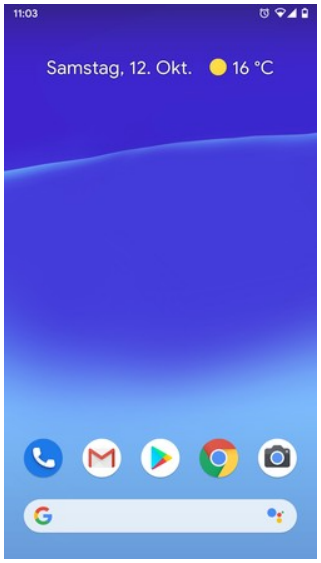
INTRODUCTION

Android

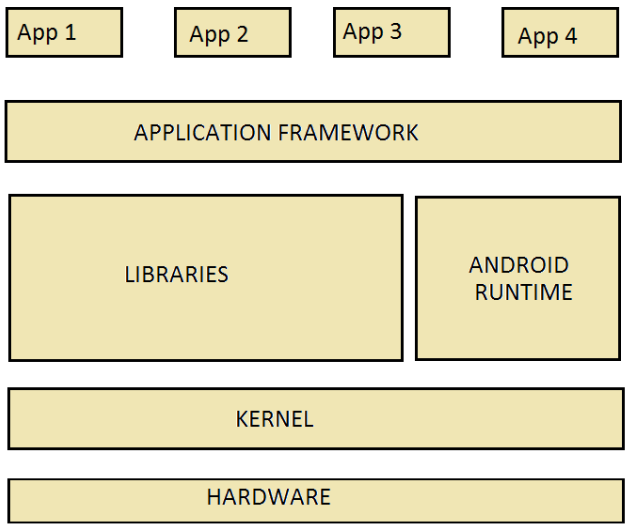


Android's home screen, also called the "launcher", is a collection of arrangable icons and mini applications called "widgets".

Android is an open-source operating system for mobile devices by Google and the Open Handset Alliance. It is mostly used for smartphones, like Google's own Google Pixel, as well as by other phone manufacturers like HTC and Samsung. It has also been used for tablets such as the Galaxy Tab.

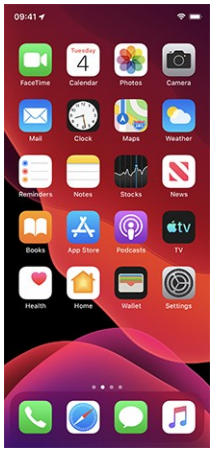
Around 1.3 million Android smartphones are sold every day. Most mobile phones run Android, making it the most popular mobile operating system. It is also the most popular operating system in general. It supports multitasking and two-dimensional and three-dimensional graphics.

Android versions are typically named with a version number and a popular dessert name (for example: Android 4.4 KitKat). The Android architecture is divided into four main layers and five sections.



Android's kernel is based on the Linux kernel. As of 2018, Android targets versions 4.4, 4.9 or 4.14 of the Linux kernel. Android's variant of the Linux kernel has further architectural changes that are implemented by Google outside the typical Linux kernel development cycle, such as the inclusion of components like device trees and different out of memory handling.

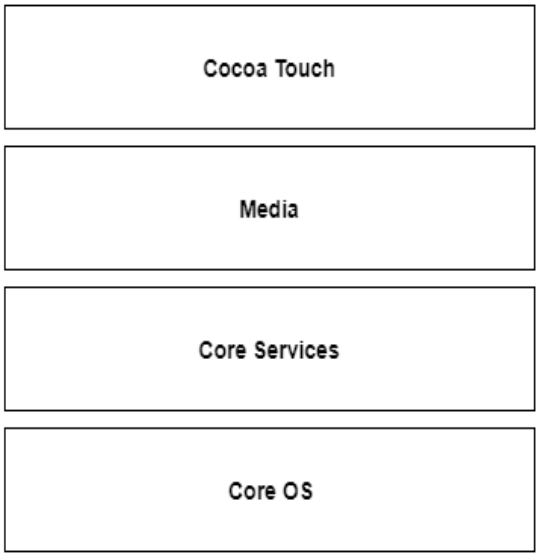
iOS



iOS's home screen, also called the "Springboard", is a collection of fixed icons pre-arranged sequentially.

iOS is a closed source and proprietary operating system for mobile devices made and sold by Apple Inc. It is the mobile operating system of the iPhone, iPad, iPod Touch and similar devices. iOS was originally called the iPhone OS but was renamed in 2010 to reflect the operating system's evolving support for additional Apple devices. It also supports multitasking and two-dimensional and three-dimensional graphics.

The iOS architecture is layered. It contains an intermediate layer between the applications and the hardware so they do not communicate directly.



