# Is comparing two completely different mobile devices nonsense?

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# Why did we choose these topic?

- Is it possible to test and compare mobile device performance in an **independent** way?

# Why are there Performance Tests?

- Find and compare the best matching smartphone for his or her needs (consumer).
- Be number one in the rankings to gain the maximum value of of media representations (producer).

**The goal of a good and reliable test**

Finding the most performant device with a fair comparison.

# Operating Systems

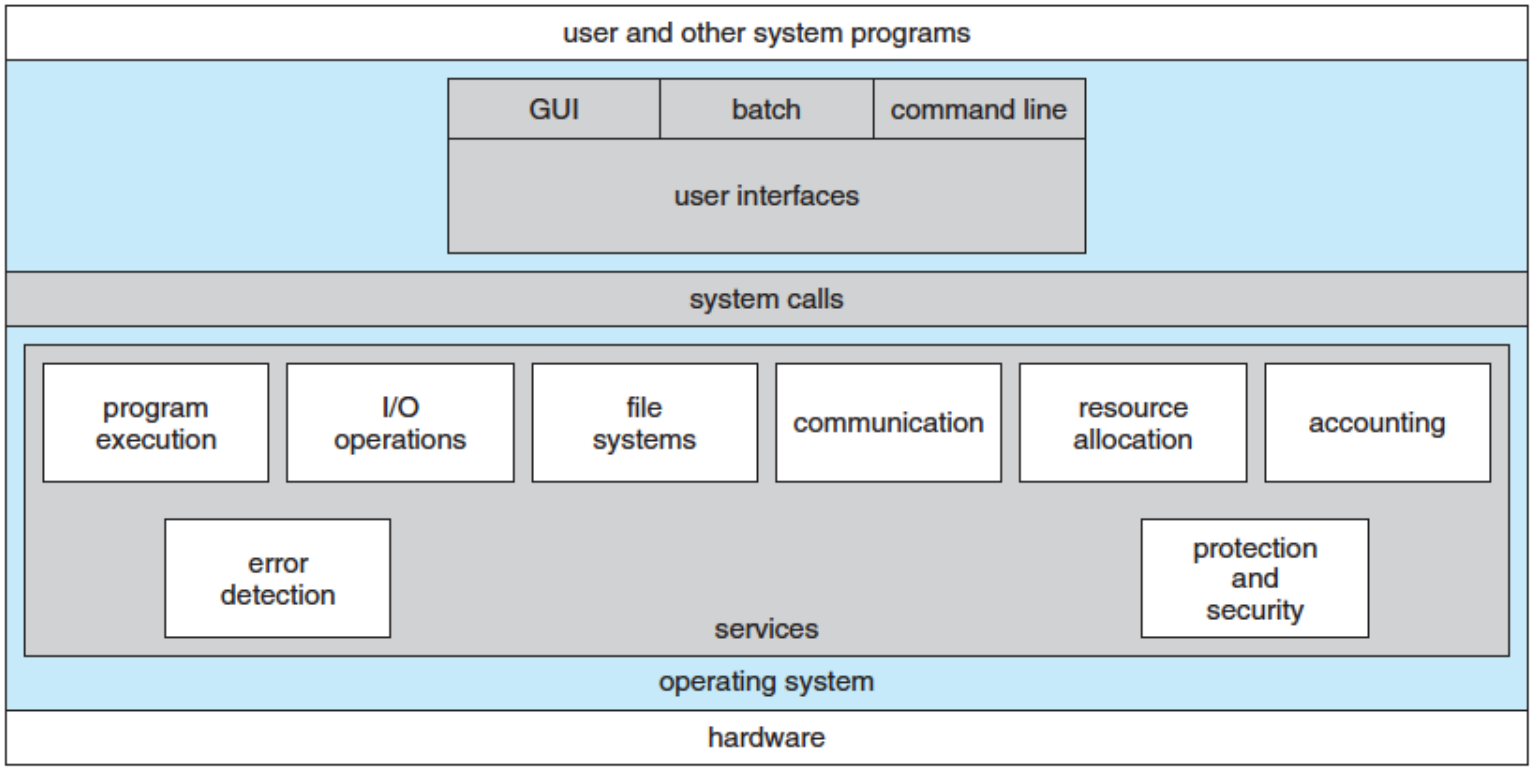



Figure: Overview of an Operating System

# Are they the same?

Figure: iPhone

$==$


Figure: Android

# iOS

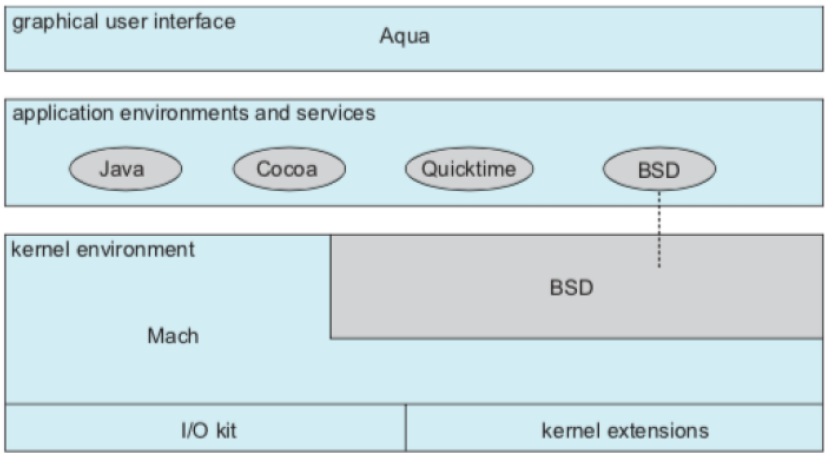



Figure: OSX

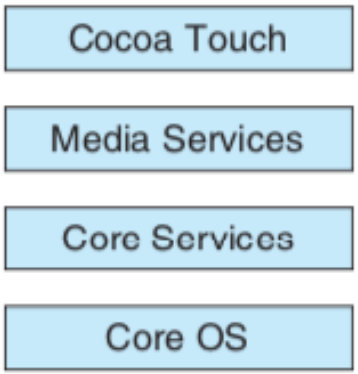



Figure: iOS

# Android

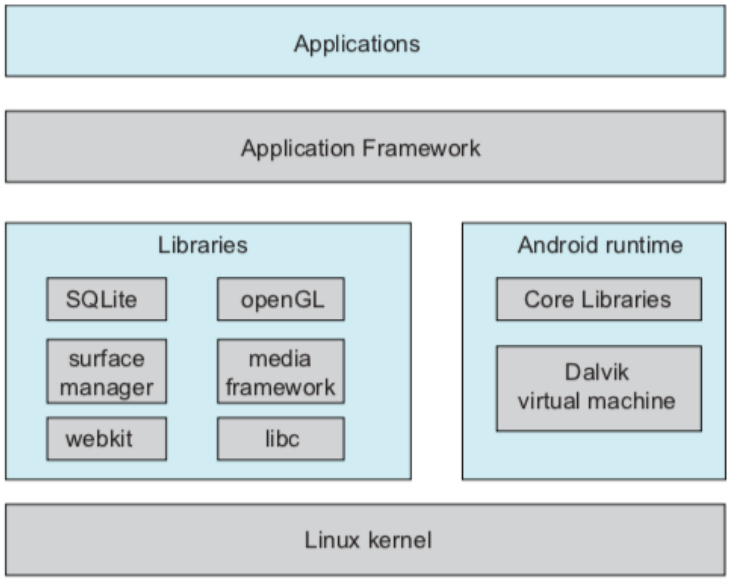



Figure: Android

# The most important Performance Tests

- Display → what the user sees.
- GPU → the overall speed and graphical performance.
- CPU → computing and overall speed.
- Battery → how long the device lasts.

