

SOFTWARE ENGINEERING BASIC

Lecture I
Android Background

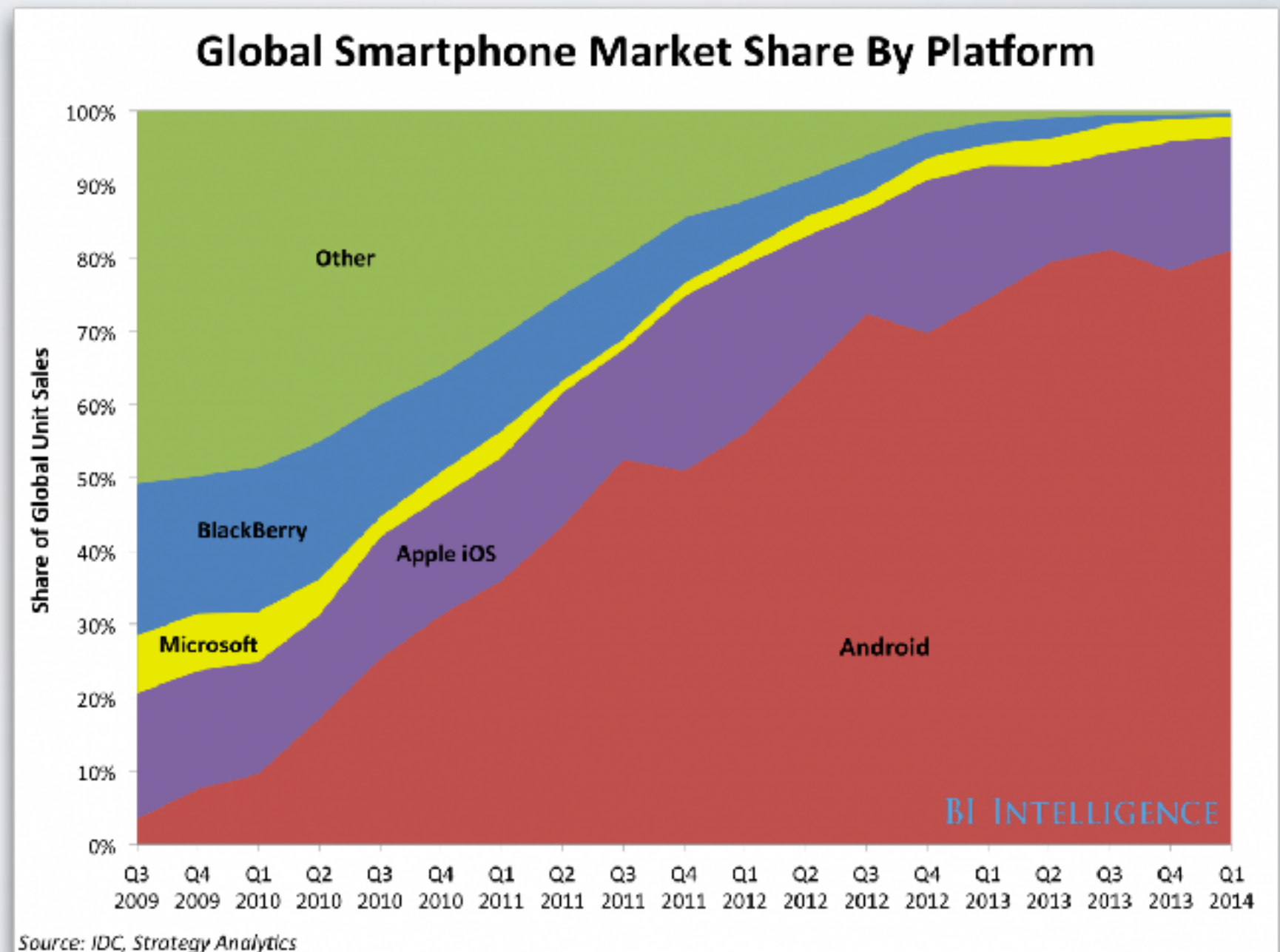
AGENDA

- Android Basics
- Motivation
- IDE



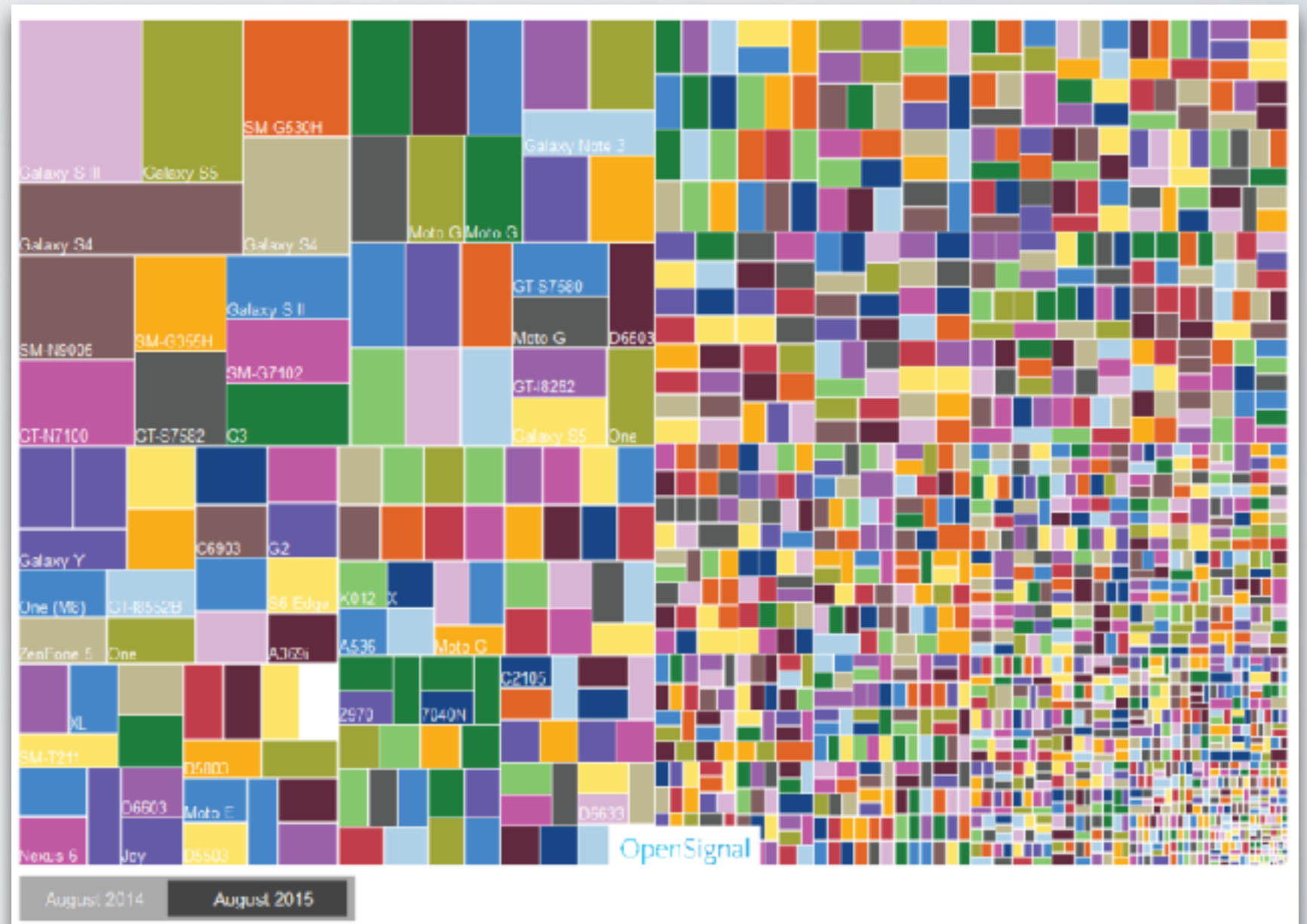
ANDROID - RANDOM FACTS

- dominant market share



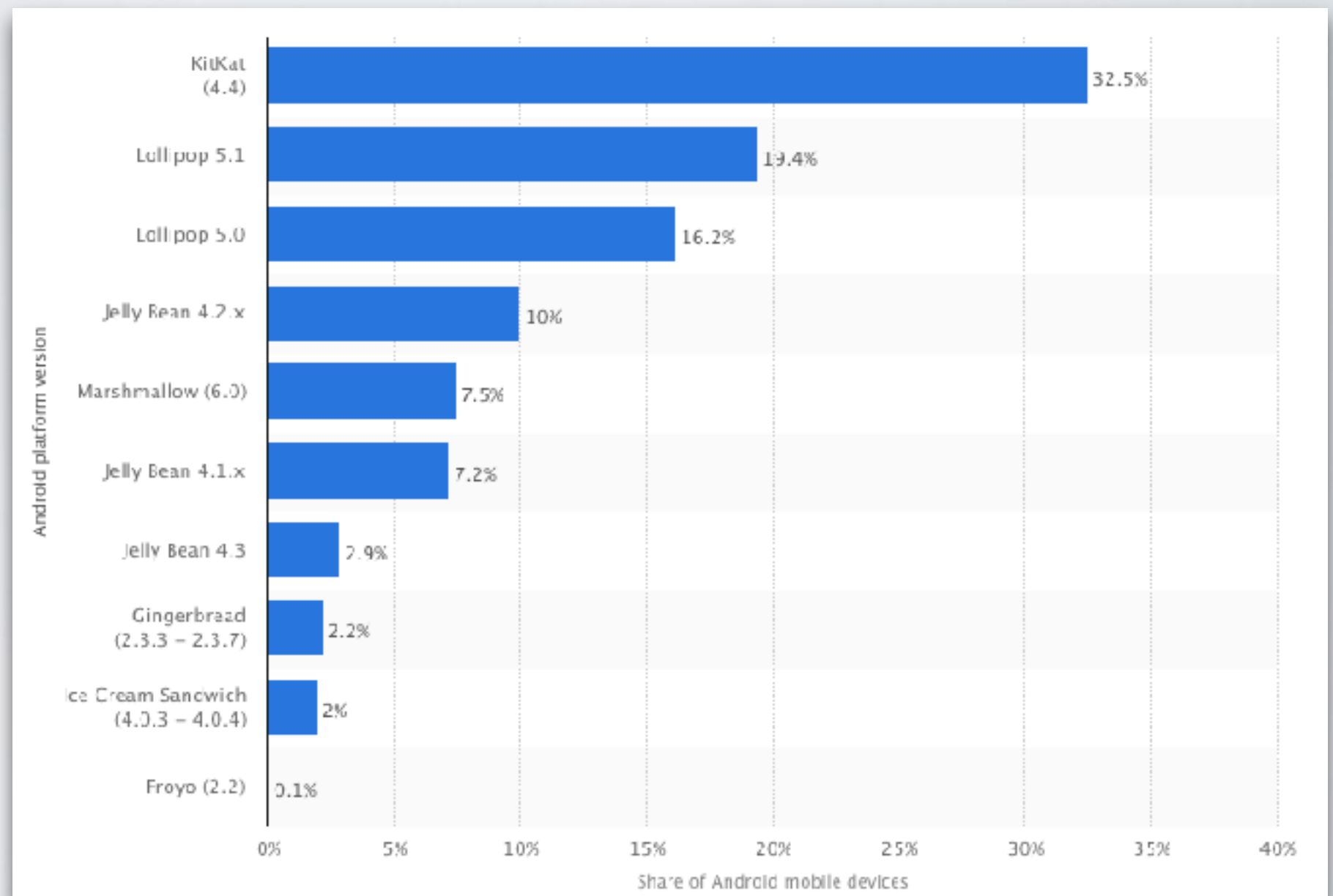
