Introduction to **Android** programming

@somkiat

Topics

Mobile programming with Android
Development tools
Android components
Building a View
ListView


STEVECUTTS.COM
SAMSUNG

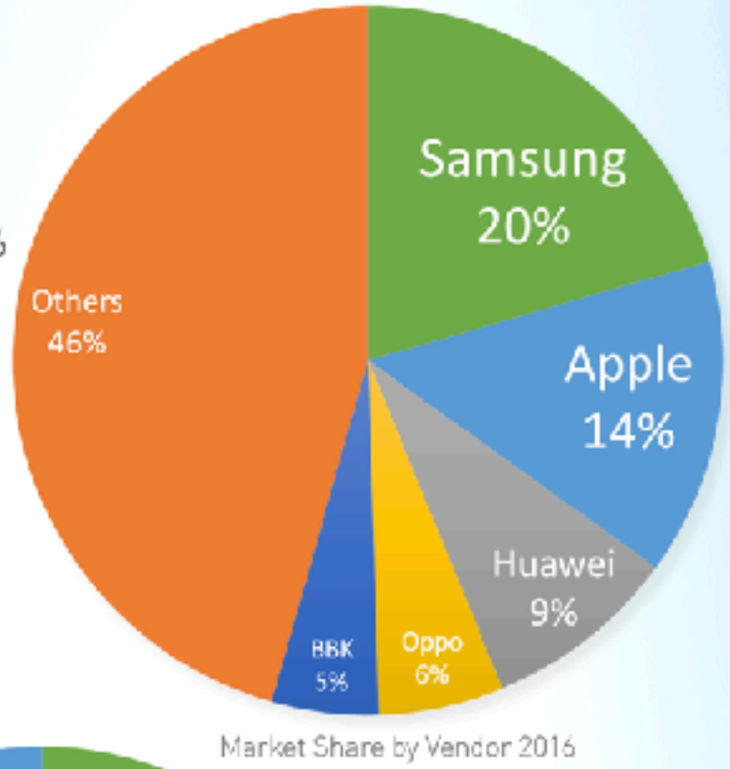

Mobile
Apps
"Yep, We
Build em"
C7CREATIVE
START


Insta

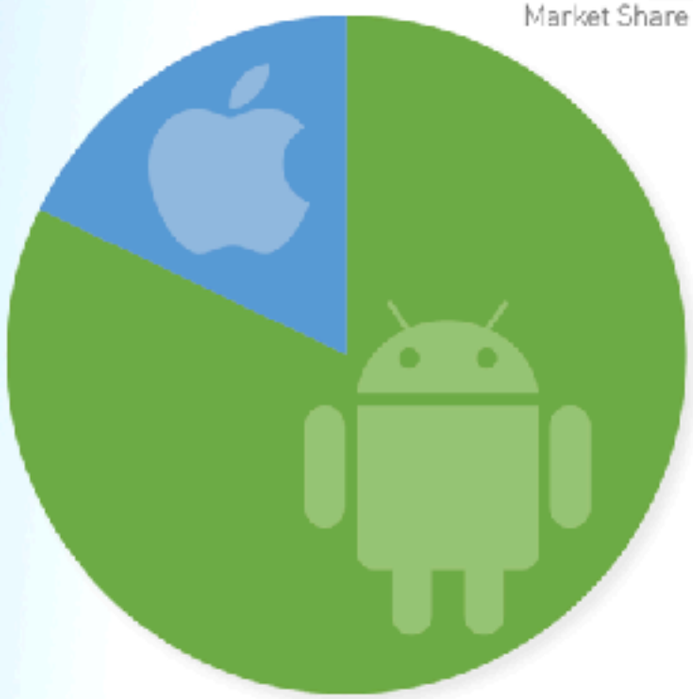
Global Smartphone Sales

1.5
billion units 2016

5%
increase over 2015



Market Share by Vendor 2016



82%
Market share for Android in Q4 2016

18%
Market share for iOS

<0.5% Others

Market Share by Operating System Q4 2016

Source data: Gartner

Infographic created by: **Omnis** Software www.omnis.net

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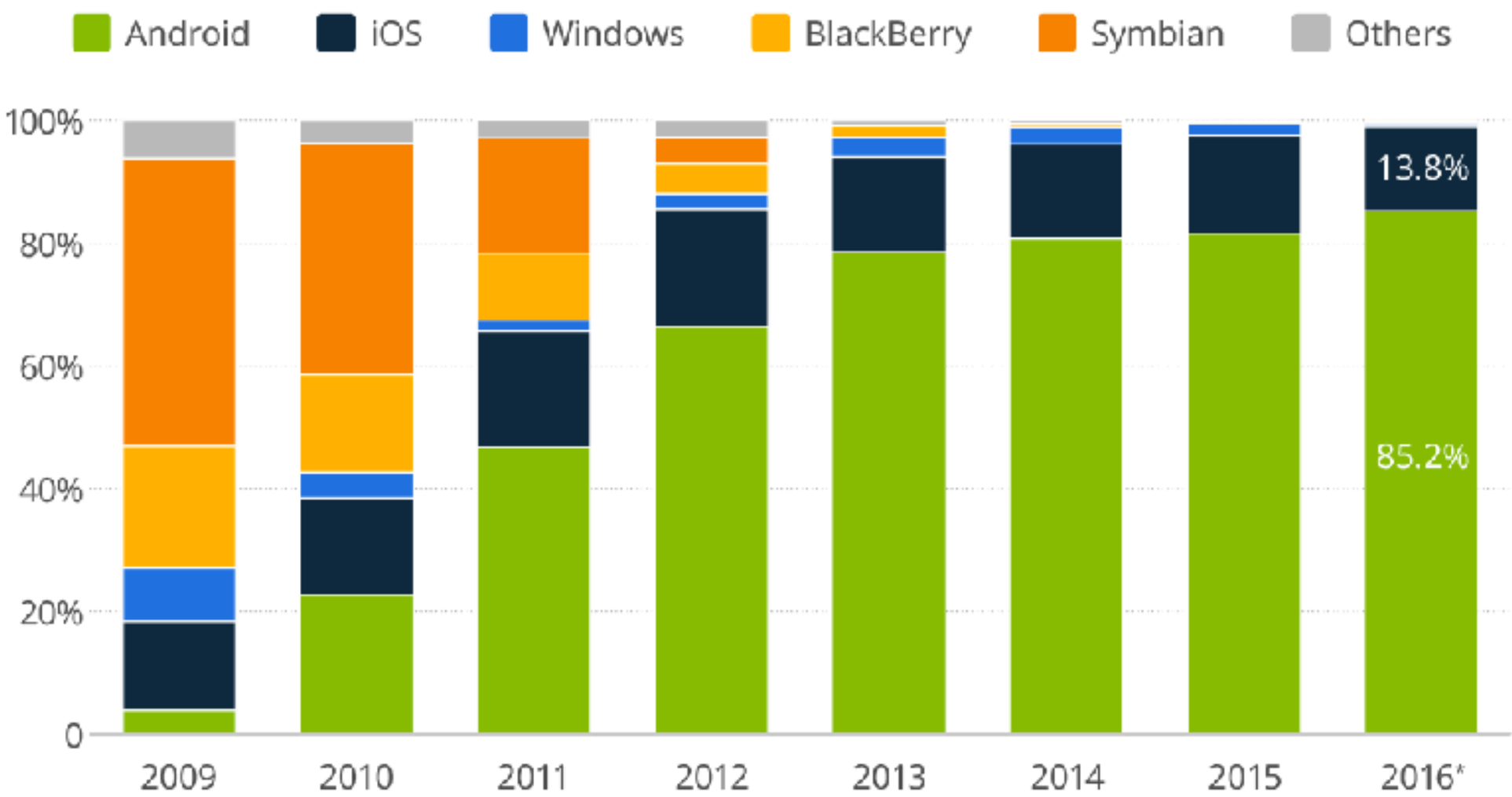
Tech Chart of the Day

