

Mobile operating system

A **mobile operating system** is an [operating system](#) used for [smartphones](#), [tablets](#), [smartwatches](#), smartglasses, or other non-laptop [personal mobile computing devices](#). While computers such as typical/mobile [laptops](#) are "mobile", the operating systems used on them are usually not considered mobile, as they were originally designed for [desktop computers](#) that historically did not have or need specific *mobile* features. This "fine line" distinguishing mobile and other forms has become blurred in recent years, due to the fact that newer devices have become smaller and more mobile, unlike the [hardware](#) of the past. Key notabilities blurring this line are the introduction of [tablet computers](#), light [laptops](#), and the hybridization of the two in [2-in-1 PCs](#).

Mobile operating systems combine features of a [desktop computer](#) operating system with other features useful for mobile or handheld use, and usually including a wireless inbuilt modem and [SIM](#) tray for telephone and data connection. In Q1 2018, over 123 million smartphones were sold (the most ever recorded) with 60.2% running [Android](#) and 20.9% running [iOS](#).^[1] Sales in 2012 were 1.56 billion; sales in 2023 were 1.43 billion^[2] with 53.32% being [Android](#).^[3] Android alone has more sales than the popular desktop operating system [Microsoft Windows](#), and smartphone use (even without tablets) outnumbers desktop use.^[4]

Mobile devices, with mobile communications abilities (for example, [smartphones](#)), contain two mobile operating systems. The main user-facing software platform is supplemented by a second low-level proprietary real-time operating system which operates the radio and other hardware. Research has shown that these low-level systems may contain a range of security vulnerabilities permitting malicious base stations to gain high levels of control over the mobile device.^[5]

Mobile operating systems have had the most use of any operating system since 2017 (measured by web use).^[2]

Timeline

Mobile operating system milestones mirror the development of [mobile phones](#), [PDAs](#), and smartphones:

Pre-1990

- 1990–2010 – [Mobile phones](#) use [embedded systems](#) to control operation.

1993–1999

- 1993
 - April – [PenPoint OS](#) by [GO Corp.](#) become available on the [AT&T EO Personal Communicator](#).^{[6][7]}
 - August – [Apple](#) launches [Newton OS](#) running on their [Newton](#) series of portable computers.
- 1994
 - March – [Magic Cap OS](#) by [General Magic](#) is first introduced on the [Sony Magic Link PDA](#).^[3]
 - August – The first smartphone, the [IBM Simon](#), has a touchscreen, [email](#), and PDA features.^[8]
- 1996
 - March – The [Palm Pilot 1000](#) personal digital assistant is introduced with the [Palm OS](#) mobile operating system.
 - August – Nokia releases the [Nokia 9000 Communicator](#) running an integrated system based on the [PEN/GEOS 3.0 OS](#) from [Geoworks](#).^{[9][10]}
- 1997 – [EPOC32](#) first appears on the [Psion Series 5](#) PDA. Release 6 of EPOC32 will later be renamed to [Symbian OS](#).
- 1998 – [Symbian Ltd.](#) is formed as a joint venture by [Psion](#), [Ericsson](#), [Motorola](#), and Nokia,^[11] Psion's [EPOC32](#) OS becomes Symbian's EPOC operating system,^[12] and is later renamed to Symbian OS. Symbian's OS was used by those companies and several other major mobile phone brands, but especially Nokia.
- 1999
 - June – [Qualcomm](#)'s [pdQ](#) becomes the first smartphone with [Palm OS](#).^{[13][14][15][16]}
 - October – [Nokia S40](#) Platform is officially introduced along with the [Nokia 7110](#), the first phone with [T9 predictive text](#) input^[17] and a [Wireless Application Protocol](#) (WAP) browser for accessing specially formatted Internet data.^[18]

2000s

- 2000 – The [Ericsson R380](#) is released with EPOC32 Release 5, marking the first use on a phone of what's to become known as Symbian OS (as of Release 6).^{[19][20]}
- 2001
 - June – Nokia's Symbian [Series 80](#) platform is first released on the [Nokia 9210 Communicator](#).^[21] This is the first phone running an OS branded as Symbian, and the first phone using that OS that allows user installation of additional software.

- September – [Qualcomm's Binary Runtime Environment for Wireless](#) (BREW) platform on their [REX real-time operating system](#) (RTOS) is first released on the [Kyocera QCP-3035](#).^[22]
- 2002
 - March
 - [BlackBerry](#) releases its first smartphone, running [Java 2 Micro Edition](#) (J2ME).^[23]
 - [UIQ](#) is first released, at v2.0,^[24] on [Symbian OS](#), and becomes available later in the year on the [Sony Ericsson P800](#), the successor to the Ericsson R380.^[25]
 - June
 - [Microsoft's](#) first [Windows CE](#) (Pocket PC) smartphones are introduced.^{[26][27][28]}
 - [Nokia's](#) Symbian [Series 60 \(S60\) platform](#) is released with the [Nokia 7650](#), Nokia's first phone with a camera and [Multimedia Messaging Service](#) (MMS).^[29] S60 would form the basis of the OS on most of Nokia's smartphones until 2011, when they adopted Microsoft's [Windows Phone 7](#). S60 was also used on some phones from [Samsung](#) and others, and later by [Sony Ericsson](#) after the consolidation of some Symbian UI variants in 2008.
 - October – The [Danger Hiptop](#) (T-Mobile Sidekick in U.S.) is first released by [Danger, Inc.](#), running [DangerOS](#).
- 2003 – [Motorola](#) introduces first Linux-based cellphone [Motorola A760](#) base on [Linux MontaVista](#) distribution.
- 2005
 - May – Microsoft announces [Windows Mobile 5.0](#).^[30]
 - November – Nokia introduces [Maemo](#) OS on the first, small Internet tablet, the [N770](#),^[31] with a 4.13" screen.
- 2007
 - January – Apple's [iPhone](#) with iOS (named "iPhone OS" for its first three releases) is introduced as a "widescreen iPod", "mobile phone", and "Internet communicator".^[32]
 - February – Microsoft announces [Windows Mobile 6.0](#).^[33]
 - May – [Palm](#) announces the [Palm Foleo](#), a "Mobile Companion" device similar to a [subnotebook](#) computer, running a modified [Linux](#) kernel and relying on a companion [Palm Treo](#) smartphone to send and retrieve mail, as well as provide data connectivity when away from Wi-Fi.^[34] Palm canceled Foleo development on September 4, 2007, after facing public criticism.^[35]

- June – World's very first [iPhone](#) is released in the United States.
- November – [Open Handset Alliance](#) (OHA) is established, led by Google with 34 members ([HTC](#), [Sony](#), [Dell](#), [Intel](#), [Motorola](#), [Samsung](#), [LG](#), etc.)^{[36][37]}
- 2008
 - February – [LiMo Foundation](#) announces the first phones running the [LiMo](#) mobile Linux distribution, from [Motorola](#), [NEC](#), [Panasonic Mobile](#), and [Samsung](#),^{[38][39]} released later in the year. The LiMo Foundation later became the [Tizen Association](#) and LiMo was subsumed by [Tizen](#).
 - June – Nokia becomes the sole owner of [Symbian Ltd.](#)^[40] The [Symbian Foundation](#) was then formed to co-ordinate the future development of the Symbian platform among the corporations using it, in a manner similar to the [Open Handset Alliance](#) with Android.^[41] Nokia remained the major contributor to Symbian's code.
 - July – Apple releases [iPhone OS 2](#) with the [iPhone 3G](#), making available Apple's [App Store](#).^{[42][43]}
 - October – OHA releases Android (based on [Linux kernel](#)) 1.0 with the [HTC Dream](#) (T-Mobile G1) as the first Android phone.^[44]
 - November – Symbian^1, the [Symbian Foundation](#)'s touch-specific S60-based platform (equivalent to [S60 5th edition](#)) is first released on Nokia's first touchscreen Symbian phone, the [Nokia 5800 XpressMusic](#),^[45] with a resistive screen and a stylus.^[46] Symbian^1 being derived from S60 meant that support for [UIQ](#) disappeared and no further devices using UIQ were released.^[47]
- 2009
 - January
 - [Intel](#) announces [Moblin 2](#), specifically created for [netbooks](#) that run the company's [Atom](#) processor.^[48] In April 2009 Intel turned Moblin over to the [Linux Foundation](#).
 - Palm introduces [webOS](#) with the [Palm Pre](#)^[49] (released in June).^[50] The new OS is not backward-compatible with their previous Palm OS.
 - February
 - [Palm](#) announces that no further devices with Palm OS are going to be released by the company.^[51] (The last was the [Palm Centro](#), released October 14, 2007.^[52])
 - [Microsoft](#) announces [Windows Mobile 6.5](#),^[53] an "unwanted stopgap" update to Windows Mobile 6.1 intended to bridge the gap between version 6.1 and the then yet-to-

be released Windows Mobile 7 (later canceled in favor of [Windows Phone 7](#)).^{[54][55]} The first devices running it appeared in late October 2009.^[56]

- May – [DangerOS](#) 5.0 becomes available, based on [NetBSD](#).^{[57][58]}
- June – Apple releases [iPhone OS 3](#) with the [iPhone 3GS](#).
- November – Nokia releases the [Nokia N900](#),^[59] its first and only smartphone running the [Maemo](#) OS intended for "handheld computers...with voice capability", while stating that they remain focused on [Symbian S60](#) as their smartphone OS.^[60] (Nokia had previously released three [Mobile Internet devices](#) running Maemo, without cellular network connectivity.)

2010s

2010

- February
 - [MeeGo](#) is announced, a mobile Linux distribution merging Maemo from Nokia and [Moblin](#) from Intel and Linux Foundation, to be hosted by Linux Foundation.^[61] MeeGo is not backward-compatible with any previous operating system.
 - [Samsung](#) introduces the [Bada](#) OS and shows the first Bada smartphone, the [Samsung S8500](#).^[62] It was later released in May 2010.^[63]
- April
 - Apple releases the [iPad \(first generation\)](#) with [iPhone OS 3.2](#).^[64] This is the first version of the OS to support tablet computers. For its next major version (4.0) iPhone OS will be renamed iOS.
 - [HP](#) acquires Palm in order to use [webOS](#) in multiple new products, including smartphones, tablets, and [printers](#),^[65] later stating their intent to use it as the universal platform for all their devices.^[66]
- May – Microsoft [Kin](#) phone line with KIN OS (based on [Windows CE](#) and a "close cousin" to [Windows Phone](#)^[67]) become available.
- June – Apple releases [iOS 4](#), renamed from iPhone OS, with the [iPhone 4](#).
- July – Microsoft [Kin](#) phones and KIN OS are discontinued.^{[68][69]}
- September
 - Apple releases a variant of iOS powering the new [2nd generation Apple TV](#).^[70]
 - [Symbian^3](#) is first released on the [Nokia N8](#).^{[71][72]} This would be Nokia's last flagship device running Symbian (though not their last Symbian phone), before switching to [Windows Phone](#)

7 for future flagship phones.

- The [Danger Hiptop](#) line and [DangerOS](#) are discontinued as a result of Microsoft's acquisition of [Danger, Inc.](#) in 2008.^[73]

- November

- [Nokia](#) assumes full control over Symbian as the Symbian Foundation disintegrates.^[74]
- Windows Phone OS is released^[75] on Windows Phone 7 [phones](#) by [HTC](#), [LG](#), Samsung, and [Dell](#). The new OS is not backward-compatible with the prior [Windows Mobile](#) OS.^{[76][77]}

2011

- February

- [Android 3.0](#) (Honeycomb), the first version to officially support tablet computers, is released on the Motorola [Xoom](#).^[78]
- [Nokia](#) abandons the Symbian OS and announces that it would use Microsoft's Windows Phone 7 as its primary smartphone platform, while Symbian would be gradually wound down.^{[79][80]}

- April – [BlackBerry Tablet OS](#), based on [QNX Neutrino](#) is released on the [BlackBerry PlayBook](#).

- July

- [Mozilla](#) announces their *Boot to Gecko* project (later named [Firefox OS](#)) to develop an OS for handheld devices emphasizing standards-based Web technologies,^[81] similar to webOS.
- webOS 3.0, the first version to support tablet computers, is released on the HP [TouchPad](#).^[82]

- August – [HP](#) announces that webOS device development and production lines would be halted.^[83] The last HP webOS version, 3.0.5, is released on January 12, 2012.^[84]

- September

- [MeeGo](#) is introduced with the limited-release [Nokia N9](#), Nokia's first and only consumer device to use the OS.^[85] (A small number of the [Nokia N950](#), a MeeGo phone available only to developers, were released in mid-2011.^[86])
- After Nokia's abandonment of MeeGo, Intel and the Linux Foundation announce a partnership with [Samsung](#) to launch [Tizen](#), shifting their focus from MeeGo (Intel and Linux Foundation) and [Bada](#) (Samsung) during 2011 and 2012.^[87]

- October

- Apple releases [iOS 5](#) with the [iPhone 4S](#), integrating the [Siri](#) voice assistant.
- The [Mer](#) project is announced, based on an ultra-portable core for building products, composed of Linux, [HTML5](#), [QML](#), and [JavaScript](#), which is derived from the MeeGo

codebase.

- November – [Fire OS](#), a fork of the Android operating system, is released by [Amazon.com](#) on the [Kindle Fire](#) tablet.

2012

- May – Nokia releases the [Nokia 808 PureView](#),^[88] later confirmed (in January 2013) to be the last Symbian smartphone.^[89] This phone was followed by a single last Symbian software update, "Nokia Belle, Feature Pack 2", later in 2012.^[90]
- July
 - Finnish start-up [Jolla](#), formed by former Nokia employees, announces that MeeGo's community-driven successor [Mer](#)^[91] would be the basis of their new [Sailfish](#) smartphone OS.^[92]
 - [Mozilla](#) announces that the project formerly named *Boot to Gecko* (which is built atop an Android Linux kernel using Android drivers and services; however it uses no Java-like code of Android) is now [Firefox OS](#) (since discontinued) and has several handset OEMs on board.
- August – Samsung announces they will not ship further phones using their Bada OS, instead focusing on [Windows Phone 8](#) and Android.^[93]
- September – Apple releases [iOS 6](#) with the [iPhone 5](#).

2013

- January – [BlackBerry](#) releases their new operating system for smartphones, [BlackBerry 10](#), with their [Q10](#) and [Z10](#) smartphones.^[94] BlackBerry 10 is not backward-compatible with the [BlackBerry OS](#) used on their previous smartphones.
- February – [HP](#) sells webOS to LG.^{[95][96]}
- September – Apple releases [iOS 7](#) with the [iPhone 5S](#) and [iPhone 5C](#).
- October
 - [Canonical](#) announces [Ubuntu Touch](#), a version of the Linux distribution expressly designed for smartphones. The OS is built on the Android Linux kernel, using Android drivers and services, but does not use any of the Java-like code of Android.^[97]
 - Google releases Android KitKat 4.4.
- November – [Jolla](#) releases [Sailfish OS](#) on the [Jolla smartphone](#).^[98]

2014

- February
 - [Microsoft](#) releases [Windows Phone 8.1](#)

- [Nokia](#) introduces their [Nokia X platform](#) OS as an Android 4.1.2 Jelly Bean fork on the [Nokia X family](#) of smartphones.^[99] Similar to [Amazon.com](#)'s Fire OS, it replaces Google's apps and services with ones from Nokia (such as [HERE Maps](#), [Nokia Xpress](#) and [MixRadio](#), and [Nokia's own app store](#)) and Microsoft (such as [Skype](#) and [Outlook](#)), with a user interface that mimics the Windows Phone UI. After the acquisition of Nokia's devices unit, Microsoft announced in July 2014 that no more Nokia X smartphones would be introduced, marking the end of the platform just a few months later.^[100]
- August – The [Samsung SM-Z9005 Z](#) is the first phone released running Tizen, with v2.2.1 of the OS.^[101]
- September
 - Apple releases [iOS 8](#) with the [iPhone 6 and 6 Plus](#).
 - [BlackBerry](#) releases [BlackBerry 10](#) version 10.3 with integration with the [Amazon Appstore](#)
- November – Google releases [Android 5.0 "Lollipop"](#)

2015

- February – Google releases Android 5.1 "Lollipop".
- April
 - [LG](#) releases the LG Watch Urbane LTE [smartwatch](#) running "LG Wearable Platform OS" based on webOS.^{[102][103]} This is a version of their Android [Wear OS](#)-based [LG Watch Urbane](#), with added [LTE](#) connectivity.
 - [watchOS](#), based on iOS, is released by Apple with the [Apple Watch](#).
- September
 - Apple releases [iOS 9](#) with the [iPhone 6S and 6S Plus](#), [iPad Pro](#), and [iPad Mini 4](#), plus [watchOS 2](#). [tvOS 9](#) is also made distinct from iOS, with its own App Store, launching with [Apple TV 4th generation](#).
 - Google releases [Android 6.0 "Marshmallow"](#).
- October – BlackBerry announces that there are no plans to release new APIs and software development kits for BlackBerry 10, and future updates would focus on security and privacy enhancements only.^[104]
- November – Microsoft releases [Windows 10 Mobile](#).^[105]

2016

- February – Microsoft releases the [Lumia 650](#),^[106] their last [Windows 10 Mobile](#) phone before discontinuing all mobile hardware production the following year.^[107]

- July – The [BlackBerry Classic](#), the last device to date running a BlackBerry OS is discontinued.^[108] While BlackBerry Limited claimed to still be committed to the BlackBerry 10 operating system,^[109] they have since only shipped Android devices after releasing the [BlackBerry Priv](#), their first Android smartphone in November 2015.^[110]
- August
 - Google posts the [Fuchsia](#) source code on GitHub.
 - Google releases [Android 7.0 "Nougat"](#).^[111]
- September – Apple releases [iOS 10](#) with the [iPhone 7 and 7 Plus](#), and [watchOS 3](#) with the [Apple Watch Series 1 and 2](#).
- November
 - Tizen releases Tizen 3.0.
 - BlackBerry releases BlackBerry 10 version 10.3.3.