ANDROID - RANDOM FACTS

- device fragmentation



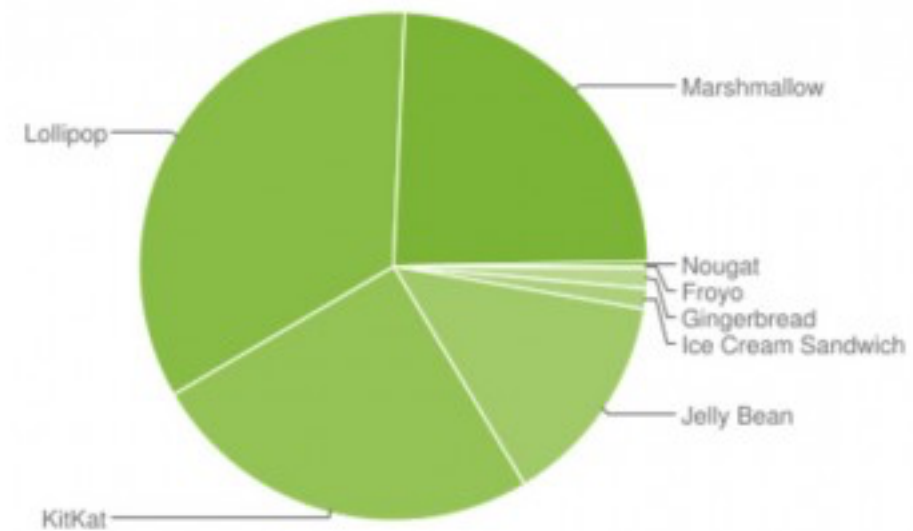
ANDROID - RANDOM FACTS

- OS distribution may 2016



ANDROID - FRAGMENTATION

| Version | Codename | API | Distribution |
|------------------|-----------------------|-----|--------------|
| 2.2 | Froyo | 8 | 0.1% |
| 2.3.3 - 2.3.7 | Gingerbread | 10 | 1.3% |
| 4.0.3 - 4.0.4 | Ice Cream Sandwich | 15 | 1.3% |
| 4.1.x | Jelly Bean | 16 | 4.9% |
| 4.2.x | | 17 | 6.8% |
| 4.3 | | 18 | 2.0% |
| 4.4 | KitKat | 19 | 25.2% |
| 5.0 | Lollipop | 21 | 11.3% |
| 5.1 | | 22 | 22.8% |
| 6.0 | Marshmallow | 23 | 24.0% |
| 7.0 | Nougat | 24 | 0.3% |



ANDROID - DEVELOPMENT

- use `_THE_` native approach, a “Java” and Android Apis
- use the (real) native approach, using C++ (... or Qt?)
- use .NET and M\$ toolchains, with C# (Xamarin)
- UNITY
- JavaFX
- or specialized engines like libGDX ... ?