Smartphone Platform Market Share

Market share based on worldwide smartphone sales to end users



* January - June

BUSINESS INSIDER

Source: Gartner

statista

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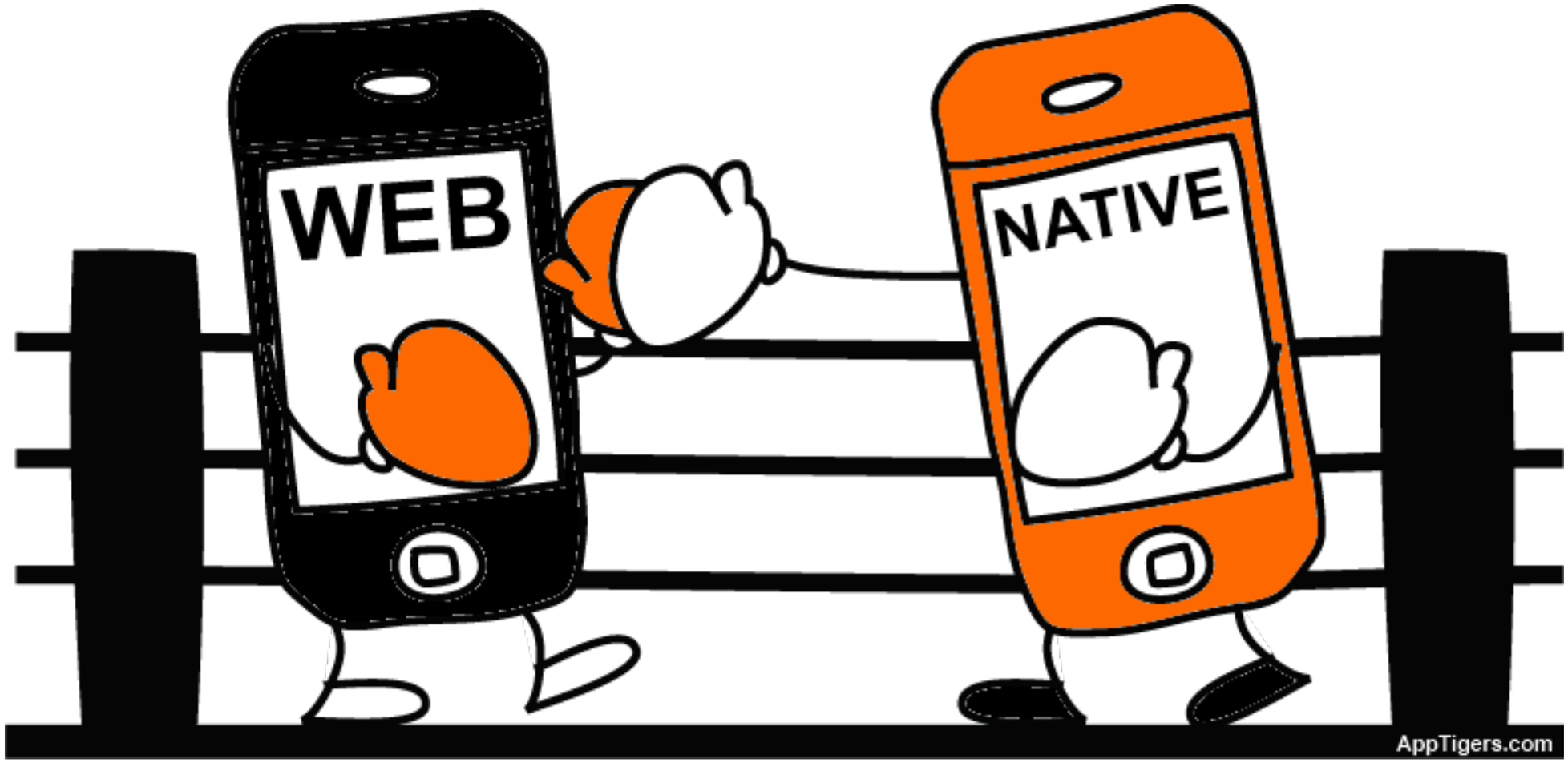
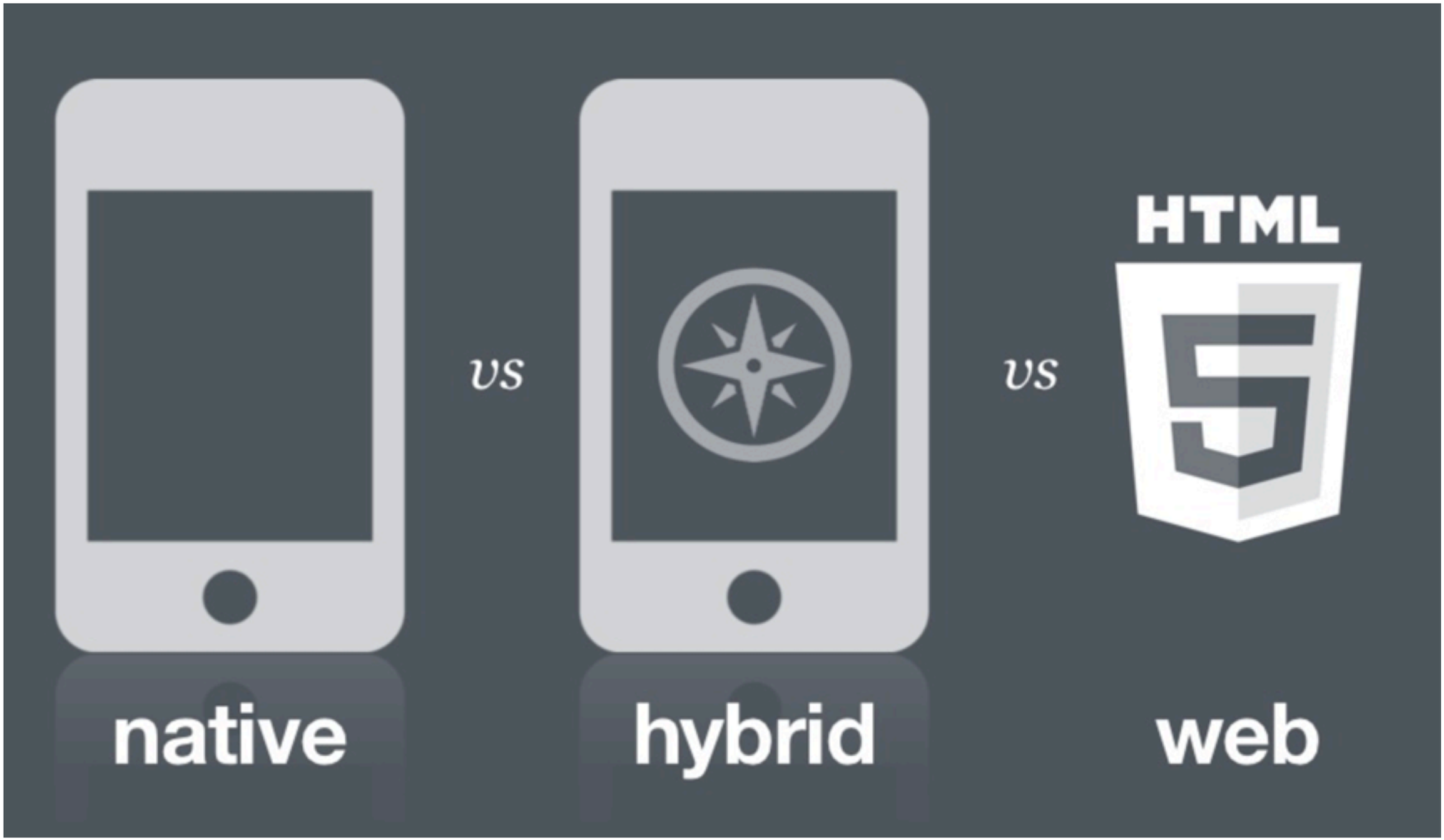
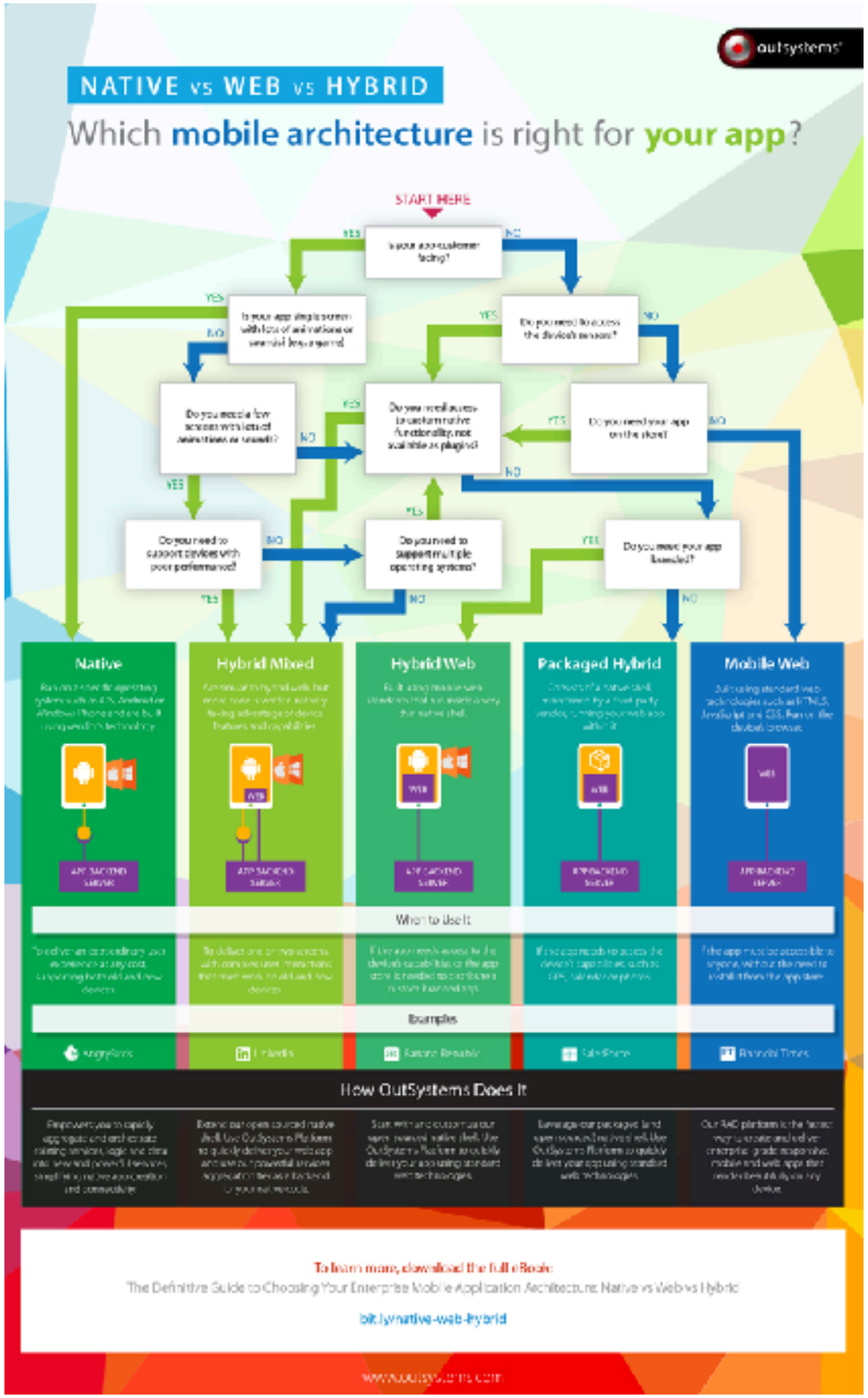