2017

- April
 - Development of [Ubuntu Touch](#) is transferred from Canonical Ltd. to the [UBports Foundation](#).^[112]
 - Samsung officially launches Android-based [Samsung Experience](#) custom firmware starting with version 8.1 on [Samsung Galaxy S8](#).
- May
 - Samsung announces Tizen 4.0 at Tizen Developer Conference 2017.
- August
 - Google releases [Android 8.0 "Oreo"](#).
- September
 - Apple releases [iOS 11](#) with the [iPhone 8 and 8 Plus](#) and [iPhone X](#), and [watchOS 4](#) with the [Apple Watch Series 3](#).
- October
 - Microsoft announces that Windows 10 Mobile development is going into maintenance mode only, ending the release of any new features or functionality due to lack of market penetration and resultant lack of interest from app developers,^{[113][114]} and releases the final major update to it, the "[Fall Creators Update](#)."^[115]
 - [Cherry Mobile](#) release [Cherry OS](#) based on Android

2018

- February
 - Samsung releases [Samsung Experience 9.0](#) based on Android "Oreo" 8.0 globally to Samsung Galaxy S8 and S8+.
- March
 - Google and partners officially launches Android Go (based on Android "Oreo" 8.1 but tailored for low-end devices) with Nokia 1, Alcatel 1X, ZTE Tempo Go, General Mobile 8 Go, Micromax Bharat Go and Lava Z50.
 - Google releases Android "9" as a developer preview.
- April
 - Microsoft release [Windows 10 Version 1803 "April 2018 Update"](#).
- May
 - Huawei release [LiteOS](#) version 2.1.
- August
 - Google releases Android [9.0 "Pie"](#).
 - UBPorts released Ubuntu Touch OTA-14, upgrading the OS based on the Canonical's long-term support version of [Ubuntu 16.04 LTS "Xenial Xerus"](#).
 - Xiaomi officially introduces [MIUI for POCO](#) for their Poco series smartphone.
 - Samsung officially introduces Tizen 4.0 with the release of Samsung Galaxy Watch series.
- September
 - Apple releases [iOS 12](#) with the [iPhone XS and XS Max](#), and [watchOS 5](#) with [Apple Watch Series 4](#).
 - Huawei releases [EMUI 9.0](#).
- October
 - Microsoft releases [Windows 10 Version 1809 "October 2018 Update"](#).
- November
 - Samsung announces the [One UI](#) as the latest version of the [Samsung Experience UI](#).
 - Amazon released Fire OS 6 to supported Fire HD devices.

2019

- January

- Microsoft announces that support for Windows 10 Mobile would [end](#) on December 10, 2019, and that Windows 10 Mobile users should migrate to iOS or Android phones.^{[116][117]}
- June
 - Apple announces [iOS 13](#), [watchOS 6](#), and [iPadOS](#) as a distinct variant of iOS.
- August
 - [Huawei](#) officially announces [HarmonyOS](#)
- September
 - Apple releases [iOS 13](#) with the [iPhone 11](#) series, [watchOS 6](#) with [Apple Watch Series 5](#), and [iPadOS](#) with the [7th generation iPad](#).
 - Google releases Android [10](#).
 - The [Librem 5](#), the first phone running [PureOS](#), is released.
- October
 - Samsung announces the [One UI 2.0](#) as the latest version of their Galaxy Smartphone and Smartwatch UI .
- November
 - Microsoft releases the Windows 10 November 10, 2019 Update.

Current software platforms

These operating systems often run atop [baseband](#) or other [real-time operating systems](#) that handle hardware aspects of the phone.

Android

Android (based on the modified [Linux kernel](#)) is a mobile operating system developed by Open Handset Alliance.^[118] The base system is [open-source](#) (and only the kernel [copyleft](#)), but the apps and drivers which provide functionality are increasingly becoming [closed-source](#).^[119] Besides having the largest installed base worldwide on smartphones, it is also the most popular operating system for [general purpose computers](#) (a category that includes desktop computers and mobile devices), even though Android is not a popular operating system for regular (desktop) [personal computers](#) (PCs). Although the Android operating system is [free and open-source software](#),^[120] in devices sold, much of the software [bundled](#) with it (including Google apps and vendor-installed software) is [proprietary software](#) and closed-source.^[121]

Android's releases before [2.0](#) (1.0, [1.5](#), [1.6](#)) were used exclusively on mobile phones. Android 2.x releases were mostly used for mobile phones but also some tablets. [Android 3.0](#) was a tablet-oriented release and does not officially run on mobile phones. Both phone and tablet compatibility were merged with [Android 4.0](#). The current Android version is [Android 14](#), released on October 4, 2023.

Android One

Android One, a successor to [Google Nexus](#), is a software experience that runs on the unmodified Android operating system. Unlike most of the "stock" Androids running on the market, the Android One [User Interface](#) (UI) closely resembles the [Google Pixel](#) UI, due to Android One being a software experience developed by Google and distributed to partners such as [Nokia Mobile \(HMD\)](#) and [Xiaomi](#). Thus, the UI is intended to be as clean as possible. [Original equipment manufacturer](#) (OEM) partners may tweak or add additional apps such as cameras to the [firmware](#), but most of the apps are handled proprietarily by Google. Operating system updates are handled by Google and internally tested by OEMs before being distributed via an [OTA update](#) to [end users](#).

Current Android One version list:

- Android One versions follow [those of the Android Open Source Project \(AOSP\)](#), starting from [Android 5.0 "Lollipop"](#)

BharOS

BharOS is a mobile operating system in India. It is an Indian government-funded project to develop a free and open-source operating system (OS) for use in government and public systems.

BlackBerry Secure

BlackBerry Secure is an operating system developed by [BlackBerry](#), based on the Android Open Source Project (AOSP). BlackBerry officially announced the name for their Android-based [front-end touch interface](#) in August 2017, before which BlackBerry Secure was running on BlackBerry brand devices, such as [BlackBerry Priv](#), [DTEK 50/60](#) and [BlackBerry KeyOne](#). Currently, BlackBerry plans to license out the BlackBerry Secure to other OEMs.

Current BlackBerry Secure version list:

- BlackBerry Secure version 1.x – based on [Android "Marshmallow" 6.x](#) and ["Nougat" 7.x](#)

CalyxOS

[CalyxOS](#) is an [operating system](#) for smartphones based on Android with mostly [free and open-source](#) software. It is produced by the [Calyx Institute](#) as part of its mission to "defend online privacy,

security and accessibility."

Cherry OS

[Cherry OS](#) is a customized operating system that was developed by [Cherry Mobile](#). It was first released in 2017 and has been developed with a light interface, optimized performance, tools for security, battery management, and access to localized apps.

ColorOS

[ColorOS](#) is a custom front-end touch interface based on the Android Open Source Project (AOSP) and developed by [OPPO Electronics Corp.](#) In 2016, OPPO officially released ColorOS with every OPPO and [Realme](#) device and released an official [ROM](#) for the [OnePlus One](#). Future Realme devices will have their own version of ColorOS.

Current ColorOS version list:

- ColorOS 1.x – based on [Android "Jelly Bean" 4.2.x](#) and ["KitKat" 4.4](#)
- ColorOS 2.x – based on Android ["KitKat" 4.4](#) and ["Lollipop" 5](#)
- ColorOS 3.x – based on Android ["Lollipop" 5](#), ["Marshmallow" 6](#), and ["Nougat" 7](#)
- ColorOS 5.x – based on [Android "Oreo" 8](#)
- ColorOS 6.x – based on [Android "Pie" 9](#)
- ColorOS 7.x – based on [Android 10](#)
- ColorOS 11.x – based on [Android 11](#)
- ColorOS 12.x – based on Android 11 and [12](#)
- ColorOS 13.x – based on [Android 13](#)
- ColorOS 14.x – based on [Android 14](#)
- ColorOS 15.x – based on [Android 15](#)

CopperheadOS

[CopperheadOS](#) is a [security-hardened](#) version of Android.

DivestOS

[DivestOS](#) is a soft fork of [LineageOS](#).^[122] Includes Monthly Updates, FOSS Focus, Deblobbing, Security and Privacy focus, and F-Droid^[123]

EMUI

Huawei EMUI is the front-end touch interface developed by [Huawei Technologies Co. Ltd.](#) and its sub-brand [Honor](#) which is based on Google's Android Open Source Project (AOSP). EMUI is preinstalled on most Huawei and Honor devices. While it was based on the open-source Android operating system, it consists of closed-source proprietary software. Since the US sanctions, it is currently a fork of Android similar to FireOS instead of a compatible one.

In mainland China, and internationally since 2020 due to U.S. sanctions, EMUI devices use Huawei Mobile Services such as Huawei AppGallery instead of Google Mobile Services. Aside from based on Android, Huawei also bundle the HarmonyOS microkernel in the latest EMUI update inside Android which handle other process including security authentication such as the fingerprint authentication.^[124]

/e/

/e/ is an operating system [forked](#) from the source code of [LineageOS](#) (based on Android). /e/ targets Android smart phone devices and uses [MicroG](#) as a replacement for [Google Play Services](#).^[125] /e/OS is not completely [open source software](#), because it comes with the proprietary Magic Earth 'Maps' app.

Fire OS

[Amazon Fire OS](#) is a mobile operating system forked from Android and produced by [Amazon](#) for its [Fire range of tablets](#), [Echo](#) and Echo Dot, and other content delivery devices like [Fire TV](#) (previously for their [Fire Phone](#)). Fire OS primarily centers on content consumption, with a customized user interface and heavy ties to content available from Amazon's own storefronts and services.

Current Fire OS version list:

- Fire OS 1.x
- Fire OS 2.x
- Fire OS 3.x
- Fire OS 4.x
- Fire OS 5.x
- Fire OS 6.x
- Fire OS 7.x

Flyme OS

[Flyme OS](#) is an operating system developed by [Meizu Technology Co., Ltd.](#), an [open-source](#) operating system based on the Android Open Source Project (AOSP). Flyme OS is mainly installed on Meizu smartphones such as the [MX series](#). However, it also has official [ROM](#) support for a few Android devices.

Current Flyme OS version list:

- Flyme OS 1.x.x – based on [Android "Ice Cream Sandwich"](#) 4.0.3, initial release
- Flyme OS 2.x.x – based on [Android "Jelly Bean"](#) 4.1.x – 4.2.x
- Flyme OS 3.x.x – based on Android "Jelly Bean" 4.3.x
- Flyme OS 4.x.x – based on [Android "KitKat"](#) 4.4.x
- Flyme OS 5.x.x – based on Android "Lollipop" 5.0.x – 5.1.x
- Flyme OS 6.x.x – based on Android "Nougat" 7.x, "Marshmallow" 6.0.x and "Lollipop" 5.0.x – 5.1.x for old devices^[126]
- Flyme OS 7.x.x – based on Android "Pie" 9, "Oreo" 8.x and "Nougat" 7.x
- Flyme OS 8.x.x – based on Android 10, "Pie" 9, "Oreo" 8.x and "Nougat" 7.x
- Flyme OS 9.x.x – based on [Android 11](#) and 10
- Flyme OS 10.x.x – based on [Android 13](#)
- Flyme AIOS (11.x.x) – based on [Android 14](#)

Funtouch OS

[Funtouch OS](#) is a custom user interface developed by [Vivo](#) that is based on the Android Open Source Project. FuntouchOS 10.5 had a redesigned UI that resembled stock Androids.

Current FuntouchOS version list:

- FuntouchOS 2.x – based on Android "KitKat" 4.4, Android "Lollipop" 5 and Android "Marshmallow" 6, initial release
- FuntouchOS 3.x – based on Android "Marshmallow" 6 and Android "Nougat" 7
- FuntouchOS 4.x – based on Android "Oreo" 8
- FuntouchOS 9.x – based on Android "Pie" 9
- FuntouchOS 10.x – based on Android "Pie" 9 and Android 10

- FuntouchOS 10.5 – based on Android 10 and [Android 11](#), redesigned UI
- FuntouchOS 11.x – based on Android 10 and Android 11
- FuntouchOS 12.x – based on Android 11 and Android 12
- FuntouchOS 13 – based on [Android 13](#)
- FuntouchOS 14 – based on [Android 14](#)
- FuntouchOS 15 – based on [Android 15](#)

iQOO UI

iQOO UI was a custom user interface based on Vivo's FuntouchOS. The UI largely resembled its predecessor, with a customized UI on top of the FuntouchOS. It was installed on iQOO smartphones sold in [China](#) and later was succeeded by OriginOS

GrapheneOS

GrapheneOS is a variant of Android for [Pixel](#) hardware.

Hello UI

Hello UI (formerly called My UI and My UX) is a custom Android UI developed by Motorola for their devices. It used to look like the stock Android user experience up until My UI 3.x.

Current Hello UI version list:

- My UX 1.x – based on Android 10, initial release
- My UI 2.x – based on Android 11
- My UI 3.x – based on Android 12
- My UI 4.x – based on Android 12
- My UI 5.x – based on Android 13
- Hello UI – based on Android 14

HiOS

HiOS is an Android-based operating system developed by [Hong Kong](#) mobile phone manufacturer [Tecno Mobile](#), a subsidiary of [Transsion Holdings](#), exclusively for their smartphones. HiOS allows for a wide range of user customization without requiring [rooting](#) the mobile device. The operating system is also bundled with utility applications that allow users to free up memory, freeze

applications, limit data accessibility to applications among others. HiOS comes with features like Launcher, Private Safe, Split Screen and Lockscreen Notification.

Current HiOS version list:

- HiOS 1.x – based on Android "Marshmallow" 6
- HiOS 2.x – based on Android "Nougat" 7
- HiOS 3.x – based on Android "Nougat" 7
- HiOS 4.x – based on Android "Oreo" 8
- HiOS 5.x – based on Android "Pie" 9
- HiOS 6.x – based on Android 10
- HiOS 7.x – based on Android 10
- HiOS 7.6.x – based on Android 11
- HiOS 8.x – based on Android 11

HTC Sense

HTC Sense is a software suite developed by HTC, used primarily on the company's Android-based devices. Serving as a successor to HTC's [TouchFLO 3D](#) software for [Windows Mobile](#), Sense modifies many aspects of the Android [user experience](#), incorporating added features (such as an altered home screen and keyboard), [widgets](#), HTC-developed applications, and redesigned applications. The first device with Sense, the [HTC Hero](#), was released in 2009.

HyperOS

Xiaomi HyperOS or HyperOS (formerly called [MIUI](#)^{[127][128]}), developed by the Chinese electronic company [Xiaomi](#), is a mobile operating system based on the [Android Open Source Project](#) (AOSP). It is mostly founded in Xiaomi smartphones and tablets such as the Xiaomi (formerly Mi) and [Redmi](#) Series. However, MIUI also had official ROM support for a few Android devices. Although HyperOS is based on AOSP, which is open-source, it consisted of closed-source proprietary software.

MIUI for POCO

A specific version of MIUI developed for Xiaomi sub-brand (Currently an independence brand) [POCO](#), the overall experience of the "skin" was similar to those of standard MIUI expect during the early release of MIUI for POCO where compared to standard MIUI it has an app drawer and allowed for 3rd party Android icon customization. Whereas the current MIUI for POCO shared all the common

experience with those of standard MIUI, except the icon and the POCO Launcher instead of stock MIUI Launcher. In 2024 MIUI for POCO was replaced by Xiaomi HyperOS.

Indus OS

Indus OS is a custom mobile operating system based on the Android Open Source Project (AOSP). It is developed by the Indus OS team based in India. No longer valid as of 2018, Indus OS is available on [Micromax](#), [Intex](#), [Karbonn](#), and other Indian smartphone brands.

