake (makewita)



Why Internals?



A real driver knows exactly what's in his car.

Bit of History

- Sidekick smart phone by Danger Inc in 2002 - Google was the default search engine
- Andy Rubin founded Android Inc. in October 2003 - Open OS for phone manufacturers
- Google acquired Android Inc. in August 2005
- Open Handset Alliance (OHA) was formed in November 2007
- Google Android 1.0 (Alpha) is released in September 2008
- "I don't understand the impact they are going to have." ~Scott Horn, then head of the Windows Mobile marketing team
- HTC Dream a.k.a HTC G1 released in October of 2008 - First device to compete with Apple's iPhone



Versions

- Alpha (1.0)
- Beta (1.1)
- Cupcake (1.5)
- Donut (1.6)
- Eclair (2.0–2.1)
- Froyo (2.2–2.2.3)
- Gingerbread (2.3–2.3.7)
- Honeycomb (3.0–3.2.6)
- Ice Cream Sandwich (4.0–4.0.4)
- Jelly Bean (4.1–4.3.1)
- KitKat (4.4–4.4.4)
- Lollipop (5.0)

Ecosystem

- Semiconductor Manufacturers
 - System-on-Chip (SoC) - ARM, TI, Qualcomm, Freescale, and Nvidia
- Device Manufacturers
 - Motorola, Samsung, HTC, Sony, LG, Archos, Dell, and ASUS
- Applications, Services and Markets
 - Google, Amazon, Verizon, Sprint and Barnes & Noble

Hardware and Compliance Requirements

“In principle, Android should run on any hardware that runs Linux.
Android has in fact been made to run on ARM, x86, MIPS, ...”

Where is Android?

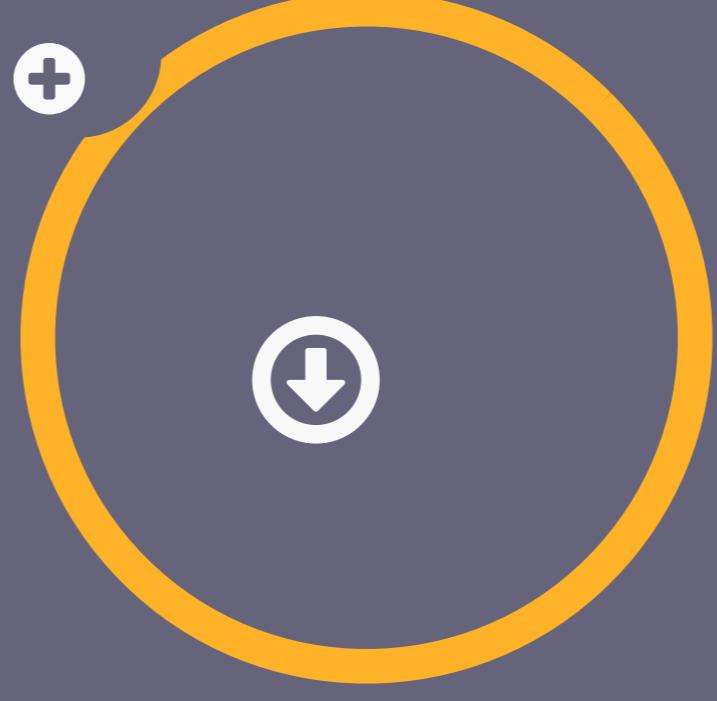
More than just smartphones and tablets



Automotive



Home Entertainment



Embedded
Computing



Wearables

Android Open Source Project - (AOSP)