WEB
NATIVE
AppTigers.com


vs
vs
HTML
native
hybrid
web



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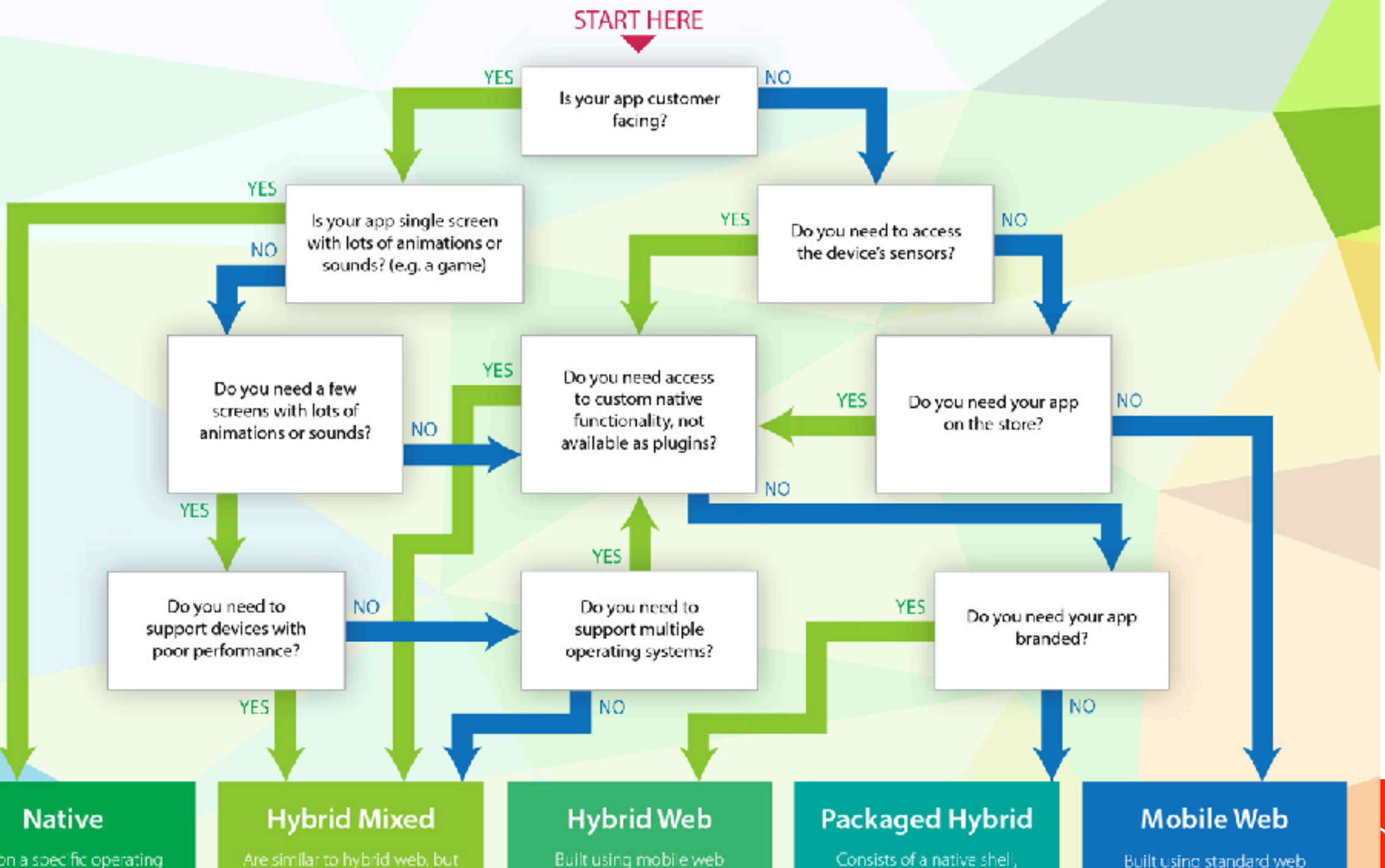
outsystems

NATIVE vs WEB vs HYBRID

Which **mobile architecture** is right for **your app**?