Current Indus OS version list:

- Firsttouch OS (based on Android "Lollipop" 5.0)
- Indus OS 2.0 (based on Android "Marshmallow" 6.0)
- Indus OS 3.0 (based on Android "Nougat" 7.0.1)

LG UX

LG UX (formerly [Optimus UI](#)) was a front-end touch interface developed by LG Electronics and partners, featuring a full [touch user interface](#). It was not an operating system. LG UX was used internally by LG for sophisticated [feature phones](#) and tablet computers, and was not available for licensing by external parties.

Optimus UI 2, based on Android 4.1.2, has been released on the Optimus K II and the Optimus Neo 3. It features a more refined user interface compared to the prior version based on Android 4.1.1, along with new functionalities such as voice shutter and quick memo.

LineageOS

Lineage Android Distribution is a custom mobile operating system based on the Android Open Source Project (AOSP). It serves as the successor to the highly popular custom ROM, [CyanogenMod](#), from which it was forked in December 2016 when Cyanogen Inc. announced it was discontinuing development and shut down the infrastructure behind the project. Since Cyanogen Inc. retained the rights to the Cyanogen name, the project rebranded its fork as LineageOS.

Similar to CyanogenMod, it does not include any proprietary apps unless the user installs them. It allows Android users who can no longer obtain update support from their manufacturer to continue updating their OS version to the latest one based on official release from Google AOSP and heavy theme customization.

MagicOS

"MagicOS" (formerly known as Magic UI and Magic Live) is a front-end touch interface developed by [Honor](#) as a subsidiary of Huawei Technologies Co. Ltd before Honor became an independent company.

Magic UI is based on Huawei [EMUI](#), which is based on the Android Open Source Project (AOSP). The overall user interface looks almost identical to EMUI, even after the separation. While it was based on the open-source Android operating system, it consists of closed-source proprietary software.

Due to sanctions imposed by the US on Huawei, new devices released by both Huawei and Honor are no longer allowed to include [Google Mobile Services](#). To allow Honor to regain access to Google services, Huawei sold off Honor to become an independent company, thereby allowing them to pre-install Google Mobile Services on their latest devices.

Current MagicOS version list:

- Magic UI 1.x – based on EMUI 8 with Android "Oreo" 8 (Initial released)
- Magic UI 2.x – based on EMUI 9 with Android "Pie" 9 (Minor UI update)
- Magic UI 3.x – based on EMUI 10 with Android 10 (Minor UI update)
- Magic UI 4.x – based on EMUI 11 with Android 10 and Android 11 (Minor UI update)
- Magic UI 5.x – based on EMUI 11 with Android 10 and Android 11 (Minor UI update)
- Magic UI 6.x – based on EMUI 12 with Android 12 (Major UI redesigned)
- Magic OS 7.x – based on EMUI 12 with Android 13 (Minor UI redesigned)
- Magic OS 8.x – based on Android 14 (Minor UI redesigned)

MyOS

MyOS (formerly called MiFavor) is a custom Android UI developed by [ZTE](#) for their flagship smartphones and [nubia](#) smartphones. MyOS is based on the Android Open Source Project (AOSP). This is a redesign from their previous custom Android UI, MiFavor.

Current MyOS version list:

- MiFavor 1.x – based on Android "KitKat" 4.4.x, initial release
- MiFavor 2.x – based on Android "Lollipop" 5.0.x – 5.1.x, redesigned UI
- MiFavor 3.x – based on Android "Marshmallow" 6.x, redesigned UI
- MiFavor 4.x – based on Android "Nougat" 7.x, redesigned UI

- MiFavor 5.x – based on Android "Oreo" 8.x, redesigned UI
- MiFavor 9.x – based on Android "Pie" 9.0, redesigned UI
- MiFavor 10.x – based on Android 10, redesigned UI
- MyOS 11.x – based on Android 11, initial release migrate from MiFavor
- MyOS 12.x – based on Android 12, redesigned UI
- MyOS 13.x – based on Android 13
- MyOS 14.x – based on Android 14

Nothing OS

Nothing OS is a custom Android UI developed by [Nothing](#) for their [Nothing Phone \(1\)](#). Nothing OS design interface are identical to the stock Android and Pixel UI experience, aside from their custom font and widget which is based on dot design.

Current Nothing OS version list:

- Nothing OS 1 – based on Android 12, initial release
- Nothing OS 1.5 – based on Android 13
- Nothing OS 2 – based on Android 13, minor UI redesigned
- Nothing OS 2.5-2.6 – based on Android 14^[129]
- Nothing OS 3.0 – based on Android 15

nubia UI

nubia UI was a custom Android UI developed by [ZTE](#) and [nubia](#) for their smartphones. nubia UI was based on the Android Open Source Project (AOSP).

Current nubia UI version list:

- nubia UI 6.x – based on Android 8 "Oreo"
- nubia UI 7.x – based on Android 9 "Pie"
- nubia UI 8.x – based on Android 10
- nubia UI 9.x – based on Android 11

One UI

One UI (formerly called [TouchWiz](#) and [Samsung Experience](#)) is a front-end touch interface developed by Samsung Electronics in 2008 with partners, featuring a full touch user interface. It is

not a true operating system, but a [user experience](#). Samsung Experience is used internally by Samsung for smartphones, [feature phones](#) and tablet computers, and is not available for licensing by external parties. The Android version of Samsung Experience also came with Samsung-made apps preloaded until the [Galaxy S6](#), which removed all Samsung pre-loaded apps except [Samsung Galaxy Store](#) (formerly Galaxy Apps) to save storage space due to the removal of its [MicroSD](#). With the release of Samsung Galaxy S8 and S8+, Samsung Experience 8.1 was preinstalled on it with new functions, known as Samsung DeX. Similar to the concept of Microsoft Continuum, Samsung DeX allowed high-end Galaxy devices such as S8/S8+ or Note 8 to connect into a docking station, which extends the device to allow desktop-like functionality by connecting a keyboard, mouse, and monitor. Samsung also announced "Linux on Galaxy", which allows users to use the standard Linux distribution on the DeX platform.

Previous Samsung Android UI version list:

- TouchWiz 3.x (based on Android 2.1 "Éclair" and Android 2.2 "Froyo") (Initial release for Android UI)
- TouchWiz 4.x (based on Android 2.3 "Gingerbread" and Android 3.0 "Honeycomb") (Minor UI update)
- TouchWiz Nature UX (based on Android 4.0 "Ice Cream Sandwich") (Minor UI update)
- TouchWiz Nature UX 2.x (based on Android 4.2 "Jellybean") (Minor UI update)
- TouchWiz Nature UX 3.x (based on Android 4.4 "KitKat") (Minor UI update)
- TouchWiz Nature UX 4.x (based on Android 5 "Lollipop") (Minor UI update)
- TouchWiz Nature UX 5.x (based on Android 5 "Lollipop") (Major UI update)
- TouchWiz Nature UX 6.x (based on Android 6 "Marshmallow") (Minor UI update)
- TouchWiz Grace UX (based on Android 6 "Marshmallow") (Major UI update)
- Samsung Experience 8.x (based on Android 7 "Nougat") (Initial release migrate from TouchWiz)
- Samsung Experience 9.x (based on Android 8 "Oreo") (Minor update)
- Samsung Experience 10.x (based on Android 9 "Pie") (Minor and Last update before redesign One UI)

Current One UI version list:

- One UI 1.x (based on Android 9 "Pie") (Initial release)
- One UI 2.x (based on Android 10) (Minor UI update)
- One UI 3.x (based on Android 11) (Minor UI update)

- One UI 4.x (based on Android 12) (Minor UI update)
- One UI 5.x (based on Android 13) (Minor UI update)
- One UI 6.x (based on Android 14) (Major UI update)

Origin OS

[Origin OS](#) is a custom user interface developed by Vivo that is based on Android. It is a redesigned skin of Funtouch OS. It is currently only available in China but may someday be released globally.

Current Origin OS version list:

- Origin OS 1.0 – based on Android 10 and Android 11 (initial release)
- Origin OS Ocean – based on Android 12
- Origin OS HD – based on Android 12 (only used in Vivo Pad)
- Origin OS 3 – based on Android 13
- Origin OS 4 – based on Android 14
- Origin OS 5 – based on Android 15

OxygenOS

OxygenOS is based on the open source Android Open Source Project (AOSP) and is developed by [OnePlus](#) to replace Cyanogen OS on OnePlus devices such as the [OnePlus One](#). It is preinstalled on the [OnePlus 2](#), [OnePlus X](#), [OnePlus 3](#), [OnePlus 3T](#), [OnePlus 5](#), [OnePlus 5T](#), and [OnePlus 6](#).^[130] As stated by OnePlus, OxygenOS is focused on stabilizing and maintaining of stock Android functionalities like those found on [Nexus](#) devices. It consists of mainly Google apps and minor UI customization to maintain the sleekness of stock Android.

Current OxygenOS version list:

- Oxygen OS 1.0.x – based on Android 5.0.x "Lollipop" (initial release)
- Oxygen OS 2.0.x – based on Android 5.1.x "Lollipop" (overall maintenance update)
- Oxygen OS 3.0.x – based on Android 6.0 "Marshmallow" (major Android update)
- Oxygen OS 3.1.x – based on Android 6.0.1 "Marshmallow" (minor maintenance update)
- Oxygen OS 3.2.x – based on Android 6.0.1 "Marshmallow" (major Android update)
- Oxygen OS 4.x.x – based on Android 7.x "Nougat" (major Android update)
- Oxygen OS 5.x.x – based on Android 8.x "Oreo" (major Android update)

- Oxygen OS 9.x.x – based on Android 9 "Pie" (major Android update)
- Oxygen OS 10.x.x – based on Android 10 (major Android update)
- Oxygen OS 11.0.x-11.2.x – based on Android 11 (major Android update)
- Oxygen OS 11.3.x – based on ColorOS^[131] – based on Android 11 (minor update)
- Oxygen OS 12.x.x – based on ColorOS 12.x – based on Android 12 (major Android update)
- Oxygen OS 13.x.x – based on ColorOS 13.x – based on Android 13 (major Android update)
- Oxygen OS 14.x.x – based on ColorOS 14.x – based on Android 14 (major Android update)
- Oxygen OS 15.x.x – based on ColorOS 15.x – based on Android 15 (major Android update)

Pixel UI (Pixel Launcher)

[Google Pixel UI](#) or Pixel Launcher is developed by Google and based on the open-source Android system. Unlike Nexus phones, where Google shipped with stock Android, the UI that came with first-generation [Pixel](#) phones was slightly modified. As part of the Google Pixel software, the Pixel UI and its home launcher are closed-source and proprietary, so it is only available on Pixel family devices. However, third-party mods allow non-Pixel smartphones to install Pixel Launcher with [Google Now](#) feed integration.

Current Google Pixel Launcher version list:

- Pixel Launcher – "7.1.1" (based on Android 7.x "Nougat") (Initial release)
- Pixel Launcher – "8.1.0" (based on Android 8.x "Oreo") (Minor UI update)
- Pixel Launcher – "9.0" (based on Android 9 "Pie") (Major UI update)
- Pixel Launcher – "10.0" (based on Android 10) (Moderate UI update that support themes)
- Pixel Launcher – "11.0" (based on Android 11) (Minor UI update)
- Pixel Launcher – "12.0" (based on Android 12) (Major UI update)
- Pixel Launcher – "13.0" (based on Android 13) (Minor UI update)
- Pixel Launcher – "14.0" (based on Android 14) (Minor UI update)
- Pixel Launcher – "15.0" (based on Android 15) (Minor UI update)

realme UI

realme UI is a mobile operating system developed by [Realme](#) which is based on [OPPO ColorOS](#), which itself is based on the Android Open Source Project (AOSP). The UI mostly resemble its

predecessor, but with a custom UI on top of ColorOS to match Realme's target audience.

Current realme UI version list:

- realme UI 1.0 – based on ColorOS 7.0 – Android 10 – Initial Release
- realme UI 2.0 / R Edition – based on ColorOS 11.0 – Android 11
- realme UI 3.0 / S Edition – based on ColorOS 12.0 – Android 12
- realme UI 4.0 / T Edition – based on ColorOS 13.0 – Android 13
- realme UI 5.0 – based on ColorOS 14.0 – Android 14
- realme UI 6.0 – based on ColorOS 15.0 – Android 15

realme UI R edition

realme UI R edition is a custom Android skin that Realme developed for their lower-end device line with "C" and Narzo series, the Android-based line of is based on [Android Go](#), hence the overall experience is tune down to allowed for smoother experience on budget Realme devices.

Red Magic OS

Red Magic OS is a mobile operating system developed by ZTE and [Nubia](#) for their Red Magic devices.

Current Red Magic OS version list:

- Red Magic OS 1.x – based on Android 8 "Oreo", initial release
- Red Magic OS 2.x – based on Android 9 "Pie", redesigned UI
- Red Magic OS 3.x – based on Android 10, redesigned UI
- Red Magic OS 4.x – based on Android 11, redesigned UI
- Red Magic OS 5.x – based on Android 12, redesigned UI
- Red Magic OS 6.x – based on Android 13, redesigned UI
- Red Magic OS 9.x – based on Android 14, redesigned UI

Replicant OS

Replicant is a custom mobile operating system based on the Android with all proprietary drivers and [bloated](#) closed-source software removed.

TCL UI

TCL UI is a custom user interface developed by [TCL Technology](#) for their in-house smartphone series. The OS is based on the Android Open Source Project (AOSP).

Current TCL UI version list:

- TCL UI 1.x – Based on Android 9 "Pie" and Android 10 – Initial Release
- TCL UI 2.x – Based on Android 10 – Minor UI upgrade
- TCL UI 3.x – Based on Android 11 – Minor UI upgrade
- TCL UI 4.x – Based on Android 12 – Minor UI upgrade
- TCL UI 5.x – Based on Android 13 – Minor UI upgrade
- TCL UI 7.x – Based on Android 14 – Minor UI upgrade

VOS

VOS is a custom Android UI developed by [BQ Aquaris](#) and [Vsmart](#).

Current VOS version list:

- VOS 1.x – based on Android "Nougat" 7.1, "Oreo" 8
- VOS 2.x – based on Android "Pie" 9
- VOS 3.x – based on Android 10
- VOS 4.x – based on Android 11

XOS

XOS (formerly known as XUI) is an Android-based operating system developed by [Hong Kong](#) mobile phone manufacturer [Infinix Mobile](#), a subsidiary of [Transsion Holdings](#), exclusively for their smartphones. XOS allows for a wide range of user customization without requiring [rooting](#) the mobile device. The operating system comes with utility applications that allow users to protect their privacy, improve speed, enhance their experience, etc. XOS comes with features like XTheme, Scan to Recharge, Split Screen and XManager.

Current XOS version list:

- XUI 1.x – based on Android "Lollipop" 5, initial release
- XOS 2.x – based on Android "Marshmallow" 6 and "Nougat" 7
- XOS 3.x – based on Android "Nougat" 7 and "Oreo" 8

- XOS 4.x – based on Android "Oreo" 8
- XOS 5.x – based on Android "Pie" 9
- XOS 6.x – based on Android 10
- XOS 7.x – based on Android 10
- XOS 7.6.x – based on Android 11
- XOS 10.x – based on Android 11, redesigned UI
- XOS 10.6.x – based on Android 12, latest update

Xperia UI

Sony Xperia UI (formerly known as Sony Ericsson Timescape UI) was the front-end UI developed by [Sony Mobile](#) (formerly Sony Ericsson) in 2010 for their Android-based [Sony Xperia](#) series. Sony Xperia UI mostly consisted of Sony's own applications such as Sony Music (formerly known as Walkman Music player), Albums and Video Player. During its time as Timescape UI, the UI differed from the standard Android UI—instead of traditional apps dock on the bottom part, they were located at the four corners of the home screen, while the middle of the screen consisted of the [widget](#). However, recent UI developments more closely resemble those of stock Android.

Current Xperia UI version list:

- Timescape version 1 – based on Android "Eclair" 2.0/2.1, initial release
- Timescape version 2 – based on Android "Gingerbread" 2.3.x, redesigned UI
- Xperia UI version 3 – based on Android "Gingerbread" and "Ice Cream Sandwich" 2.3.x and 4.0.x, redesigned UI
- Xperia UI version 4 – based on Android "Jelly Bean" 4.2.x – 4.3.x, redesigned UI
- Xperia UI version 5 – based on Android "KitKat" 4.4.x, redesigned UI
- Xperia UI version 6 – based on Android "Lollipop" 5.0.x – 5.1.x, redesigned UI
- Xperia UI version 7 – based on Android "Marshmallow" 6.0.x, redesigned UI
- Xperia UI version 8 – based on Android "Nougat" 7.x, redesigned UI
- Xperia UI version 9 – based on Android "Oreo" 8.x, redesigned UI

ZenUI

ZenUI is a front-end touch interface developed by [ASUS](#) with partners, featuring a full touch user interface. ZenUI is used by ASUS for its [Android phones](#) and tablet computers, and is not available

for licensing by external parties. ZenUI also comes preloaded with ASUS-made apps like ZenLink (PC Link, Share Link, Party Link & Remote Link).