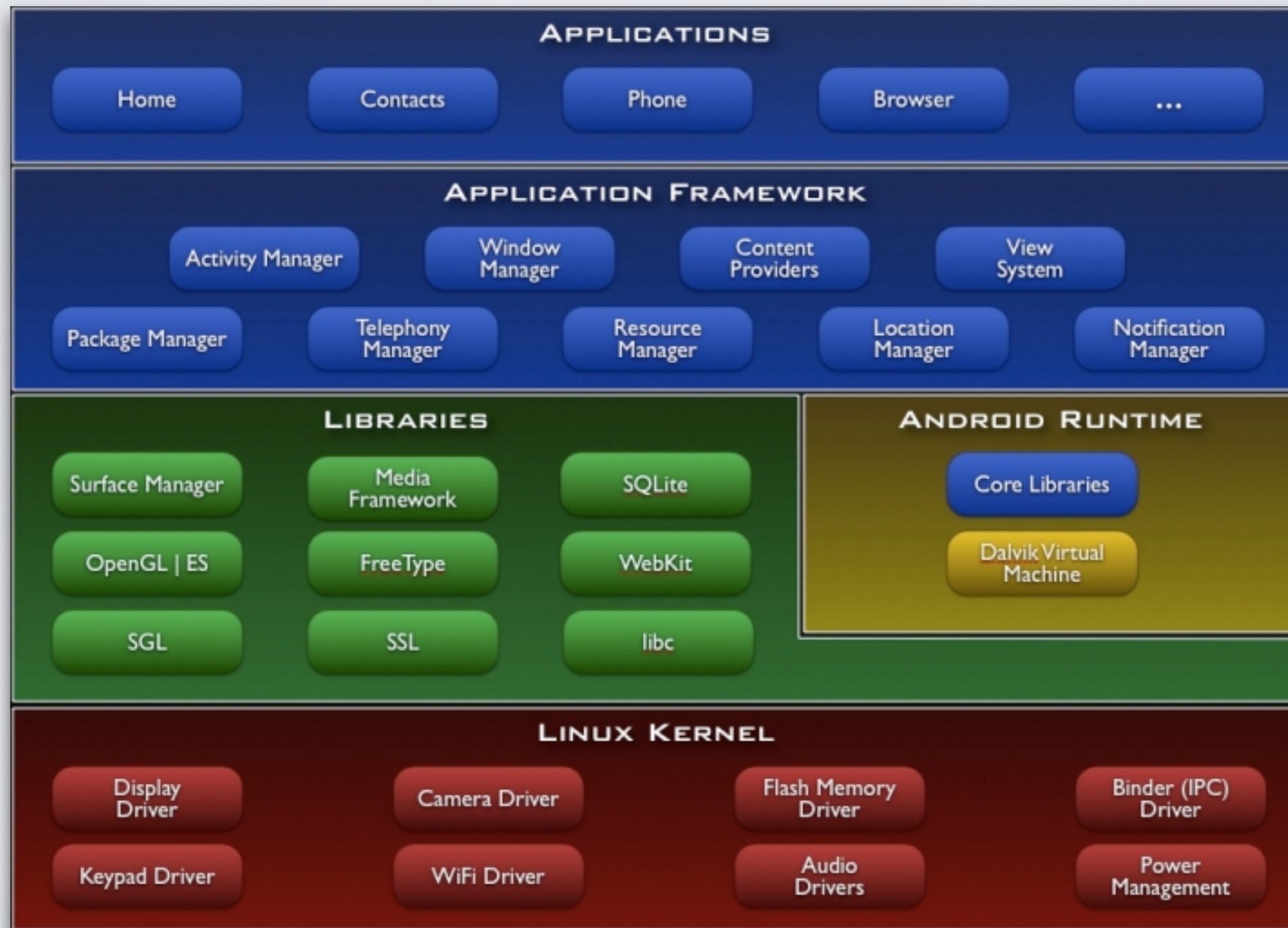
ANDROID



ANDROID - WHAT IS IT?

- Android is a platform for developing (mobile) apps
- Consists of
 - OS (adapted linux kernel)
 - Dalvik / ART (Virtual machine)
 - APIs (subset / specialized JDK)
 - Apps (vendor specific)

ANDROID ARCHITECTURE



DALVIK

- Not a 'real' JVM
- but nonetheless a top notch virtual machine
- designed for low resource environment (ram/cpu)

ART (ANDROID RUNTIME)

- Successor of Dalvik since Android V4.4 Kitkat
- Dalvik: JIT compilation
- ART: Ahead of time compilation
- ART: better battery life, startup time

THIS COURSE IS ABOUT



writing simple - very simple -
android apps

THIS COURSE IS ABOUT



writing simple android apps - in scala!



HOWTO CREATE AN APP

- Write an app in any language you want
- Compile it somehow to java bytecode
- Convert java bytecode to single dex file (classes.dex)
- Dalvik VM executes dex file

HOW TO CREATE AN SCALA ANDROID APP

- Write an app in **Scala**
- Compile it via **scalac (2.11)** to java bytecode (1.6)
- Convert java bytecode to single dex file
- Dalvik VM executes dex file

ANDROID FUTURE

- It is likely that Google creates a new stack
- codename: fuchsia
- not based on android nor linux
- written for IoT



LINKS

- <https://developer.android.com/index.html>
- <http://scala-lang.org>
- <https://developer.android.com/distribute/tools/promote/device-art.html>
- <https://romannurik.github.io/AndroidAssetStudio/>

LINKS

- SDK Man: sdkman.io
- Cygwin: cygwin.com
- Gradle: gradle.org