Good App Idea
Great Developers
The Perfect App


Good App Idea
Great Developers
The Perfect App

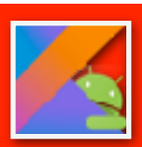
Goals of this course

Better Android developer

Better Android App Architecture

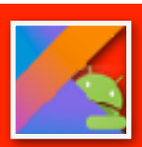
Build Android App with Native

Mobile programming

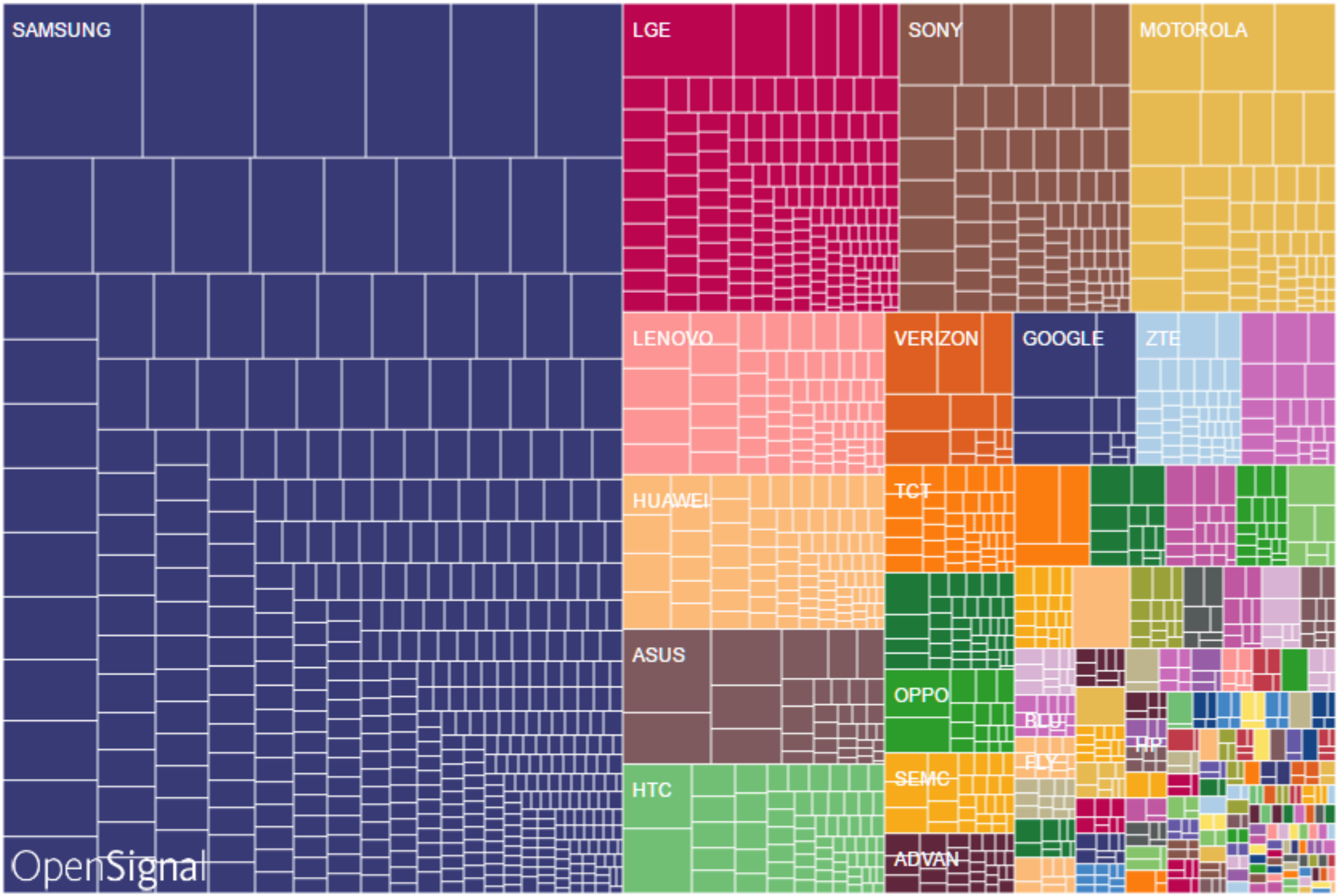


Different !!

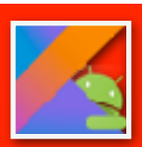
Different type of device !!
Different type of resources !!
Different user interaction !!
Change Faster !!
Time to Market !!



Android fragmentation !!



Android more than Java



Android programming

Using **Java** and **Android APIs**
We can use **Kotlin** to develop Android app
We can use some Java standard libraries

Android != Java

Process life cycle
Limitation to access resources
Required Android SDK
Required Emulator or **Real device**
Need special **IDE**

Practical matter

Practical matter

Go to Android developer documentation

Practical matter

Go to Android developer documentation
Read through the main page/classes

Practical matter

Go to Android developer documentation
Read through the main page/classes
Start working on your own application

Practical matter

Go to Android developer documentation
Read through the main page/classes
Start working on your own application
When you get struck/problem,
read the documentation first !!

Practical matter

https://stackoverflow.com/questions/tagged/android
https://stackoverflow.com/documentation/android/topics

Installation

Android Studio

Android Studio

The Official IDE for Android

Android Studio provides the fastest tools for building apps on every type of Android device.

World-class code editing, debugging, performance tooling, a flexible build system, and an instant build/deploy system all allow you to focus on building unique and high quality apps.

DOWNLOAD ANDROID STUDIO
2.3.3 FOR MAC (463 MB)

› Read the docs › See the release notes

https://developer.android.com/studio/index.html

Setting up Emulator

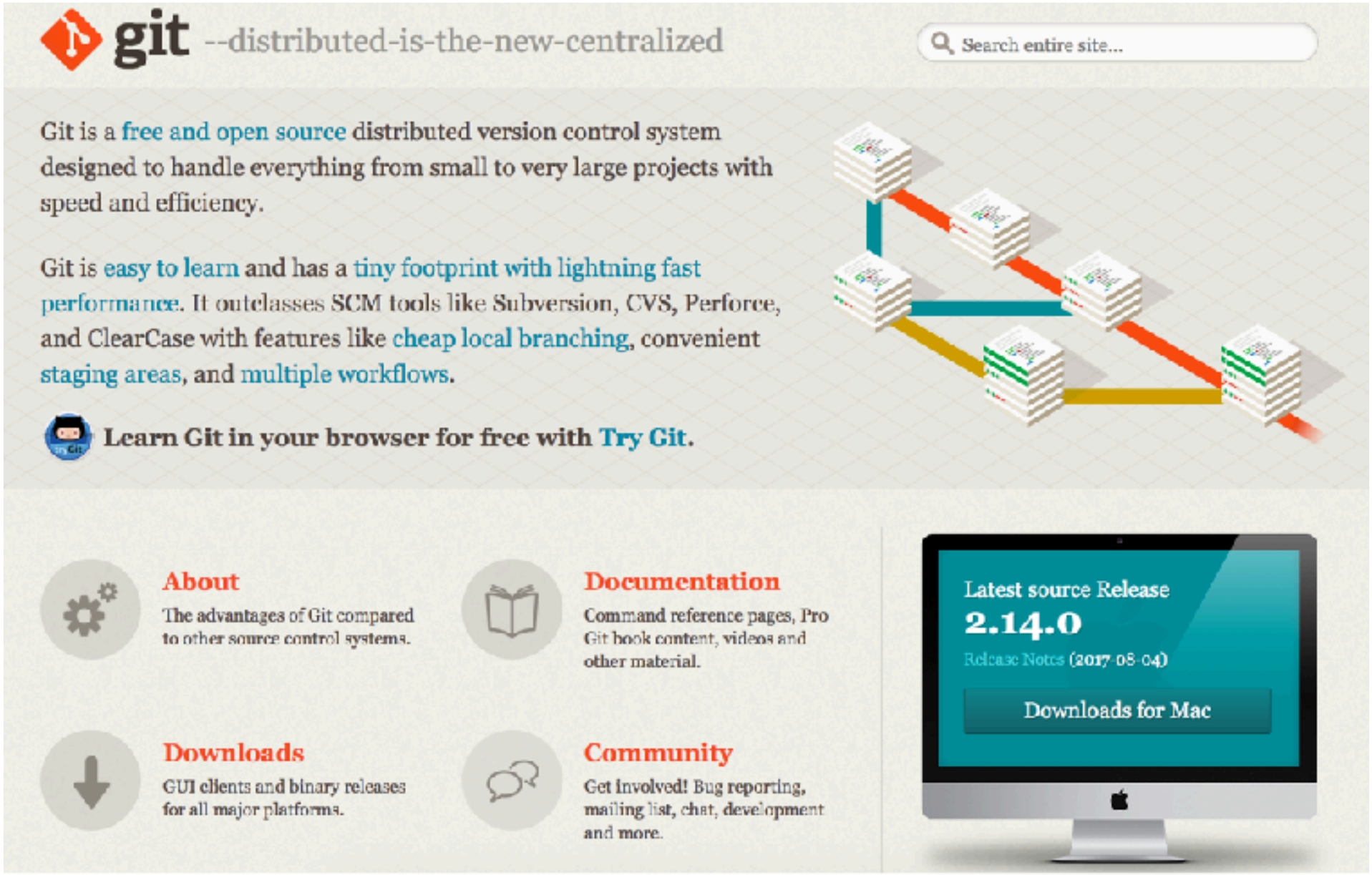
Fast and feature-rich emulator

Install and run your apps faster than with a physical device and test your app on virtually any Android device configuration: Android phones, Android tablets, Android Wear, and Android TV devices.

The new Android Emulator 2.0 is faster than ever and allows you to dynamically resize the emulator and access a suite of sensor controls.