Current ZenUI version list:

- ZenUI 1.0 – based on Android "Jelly Bean" and "KitKat" 4.3.x and 4.4.x, initial release
- ZenUI 2.0 – based on Android "Lollipop" 5.0.x – 5.1.x, redesigned UI
- ZenUI 3.0 – based on Android "Marshmallow" 6.0.x, redesigned UI
- ZenUI 4.0 – based on Android "Nougat" 7.x, redesigned UI
- ZenUI 5.0 – based on Android "Oreo" 8.x, redesigned UI
- ZenUI 6.0 – based on Android "Pie" 9, redesigned UI
- ZenUI 7.0 – based on Android 10, redesigned UI
- ZenUI 8.0 – based on Android 11, minor UI upgrade

ZUI

ZUI is a custom operating system originally developed by [Lenovo](#) subsidiary [ZUK Mobile](#) for their smartphones. However, after the shutting down of ZUK Mobile, Lenovo took over as the main developer of ZUI. The operating system is based on the Android Open Source Project (AOSP).

Current ZUI version list:

- ZUI 1.x – Initial Release
- ZUI 2.x
- ZUI 3.x
- ZUI 4.x
- ZUI 4.x
- ZUI 10.x - Based on Android 9 "Pie"
- ZUI 11.x - Based on Android 9 "Pie" and Android 10
- ZUI 12.x - Based on Android 11
- ZUI 13.x - Based on Android 11

Wear OS

Wear OS (also known simply as Wear and formerly Android Wear) is a version of Google's Android operating system designed for smartwatches and other [wearables](#). By pairing with mobile phones

running Android version 6.0 or newer, or iOS version 10.0 or newer with limited support from Google's pairing application, Wear OS integrates [Google Assistant](#) technology and mobile notifications into a smartwatch form factor.

In May 2021 at [Google I/O](#), Google announced a major update to the platform, internally known as Wear OS 3.0. It incorporates a new visual design inspired by Android 12, and Fitbit exercise tracking features. Google also announced a partnership with Samsung Electronics, who is collaborating with Google to unify its Tizen-based smartwatch platform with Wear OS, and has committed to using Wear OS on its future smartwatch products. The underlying codebase was also upgraded to Android 11. Wear OS 3.0 will be available to Wear OS devices running [Qualcomm Snapdragon Wear 4100 system on chip](#), and will be an opt-in upgrade requiring a factory reset to install.

Current Wear OS version list:

- Android Wear 4.4w (Based on Android 4.4 "KitKat") – (Initially release)
- Android Wear 1.0 – 1.3 (Based on Android 5.0 "Lollipop") – (Minor update)
- Android Wear 1.4 (Based on Android 6.0 "Marshmallow") – (Minor update)
- Android Wear 2.0 – 2.6 (7.1.1W2) (Based on Android 7.1 "Nougat") – (Minor update)
- Android Wear 2.6 (7.1.1W3, 8.0.0 W1) – 2.9 (7.1.1W6, 8.0.0W4) (Based on Android 8.0 "Oreo") – (Minor update)
- Wear OS 1.0 (Based on Android 8.0 "Oreo") – (Renamed and Minor update)
- Wear OS 2.0 (Based on Android 8.0 "Oreo") – (Minor update)
- Wear OS 2.2 (Based on Android 9 "Pie") – (Minor update)
- Wear OS 3.x (Based on Android 11) – (Major UI and system update)

One UI Watch

One UI Watch is the user interface Samsung developed for their Wear OS based smartwatch, officially announced after both Google and Samsung confirmed they would unify their respective wearable operating systems (Google Wear OS 2.0 and Samsung Tizen) into Wear OS 3.0.

Current One UI Watch version list:

- One UI Watch 3.0 (Based on Wear OS 3.0 – Android 11) (Initial release)
- One UI Watch 4.5 (Based on Wear OS 3.5 – Android 11) (Minor update)
- One UI Watch 5.0 (Based on Wear OS 4.0 – Android 13) (Minor update)
- One UI Watch 6.0 (Based on Wear OS 5.0 – Android 14) (Minor update)

ChromeOS

ChromeOS is an operating system designed by Google that is based on the Linux kernel and uses the [Google Chrome](#) web browser as its principal user interface. As a result, ChromeOS primarily supports [web applications](#). Google announced the project in July 2009, conceiving it as an operating system in which both applications and user data reside in the [cloud](#): hence ChromeOS primarily runs [web applications](#).^[132]

Due to increase of popularity with 2-in-1 PCs, most recent Chromebooks are introduced with touch screen capability, with Android applications starting to become available for the operating system in 2014. And in 2016, access to Android apps in the entire [Google Play Store](#) was introduced on supported ChromeOS devices. With the support of Android applications, there are Chromebook devices that are positioned as tablet based instead of notebooks.

ChromeOS is only available pre-installed on hardware from Google manufacturing partners. An open source equivalent, [ChromiumOS](#), can be [compiled](#) from downloaded [source code](#). Early on, Google provided design goals for ChromeOS, but has not otherwise released a technical description.

Sailfish OS

Sailfish OS is from Jolla. It is open source with [GNU General Public License](#) (GPL) for middleware stack core which comes from MER. Sailfish due to Jolla's business model and due to alliances with various partners and due to intentional design of OS internals, is capable to adopt in several layers third-party software including Jolla software e.g. Jolla's UI is proprietary software (closed source), so such components can be proprietary with many kinds of licences. However, user can replace them with open source components like e.g. NEMO UI instead Jolla's UI.

After Nokia abandoned in 2011 the MeeGo project, most of the MeeGo team left Nokia, and established Jolla as a company to use MeeGo and Mer business opportunities. The MER standard allows it to be launched on any hardware with kernel compatible with MER. In 2012, Linux Sailfish OS based on MeeGo and using middleware of MER core stack distribution was launched for public use. The first device, the [Jolla smartphone](#), was unveiled on May 20, 2013. In 2015, Jolla Tablet was launched and the [BRICS](#) countries declared it an officially supported OS there. Jolla started licensing Sailfish OS 2.0 for third parties. Some devices sold are updateable to Sailfish 2.0 with no limits.

[Nemo Mobile](#) is a community-driven OS, similar to Sailfish but attempting to replace its proprietary

components, such as the user interface.^{[133][134][135]}||

SteamOS

SteamOS is a [Linux distribution](#) developed by [Valve](#). It incorporates Valve's popular namesake [Steam](#) video game storefront and is the primary operating system for [Steam Machines](#) and the [Steam Deck](#). SteamOS is [open source](#) with some closed source components.

SteamOS was originally built to support streaming of video games from one [personal computer](#) to the one running SteamOS within the same network, although the operating system can support standalone systems and was intended to be used as part of Valve's [Steam Machine](#) platform. SteamOS versions 1.0, released in December 2013, and 2.0 were based on the [Debian](#) distribution of Linux with [GNOME](#) desktop.^[136] With SteamOS, Valve encouraged developers to incorporate Linux compatibility into their releases to better support Linux gaming options.

In February 2022, Valve released the [handheld gaming computer Steam Deck](#) running SteamOS 3.0. SteamOS 3 is based on the [Arch Linux](#) distribution with [KDE Plasma 5](#).^{[137][138]}

Tizen

Tizen (based on the Linux kernel) is a mobile operating system hosted by Linux Foundation, together with support from the Tizen Association, guided by a Technical Steering Group composed of Intel and Samsung.

Tizen is an operating system for devices including smartphones, tablets, [In-Vehicle Infotainment](#) (IVI) devices, however currently it mainly focuses on wearable and smart TVs. It is an open source system (however the SDK was closed-source and proprietary) that aims to offer a consistent user experience across devices. Tizen's main components are the Linux kernel and the [WebKit](#) runtime. According to Intel, Tizen "combines the best of LiMo and MeeGo." [HTML5](#) apps are emphasized, with MeeGo encouraging its members to transition to Tizen, stating that the "future belongs to HTML5-based applications, outside of a relatively small percentage of apps, and we are firmly convinced that our investment needs to shift toward HTML5." Tizen will be targeted at a variety of platforms such as handsets, touch pc, smart TVs and in-vehicle entertainment.^{[139][140]} On May 17, 2013, Tizen released version 2.1, code-named Nectarine.^[141]

While Tizen itself was open source, most of the UX and UI layer that was developed by Samsung was mainly closed-source and proprietary, such as the TouchWiz UI on the Samsung Z's series

smartphone and One UI for their Galaxy Watch wearable lines.

Note that some refrigerators use Tizen,^[142] even though they are not very mobile.

Samsung has revealed plans to discontinue the Tizen operating system by the end of 2025, marking a complete halt in support for the smartwatch OS. The company ceased using Tizen OS with its Galaxy Watch4 release, favoring a hybrid OS developed with Google.

KaiOS

KaiOS is from Kai. It is based on [Firefox OS/Boot to Gecko](#). Unlike most mobile operating systems which focus on smartphones, KaiOS was developed mainly for feature phones, giving these access to more advanced technologies usually found on smartphones, such as app stores and Wi-Fi/4G capabilities.^[143]

It is a mix of closed-source and open-source components.^{[144][145]} FirefoxOS/B2G was released under the permissive [MPL 2.0](#). It does not redistribute itself under the same license, so KaiOS is now presumably proprietary (but still mostly [open-source](#), publishing its source code).^{[144][145]} KaiOS is not entirely proprietary, as it uses the copyleft [GPL](#) Linux kernel also used in Android.^[146]

Smart Feature OS

[Smart Feature OS](#) is a custom version of KaiOS that was developed and solely used by [HMD Global](#) for their KaiOS line of Nokia feature phone. The main differences between stock KaiOS and Smart Feature OS is the aesthetics such as icons, widgets, a custom Nokia ringtone and notification tone.

Fully open-source, entirely permissive licenses

Fuchsia

Fuchsia is a capability-based, real-time operating system (RTOS) currently being developed by Google. It was first discovered as a mysterious code post on GitHub in August 2016, without any official announcement. In contrast to prior Google-developed operating systems such as ChromeOS and Android, which are based on Linux kernels, Fuchsia is based on a new microkernel called "Zircon", derived from "Little Kernel", a small operating system intended for embedded systems. This allows it to remove Linux and the copyleft [GPL](#) under which the Linux kernel is licensed; Fuchsia is licensed under the [permissive BSD 3-clause](#), [Apache 2.0](#), and [MIT licenses](#). Upon inspection, media outlets noted that the code post on GitHub suggested Fuchsia's capability to run on universal devices, from embedded systems to smartphones, tablets and personal computers. In May 2017,

Fuchsia was updated with a user interface, along with a developer writing that the project was not a for experimental, prompting media speculation about Google's intentions with the operating system, including the possibility of it replacing Android.^[147]

LiteOS

LiteOS is a lightweight open source real-time operating system which is part of Huawei's "1+2+1" Internet of Things solution, which is similar to Google Android Things and Samsung Tizen. It is released under the [permissive BSD 3-clause license](#). Huawei LiteOS features lightweight, low-power, fast-response, multi-sensor collaboration, multi-protocol interconnect connectivity, enabling IoT terminals to quickly access the network. Huawei LiteOS will make intelligent hardware development easier. Thereby accelerating the realization of the interconnection of all things. Currently LiteOS are introduce to the consumer market with the Huawei Watch GT series and their sub-brand Honor Magic Watch series.

OpenHarmony

[OpenHarmony](#) is an open-source version of HarmonyOS developed and donated by Huawei to the OpenAtom Foundation. It supports devices running a mini system with memory as small as 128 KB, or running a standard system with memory greater than 128 MB. The open source [HarmonyOS](#) is based on the Huawei [LiteOS](#) kernel and [Linux kernel](#) for standard systems. OpenHarmony LiteOS Cortex-A brings small-sized, low-power, and high-performance experience and builds a unified and open ecosystem for developers. In addition, it provides rich kernel mechanisms, more comprehensive Portable Operating System Interface (POSIX), and a unified driver framework, Hardware Driver Foundation (HDF), which offers unified access for device developers and friendly development experience for application developers.

Fully open-source, mixed copyleft and permissive licenses

Fedora Mobility

Fedora Mobility is under developing mobile operating system by the Fedora Project that are porting Fedora to run on portable devices such as phones and tablets.

LuneOS

LuneOS is a modern reimplementaion of the Palm/HP webOS interface.

Manjaro ARM

Manjaro ARM is a mobile operating system with Plasma Mobile desktop environment that is running and default operating system on the PinePhone, an ARM-based smartphone released by Pine64.

Mobian

A mobile [Debian](#) focused for [PinePhone](#) and soon [Librem](#).

Plasma mobile

Plasma Mobile is a Plasma variant for smartphones.^[148] Plasma Mobile runs on [Wayland](#) and it is compatible with Ubuntu Touch applications,^[149] [PureOS](#) applications,^[150] and eventually Android applications^[151] via KDE's [Shashlik](#) project – also sponsored by Blue Systems,^{[152][153]} or [Anbox](#). It is under the copyleft [GPLv2](#) license.

The [Necuno](#) phone uses Plasma Mobile. It is entirely open-source and thus does not have a cellular modem, so it must make calls by [VOIP](#), like a pocket computer.^[154]

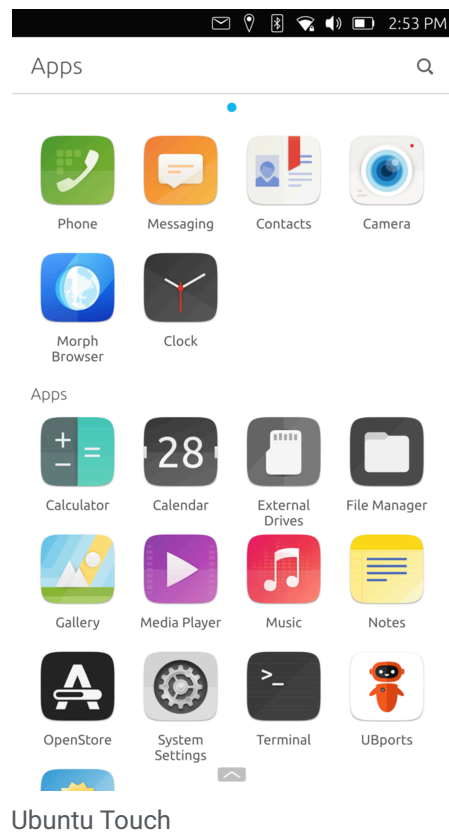
postmarketOS

postmarketOS is based on the [Alpine Linux](#) Linux distribution. It is intended to run on older phone hardware. As of 2019 it is in [alpha](#).

PureOS

PureOS is a Debian GNU/Linux derivative using only [free software](#) meeting the [Debian Free Software Guidelines](#), mainly the [copyleft](#) GPL. PureOS is endorsed by [Free Software Foundation](#) as one of the freedom-respecting operating systems.^[155] It is developed by [Purism](#), and was already in use on Purism's laptops before it was used on the [Librem 5](#) smartphone. Purism, in partnership with [GNOME](#) and [KDE](#), aims to separate the [CPU](#) from the [baseband processor](#) and include hardware [kill switches](#) for the phone's [Wi-Fi](#), [Bluetooth](#), camera, microphone, and baseband processor, and provide both GNOME and [KDE Plasma Mobile](#) as options for the desktop environment.^{[156][157]}

Ubuntu Touch



Ubuntu Touch is an open-source (GPL) mobile version of the [Ubuntu](#) operating system^[112] originally developed in 2013 by [Canonical Ltd.](#) and continued by the non-profit [UBports Foundation](#) in 2017.^{[158][159]} Ubuntu Touch can run on a pure GNU/Linux base on phones with the required drivers, such as the [Librem 5](#)^[150] and the [PinePhone](#).^[160] To enable hardware that was originally shipped with Android, Ubuntu Touch makes use of the Android Linux kernel, using Android drivers and services via an [LXC](#) container, but does not use any of the Java-like code of Android.^{[161][162]} As of February 2022, Ubuntu Touch is available on 78 phones and tablets.^{[112][163]} The UBports Installer serves as an easy-to-use tool to allow inexperienced users to install the operating system on third-party devices without damaging their hardware.^{[112][164]}

Closed source

iOS

iOS (formerly named iPhone OS) was created by [Apple Inc.](#) It has the second largest installed base worldwide on smartphones, but the largest profits, due to aggressive price competition between Android-based manufacturers.^[165] It is closed-source and proprietary, and is built on the open source [Darwin](#) operating system. The iPhone, [iPod Touch](#), [iPad](#), and second and third-generation [Apple TV](#) all use iOS, which is derived from [macOS](#).