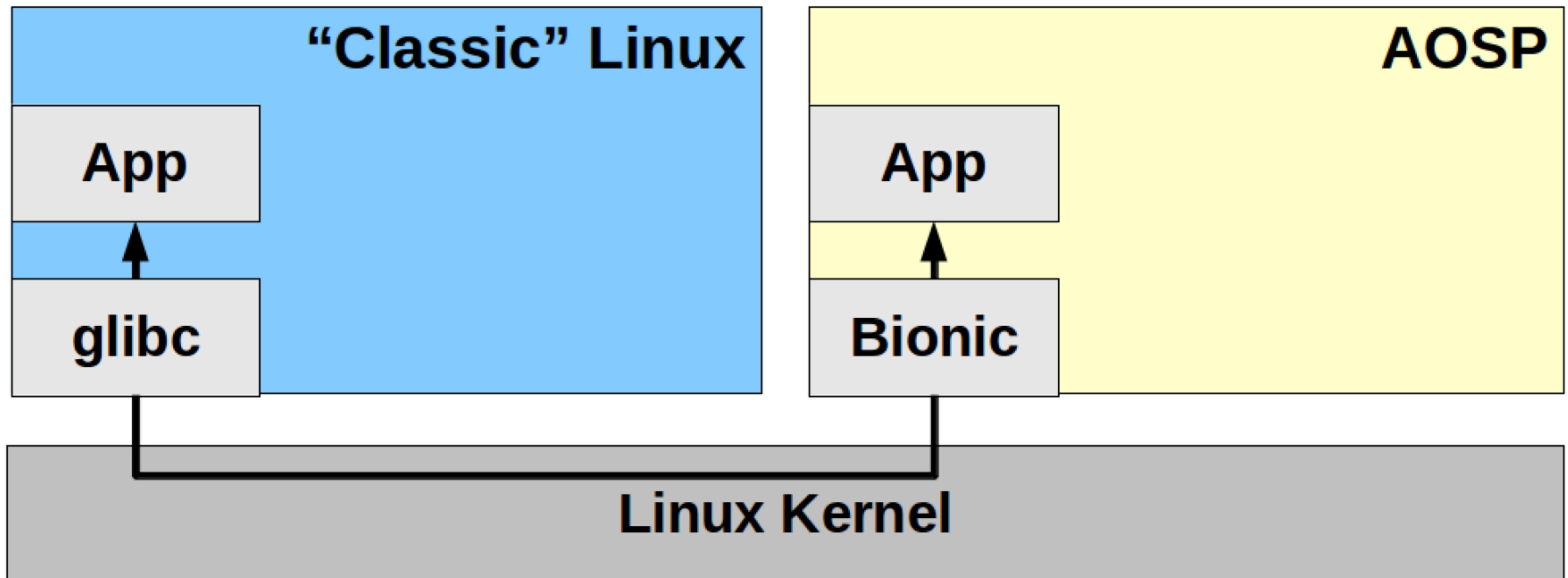
Download: <https://source.android.com/source/building.html>

“A 64-bit Linux or Mac system with 16GB of RAM/swap and >30GB of disk space to build the AOSP”

- Python 2.6 -- 2.7, [python.org]
- GNU Make 3.81 -- 3.82, [gnu.org]
- JDK 7 [openjdk.java.net]
- Git 1.7 [git-scm.com]

