SEN 208 Group 10

Group Topic: Android

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Android

Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touchscreen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance and commercially sponsored by Google. It was unveiled in November 2007, with the first commercial Android device, the HTC Dream, being launched in September 2008.

It is free and open-source software; its source code is known as Android Open Source Project (AOSP), which is primarily licensed under the Apache License. However most Android devices ship with additional proprietary software pre-installed, most notably Google Mobile Services (GMS) which includes core apps such as Google Chrome, the digital distribution platform Google Play and associated Google Play Services development platform.

About 70 percent of Android smartphones run Google's ecosystem; some with vendor-customized user interface and software suite, such as TouchWiz and later One UI by Samsung, and HTC Sense. Competing Android ecosystems and forks include Fire OS (developed by Amazon) or LineageOS. However the "Android" name and logo are trademarks of Google which impose standards to restrict "uncertified" devices outside their ecosystem to use Android branding.

Software packages on Android, which use the APK format, are generally distributed through proprietary application stores like Google Play Store, Samsung Galaxy Store, Huawei AppGallery, Cafe Bazaar, and GetJar, or open source platforms like Aptoide or F-Droid.

Android has been the best-selling OS worldwide on smartphones since 2011 and on tablets since 2013. As of May 2021, it has over three billion monthly active users, the largest installed base of any operating system, and as of January 2021, the Google Play Store features over 3 million apps.[17] The current stable version is Android 11, released on September 8, 2020

History of Android

Android Inc. was founded in Palo Alto, California, in October 2003 by Andy Rubin, Rich Miner, Nick Sears, and Chris White. Rubin described the Android project as having "tremendous potential in developing smarter mobile devices that are more aware of its owner's location and preferences". The early intentions of the company were to develop an advanced operating system for digital cameras, and this was the basis of its pitch to investors in April 2004. The company then decided that the market for cameras was not large enough for its goals, and five months later it had diverted its efforts and was pitching Android as a handset operating system that would rival Symbian and Microsoft Windows Mobile.

In July 2005, Google acquired Android Inc. for at least $50 million. Its key employees, including Rubin, Miner, Sears, and White, joined Google as part of the acquisition. At Google, the team led by Rubin developed a mobile device platform powered by the Linux kernel. Google marketed the platform to handset makers and carriers on the promise of providing a flexible, upgradeable system. Google had "lined up a series of hardware components and software partners and signaled to carriers that it was open to various degrees of cooperation".

The first commercially available smartphone running Android was the HTC Dream, also known as T-Mobile G1, announced on September 23, 2008.

Since 2008, Android has seen numerous updates which have incrementally improved the operating system, adding new features and fixing bugs in previous releases. Each major release is named in alphabetical order after a dessert or sugary treat, with the first few Android versions being called "Cupcake", "Donut", "Eclair", and "Froyo", in that order. During its announcement of Android KitKat in 2013, Google explained that "Since these devices make our lives so sweet, each Android version is named after a dessert".

Features of Android

Interface
Android's default user interface is mainly based on direct manipulation, using touch inputs that loosely correspond to real-world actions, like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects, along with a virtual keyboard. Game controllers and full-size physical keyboards are supported via Bluetooth or USB.

Home screen
Android devices boot to the home screen, the primary navigation and information "hub" on Android devices, analogous to the desktop found on personal computers. Android

homescreens are typically made up of app icons and widgets; app icons launch the associated app, whereas widgets display live, auto-updating content, such as a weather forecast, the user's email inbox, or a news ticker directly on the homescreen.

Status bar
Along the top of the screen is a status bar, showing information about the device and its connectivity. This status bar can be pulled (swiped) down from to reveal a notification screen where apps display important information or updates, as well as quick access to system controls and toggles such as display brightness, connectivity settings (WiFi, Bluetooth, cellular data), audio mode, and flashlight.[89] Vendors may implement extended settings such as the ability to adjust the flashlight brightness.

Notifications
Notifications are "short, timely, and relevant information about your app when it's not in use", and when tapped, users are directed to a screen inside the app relating to the notification. Beginning with Android 4.1 "Jelly Bean", "expandable notifications" allow the user to tap an icon on the notification in order for it to expand and display more information and possible app actions right from the notification.

App lists
An "All Apps" screen lists all installed applications, with the ability for users to drag an app from the list onto the home screen. A Recents screen lets users switch between recently used apps.
The list may appear side-by-side or overlapping, depending on Android version.

Navigation buttons
Many early Android OS smartphones were equipped with a dedicated search button for quick access to a web search engine and individual apps' internal search feature. More recent devices typically allow the former through a long press or swipe away from the home button.

Charging while powered off
When connecting or disconnecting charging power and when shortly actuating the power button or home button, all while the device is powered off, a visual battery meter whose appearance varies among vendors appears on the screen, allowing the user to quickly assess the charge status of a powered-off without having to boot it up first. Some display the battery percentage.

Hardware

The main hardware platform for Android is ARM (the ARMv7 and ARMv8-A architectures), with x86 and x86-64 architectures also officially supported in later versions of Android

Requirements for the minimum amount of RAM for devices running Android 7.1 range from in practice 2 GB for best hardware, down to 1 GB for the most common screen. Android supports all versions of OpenGL ES and Vulkan (and version 1.1 available for some devices[Android devices incorporate many optional hardware components, including still or video cameras, GPS, orientation sensors, dedicated gaming controls, accelerometers,

gyroscopes, barometers, magnetometers, proximity sensors, pressure sensors, thermometers, and touchscreens. Some hardware components are not required, but became standard in certain classes of devices, such as smartphones, and additional requirements apply if they are present. Some other hardware was initially required, but those requirements have been relaxed or eliminated altogether.

Development

Android is developed by Google until the latest changes and updates are ready to be released, at which point the source code is made available to the Android Open Source Project (AOSP), an open source initiative led by Google.[164] The AOSP code can be found without modification on select devices, mainly the former Nexus and current Android One series of devices.

The source code is, in turn, customized by original equipment manufacturers (OEMs) to run on their hardware. Android's source code does not contain the device drivers, often proprietary, that are needed for certain hardware components.[168] As a result, most Android devices, including Google's own, ship with a combination of free and open source and proprietary software, with the software required for accessing Google services falling into the latter category