Native third-party applications were not officially supported until the release of iPhone OS 2.0 on July 11, 2008. Before this, "[jailbreaking](#)" allowed third-party applications to be installed. In recent years, the jailbreaking scene has changed drastically due to Apple's continued efforts to secure their operating system and prevent unauthorized modifications. Currently, jailbreaks of recent iterations of iOS are only semi-untethered, which requires a device to be re-jailbroken at every boot, and exploits for jailbreaks are becoming increasingly hard to find and use.

Currently all iOS devices are developed by Apple and manufactured by [Foxconn](#) or another of Apple's partners.

iPadOS

iPadOS is a tablet operating system created and developed by Apple Inc. specifically for their iPad line of tablet computers. It was announced at the company's 2019 Worldwide Developers Conference (WWDC), as a derivation from iOS but with a greater emphasis put on multitasking. It was released on September 24, 2019.

watchOS

watchOS is the operating system of the Apple Watch, developed by Apple Inc. It is based on the iOS operating system and has many similar features. It was released on April 24, 2015, along with the Apple Watch, the only device that runs watchOS. It is currently the most widely used wearable operating system. It features focus on convenience, such as being able to place phone calls and send texts, and health, such as fitness and heart rate tracking.

The most current version of the watchOS operating system is [watchOS 10](#).

Kindle firmware

Kindle firmware is a mobile operating system specifically designed for [Amazon Kindle e-readers](#). It is based on a custom Linux kernel, but it is mostly closed-source and proprietary.

HarmonyOS

HarmonyOS is a distributed operating system developed by Huawei that was specifically designed for smartphones, tablets, TVs, smartwatches, smart devices made by Huawei. It is based on a proprietary multi-kernel and Linux kernel subsystem. Released officially for smartphones on June 2, 2021, from its initial launch on August 9, 2019, for smart screen TVs. On August 4, 2023, Huawei announces its full stack [HarmonyOS NEXT](#) for HarmonyOS that will replace the current multi-kernel stack that contains Linux kernel subsystem with APK apps, with only native HarmonyOS apps able

to be used. On January 18, 2024, Galaxy Edition version was announced to be used for the next version of HarmonyOS.

Nintendo Switch system software

The [Nintendo Switch system software](#) (also known by its codename Horizon) is an updatable firmware and operating system used by the [Nintendo Switch](#) hybrid video game console/tablet and [Nintendo Switch Lite](#) handheld game console. It is based on a proprietary microkernel. The UI includes a HOME screen, consisting of the top bar, the screenshot viewer ("Album"), and shortcuts to the Nintendo eShop, News, and Settings.

The system itself is based on the [Nintendo 3DS system software](#), additionally the networking stack in the Switch OS is derived at least in part from [FreeBSD](#) code while the Stagefright multimedia framework is derived from [Android](#) code.

PlayStation Vita system software

The [PlayStation Vita system software](#) is the official firmware and operating system for the [PlayStation Vita](#) and [PlayStation TV](#) video game consoles. It uses the LiveArea as its graphical shell. The PlayStation Vita system software has one optional add-on component, the PlayStation Mobile Runtime Package. The system is built on a Unix-base which is derived from FreeBSD and NetBSD.

Windows 10

Windows 10 (not to be confused with Windows 10 Mobile—see below) is a personal computer operating system developed and released by Microsoft as part of the [Windows NT family](#) of operating systems. It was released on July 29, 2015, and many [editions](#) and [versions](#) have been released since then. It was designed to run across multiple Microsoft product such as PCs and Tablets. The Windows user interface was revised to handle transitions between a mouse-oriented interface and a touchscreen-optimized interface based on available input devices particularly on 2-in-1 PCs.

Windows 10 also introduced universal apps, expanding on Metro-style apps, these apps can be designed to run across multiple Microsoft product families with nearly identical code including PCs, tablets, smartphones, embedded systems, Xbox One, Surface Hub and Mixed Reality.

Windows 11

Windows 11 is a major version of the [Windows NT](#) operating system developed by Microsoft that was announced on June 24, 2021, and is the successor to Windows 10, which was released in 2015.

Windows 11 was released on October 5, 2021, as a free upgrade via [Windows Update](#) for eligible devices running Windows 10.

Microsoft promoted that Windows 11 would have improved performance and ease of use over Windows 10; it features major changes to the Windows [shell](#) influenced by the canceled [Windows 10X](#), including a redesigned [Start menu](#), the replacement of its "live tiles" with a separate "Widgets" panel on the [taskbar](#), the ability to create tiled sets of windows that can be minimized and restored from the [taskbar](#) as a group, and new gaming technologies inherited from [Xbox Series X and Series S](#) such as [Auto HDR](#) and [DirectStorage](#) on compatible hardware. [Internet Explorer](#) is fully replaced by the [Blink layout engine](#)-based [Microsoft Edge](#), while [Microsoft Teams](#) is integrated into the Windows shell. Microsoft also announced plans to offer support for Android [apps](#) to run on Windows 11, with support for [Amazon Appstore](#) and manually-installed [packages](#). On March 5, 2024, Microsoft announced that Android apps support will be depreciated on March 5, 2025.

Similar to Windows 10, it was designed to run across multiple Microsoft product such as PCs and Tablets. The Windows user interface was further revised to combine the UI element of both mouse-oriented interface and a touchscreen-optimized interface based into a hybrid UI that combined the capabilities of touch with a traditional desktop UI.

Minor proprietary operating systems

Other than the major operating systems, some companies such as Huami (Amazfit), Huawei, realme, TCL, and Xiaomi have developed their own proprietary RTOSes specifically for their own smartbands and smartwatches that are designed for power efficiency and lower battery consumption and are not based on any other operating system.

- **Proprietary Amazfit OS**

Operating System that is primarily designed for their Bip series, however, Huami is currently developing the operating system to run on other smartwatches as well.

- **Huawei/Honor Band Operating System**

Huawei Band Operating system is an operating system specifically designed and developed by Huawei for their fitness trackers, including smartbands from [Honor](#)

- **Lenovo RTOS**

Proprietary OS developed by Lenovo for their fitness trackers and smartwatches.

- **realme Wearable Operating System**

A proprietary operating system design to run on realme smartbands and smartwatches.

- **TCL Wearable Real Time Operating System**

A proprietary RTOS powering TCL and Alcatel branded smartbands and smartwatches.

- **Xiaomi Mi Band Operating System**

Proprietary RTOS that is developed by Huami for the [Xiaomi Mi Band](#) series.

Discontinued software platforms

Open source

CyanogenMod

CyanogenMod was a custom mobile operating system based on the Android Open Source Project (AOSP). It was a custom ROM that was co-developed by the CyanogenMod community. The OS did not include any proprietary apps unless the user installed them. Due to its open source nature, CyanogenMod allowed Android users who could no longer obtain update support from their manufacturer to continue updating their OS version to the latest one based on official releases from Google AOSP and heavy theme customization. The last version of the OS was CyanogenMod 13 which was based on Android Asus.

On December 24, 2016, CyanogenMod announced on their blog that they would no longer be releasing any CyanogenMod updates. All development moved to LineageOS.

Cyanogen OS

Cyanogen OS was based on [CyanogenMod](#) and maintained by Cyanogen Inc; however, it included proprietary apps and it was only available for commercial uses.

Firefox OS

Firefox OS (formerly known as "Boot to Gecko" and shortly "B2G")^[166] is from Mozilla. It was an open source mobile operating system released under the [Mozilla Public License](#) built on the Android Linux kernel and used Android drivers, but did not use any Java-like code of Android.

According to [Ars Technica](#), "Mozilla says that B2G is motivated by a desire to demonstrate that the standards-based open Web has the potential to be a competitive alternative to the existing single-vendor application development stacks offered by the dominant mobile operating systems."^[167] In September 2016, Mozilla announced that work on Firefox OS has ceased, and all B2G-related code would be removed from mozilla-central.^[168]

MeeGo/Maemo/Moblin

[MeeGo](#) was from non-profit organization [The Linux Foundation](#). It is open source and GPL. At the 2010 [Mobile World Congress](#) in Barcelona, Nokia and Intel both unveiled MeeGo, a mobile operating system that combined Moblin and Maemo to create an open-sourced experience for users across all devices. In 2011 Nokia announced that it would no longer pursue MeeGo in favor of Windows Phone. Nokia announced the [Nokia N9](#) on June 21, 2011, at the Nokia Connection event^[169] in Singapore. LG announced its support for the platform.^[170] Maemo was a platform developed by Nokia for smartphones and [Internet tablets](#). It is open source and GPL, based on [Debian GNU/Linux](#) and draws much of its [graphical user interface](#) (GUI), [frameworks](#), and [libraries](#) from the GNOME project. It uses the [Matchbox](#) window manager and the [GTK](#)-based [Hildon](#) as its GUI and [application framework](#).

webOS

webOS was developed by Palm. webOS is an open source mobile operating system running on the Linux kernel, initially developed by Palm, which launched with the [Palm Pre](#). After being acquired by HP, two phones (the [Veer](#) and the [Pre 3](#)) and a tablet (the [TouchPad](#)) running webOS were introduced in 2011. On August 18, 2011, HP announced that webOS hardware would be discontinued,^[171] but would continue to support and update webOS software and develop the webOS ecosystem.^[172] HP released webOS as open source under the name Open webOS, and plans to update it with additional features.^[173] On February 25, 2013, HP announced the sale of webOS to LG Electronics, who used the operating system for its "smart" or Internet-connected TVs. However, HP retained patents underlying WebOS and cloud-based services such as the App Catalog.

Closed source

Bada

Bada platform (stylized as bada; Korean: 바다) was an operating system for mobile devices such as smartphones and tablet computers. It was developed by Samsung Electronics. Its name is derived from "바다 (bada)", meaning "ocean" or "sea" in Korean. It ranges from mid- to high-end smartphones. To foster adoption of Bada OS, since 2011 Samsung reportedly has considered releasing the source code under an open-source license, and expanding device support to include Smart TVs. Samsung announced in June 2012 intentions to merge Bada into the Tizen project, but would meanwhile use its own Bada operating system, in parallel with Google Android OS and Microsoft Windows Phone, for its smartphones. All Bada-powered devices are branded under the Wave name, but not all of Samsung's Android-powered devices are branded under the name Galaxy.

On February 25, 2013, Samsung announced that it will stop developing Bada, moving development to Tizen instead. Bug reporting was finally terminated in April 2014.^[174]

BlackBerry OS

In 1999, [Research In Motion](#) released its first BlackBerry devices, providing secure real-time push-email communications on wireless devices. Services such as BlackBerry Messenger provide the integration of all communications into a single inbox. In September 2012, RIM announced that the 200 millionth BlackBerry smartphone was shipped. As of September 2014, there were around 46 million active BlackBerry service subscribers.^[175] In the early 2010s, RIM underwent a platform transition, changing its company name to BlackBerry Limited and making new devices using a new operating system named "BlackBerry 10".^[176]

BlackBerry 10

BlackBerry 10 (based on the [QNX OS](#)) is from BlackBerry. As a smartphone OS, it is closed-source and proprietary, and only runs on phones and tablets manufactured by BlackBerry.

One of the dominant platforms in the world in the late 2000s, its global market share was reduced significantly by the mid-2010s. In late 2016, BlackBerry announced that it will continue to support the OS, with a promise to release 10.3.3.^{[177][178]} Therefore, BlackBerry 10 would not receive any major updates as BlackBerry and its partners would focus more on their Android base development.^[179]

Nintendo 3DS system software

The [Nintendo 3DS system software](#) is the updatable operating system used by the Nintendo 3DS.

Symbian

Symbian platform was developed by Nokia for some models of smartphones. It is proprietary software, it was however used by Ericsson (Sony Ericsson), Sendo and Benq. The operating system was discontinued in 2012, although a slimmed-down version for basic phones was still developed until July 2014. Microsoft officially shelved the platform in favor of Windows Phone after its acquisition of Nokia.^[180]

Palm OS

Palm OS/Garnet OS was from [Access Co.](#) It is closed-source and proprietary. webOS was introduced by Palm in January 2009, as the successor to Palm OS with Web 2.0 technologies, [open architecture](#) and multitasking abilities.

Microsoft

Windows Mobile

Windows Mobile was a family of proprietary operating systems from Microsoft aimed at business and enterprise users, based on Windows CE and originally developed for [Pocket PC](#) (PDA) devices. In 2010 it was replaced with the consumer-focused Windows Phone.^{[118][55]}

Versions of Windows Mobile came in multiple editions, like "Pocket PC Premium", "Pocket PC Professional", "Pocket PC Phone", and "Smartphone" ([Windows Mobile 2003](#)) or "Professional", "Standard", and "Classic" ([Windows Mobile 6.0](#)). Some editions were touchscreen-only and some were keyboard-only, although there were cases where device vendors managed to graft support for one onto an edition targeted at the other. Cellular phone features were also only supported by some editions. Microsoft started work on a version of Windows Mobile that would combine all features together, but it was aborted, and instead they focused on developing the non-backward-compatible, touchscreen-only Windows Phone 7.^[76]

Windows Phone

Windows Phone is a proprietary mobile operating system developed by Microsoft for smartphones as the replacement successor to Windows Mobile and [Zune](#). Windows Phone features a new touchscreen-oriented user interface derived from Metro design language. Windows Phone was replaced by Windows 10 Mobile in 2015.

Windows 10 Mobile

Windows 10 Mobile (formerly called Windows Phone) was from Microsoft. It was closed-source and proprietary.

Unveiled on February 15, 2010, Windows Phone included a user interface inspired by Microsoft's [Metro Design Language](#). It was integrated with Microsoft services such as [OneDrive](#) and Office, [Xbox Music](#), [Xbox Video](#), [Xbox Live](#) games, and [Bing](#), but also integrated with many other non-Microsoft services such as [Facebook](#) and [Google accounts](#). Windows Phone devices were made primarily by [Microsoft Mobile](#)/Nokia, and also by HTC and Samsung.

On January 21, 2015, Microsoft announced that the Windows Phone brand would be phased out and replaced with Windows 10 Mobile, bringing tighter integration and unification with its PC counterpart Windows 10, and providing a platform for smartphones and tablets with screen sizes under 8 inches.

On October 8, 2017, Microsoft officially announced that they would no longer push any major updates to Windows 10 Mobile. The operating system was put in maintenance mode, where Microsoft would push bug fixes and general improvements only. Windows 10 Mobile would not receive any new feature updates.^{[113][114]}

On January 18, 2019, Microsoft announced that support for Windows 10 Mobile would [end](#) on December 10, 2019, with no further security updates released after then, and that Windows 10 Mobile users should migrate to iOS or Android phones.^{[116][117]}

The released version of Windows 10 Mobile were:

- Windows 10 Mobile – Version 1511 (November Update "Threshold") – major UI update
- Windows 10 Mobile – Version 1607 (Anniversary Update "Redstone 1")
- Windows 10 Mobile – Version 1703 (Creators Update "Redstone 2")
- Windows 10 Mobile – Version 1709 (Fall Creators Update)

Windows 8

Windows 8 is a major release of the [Windows NT operating system](#) developed by [Microsoft](#). It was [released to manufacturing](#) on August 1, 2012, and was made available for download via [MSDN](#) and [TechNet](#) on August 15, 2012.^[181] Nearly three months after its initial release, it finally made its first retail appearance on October 26, 2012.^[182]

Windows 8 introduced major changes to the operating system's platform and [user interface](#) with the intention to improve its user experience on [tablets](#), where [Windows](#) competed with mobile operating systems such as [Android](#) and [iOS](#).^[183] In particular, these changes included a touch-optimized [Windows shell](#) and [start screen](#) based on Microsoft's [Metro](#) design language, integration with online services, the [Windows Store](#), and a new keyboard shortcut for [screenshots](#).^[184] Many of these features were adapted from [Windows Phone](#). Windows 8 also added support for [USB 3.0](#), [Advanced Format](#), [near-field communication](#), and [cloud computing](#), as well as a new lock screen with clock and notifications and the previously released "[Domino](#)" and "[Beauty and a Beat](#)". Additional security features—including built-in [antivirus software](#), integration with [Microsoft SmartScreen](#) phishing filtering, and support for [Secure Boot](#) on supported devices—were introduced. It was the first Windows version to support ARM architecture under the [Windows RT](#) branding. No CPUs without [PAE](#), [SSE2](#) and [NX](#) are supported in this version.

Windows 8.1

Windows 8.1 is a release of the [Windows NT operating system](#) developed by [Microsoft](#). It was [released to manufacturing](#) on August 27, 2013, and broadly released for retail sale on October 17,

2013, about a year after the retail release of its predecessor, and succeeded by [Windows 10](#) on July 29, 2015. Windows 8.1 was made available for download via [MSDN](#) and [Technet](#) and available as a free upgrade for retail copies of [Windows 8](#) and [Windows RT](#) users via the [Windows Store](#). A server version, [Windows Server 2012 R2](#), was released on October 18, 2013.