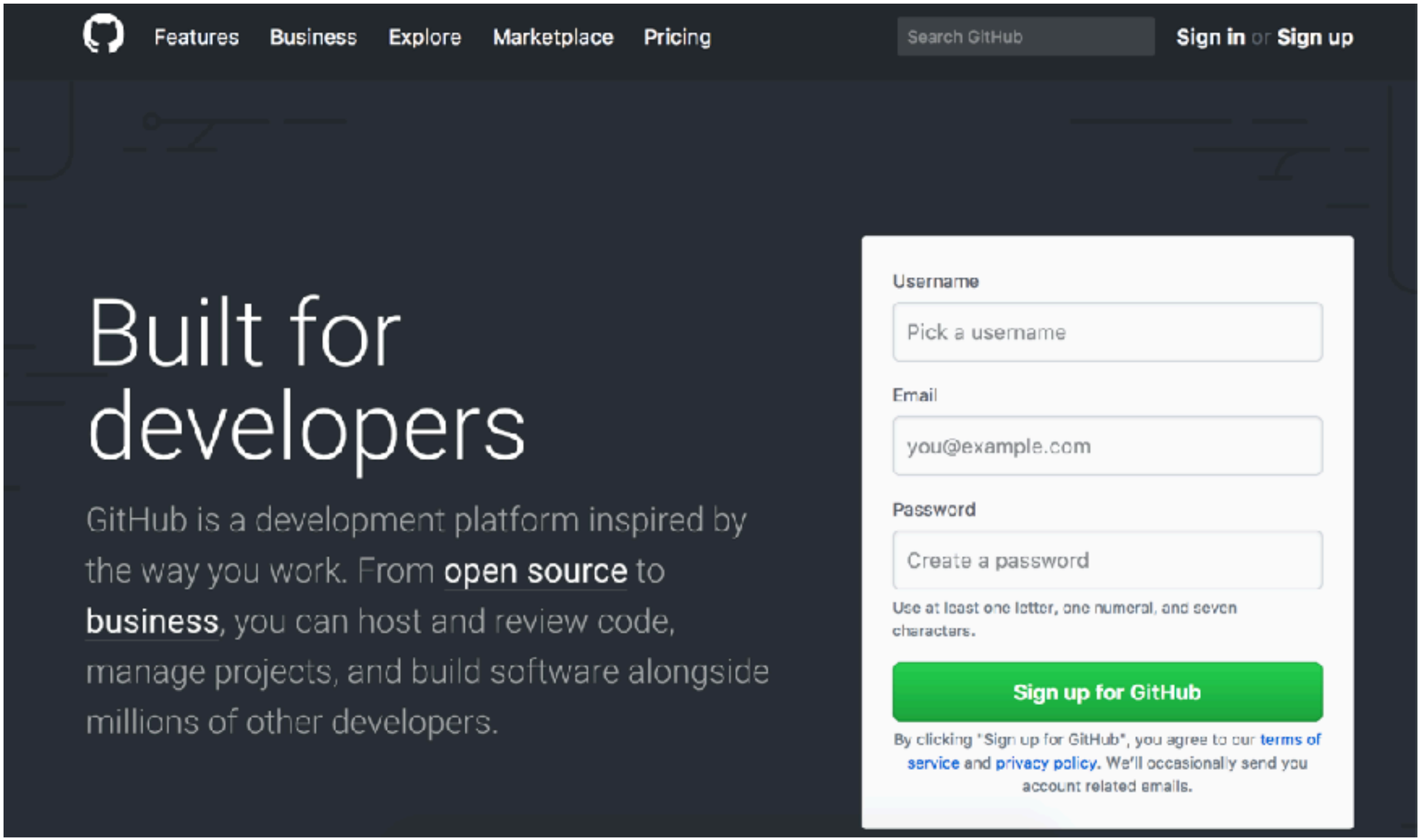
› Learn more

Git



https://git-scm.com/

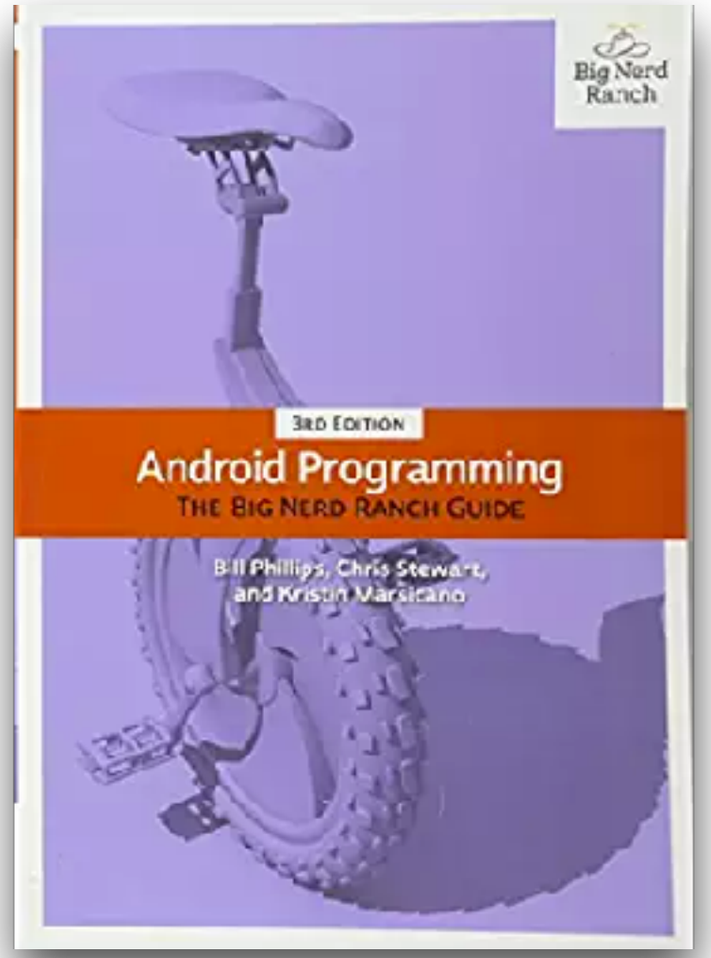
GitHub

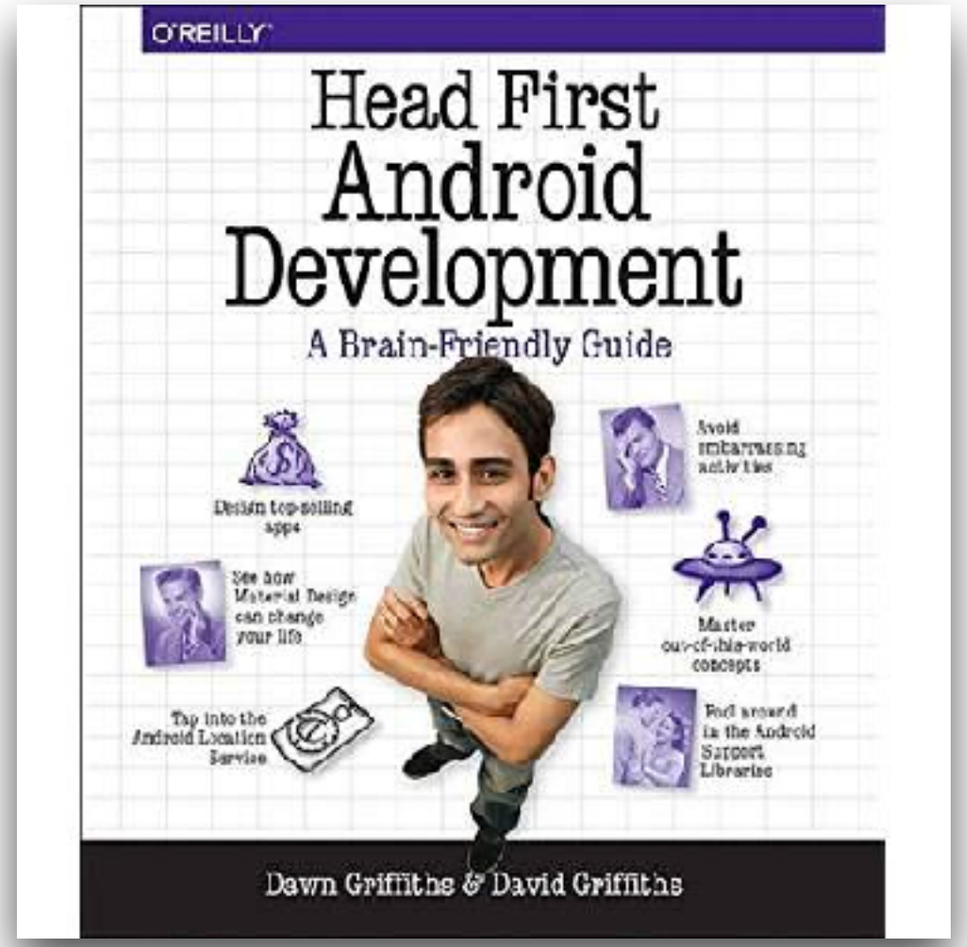


https://github.com/

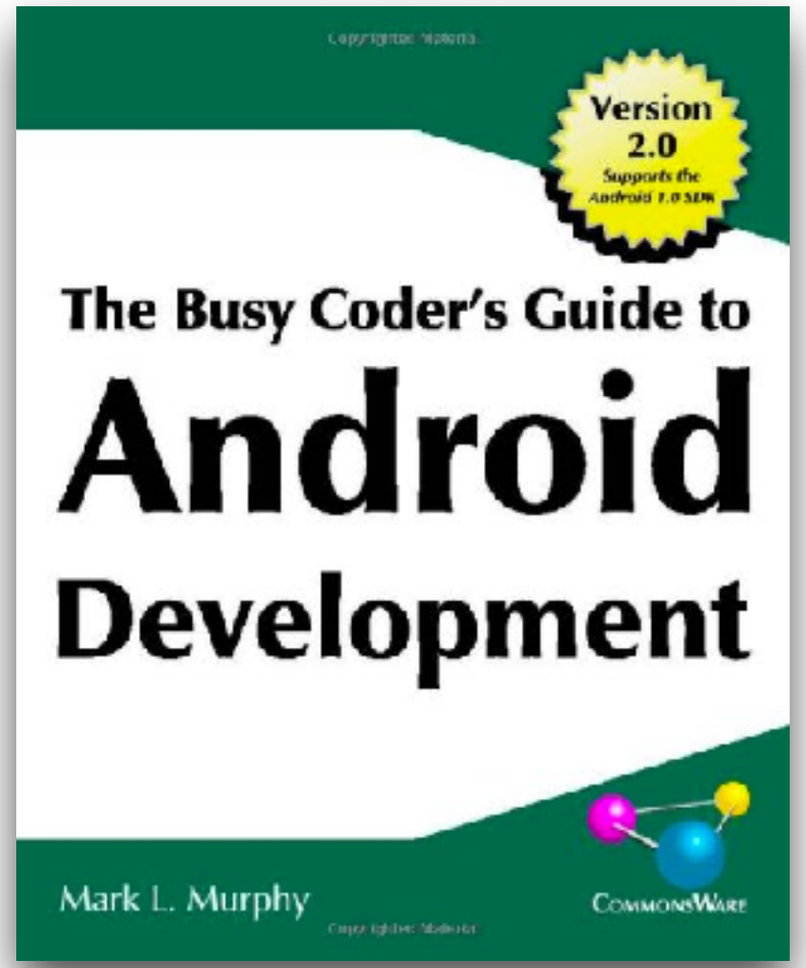
Resources

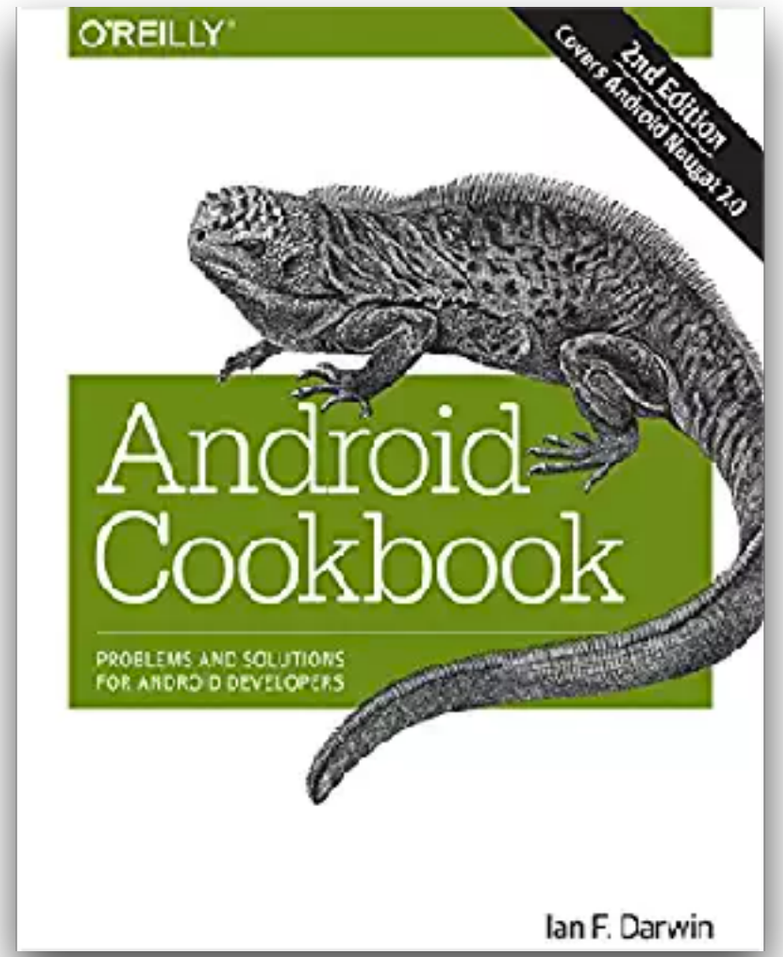
Books


Big Nerd Ranch
3rd Edition
Android Programming
The Big Nerd Ranch Guide
Bill Phillips, Chris Stewart, and Kristin Marsicano


O'REILLY
Head First
Android
Development
A Brain-Friendly Guide
Design top-selling apps
See how Material Design can change your life
Tap into the Android Location Service
Master out-of-this-world concepts