Browse Code: <https://android.googlesource.com/>

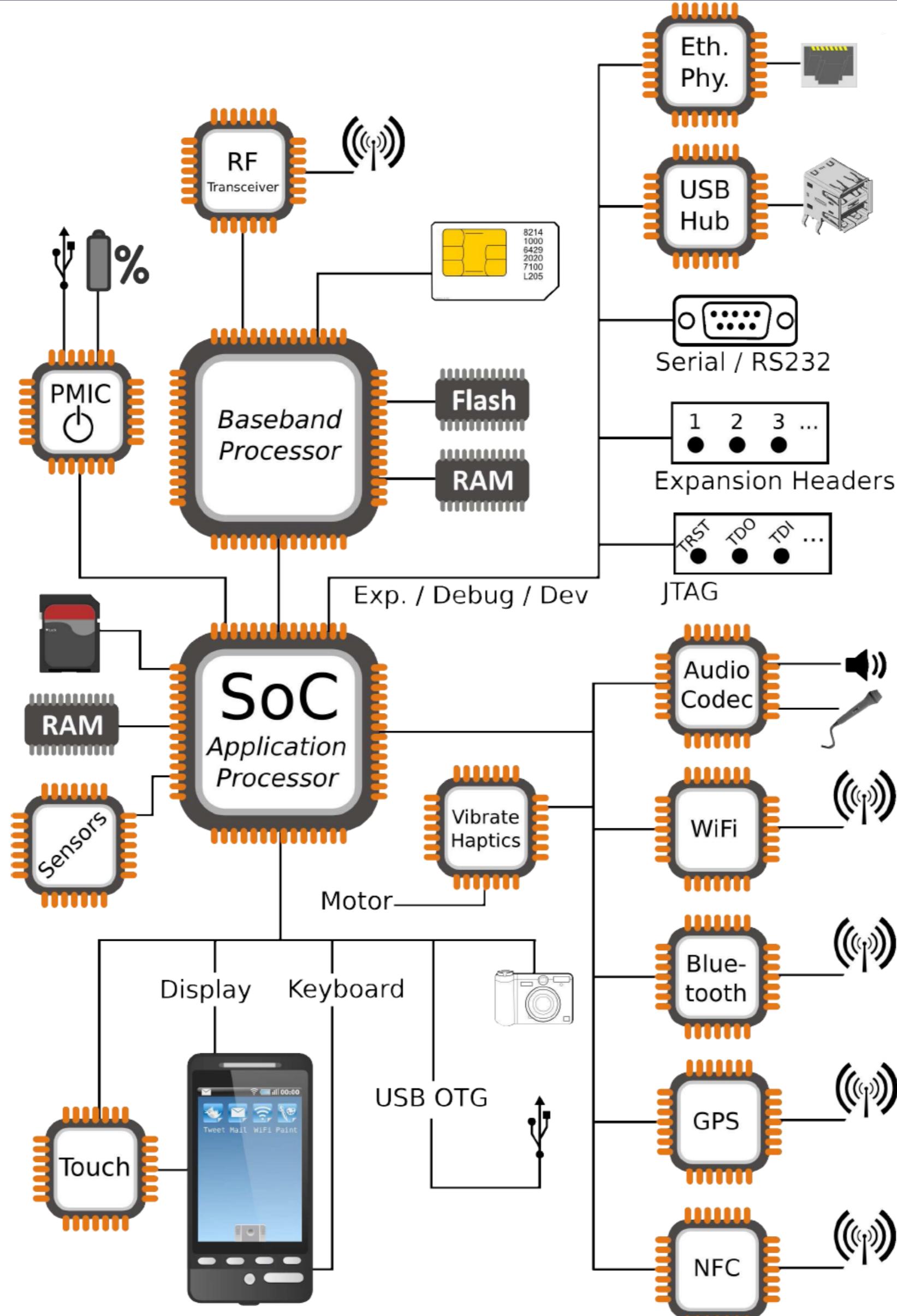
Architecture



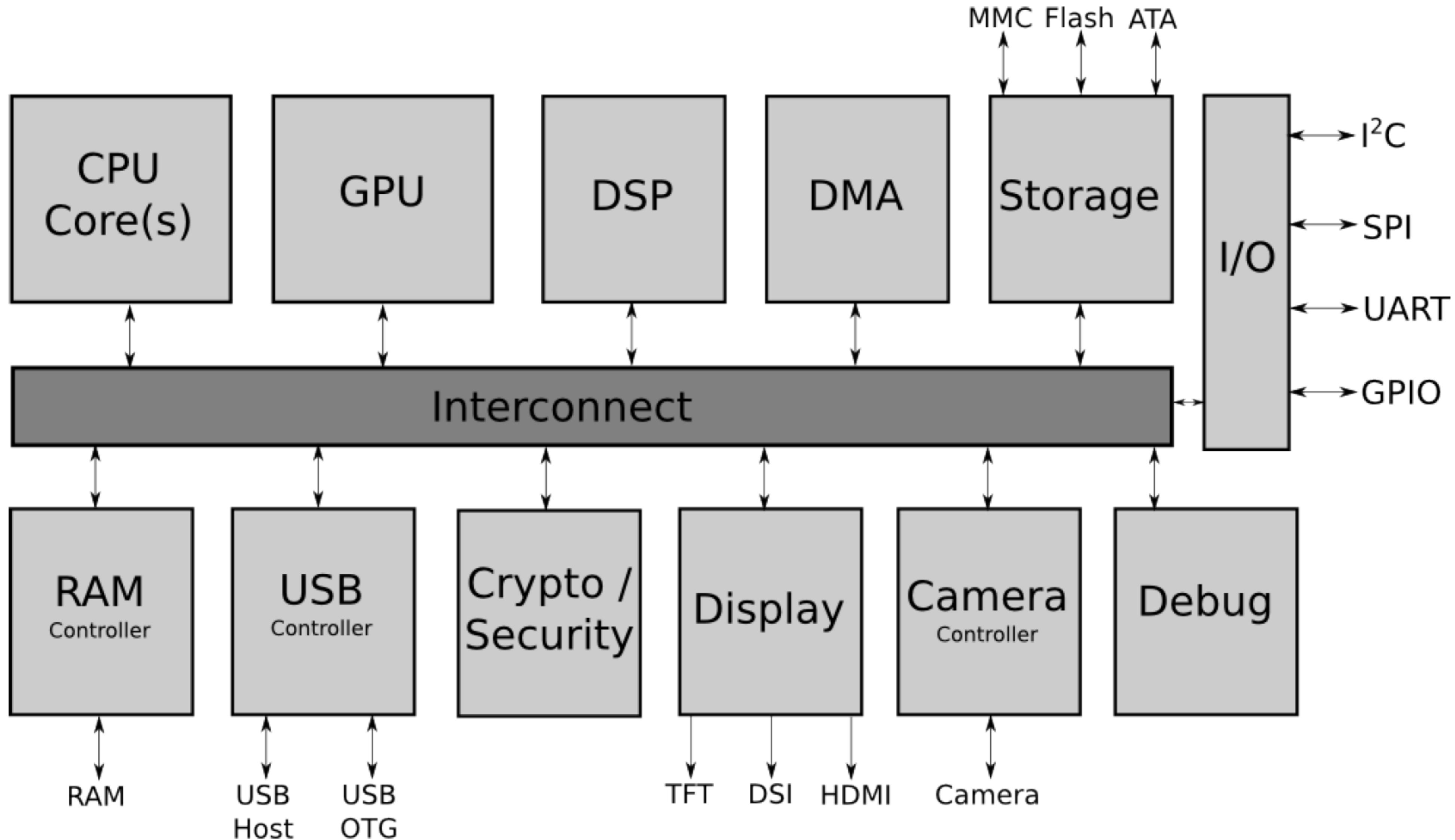
App Developer's View

- Android Software Development Kit (SDK) - Java
- Native Development Kit (NDK) - C
 - The infamous Angry Birds game is heavily built on the NDK
- Apps will be killed (randomly) by the system , developers must code accordingly