Windows 8.1 aimed to address complaints of Windows 8 users and reviewers on launch. Enhancements include an improved [Start screen](#), additional snap views, additional bundled apps, tighter [OneDrive](#) (formerly SkyDrive) integration, [Internet Explorer 11](#) (IE11), a [Bing](#)-powered unified search system, restoration of a visible [Start button](#) on the [taskbar](#), and the ability to restore the previous behavior of opening the user's desktop on login instead of the Start screen.

Market share

Usage

In 2006, Android and iOS did not exist and only 64 million smartphones were sold.^[185] In 2018 Q1, 183.5 million smartphones were sold and global market share was 48.9% for Android and 19.1% for iOS. Only 131,000 smartphones running other operating systems were sold, constituting 0.03% of sales.^[186]

According to [StatCounter](#) web use statistics (a proxy for all use), smartphones (alone without tablets) have majority use globally, with desktop computers used much less (and Android, in particular, more popular than Windows).^[187] Use varies however by continent with smartphones way more popular in the biggest continents, i.e. Asia, and the desktop still more popular in some, though not in North America.

The desktop is still popular in many countries (while overall down to 44.9% in the first quarter of 2017^[188]), smartphones are more popular even in many developed countries (or about to be in more). A few countries on any continent are desktop-minority; European countries (and some in South America, and a few, e.g. Haiti, in North America; and most in Asia and Africa) are smartphone-majority, Poland and Turkey highest with 57.68% and 62.33%, respectively. In Ireland, smartphone use at 45.55% outnumbers desktop use and mobile as a whole gains majority when including the tablet share at 9.12%.^{[189][188]} Spain is also slightly desktop-minority.

The range of measured mobile web use varies a lot by country, and a StatCounter press release recognizes "India among world leaders in use of mobile to surf the internet"^[190] (of the big countries) where the share is around (or over) 80%^[191] and desktop is at 19.56%, with Russia trailing with 17.8% mobile use (and desktop the rest).

Smartphones (alone, without tablets), first gained majority in December 2016 (desktop-majority was lost the month before), and it was not a Christmas-time fluke, as while close to majority after smartphone majority happened again in March 2017.^[188]

In the week from November 7–13, 2016, smartphones alone (without tablets) overtook desktop, for the first time (for a short period; non-full-month).^[192] Mobile-majority applies to countries such as Paraguay in South America, Poland in Europe and Turkey; and most of Asia and Africa. Some of the world is still desktop-majority, with e.g. in the United States at 54.89% (but not on all days).^[193] However, in some [territories of the United States](#), such as [Puerto Rico](#),^[194] desktop is way under majority, with Windows under 30% overtaken by Android.

On October 22, 2016 (and subsequent weekends), mobile showed majority.^[195] Since October 27, the desktop has not shown majority, not even on weekdays. Smartphones alone have showed majority since December 23 to the end of the year, with the share topping at 58.22% on Christmas Day.^[196] To the "mobile"-majority share then of smartphones, tablets could be added giving a 63.22% majority. While an unusually high top, a similarly high also happened on Monday April 17, 2017, with then only smartphones share slightly lower and tablet share slightly higher, with them combined at 62.88%.

According to a StatCounter November 1, 2016 press release, the world has turned desktop-minority,^[197] at about 49% desktop use for the previous month, but mobile was not ranked higher, tablet share had to be added to it to exceed desktop share. By now, mobile (smartphones) have full majority, outnumbering desktop/laptop computers by a safe margin (and no longer counting tablets with desktops makes them most popular).

By operating system

Notes:

1. Windows includes all versions.
2. BlackBerry includes all versions.
3. Other includes all other smartphone OSes but not feature phone OSes.

Worldwide smartphone sales (thousands of units)

Year	Android	iOS	BharOS	Windows	BlackBerry	Symbian	Other	Total smartphones
2023 (est.)	1,125,000	280,000	55,000	–	–	–	11,000	1,163,000 ^[198]
2022	1,000,000	200,000	50,000	–	–	–	10,000	1,200,000 ^[199]
2021	1,250,000	250,000	–	–	–	–	–	1,500,000 ^[200]
2020	1,020,000	240,000	–	–	–	–	–	1,280,000 ^[201]
2019	1,100,000	220,000	–	–	–	–	–	1,370,000 ^[202]
2018	1,337,480	209,616	89,500	–	–	–	562	1,491,619
2017	1,329,206	224,720	–	–	–	–	2,875	1,557,282

See also

- [Comparison of mobile operating systems](#) – Operating system comparison
- [Comparison of satellite navigation software](#)
- [Information appliance](#) – Mobile device that can process information
- [List of open-source mobile phones](#)
- [Mobile device](#) – Small, hand-held computing device
- [Network operating system](#) – Computer software for running local area networks
- [Operating system](#) – Software that manages computer hardware resources
- [Real-time operating system](#) – Computer operating system for applications with critical timing constraints
- [Smartphone](#) – Handheld mobile device
- [Software agent](#) – Computer program acting for a user
- [Tablet computer](#) – Mobile computer with integrated display, circuitry and battery
- [Usage share of operating systems](#) – Relative market adoption of operating systems



References

1. "Gartner Says Worldwide Sales of Smartphones Returned to Growth in First Quarter of 2018" (<https://web.archive.org/web/20180829072934/https://www.gartner.com/newsroom/id/3876865>) . *Gartner, Inc.* Gartner. May 29, 2018. Archived from [the original \(https://www.gartner.com/newsroom/id/3876865\)](https://www.gartner.com/newsroom/id/3876865) on August 29, 2018. Retrieved August 29, 2018.

2. TechFoogle, June 30, 2019, [Top 10 Mobile Operating System](https://www.techfoogle.com/top-10-mobile-operating-system) (<https://www.techfoogle.com/top-10-mobile-operating-system>) Archived (<https://web.archive.org/web/20190630110045/http://www.techfoogle.com/top-10-mobile-operating-system>) June 30, 2019, at the Wayback Machine
3. "Pen Computing Magazine: Magic Cap/DataRover Resource" (https://www.pencomputing.com/magic_cap/) . www.pencomputing.com.
4. "Operating System Market Share Worldwide" (<https://gs.statcounter.com/os-market-share>) . *StatCounter Global Stats*. Retrieved March 31, 2023.
5. Holwerda, Thom (November 12, 2013). "The second operating system hiding in every mobile phone" (<https://www.osnews.com/story/27416/the-second-operating-system-hiding-in-every-mobile-phone/>) . *OSNews*. Archived (https://web.archive.org/web/20131113173925/http://www.osnews.com/story/27416/The_second_operating_system_hiding_in_every_mobile_phone) from the original on November 13, 2013.
6. Jerry Kaplan (1994). *Startup: a Silicon Valley adventure*. New York: Penguin Books. ISBN 0-14-025731-4.
7. Segan, Sasha (February 13, 2012). "Enter the Phablet: A History of Phone-Tablet Hybrids" (<http://web.archive.org/web/20170411120557/http://www.pcmag.com/slideshow/story/294004/enter-the-phablet-a-history-of-phone-tablet-hybrids>) . *PCmag*. Archived from the original (<http://www.pcmag.com/news/enter-the-phablet-a-history-of-phone-tablet-hybrids>) on April 11, 2017. Retrieved September 6, 2019.
8. Aamoth, Doug (August 18, 2014). "First Smartphone Turns 20: Fun Facts About Simon" (<https://time.com/3137005/first-smartphone-ibm-simon/>) . *Time*. Retrieved August 18, 2019.
9. "First GSM-based communicator product hits the market Nokia Starts Sales of the Nokia 9000 Communicator" (<https://web.archive.org/web/20160603191142/http://company.nokia.com/en/news/press-releases/1996/08/15/first-gsm-based-communicator-product-hits-the-market-nokia-starts-sales-of-the-nokia-9000-communicator>) . *Nokia* (Press release). August 15, 1996. Archived from the original (<http://company.nokia.com/en/news/press-releases/1996/08/15/first-gsm-based-communicator-product-hits-the-market-nokia-starts-sales-of-the-nokia-9000-communicator>) on June 3, 2016. Retrieved January 10, 2019.
10. "Nokia 9000 Communicator | Device Specs" (https://phonedb.net/index.php?m=device&id=879&c=nokia_9000_communicator) . *PhoneDB*. October 13, 2007. Retrieved January 10, 2019.
11. Litchfield, Steve (2005) [1998]. "The History of Psion" (<https://stevelitchfield.com/historyofpsion.htm>) . *Palmtop Magazine*. UK Online. Retrieved December 27, 2008.

12. "The Nokia 9210 Communicator heralds the dawn of mobile multimedia" (<https://web.archive.org/web/20131212112345/http://press.nokia.com/2000/11/21/the-nokia-9210-communicator-heralds-the-dawn-of-mobile-multimedia/>) . *Nokia* (Press release). November 21, 2000. Archived from the original (<http://press.nokia.com/2000/11/21/the-nokia-9210-communicator-heralds-the-dawn-of-mobile-multimedia/>) on December 12, 2013. Retrieved January 10, 2019.
13. "Qualcomm Unveils "pdQ" CDMA Digital Smartphone" (<https://www.qualcomm.com/news/releases/1998/09/21/qualcomm-unveils-pdq-cdma-digital-smartphone>) . *Qualcomm* (Press release). September 21, 1998. Retrieved June 13, 2019.
14. "Qualcomm's pdQ Smartphone Provides Ideal Platform For Wireless Business Solutions" (<http://www.qualcomm.com/news/releases/1999/06/15/qualcomm-s-pdq-smartphone-provides-ideal-platform-wireless-business>) . *Qualcomm* (Press release). June 15, 1999. Retrieved September 29, 2019.
15. "Qualcomm pdQ 800 | Device Specs" (https://phonedb.net/index.php?m=device&id=1150&c=qualcomm_pdq_800) . *PhoneDB*. February 28, 2008. Retrieved September 29, 2019.
16. "Qualcomm pdQ 1900 | Device Specs" (https://phonedb.net/index.php?m=device&id=1151&c=qualcomm_pdq_1900) . *PhoneDB*. February 28, 2008. Retrieved September 29, 2019.
17. "Nokia unveils new media phones for mobile internet access First WAP 1.1 compliant phones for Americas market" (http://www.mobic.com/oldnews/9909/nokia_unveils_new_media_phones_f.htm) . *www.mobic.com*. Retrieved September 26, 2019.
18. "Nokia unveils the world's first media phone for Internet access" (https://web.archive.org/web/20010827093408/http://press.nokia.com/PR/199902/777256_5.html) (Press release). February 23, 1999. Archived from the original (http://press.nokia.com/PR/199902/777256_5.html) on August 27, 2001. Retrieved September 26, 2019.
19. "Ericsson R380 PDA & Phone" (https://web.archive.org/web/20160304030000/http://www.cellular.co.za/ericsson_r380.htm) . *CellularOnline*. Archived from the original (http://www.cellular.co.za/ericsson_r380.htm) on March 4, 2016. Retrieved April 27, 2011.
20. "Ericsson R380 / R380s | Device Specs" (https://phonedb.net/index.php?m=device&id=1062&c=ericsson_r380__r380s) . *PhoneDB*. January 25, 2008. Retrieved September 29, 2019.
21. "Nokia 9210 Communicator Device Specs" (http://pdadb.net/index.php?m=specs&id=886&c=nokia_9210_communicator) . *PhoneDB*. October 16, 2007. Retrieved September 28, 2019.
22. "Binary Runtime Environment for Wireless". *Wikipedia*. "Developed in 1999, as a platform for wireless applications on CDMA-based mobile phones, it debuted in September 2001 ... Originally made for the Kyocera QCP-3035 (which was the very first Brew-enabled phone)"

23. "RIM Introduces Java-Based BlackBerry Handheld With Integrated Phone for GSM/GPRS Networks in North America" (https://web.archive.org/web/20071028143020/http://www.blackberry.com/news/press/2002/pr-04_03_2002-01.shtml) (Press release). BlackBerry. March 4, 2002. Archived from the original (http://www.blackberry.com/news/press/2002/pr-04_03_2002-01.shtml) on October 28, 2007. Retrieved September 6, 2019.
24. "UIQ History" (<https://web.archive.org/web/20070523072447/http://www.uiq.com/uiqhistory.html>) . *UIQ Technology*. Archived from the original (<http://www.uiq.com/uiqhistory.html>) on May 23, 2007. Retrieved September 26, 2019.
25. Orlowski, Andrew (April 26, 2002). "Hands on with the PDA-killer Sony P800" (https://www.theregister.co.uk/2002/04/26/hands_on_with_the_pdakiller/) . *The Register*. Retrieved September 26, 2019. "The P800 resembles its Symbian predecessor, the R380"
26. Morris, John; Taylor, Josh (November 12, 2001). "Microsoft jumps in the all-in-one game" (<http://web.archive.org/web/20011217080411/http://www.zdnet.com/products/stories/reviews/0%2C4161%2C2824082%2C00.html>) . *ZDNet*. Archived from the original (<https://www.zdnet.com/products/stories/reviews/0%2C4161%2C2824082%2C00.html>) on December 17, 2001. Retrieved May 24, 2017.
27. Brown, Bruce; Brown, Marge (August 1, 2002). "Audiovox Thera reviewed by PC Magazine" (<http://www.pcmag.com/archive/audiovox-pdaphone-delivers-high-speed-data-28938>) . *PC Magazine*. Retrieved September 6, 2019.
28. "Audiovox Thera" (https://www.phonearena.com/news/Audiovox-Thera_id11) . *PhoneArena*. August 8, 2002. Retrieved September 6, 2019.
29. "Nokia's first imaging phone marks start of Multimedia Messaging era" (<https://web.archive.org/web/20160924133635/http://company.nokia.com/en/news/press-releases/2001/11/19/nokias-first-imaging-phone-marks-start-of-multimedia-messaging-era>) . *Nokia* (Press release). November 19, 2001. Archived from the original (<http://company.nokia.com/en/news/press-releases/2001/11/19/nokias-first-imaging-phone-marks-start-of-multimedia-messaging-era>) on September 24, 2016. Retrieved September 26, 2019.
30. De Herrera, Chris. "Windows CE / Windows Mobile Versions" (<http://www.pocketpcfaq.com/wce/versions.htm>) . *pocketpcfaq.com*. Retrieved September 6, 2007.
31. "Nokia 770 Now Available in Europe" (<https://web.archive.org/web/20051124111901/http://www.internettablettalk.com/content/view/132/2/>) . *Internet Tablet Talk*. November 3, 2005. Archived from the original (<http://www.internettablettalk.com/content/view/132/2/>) on November 24, 2005. Retrieved November 5, 2005.

32. Jobs, Steve (19 January 2007). *Macworld San Francisco 2007 Keynote Address* (<https://web.archive.org/web/20070123133238/http://www.apple.com/quicktime/qttv/mwsf07/>) . San Francisco: Apple, Inc. Archived from the original (<https://www.apple.com/quicktime/qttv/mwsf07/>) on 23 January 2007.
33. "Windows Mobile 6 press release" (<https://web.archive.org/web/20070310090007/http://www.microsoft.com/presspass/press/2007/feb07/02-11WM6SoftwarePR.msp>) (Press release). Microsoft. February 7, 2007. Archived from the original (<http://www.microsoft.com/presspass/press/2007/feb07/02-11WM6SoftwarePR.msp>) on March 10, 2007. Retrieved February 18, 2007.
34. Bohn, Dieter; Adolfsson, Marcus (May 30, 2007). "Palm Announces Foleo" (<http://www.treocentral.com/content/Stories/1220-1.htm>) . *treocentral.com*. Retrieved September 10, 2019.
35. "The Official Palm Blog: A Message to Palm Customers, Partners and Developers" (<https://web.archive.org/web/20071109201709/http://blog.palm.com/palm/2007/09/a-message-to-pa.html>) . Archived from the original (<http://blog.palm.com/palm/2007/09/a-message-to-pa.html>) on November 9, 2007. Retrieved September 10, 2019.
36. "Industry Leaders Announce Open Platform for Mobile Devices" (http://www.openhandsetalliance.com/press_110507.html) . Open Handset Alliance. November 5, 2007. Retrieved November 5, 2007.
37. Delft, Miguel (November 5, 2007). "Google Enters the Wireless World" (<https://web.archive.org/web/20121110234644/http://www.nytimes.com/2007/11/05/technology/05cnd-gphone.html?ex=1352005200&en=d7a169e184415788&ei=5088&partner=rssnyt&emc=rss>) . *New York Times*. Archived from the original (<https://www.nytimes.com/2007/11/05/technology/05cnd-gphone.html?ex=1352005200&en=d7a169e184415788&ei=5088&partner=rssnyt&emc=rss>) on November 10, 2012. Retrieved September 7, 2011.
38. "LiMo Foundation™ Unveils First LiMo Handsets" (<http://www.limofoundation.org/en/limo-press-releases/limo-foundation-unveils-first-limo-handsets-3.html>) . *LiMo Foundation* (Press release). February 11, 2008.
39. "LiMo Foundation™ Unveils First LiMo Handsets" (<http://justamp.blogspot.com/2008/02/limo-foundation-unveils-first-limo.html>) . *Just Another Mobile Phone Blog* (Press release). February 14, 2008. Retrieved October 21, 2019.