# What is Geekbench?

## Geekbench

This software compares Android and iOS smartphones in the most comparable way possible. This means that the test results are calculated in the most abstract way possible.

# Geekbench's Performance Tests

Geekbench does have three different kinds of benchmarks:

1. CPU
2. Compute (graphical performance)
3. Battery

# The CPU benchmark

Geekbench groups CPU workloads into two sections:

1. Single-Core Workloads
2. Multi-Core Workloads

Each section is grouped into four subsections:

1. Cryptography Workloads
2. Integer Workloads
3. Floating-Point Workloads
4. Memory

# Calculation of the result

| Subsection | Weight |
|---|---|
| Cryptography | 5% |
| Integer | 45% |
| Floating Point | 30% |
| Memory Workloads | 20% |

# The Problem with Perfomance Tests

## The real performance

We are comparing the performance of APIs not the actual Hardware. Especially with GPU tests, there is an extra layer between the raw hardware performance.

# Example GPU API

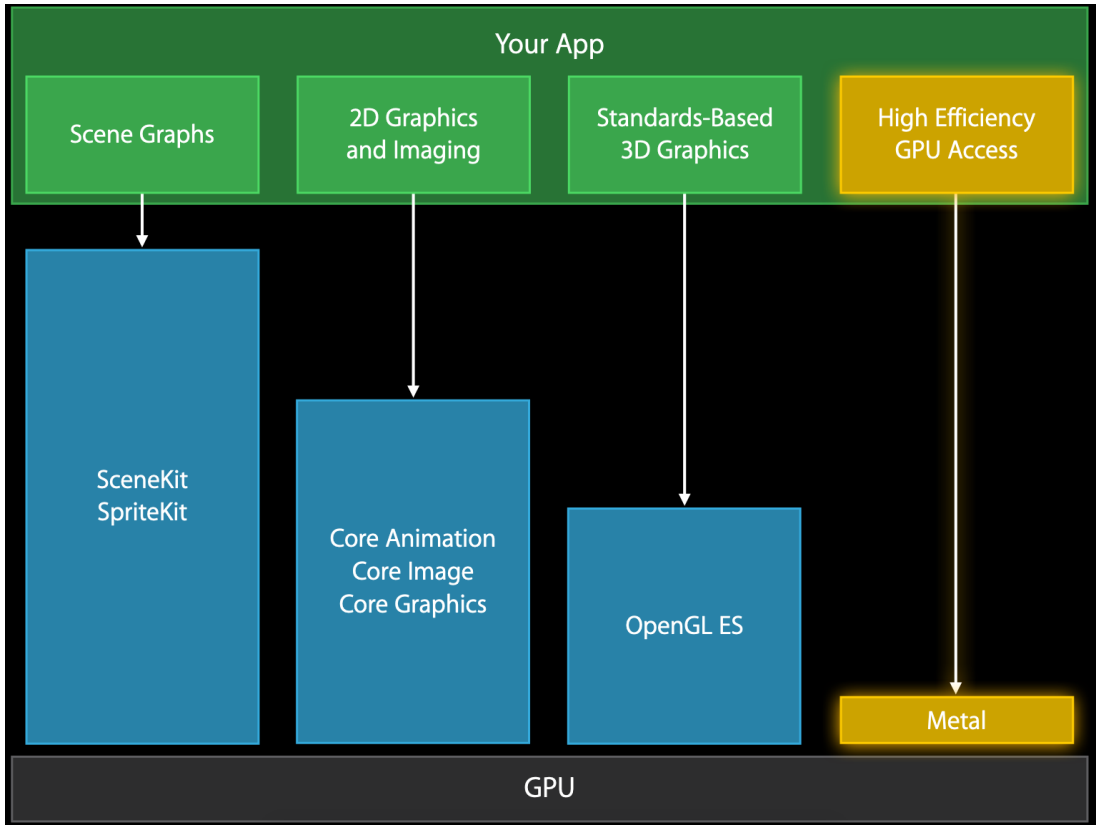



Figure: Apple's Metal API

# Our Test results

| | Test 1 | Test 2 | Test 3 |
|---|---|---|---|
| CPU temperature | 28°C | 15°C | 29°C |
| Battery temperature | 26°C | 13°C | 26°C |
| Memory usage | 68 % | 64 % | 59 % |
| charging | no | no | yes |
| Results | | | |
| Multicore | 5713 | 6467 | 6125 |
| Singlecore | 1963 | 1997 | 2003 |

- The tested device was a Samsung Galaxy S8

# Problems with Performance Tests

## The Heat

Modern Smartphones are fan less, which means they are dealing with heat problems.