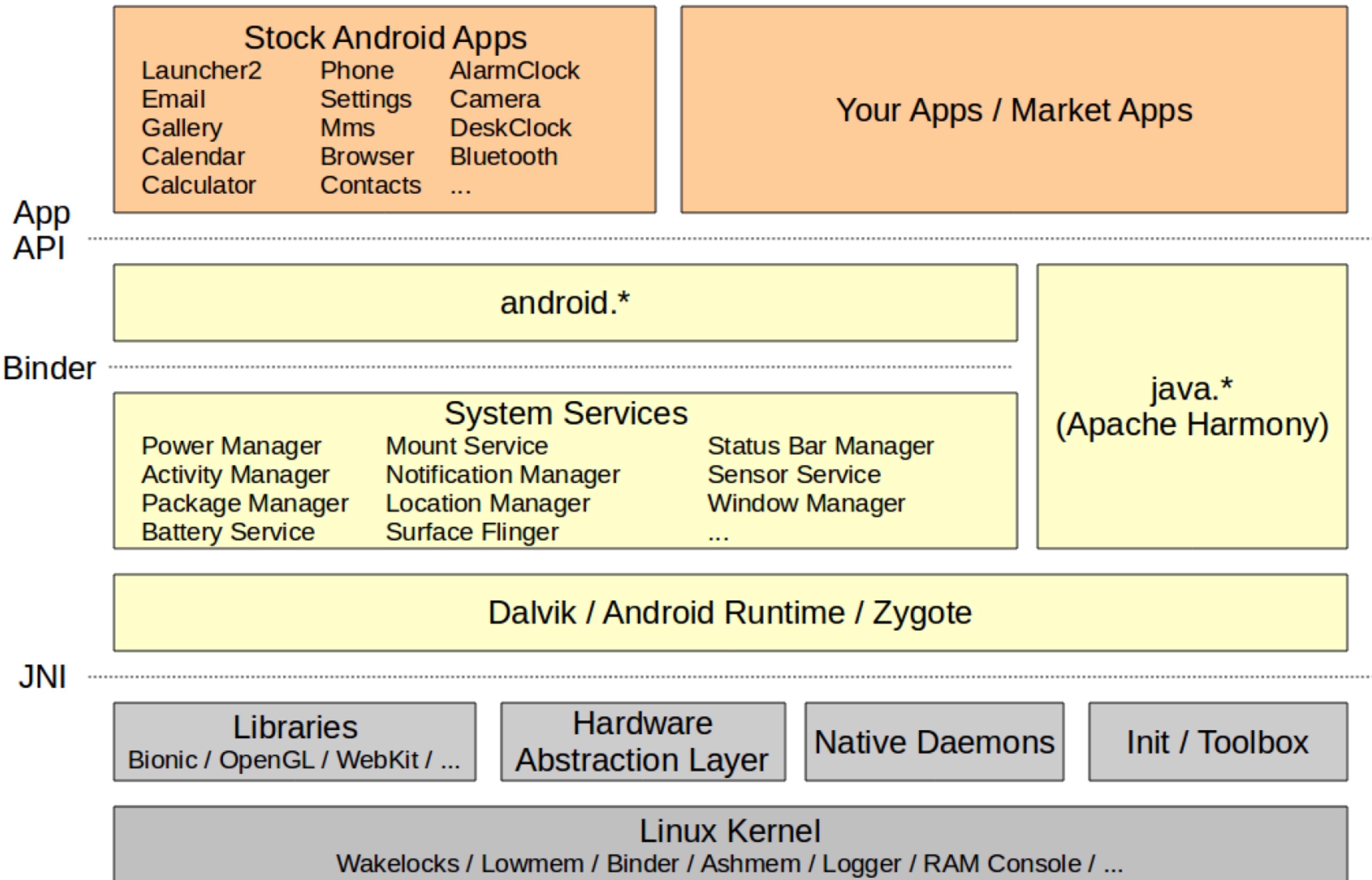
Inside Smart Phone



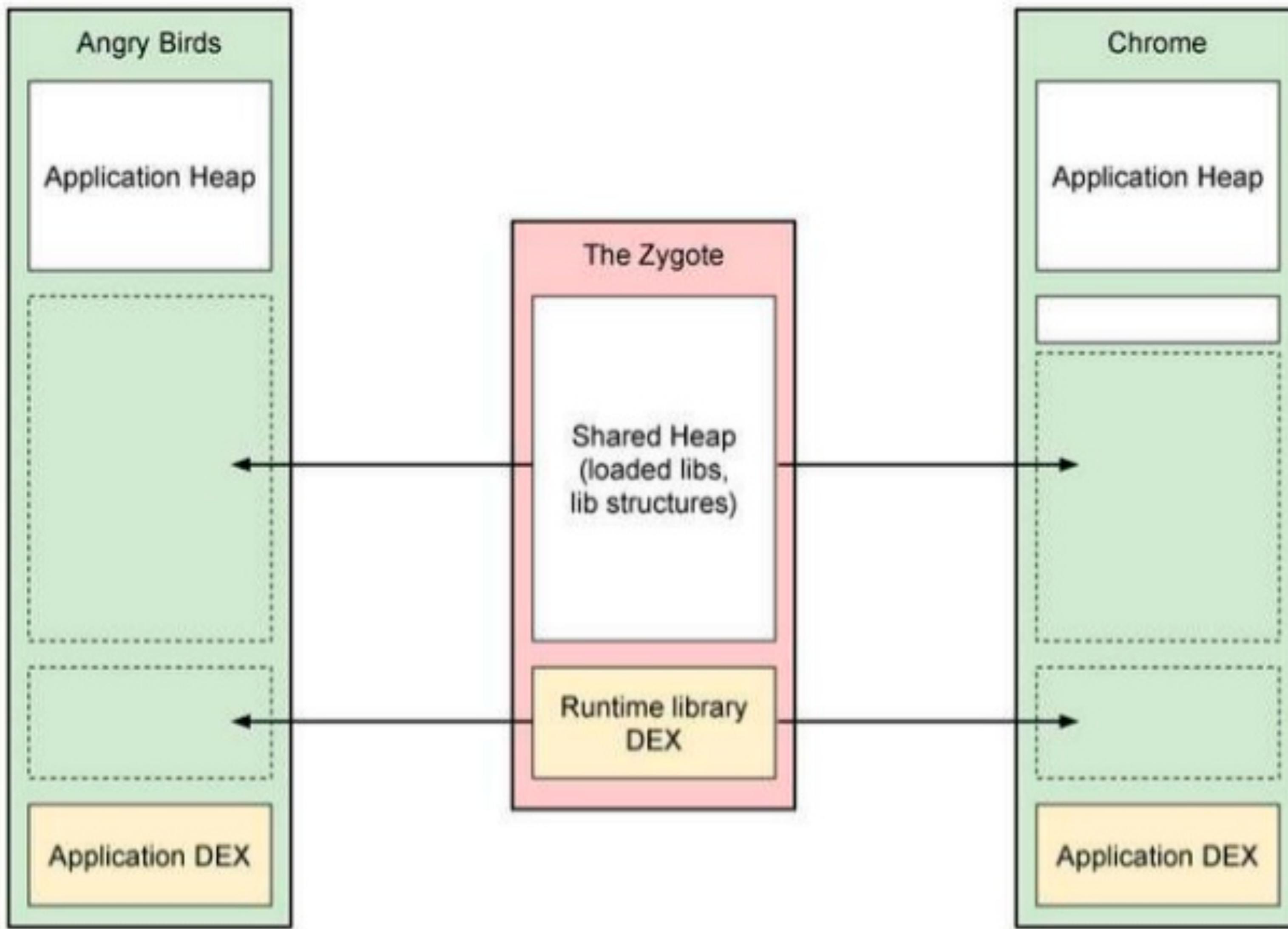