Avoid embarrassing activities
Tool around in the Android Support Libraries
Dawn Griffiths & David Griffiths

Books


Version
2.0
Supports the
Android 1.0 SDK
The Busy Coder's Guide to
Android
Development
Mark L. Murphy
CommonsWare


O'REILLY
2nd Edition
Covers Android Nougat 7.0
Android
Cookbook
PROBLEMS AND SOLUTIONS
FOR ANDROID DEVELOPERS
Ian F. Darwin

Links

https://github.com/up1/course-android-kmitl

https://developer.android.com/index.html

https://github.com/wasabeef/awesome-android-ui

https://android-arsenal.com/

Let’s start with Android

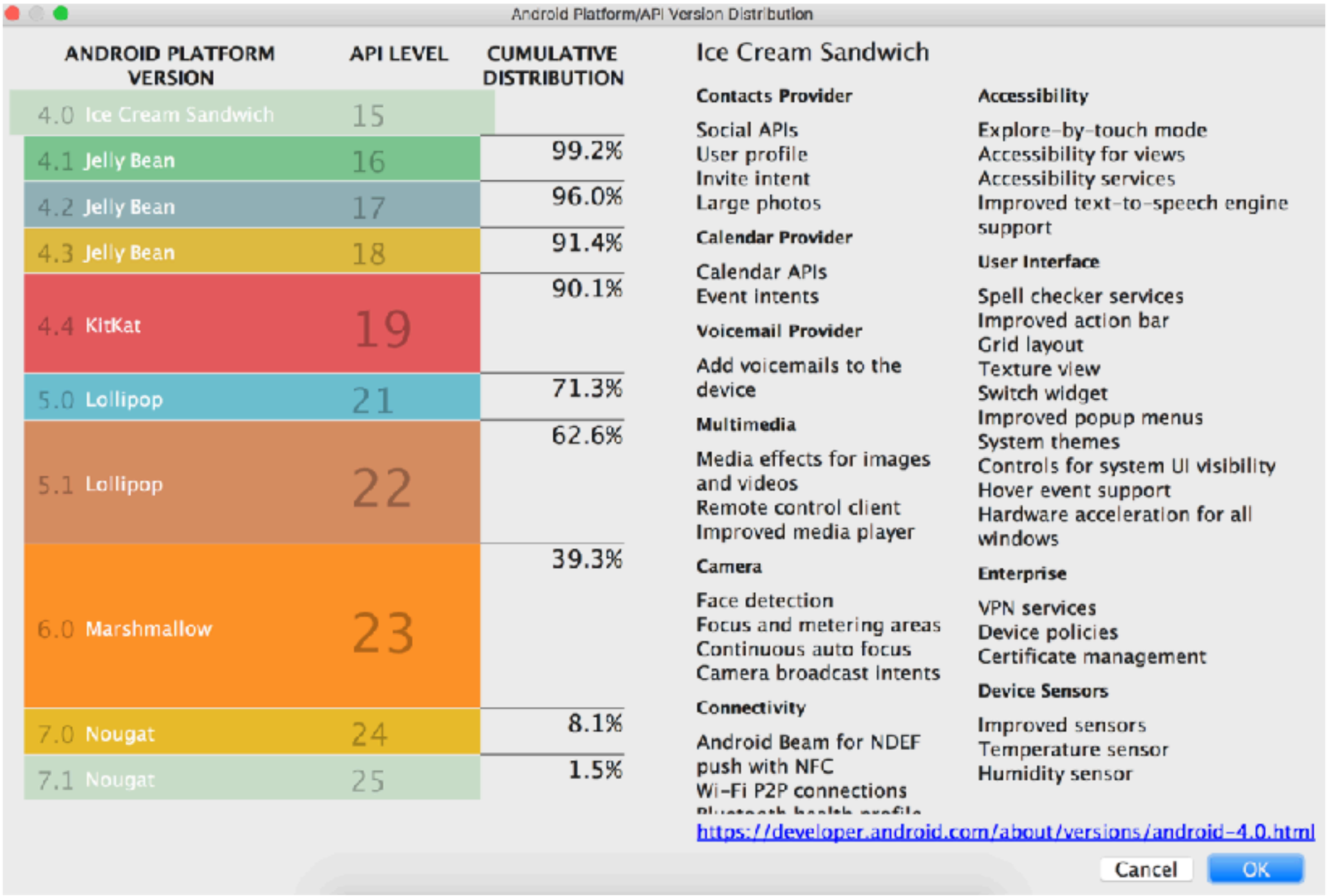
Try to create a sample app !!