40. McGlaun, Shane. "Nokia Offers to Purchase All Symbian Shares for \$410M" (<https://web.archive.org/web/20160821030054/http://www.dailytech.com/Nokia+Offers+to+Purchase+All+Symbian+Shares+for+410M/article12178.htm>) . *DailyTech*. Archived from the original (<http://www.dailytech.com/Nokia+Offers+to+Purchase+All+Symbian+Shares+for+410M/article12178.htm>) on August 21, 2016. Retrieved May 22, 2016.
41. "Mobile leaders to unify the Symbian software platform and set the future of mobile free" (<http://web.archive.org/web/20120325025959/http://press.nokia.com/2008/06/24/mobile-leaders-to-unify-the-symbian-software-platform-and-set-the-future-of-mobile-free/>) (Press release). Nokia. June 24, 2008. Archived from the original (<http://press.nokia.com/2008/06/24/mobile-leaders-to-unify-the-symbian-software-platform-and-set-the-future-of-mobile-free/>) on March 25, 2012. Retrieved April 9, 2011.
42. "iPhone OS 2" (<https://web.archive.org/web/20080912112138/http://www.apple.com/iphone/softwareupdate/iphone2.html/>) . *apple.com*. Archived from the original (<http://www.apple.com/iphone/softwareupdate/iphone2.html/>) on September 12, 2008.
43. Moren, Dan (July 15, 2008). "Review: iPhone 2.0 software update" (<http://www.macworld.com/article/1134503/iphone2update.html>) . *Macworld*.
44. Moor, Chris (September 23, 2008). "Android G1 Release Dates, Pricing and More" (<https://www.talkandroid.com/260-t-mobile-g1-details/>) . *TalkAndroid.com*.
45. "Nokia 5800 XpressMusic now shipping" (<https://web.archive.org/web/20120708045329/http://press.nokia.com/2008/11/27/nokia-5800-xpressmusic-now-shipping/>) . *Nokia* (Press release). November 27, 2008. Archived from the original (<http://press.nokia.com/2008/11/27/nokia-5800-xpressmusic-now-shipping/>) on July 8, 2012. Retrieved January 10, 2019.
46. "Nokia 5800 / 5800d-1 XpressMusic (Nokia Tube) | Device Specs" (https://phonedb.net/index.php?m=device&id=1336&c=nokia_5800__5800d-1_xpressmusic__nokia_tube) . *PhoneDB*. June 17, 2008. Retrieved January 10, 2019.
47. Hardy, Ed (January 5, 2009). "UIQ Technology Files for Bankruptcy" (<http://www.brighthand.com/news/uiq-technology-files-for-bankruptcy/>) . *Brighthand*. Retrieved January 10, 2019.
48. Ganapati, Priya (January 30, 2009). "Intel Pushes New Operating System For Netbooks" (<http://www.wired.com/2009/01/intel-bets-on-m/>) . *Wired*. Retrieved September 15, 2019.
49. Keilhack, Kris (January 8, 2009). "Palm Announces the Palm Pre Smartphone" (<http://www.palminfocenter.com/news/9668/palm-announces-the-palm-pre-smartphone/>) . *Palminfocenter.com*. Retrieved January 8, 2009.

50. "Palm Pre's coming out party: June 6th" (<http://www.wealthalchemist.com/Blog/2009/06/palm-pres-coming-party-june-6th/>) . Wealth Alchemist. June 5, 2009. Retrieved July 3, 2009.
51. Bohn, Dieter (February 11, 2009). "No More PalmOS Devices from Palm. No Patent Fight with Apple (yet)" (<http://www.treocentral.com/content/Stories/2399-1.htm>) . *treocentral.com*. Retrieved September 10, 2019.
52. Ducker, Michael (September 27, 2007). "Hands-on With the Palm Centro" (<http://www.treocentral.com/content/Stories/1361-1.htm>) . *treocentral.com*. Retrieved September 10, 2019.
53. Ziegler, Chris (February 16, 2009). "Windows Mobile 6.5 walkthrough with Engadget (now with video!)" (<https://www.engadget.com/2009/02/16/windows-mobile-6-5-walkthrough-with-engadget/>) . Engadget.
54. "Ballmer: Win Mobile 6.5 an unwanted stopgap" (<https://web.archive.org/web/20150318235554/http://www.electronista.com/articles/09/03/05/ballmer.on.win.mobile.6.5/>) . *Electronista*. March 5, 2009. Archived from the original (<http://www.electronista.com/articles/09/03/05/ballmer.on.win.mobile.6.5/>) on March 18, 2015. Retrieved September 4, 2019.
55. "Ballmer: We 'screwed up with Windows Mobile' " (<https://web.archive.org/web/20091001113618/http://news.idg.no/cw/art.cfm?id=F2F7C35E-1A64-67EA-E4BC04F120F0B898>) . *Computerworld*. September 25, 2009. Archived from the original (<http://news.idg.no/cw/art.cfm?id=F2F7C35E-1A64-67EA-E4BC04F120F0B898>) on October 1, 2009. Retrieved September 4, 2019.
56. "Windows Mobile: What's coming when – All about microsoft" (<https://web.archive.org/web/20090304110726/http://blogs.zdnet.com/microsoft/?p=1908>) . ZDNet.com. Archived from the original (<http://blogs.zdnet.com/microsoft/?p=1908>) on March 4, 2009. Retrieved September 4, 2019.
57. "Sidekick LX 2009 / Blade Will Run NetBSD" (<https://web.archive.org/web/20090317022256/http://www.hiptop3.com/archives/sidekick-lx-2009-blade-will-run-netbsd/>) . *www.hiptop3.com*. January 30, 2009. Archived from the original (<http://www.hiptop3.com/archives/sidekick-lx-2009-blade-will-run-netbsd/>) on March 17, 2009. Retrieved February 5, 2009.
58. "How NetBSD came to be shipped by Microsoft. | A Dinosaur Contemplating Asteroids" (<http://fogey.com/contemplating/?p=1023>) . December 14, 2018.
59. Murph, Darren (November 18, 2009). "Nokia's Maemo 5-equipped N900 on sale in America for \$649" (<https://www.engadget.com/2009/11/18/nokias-maemo-5-equipped-n900-on-sale-in-america-for-649/>) . *Engadget*. Retrieved September 15, 2019.

60. Ziegler, Chris (January 19, 2010). "Nokia N900 review" (<https://www.engadget.com/2010/01/19/nokia-n900-review/>) . Engadget. Retrieved September 15, 2019. "Thing is, Nokia's been absolutely emphatic with us – Maemo's intended for handheld computers (read: MIDs) with voice capability, while S60 continues to be the choice for purebred smartphones"
61. Ryan, Justin (February 16, 2010). "Maemo + Moblin=MeeGo" (<https://www.linuxjournal.com/content/maemo-moblin-meego>) . Linux Journal.
62. "Samsung GT-S8500 Wave 8GB | Device Specs" (https://phonedb.net/index.php?m=device&id=2248&c=samsung_gt-s8500_wave_8gb) . PhoneDB. February 20, 2010. Retrieved October 17, 2019.
63. "Samsung Wave, first Bada smartphone hits the market" (<https://web.archive.org/web/20101223231522/http://www.bada.com/samsung-wave-first-bada-smartphone-hits-the-market/>) . Samsung (Press release). May 24, 2010. Archived from the original (<http://www.bada.com/samsung-wave-first-bada-smartphone-hits-the-market/>) on December 23, 2010. Retrieved September 15, 2019.
64. "iPad Available in US on April 3" (<https://www.apple.com/pr/library/2010/03/05iPad-Available-in-US-on-April-3.html>) (Press release). Apple. March 5, 2010. Retrieved March 5, 2010.
65. Bjarin, Ben (June 30, 2011). "HP Is Committed to Its 'webOS' Platform (and It Should Be)" (<http://techland.time.com/2011/06/30/hp-is-committed-to-its-webos-platform-and-it-should-be/#ixzz1QshLqoCZ>) . Time. TechLand. Time Inc. Retrieved November 27, 2013.
66. "HP snubs Windows, plans to integrate webOS into PCs" (<http://www.digitaltrends.com/mobile/hp-snubs-windows-plans-to-integrate-webos-into-pcs>) . Digital Trends. February 9, 2011. Retrieved June 14, 2013.
67. "Windows Phone 7 and KIN Closer Cousins Than Thought" (<https://archive.today/20130131104109/http://www.phonescoop.com/news/item.php?n=5969>) . Phone Scoop. May 12, 2010. Archived from the original (<http://www.phonescoop.com/news/item.php?n=5969>) on January 31, 2013.
68. "Verizon returns unsold Kin phones, pulls online sales, July 18, 2010" (<https://web.archive.org/web/20130517223829/http://www.electronista.com/articles/10/07/18/verizon.decides.against.selling.out.kin.stock/>) . Electronista.com. July 18, 2010. Archived from the original (<http://www.electronista.com/articles/10/07/18/verizon.decides.against.selling.out.kin.stock/>) on May 17, 2013. Retrieved February 4, 2013.
69. Ziegler, Chris (June 30, 2010). "Microsoft Kin is dead" (<https://www.engadget.com/2010/06/30/microsoft-kin-is-dead/>) . Engadget.com. Retrieved February 4, 2013.

70. Heussner, Ki Mae (September 1, 2010). "Apple Goes 'Wild' Over New iPods" (<https://abcnews.go.com/Technology/apples-ipods-unveiled-ceo-steve-jobs/story?id=11534551>) . ABC News. Archived (<https://web.archive.org/web/20100904133427/https://abcnews.go.com/Technology/apples-ipods-unveiled-ceo-steve-jobs/story?id=11534551>) from the original on September 4, 2010. Retrieved September 8, 2010.
71. "Nokia N8 is shipping (photos) – Nokia Conversations: the official Nokia blog" (<https://archive.today/20120707084227/http://conversations.nokia.com/2010/09/30/nokia-n8-is-shipping-photos/>) . Nokia. September 30, 2010. Archived from the original (<http://conversations.nokia.com/2010/09/30/nokia-n8-is-shipping-photos/>) on July 7, 2012. Retrieved January 10, 2019.
72. "Nokia N8-00 (Nokia Vasco) | Device Specs" (https://phonedb.net/index.php?m=device&id=2379&c=nokia_n8-00__nokia_vasco) . PhoneDB. May 11, 2010. Retrieved January 10, 2019.
73. Hahn, Jason Duaine (September 11, 2015). "The History of the Sidekick: The Coolest Smartphone of All Time" (<https://www.complex.com/pop-culture/a/jason-duaine-hahn/history-of-the-sidekick>) . *Complex Networks*.
74. "Nokia reabsorbs Symbian software" (<https://www.bbc.co.uk/news/technology-11713192>) . BBC News. November 8, 2010.
75. Hollister, Sean (September 26, 2010). "Microsoft prepping Windows Phone 7 for an October 21 launch? (update: US on Nov. 8?)" (<https://www.engadget.com/2010/09/26/microsoft-prepping-windows-phone-7-for-an-october-21st-launch/>) . *Engadget*. AOL. Retrieved September 29, 2010.
76. Miniman, Brandon (February 17, 2010). "Thoughts on Windows Phone 7 Series (BTW: Photon is Dead)" (<https://web.archive.org/web/20131029192149/http://pocketnow.com/thought/thoughts-on-windows-phone-7-series-btw-photon-is-dead>) . *Pocketnow*. Archived from the original (<https://pocketnow.com/thought/thoughts-on-windows-phone-7-series-btw-photon-is-dead>) on October 29, 2013. Retrieved June 5, 2010.
77. "Steve Ballmer wishes Windows Mobile 7 had already launched, but they screwed up" (<https://web.archive.org/web/20131104214039/http://www.mobiletechworld.com/2009/09/24/steve-ballmer-wishes-windows-mobile-7-had-already-launched-but-they-screwed-up/>) . *MobileTechWorld*. September 24, 2009. Archived from the original (<http://www.mobiletechworld.com/2009/09/24/steve-ballmer-wishes-windows-mobile-7-had-already-launched-but-they-screwed-up/>) on November 4, 2013. Retrieved July 21, 2012.
78. "Motorola Xoom" (<http://reviews.cnet.com/motorola-xoom#reviewPage1>) . CNET. February 24, 2011. Archived (<https://web.archive.org/web/20110410020624/http://reviews.cnet.com/motorola-xoom/#reviewPage1>) from the original on April 10, 2011. Retrieved April 8, 2011.

79. Litchfield, Steve (February 11, 2011). "Nokia's new strategy and structure, Symbian to be a "franchise platform", MeeGo still in long term plans" (https://web.archive.org/web/20130906135631/http://www.allaboutmeego.com/news/item/12584_Nokias_new_strategy_and_struct.php) . *All About MeeGo*. Archived from the original (http://www.allaboutmeego.com/news/item/12584_Nokias_new_strategy_and_struct.php/) on September 6, 2013. Retrieved September 10, 2019.
80. Ricker, Thomas (February 11, 2011). "RIP: Symbian" (<https://www.engadget.com/2011/02/11/rip-symbian/>) . *engadget.com*. Retrieved September 10, 2019.
81. Paul, Ryan (July 25, 2011). "Mozilla eyes mobile OS landscape with new Boot to Gecko project" (<https://arstechnica.com/information-technology/2011/07/mozilla-eyes-mobile-os-landscape-with-new-boot-to-gecko-project/>) . *Ars Technica*. Retrieved September 15, 2019.
82. "webOS 3.0.5 now available for TouchPad" (<http://www.webosnation.com/webos-3-0-5-now-available-touchpad>) . January 12, 2012. Retrieved January 12, 2012.
83. "HP kills webOS, spins off PC business to focus on software" (http://www.appleinsider.com/articles/11/08/18/hp_to_spin_off_pc_business_to_focus_on_enterprise_software.html) . *AppleInsider*. August 11, 2011. Retrieved August 18, 2011.
84. Ziegler, Chris (January 12, 2012). "HP TouchPad updated to webOS 3.0.5" (<https://www.theverge.com/2012/1/12/2702658/hp-touchpad-updated-to-webos-3-0-5>) . *The Verge*. Retrieved August 7, 2017.
85. Halliday, Josh; Arthur, Charles (September 28, 2011). "Nokia N9: last of the line" (<https://www.theguardian.com/technology/2011/sep/28/nokia-n9-last-of-line>) . *the Guardian*. Retrieved April 3, 2018.
86. Davies, Chris (June 23, 2011). "Nokia N950 arriving with MeeGo developers now" (<https://www.slashgear.com/nokia-n950-arriving-with-mee-go-developers-now-23161090/>) . *SlashGear*. Retrieved September 15, 2019.
87. Paul, Ryan (September 28, 2011). "MeeGo rebooted as Intel and Samsung launch new Tizen platform" (<https://arstechnica.com/free/news/2011/09/meego-rebooted-as-intel-and-samsung-launch-new-tizen-platform.ars>) . *Ars Technica*. Retrieved September 28, 2011.
88. Warren, Tom (May 2, 2012). "Nokia's 41-megapixel 808 PureView phone arriving in Russia and India in May" (<https://www.theverge.com/2012/5/2/2993328/nokia-808-pureview-russia-india-may-release>) . *The Verge*. Retrieved September 27, 2019.