Inside SoC



Inside Android



Zygote



System Startup

1.Bootloader

2.Kernel

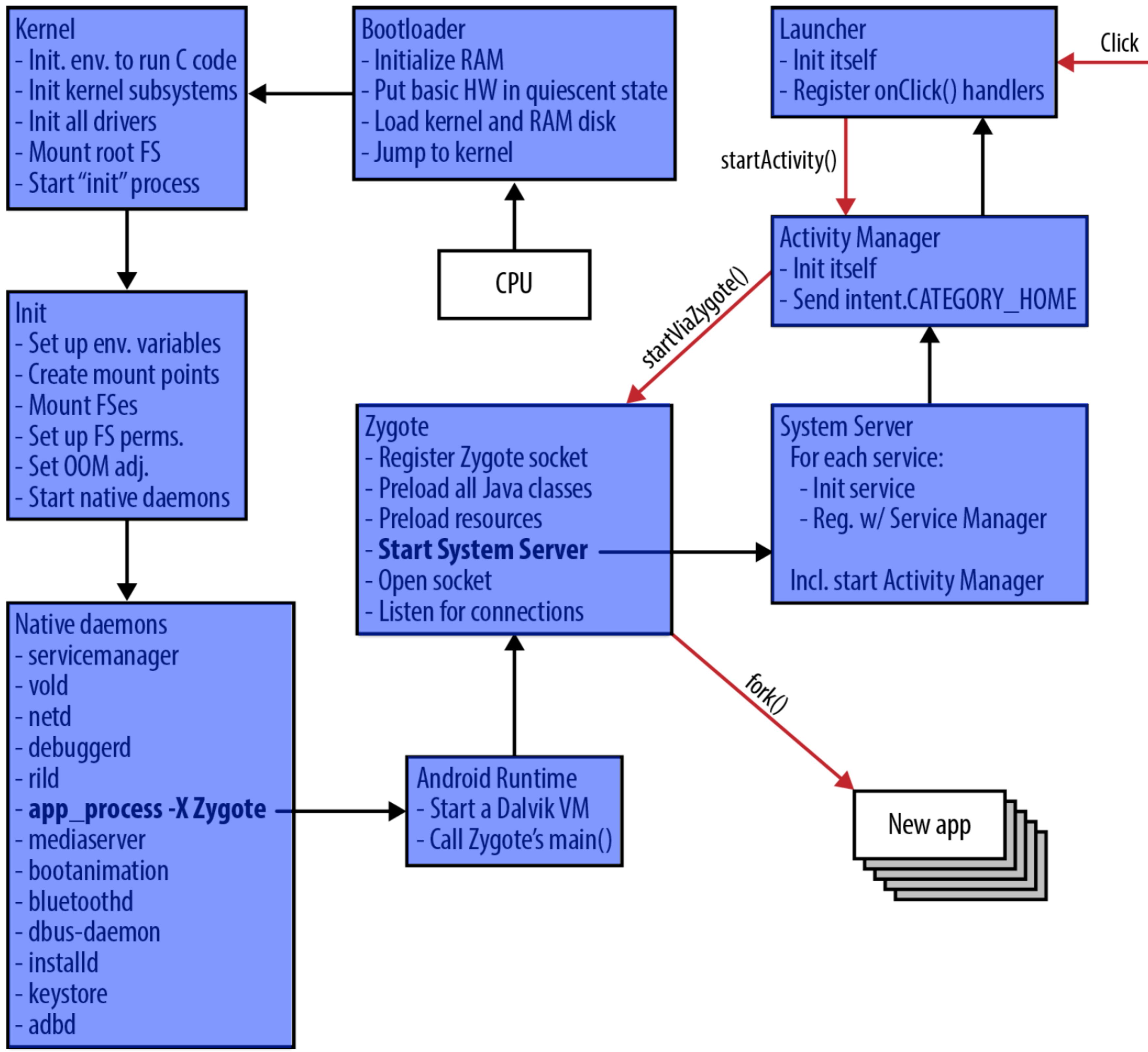