The lower layers in iOS provide the basic services and the higher layers provide the user interface and sophisticated graphics. iOS versions are typically named with an incremental version (for example: iOS 11). A major version of iOS is released every year at the Wordwide Developers conference (WWDC) hosted by Apple.

The iOS kernel is based on Darwin, which is an open-source Unix-like operating system first released by Apple Inc. in 2000. It is composed of code developed by Apple, as well as code derived from NeXTSTEP, BSD, Mach, and other free software projects. The original iPhone OS (1.0) used Darwin 9.0.0d1. The latest version, iOS 12, is based on Darwin 18.

KEY DIFFERENCES

Source model

iOS is a closed system whereas Android is more open. Users have barely any system permissions in iOS but in Android, users can customize their phones easily.

Android software is available for many manufacturers such as Samsung, LG etc. and this may lead to some quality problems in the cheaper phones. However, iOS is strictly controlled by Apple and there is no quality problem as there are few models.

Application repository

The Android applications are obtained from Google Play while iOS applications are available in the Apple app store.

Speed & quality

The running speed of iOS devices remains consistent with time. In contrast to this, the performance of Android devices may decline over time.

Development language

Android's user interface (UI) is written primarily in Java, while its core libraries are written in C, C++ Assembly and others. Android app development uses Java and/or Kotlin. Dart is a recently introduced language by Google that can also be used to write Android apps.

iOS's user interface (UI) is written primarily in Swift, while its core libraries are written in Objective-C, C++ Assembly and others. Android app development uses Swift. The coding on Swift is much faster as compared to Java.

User interface

- **Screen sizes and resolutions:** iOS devices have two main screen classes, iPhone and iPad, with more than three possible resolutions for iPhone and a few for iPad.

  Android devices have a wide array of custom resolutions, though the most popular ones are 1280x720 (720p), 1920x1080 (1080p) and 2560x1440 (Quad HD).

- **Navigation:** Android devices use an on-screen navigation bar. Some devices use swipe gestures, while some have physical buttons.

  iOS devices have a Home button on the front. Newer devices such as the iPhone X have swiping gestures as well.

- **Alerts and pop-ups:** Android devices have customizable dismissable popups with typical actions like “OK/Cancel”.

  iOS has fixed dialog boxes like “Agree/Disagree” or “Don’t allow/OK” for Apple-backed users.

- **Back button:** iOS does not have a real ‘Back’-button. iPhone users can use the top left button to go back to the previous screens in the hierarchical order without navigating through the entire app. Android users can return to the previous page earlier opened, irrespective of hierarchy, using either the Navbar or the back button on the Action bar.

Development

Android-based development is more time-consuming and slow in terms of OS fragmentation. It takes 30-40% longer for developers to build an Android-powered mobile app in contrast to the app that runs iOS. And it is even despite simple languages like Java/Kotlin.

iOS-based development is fast and quick thanks to an extensive inbuilt library suppport and the easy-to-use Swift programming language.

Market share

Android has a massive market share compared to iOS as it has been available free of cost and Google made it clear that it will be free in future as well. The OS caught the attention of manufacturers across the world and many initially adopted it for low cost smartphones.

iOS has a smaller market share than Android but is still the world’s second largest mobile operating system. iOS devices are preferred for their stability, timely update, warranty, security and durability.

DISADVANTAGES

Android

Coding is very extensive and lengthy in Android, due to Java. Complex layouts and animations are harder to code in Android, since there are too many complexities associated with them.

The Play Store is filled with low quality applications containing malware. Low security and fake apps can be installed to steal your info from unknown resources. Advertisements are rampant and there are always ads on display, either the top or bottom of the application.

High device fragmentation is also a major issue in Android. Device manufacturers refuse to update their devices, which means applications developers cannot implement the latest features, leading to a major division across customers.

iOS

Uploading applications to the App Store has a strict review process. When developers want to publish an app they need to send it to Apple. For review it takes around 7 days and it takes even more in some cases.

Applications are very large when compared to other mobile platforms. They also tend to be expensive compared to Android. Applications are also locked down to simple views. Since iOS is closed source, it runs only on Apple devices. It is also not very customizable for this reason, driving away power users and enterprises.

CONCLUSION

Mobile Operating Systems are very widespread these days with many applications. They become more useful and stable everyday. They help us connect with family and friends with the help of mobile. They give the connectivity to everybody in the world. There are a lot of learning applications for students in the Play Store or the App Store. One can easily access events via calendars, the camera is allow you to capture thousands of images, calculators inbuilt can perform huge operations. Thus both Android and iOS are excellent operating systems for mobile devices.