Basic of android

https://developer.android.com/guide/platform/index.html

Platform Architecture

Platform and API Distribution



Android fundamentals

Develop with **Java** and **Kotlin**
Using Principle of least privilege
Each Android app run in sandbox
Multi-user OS
Run on **VM** (Virtual Machine) ?

Android Runtime

DVM (**D**alvik **V**irtual **M**achine)
ART (**A**ndroid **R**un**T**ime)

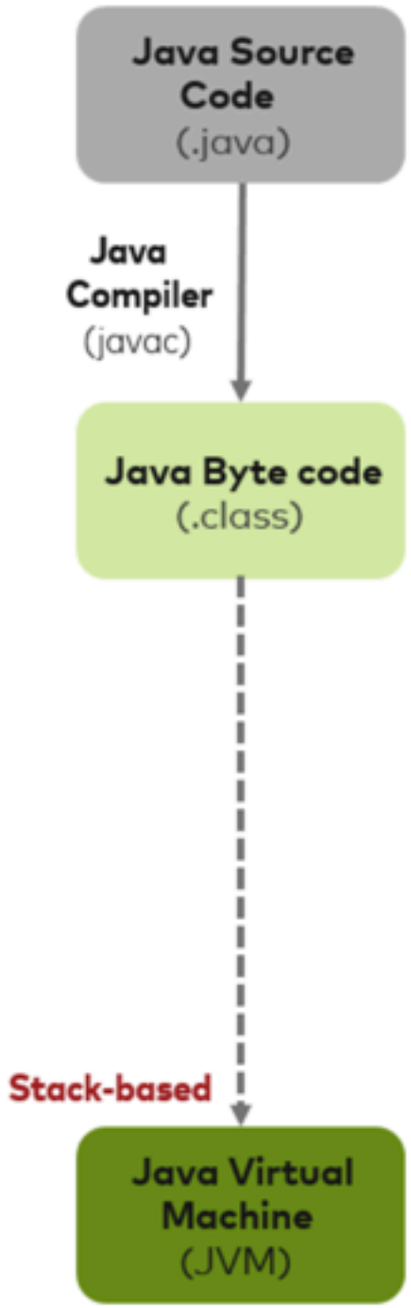
Android Runtime

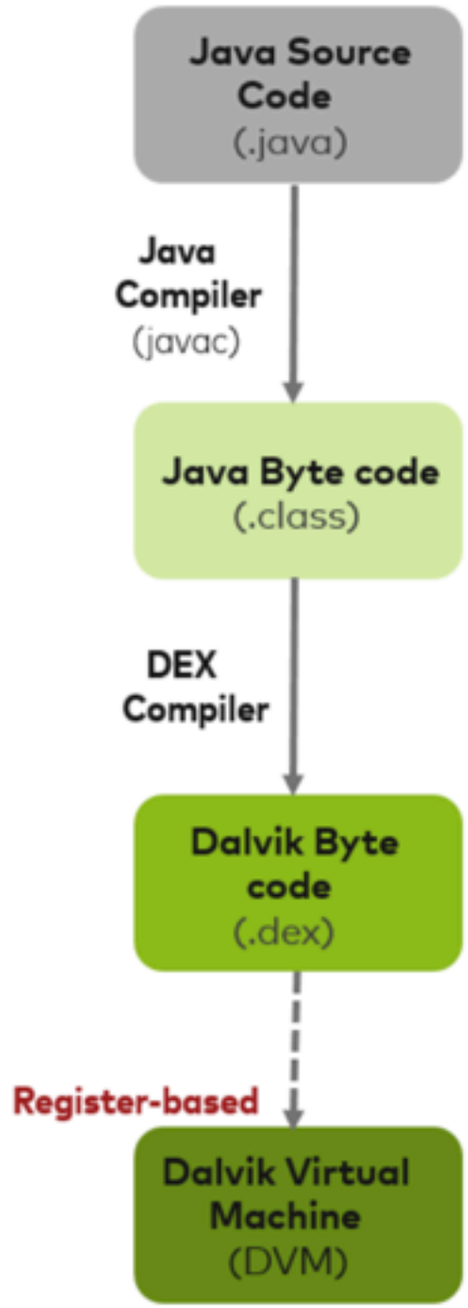
DVM (**D**alvik **V**irtual **M**achine)

ART (**A**ndroid **R**un**T**ime)

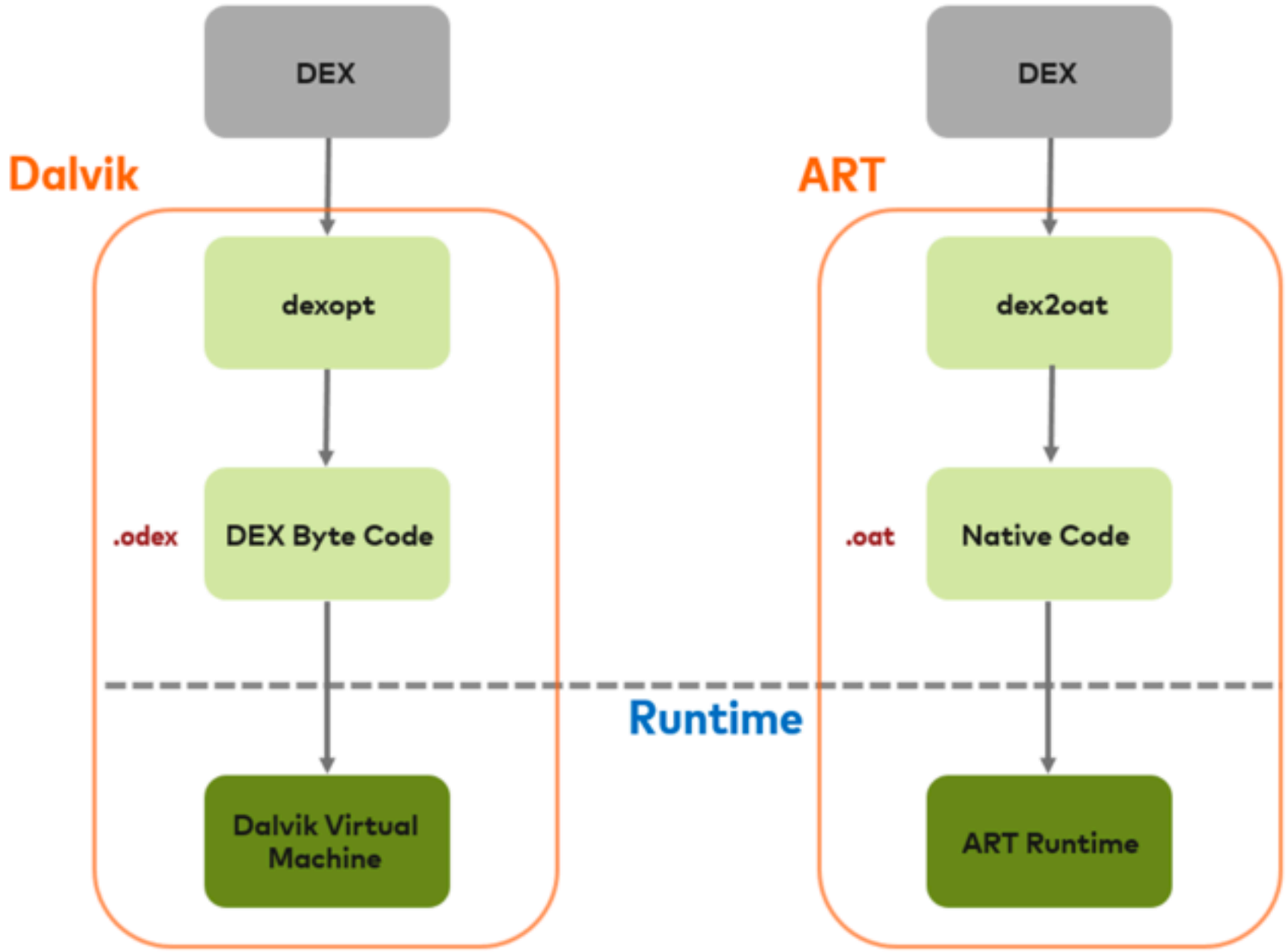
Android 5.0+ (API level 21)

JVM vs DVM


Java Source Code
(.java)
Java Compiler
(javac)
Java Byte code
(.class)
Stack-based
Java Virtual Machine
(JVM)