3.Android Init

4.Zygote & Dalvik

5.System Server

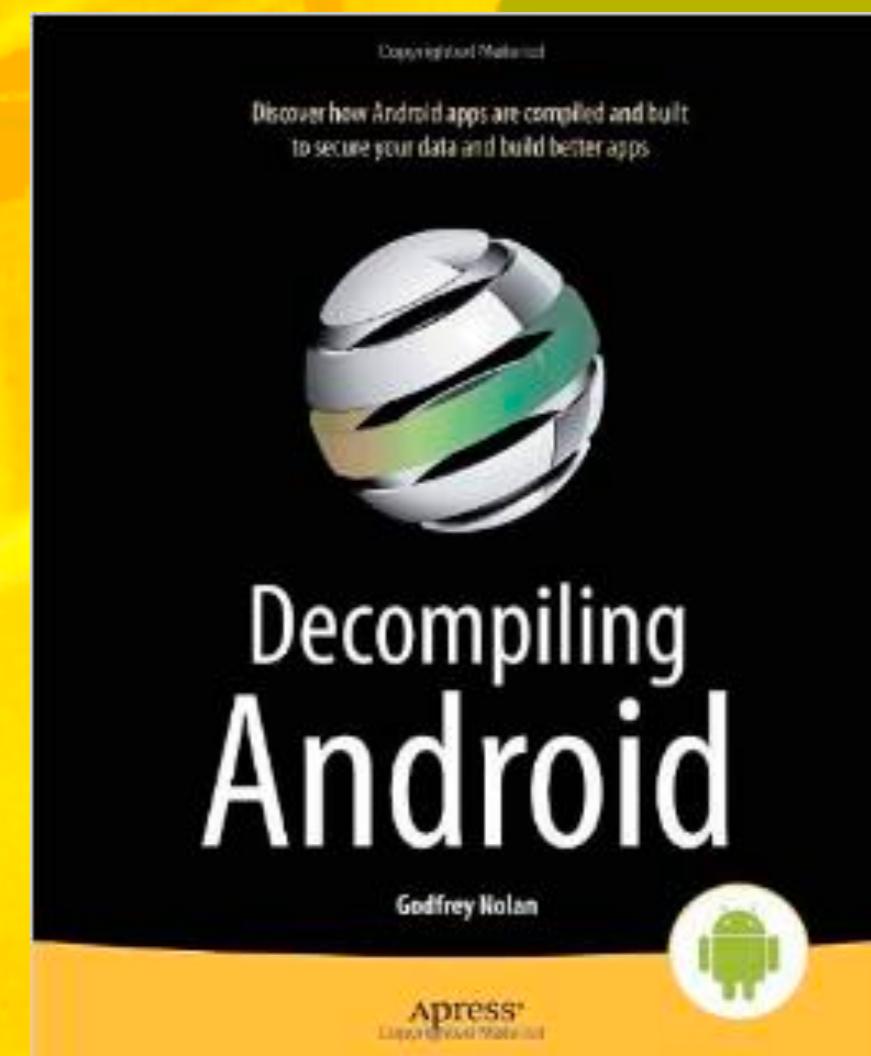