## Dependencies

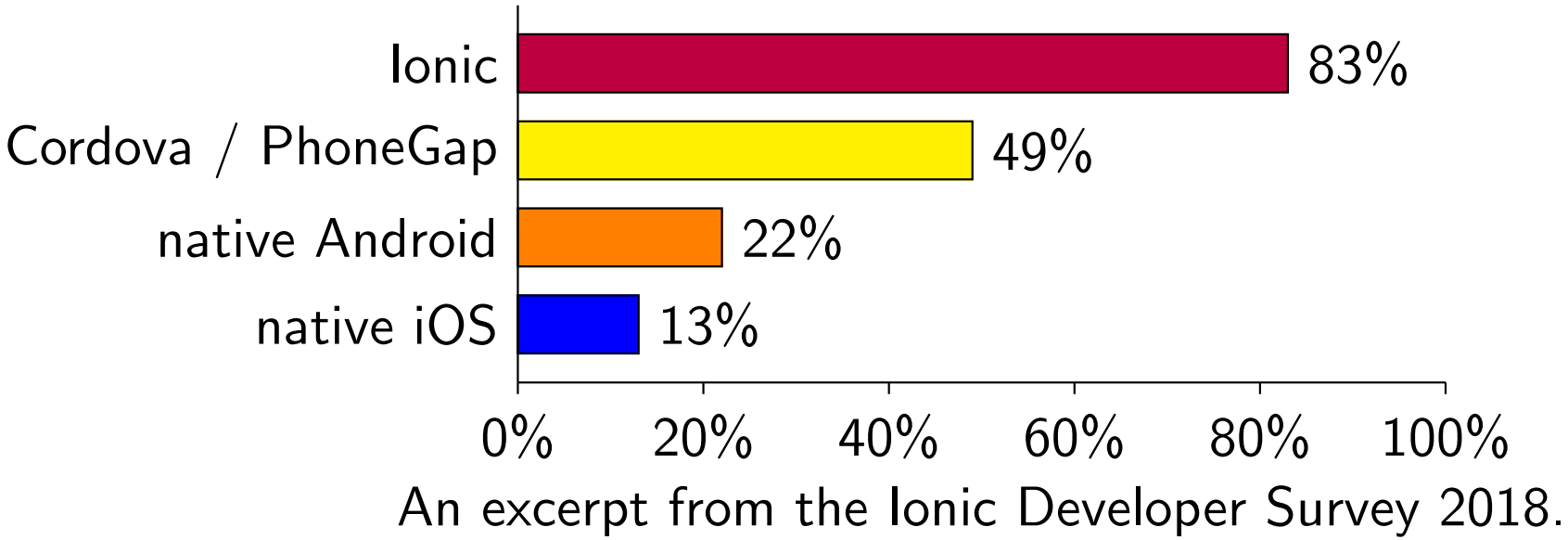
The results depend on many factors.

# Performance which really matters

## Daily Performance

The daily performance depends on the performance of the apps which you use. Most of the applications developed today are made with web technologies and are so called web apps.

# Statistics of Hybrid Apps




An excerpt from the Ionic Developer Survey 2018.

# Conclusion

The performance in the everyday scenarios like browsing the web and scrolling through social media depends on the implementation of the hybrid app frameworks.

**Performance tests of mobile phones are giving the consumer a better overview and comparison of the smartphone market to identify the best performer.**

# Are there any questions?