Java Source Code
(.java)
Java Compiler
(javac)
Java Byte code
(.class)
DEX Compiler
Dalvik Byte code
(.dex)
Register-based
Dalvik Virtual Machine
(DVM)

DVM vs ART


DEX
Dalvik
dexopt
.odex
DEX Byte Code
Dalvik Virtual Machine
DEX
ART
dex2oat
.oat
Native Code
ART Runtime
Runtime

DEX (**D**alvik **EX**ecutable)

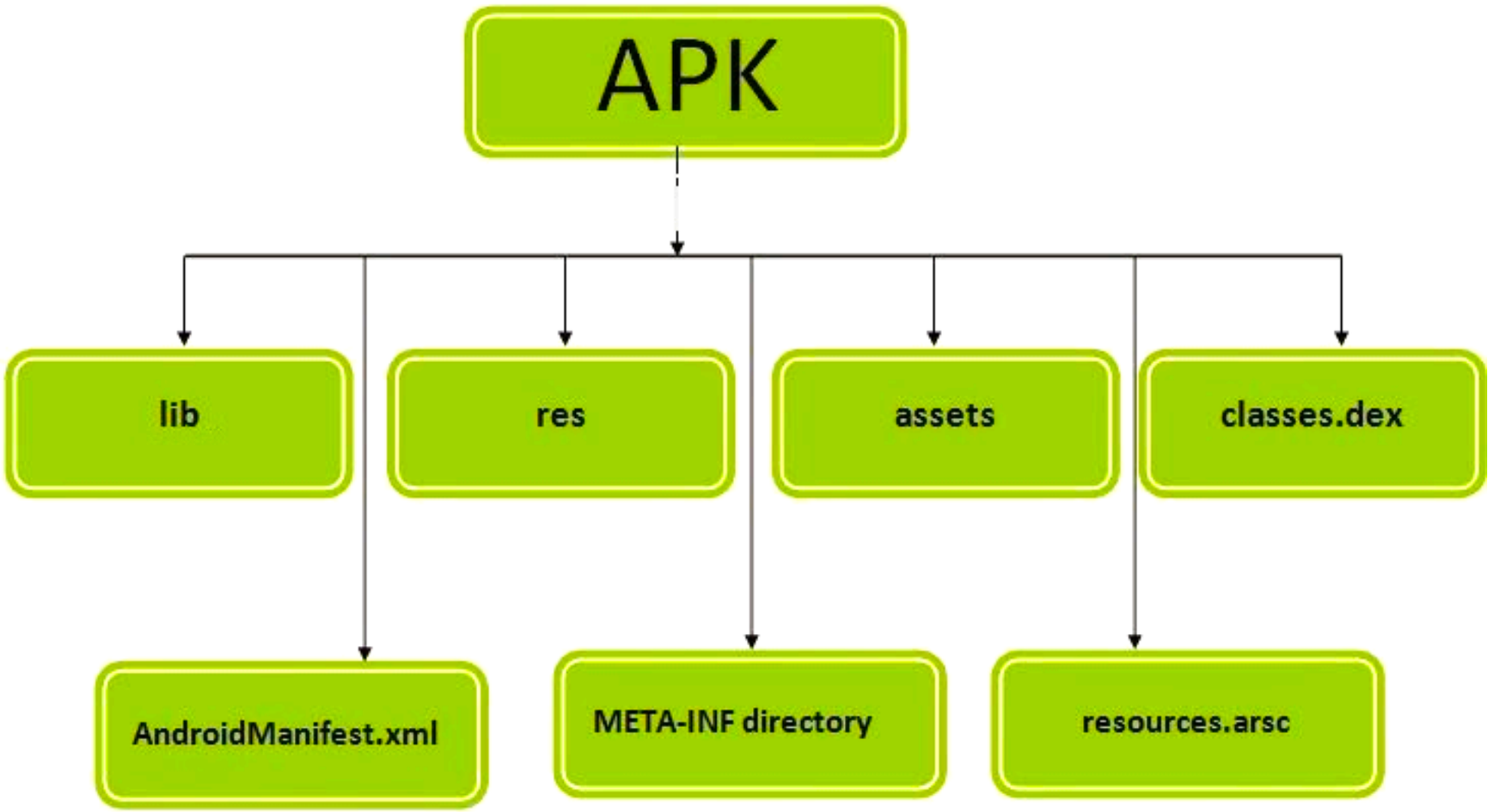
Executable files in APK file

Limit 65,536 methods !!

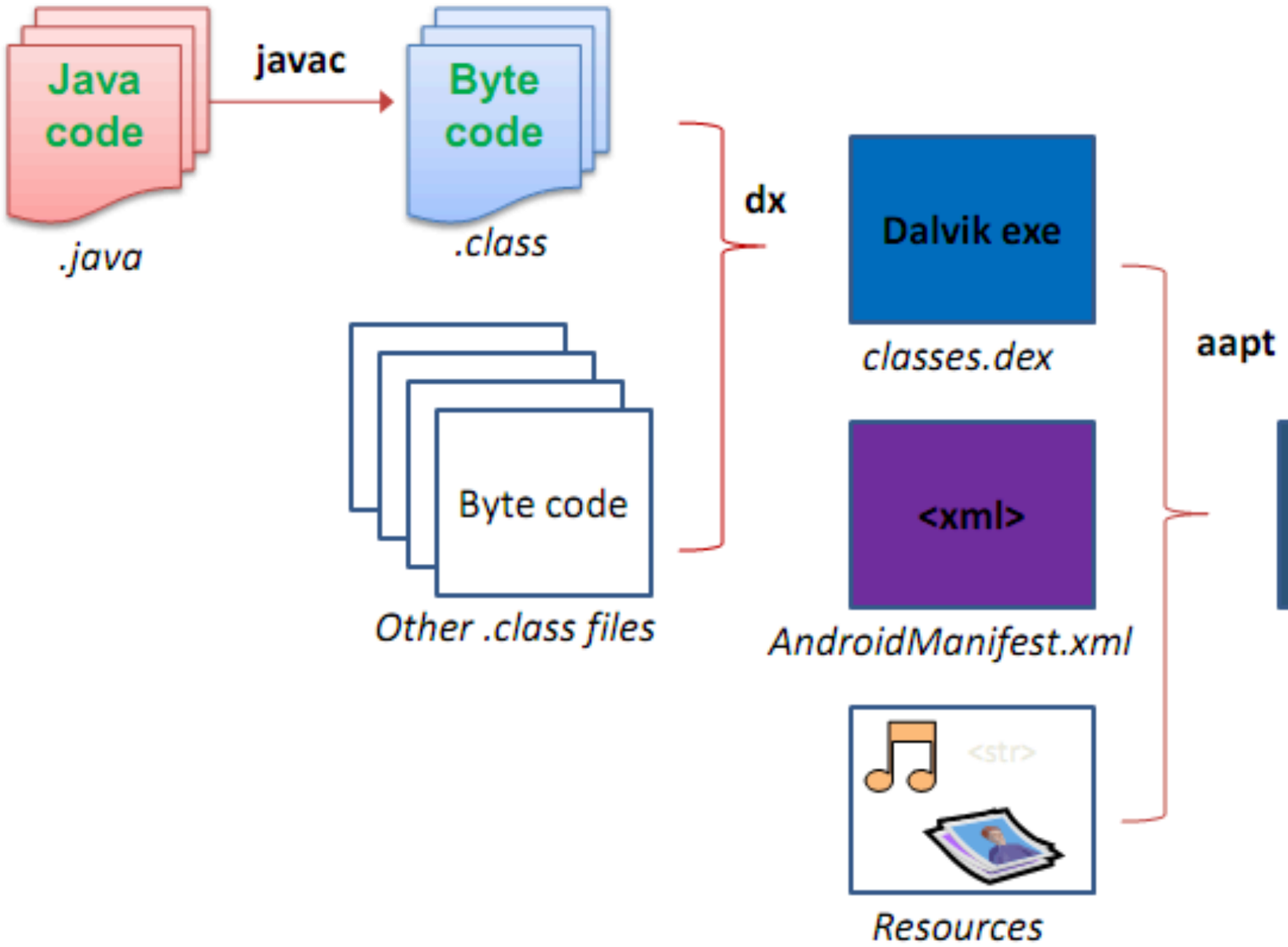
Multi-Dex !!

https://developer.android.com/studio/build/multidex.html

APK structure



Build process



Android components

Android Components

Activities/Fragments/Views
Intents
Tasks

Android Components

Services
Content Providers
Broadcast Receivers

Activities

Things the user can see on the screen
A unit of user interaction
A unit of user execution
Control sequence of UI flow in app
Reusable

Intents