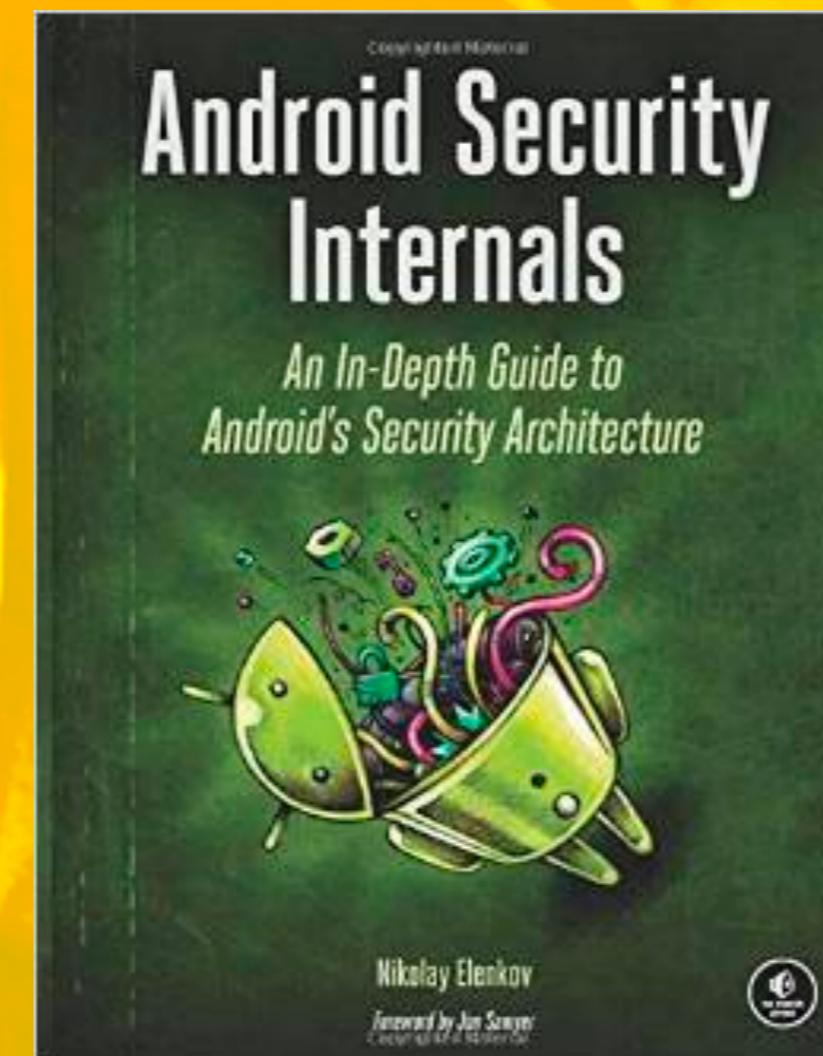
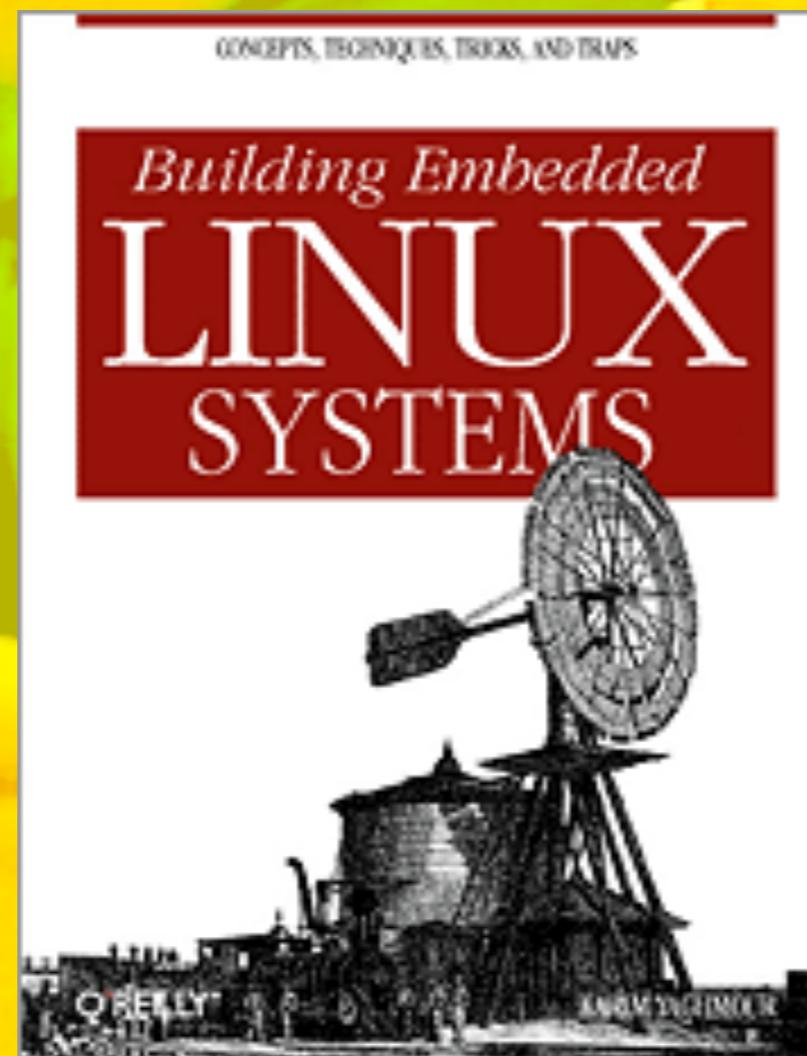
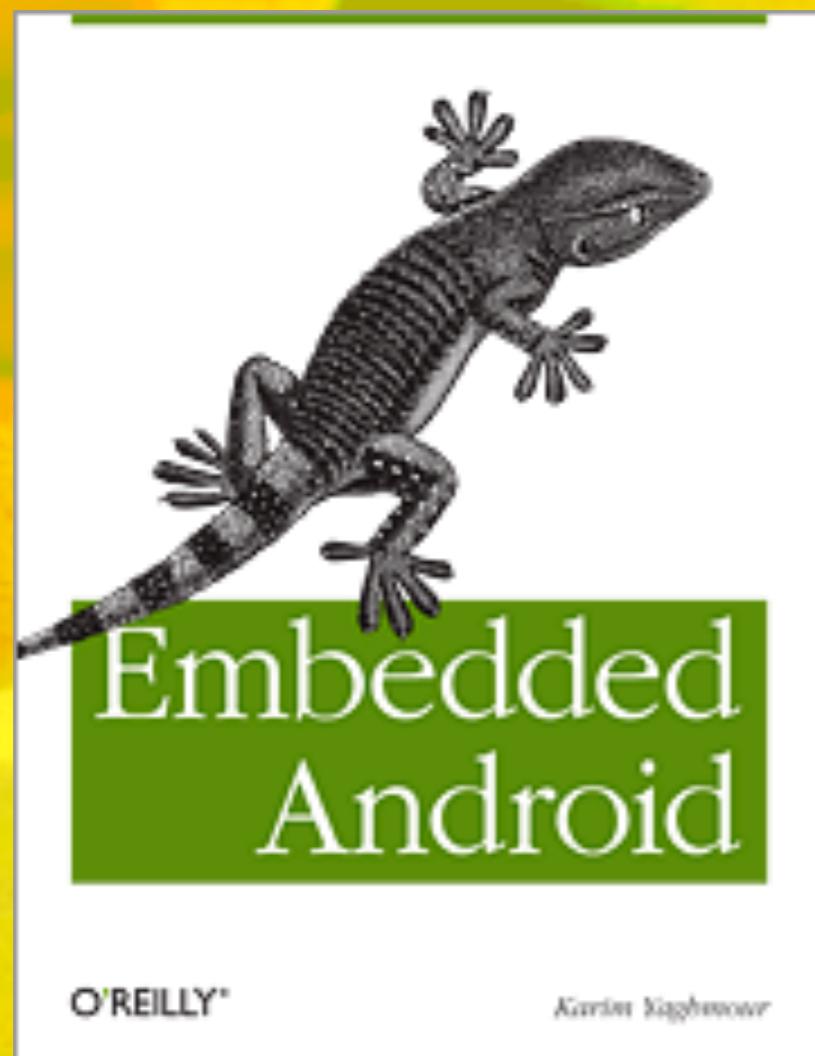
6.Activity Manager

7.Launcher (Home)



Leapset

Further Reading



Thank You!