89. Lunden, Ingrid (January 24, 2013). "Nokia Confirms The PureView Was Officially The Last Symbian Phone" (<https://techcrunch.com/2013/01/24/nokia-confirms-the-pure-view-was-officially-the-last-symbian-phone>) . *TechCrunch*. AOL. Retrieved September 14, 2015.
90. Hay, Emma (May 25, 2012). "Symbian Carla Cancelled, Beginning Of The End For Symbian?" (<https://web.archive.org/web/20181106221712/https://www.itproportal.com/2012/05/25/symbian-carla-cancelled-beginning-of-the-end-for-symbian/>) . *ITProPortal*. Archived from the original (<https://www.itproportal.com/2012/05/25/symbian-carla-cancelled-beginning-of-the-end-for-symbian/>) on November 6, 2018. Retrieved September 27, 2019.
91. Jolla [@JollaHQ] (August 1, 2012). "@kavalczyk #MeeGo is the name people know and love. #merproject is the core OS project name" (<https://x.com/JollaHQ/status/230579553142181888>) (Tweet) – via Twitter.
92. Fingas, Jon (July 7, 2012). "Jolla promises MeeGo will live on, plans new smartphone to reward the faithful" (<https://www.engadget.com/2012/07/07/jolla-promises-meego-will-live-on-plans-new-smartphone/>) . *Engadget*. Retrieved September 15, 2019.
93. "No more bada and TIZEN in 2012" (<https://www.sammobile.com/2012/08/22/no-more-bada-and-tizen-in-2012>) . *Sammobile.com*. August 22, 2012. Retrieved September 15, 2019.
94. Spoonauer, Mark (November 12, 2012). "BlackBerry 10 launches Jan. 30 with two new phones" (<https://www.nbcnews.com/technology/technology/blackberry-10-launches-jan-30-two-new-phones-1C6983302>) . *NBC News*. Retrieved February 12, 2013.
95. "LG Electronics Acquires webOS from HP to Enhance Smart TV" (<http://www8.hp.com/us/en/hp-news/press-release.html?id=1375489#.USvx7qK-q2E>) (Press release). Hewlett-Packard. February 25, 2013. Retrieved June 14, 2013.
96. Byford, Sam (February 25, 2013). "LG buys webOS from HP for use in smart TVs" (<https://www.theverge.com/2013/2/25/4027018/lg-buys-webos-smart-tv>) . *The Verge*. Retrieved September 8, 2019.
97. "Ubuntu phone OS announced, first devices shipping in early 2014" (<https://www.theverge.com/2013/1/2/3827922/ubuntu-phone-os-announcement>) . January 2, 2013. Archived (<https://web.archive.org/web/20170620183009/https://www.theverge.com/2013/1/2/3827922/ubuntu-phone-os-announcement>) from the original on June 20, 2017.
98. "Jolla Smartphone specs" (https://www.phonearena.com/phones/Jolla-Smartphone_id8153) . *PhoneArena*. September 20, 2013. Retrieved September 15, 2019.

99. Robertson, Adi (February 24, 2014). "This is Nokia X: Android and Windows Phone collide" (<http://www.theverge.com/2014/2/24/5440498/nokia-x-android-phone-hands-on>) . The Verge. Retrieved March 2, 2014.
100. "Microsoft kills off its Nokia Android phones" (<https://www.theverge.com/2014/7/17/5911909/microsoft-kills-off-its-nokia-android-phones>) . The Verge. April 8, 2014.
101. "Samsung SM-Z9005 Z (Samsung Redwood) | Device Specs" (https://phonedb.net/index.php?m=device&id=6292&c=samsung_sm-z9005_z__samsung_redwood) . PhoneDB. June 2, 2014. Retrieved October 17, 2019.
102. Byford, Sam (March 1, 2015). "Our first look at LG's new webOS and Android Wear smartwatches" (<https://www.theverge.com/2015/3/1/8128483/lg-watch-urbane-lte-hands-on>) . The Verge. Retrieved August 28, 2016.
103. Benson, Matthew (June 23, 2015). "Watch Urbane LTE impressions: LG's little known webOS experiment" (<http://www.androidauthority.com/urbane-lte-impressions-lgs-little-known-webos-617814/>) . Android Authority. Retrieved August 28, 2016.
104. "An update for BlackBerry® 10 Developers" (<http://devblog.blackberry.com/2015/10/an-update-for-blackberry-10-developers/>) . BlackBerry Developer Blog. October 26, 2015. Retrieved January 7, 2016.
105. Dolcourt, Jessica (October 6, 2015). "Microsoft Lumia 950 coming in November with Windows 10, 5.2-inch screen, starts at \$549 (hands-on)" (<https://www.cnet.com/products/microsoft-lumia-950/>) . CNET. CBS Interactive.
106. Litchfield, Steve (February 15, 2016). "Microsoft officially announces the Lumia 650" (http://aboutwindowsphone.com/news/item/21249_Microsoft_officially_announces.php) . All About Windows Phone. Retrieved February 15, 2016.
107. Bowden, Zac (October 8, 2017). "Microsoft's Joe Belfiore says Windows 10 Mobile features and hardware are no longer a focus" (<https://www.windowscentral.com/microsoft-windows-10-mobile-features-and-hardware-are-not-focus-anymore>) . Windows Central. Mobile Nations. Retrieved October 31, 2017.
108. "BlackBerry to stop making Classic smartphone" (<https://www.theglobeandmail.com/report-on-business/blackberry-to-stop-making-blackberry-classic-smartphone/article30754260/>) . The Globe and Mail. Retrieved July 27, 2016.
109. McCaskill, Steve (July 14, 2016). "BlackBerry: BB10 And Keyboard Phones Are Not Dead" (<http://www.techweekeurope.co.uk/mobility/smartphones/blackberry-bb10-keyboard-smartphones-195058>) . NetMediaEurope.

110. Lomas, Natasha (October 23, 2015). "Priv, The Android Phone With A Physical Keyboard, Goes Up For Pre-Order" (<https://techcrunch.com/2015/10/23/priv-pre-orders/>) . *TechCrunch*. AOL. Retrieved November 3, 2015.
111. "Google Rolling Out Latest Android System to Nexus Phones" (<https://www.nytimes.com/aponline/2016/08/22/business/ap-us-google-android-nougat.html>) . *The New York Times*. The Associated Press. August 22, 2016. ISSN 0362-4331 (<https://search.worldcat.org/issn/0362-4331>) . Archived (<https://web.archive.org/web/20160826204244/http://www.nytimes.com/aponline/2016/08/22/business/ap-us-google-android-nougat.html>) from the original on August 26, 2016. Retrieved August 29, 2016.
112. Sprinz, Johannah (January 29, 2022). "Leveraging Human Computation for Quality Assurance in Open Source Communities" (https://www.en.pms.ifi.lmu.de/publications/index.php#BA_Johannah.Sprinz) . *LMU Munich, Department of Computer Science*. doi:10.5282/UBM/EPUB.91046 (<https://doi.org/10.5282%2FUBM%2FEPUB.91046>) .
113. Reilly, Claire (October 8, 2017). "Windows 10 Mobile gets its final death sentence" (<https://www.cnet.com/news/windows-10-mobile-features-hardware-death-sentence-microsoft/>) . *CNET*. Retrieved October 9, 2017.
114. Hruska, Joel (October 9, 2017). "Microsoft Admits Windows 10 Mobile Is Finally, Mercifully Dead" (<https://www.extremetech.com/mobile/257174-microsoft-admits-windows-10-mobile-finally-mercifully-dead>) . *Extremetech*. Retrieved April 3, 2018.
115. Allison, Michael (October 18, 2017). "The Lumia 640 and 640 XL can't handle Microsoft's feature-packed Windows 10 Fall Creators Update" (<https://mspoweruser.com/lumia-640-640-xl-cant-handle-microsofts-feature-packed-windows-10-fall-creators-update/>) . *MSPoweruser*. Retrieved July 20, 2018.
116. Haselton, Todd (January 18, 2019). "Microsoft recommends switching to iPhone or Android as it prepares to kill off Windows phones" (<https://www.cnbc.com/2019/01/18/microsoft-ending-windows-10-mobile-says-switch-to-iphone-or-android.html>) . *CNBC*. CNBC LLC, a Division of NBCUniversal. Retrieved January 19, 2019.
117. Warren, Tom (January 18, 2019). "Microsoft to end Windows 10 Mobile updates and support in December" (<https://www.theverge.com/2019/1/18/18188054/microsoft-windows-phone-windows-10-mobile-end-of-support-updates>) . *The Verge*. Retrieved January 23, 2019.

118. "Gartner Says Mobile Phone Sales Grew 35 Percent in Third Quarter 2010; Smartphone Sales Increased 96 Percent" (<https://web.archive.org/web/20110113073826/http://www.gartner.com/it/page.jsp?id=1466313>) . Gartner, Inc. November 10, 2010. Table 2. Archived from the original (<http://www.gartner.com/it/page.jsp?id=1466313>) on January 13, 2011. Retrieved February 21, 2011.
119. Amadeo, Ron (July 21, 2018). "Google's iron grip on Android: Controlling open source by any means necessary" (<https://arstechnica.com/gadgets/2018/07/googles-iron-grip-on-android-controlling-open-source-by-any-means-necessary/>) . *Ars Technica*.
120. "ICS is coming to AOSP" (<https://groups.google.com/g/android-building/c/T4XZJCZnqF8/m/WkWhGUYb4MAJ>) . *groups.google.com*.
121. Balking carriers and slow OEMs step aside: Google is defragging Android. (<https://arstechnica.com/gadgets/2013/09/balking-carriers-and-slow-oems-step-aside-google-is-defragging-android/>) Archived (<https://web.archive.org/web/20130903011541/http://arstechnica.com/gadgets/2013/09/balking-carriers-and-slow-oems-step-aside-google-is-defragging-android/>) September 3, 2013, at the Wayback Machine *Ars Technica* (<https://arstechnica.com/>) Archived (<https://web.archive.org/web/20170703174116/https://arstechnica.com/>) July 3, 2017, at the Wayback Machine. Retrieved December 24, 2013.
122. "About – DivestOS Mobile" (<https://divestos.org/index.php?page=about>) . *divestos.org*. Retrieved July 30, 2022.
123. "DivestOS: long term device support with enhanced privacy and security" (<https://forum.f-droid.org/t/divestos-long-term-device-support-with-enhanced-privacy-and-security/10105>) . *F-Droid Forum*. June 12, 2020. Retrieved July 30, 2022.
124. Barcza, Marton (June 30, 2021). "How Huawei plans to take over (HarmonyOS explained)" (<https://www.youtube.com/watch?v=el9Wxwui1dw&t=414s/>) . *YouTube*. Retrieved April 22, 2023.
125. "microG Project" (<https://microg.org/>) . *microg.org*.
126. "Flyme 6-Android 5.1-Flyme Official Forum" (<http://forum.flymeos.com/thread-11964-1-1.html>) . Archived (<https://web.archive.org/web/20170805221531/http://forum.flymeos.com/thread-11964-1-1.html>) from the original on August 5, 2017. Retrieved August 5, 2017.
127. Yordan. "Xiaomi CEO announces HyperOS, first to arrive with the Xiaomi 14 series" (https://www.gsmarena.com/xiaomi_ceo_announces_hypermios_first_to_arrive_with_the_xiaomi_14_series-news-60255.php) . *GSMarena.com*. Retrieved March 31, 2024.
128. Vlad. "Xiaomi unveils the official HyperOS logo" (https://www.gsmarena.com/xiaomi_unveils_the_official_hypermios_logo-news-61039.php) . *GSMarena.com*. Retrieved September 19, 2024.

129. "Nothing Phone (2a) - Nothing India" (<https://in.nothing.tech/pages/phone-2a#nothingos>) .
Nothing.
130. "OnePlus 3" (<https://oneplus.net/3/oxygenos>) . *oneplus.net*. Archived (<https://web.archive.org/web/20160921180138/https://oneplus.net/3/oxygenos>) from the original on September 21, 2016. Retrieved September 9, 2016.
131. Enrique. "OnePlus Nord2's Oxygen OS is merged with Oppo's Color OS" (https://www.gsmarena.com/oneplus_nord2s_oxygen_os_is_now_based_on_color_os-news-50205.php) .
GSMarena.com. Retrieved September 19, 2024.
132. "Kernel Design" (<https://www.chromium.org/chromium-os/chromiumos-design-docs/chromium-os-kernel>) . *The Chromium Projects*.
133. "Nemo" (<https://wiki.merproject.org/wiki/Nemo>) . *Mer Wiki*. Retrieved August 20, 2013.
134. "The Nemo Mobile Open Source Project on Ohloh" (<https://archive.today/20130729164508/http://www.ohloh.net/p/nemomobile>) . Ohloh.net. Archived from the original (<http://www.ohloh.net/p/nemomobile>) on July 29, 2013. Retrieved August 20, 2013.
135. Marko Saukko (February 3, 2013), *Porting Nemo Mobile and Mer Project to new Hardware* (https://archive.fosdem.org/2013/schedule/event/porting_nemo_mobile_and_mer/) , FOSDEM 2013, retrieved July 29, 2013
136. Makuch, Eddie (September 25, 2013). "Valve reveals Steam Machines" (<https://web.archive.org/web/20130930035955/http://uk.gamespot.com/news/valve-reveals-steam-machines-6414959>) . *GameSpot*. Archived from the original (<http://uk.gamespot.com/news/valve-reveals-steam-machines-6414959>) on September 30, 2013. Retrieved September 30, 2013.
137. Duckett, Chris (July 16, 2021). "Steam Deck is an AMD-powered handheld PC from Valve that runs KDE on Arch Linux" (<https://www.zdnet.com/article/steam-deck-is-an-amd-powered-handheld-pc-from-valve-that-runs-kde-on-arch-linux/>) . *ZDNet*. Retrieved July 16, 2021.
138. "Tech Specs" (<https://www.steamdeck.com/en/tech>) . *Steam Deck*. Valve Corporation. Retrieved July 16, 2021.
139. Welcome to Tizen! (<https://www.tizen.org/blogs/dawnfoster/2011/welcome-tizen>) Archived (<https://web.archive.org/web/20111013071516/https://www.tizen.org/blogs/dawnfoster/2011/welcome-tizen>) October 13, 2011, at the Wayback Machine. Tizen.org (September 27, 2011). Retrieved on July 3, 2012.

140. Ricker, Thomas. (September 28, 2011) [MeeGo is dead: Meet Tizen, another new open source OS based on Linux](http://thisismynext.com/2011/09/28/meego-dead-meet-tizen-open-source-os-based-linux/) (<http://thisismynext.com/2011/09/28/meego-dead-meet-tizen-open-source-os-based-linux/>) Archived (<https://web.archive.org/web/20110930051802/http://thisismynext.com/2011/09/28/meego-dead-meet-tizen-open-source-os-based-linux/>) September 30, 2011, at the [Wayback Machine](#). Thisismynext.com. Retrieved on July 3, 2012.
141. "Tizen 2.1 SDK and Source Code Release" (<https://www.tizen.org/blogs/tsg/2013/tizen-2.1-sdk-and-source-code-release>) . Tizen.org. Archived (<https://web.archive.org/web/20130730123852/https://www.tizen.org/blogs/tsg/2013/tizen-2.1-sdk-and-source-code-release>) from the original on July 30, 2013.
142. "Side-by-Side Refrigerator with Family Hub (RS27T5561SR) | Samsung US" (<https://www.samsung.com/us/home-appliances/refrigerators/side-by-side/26-7-cu-ft-large-capacity-side-by-side-refrigerator-with-touch-screen-family-hub--in-stainless-steel-rs27t5561sr-aa/>) . *Samsung Electronics America*. Retrieved June 25, 2020.
143. "The emerging OS" (<https://www.kaiotech.com/>) . KaiOS. Retrieved March 27, 2019.
144. "Can I access the source code? • KaiOS" (<https://support.kaiotech.com/support/solutions/articles/35000078432-can-i-access-the-source-code->) . *Support.kaiotech.com*.
145. "KaiOS/B2G repository" (<https://github.com/kaiotech/gecko-b2g>) . *GitHub*. January 10, 2022.
146. "KaiOS is doing well in India, but it's pulling some big numbers in US too" (<https://www.androidauthority.com/kaio-usa-india-958519/>) . *Android Authority*. March 1, 2019.
147. Amadeo, Ron (May 8, 2017). "Google's "Fuchsia" smartphone OS dumps Linux, has a wild new UI" (<https://arstechnica.com/gadgets/2017/05/googles-fuchsia-smartphone-os-dumps-linux-has-a-wild-new-ui/>) . *Ars Technica*.
148. Swapnil Bhartiya (July 25, 2015). "KDE Community announces fully open source Plasma Mobile" (<http://www.itworld.com/article/2952189/linux/kde-community-announces-fully-open-source-plasma-mobile.html>) . *ITworld*. Retrieved August 23, 2015.
149. Bhartiya, Swapnil (July 25, 2015). "Sebastian Kügler: KDE's Plasma Mobile is running on Plasma 5 and Kubuntu" (<http://www.itworld.com/article/2952574/open-source-tools/sebastian-kugler-kdes-plasma-mobile-is-running-on-plasma-5-and-kubuntu.html>) . *ITworld*. Retrieved August 23, 2015.

150. Verma, Ardash (April 25, 2018). "Open Source Smartphone Librem 5 Will Officially Support Ubuntu Touch" (<https://www.ultimate-tech-news.com/open-source-smartphone-librem-5-will-officially-support-ubuntu-touch/>) . Fossbytes. Archived (<https://web.archive.org/web/20180612143819/https://fossbytes.com/librem-5-ubuntu-touch-support/>) from the original on June 12, 2018. Retrieved August 29, 2018.
151. K ugler, Sebastian (July 25, 2015). "Plasma Mobile, a Free Mobile Platform" (<https://dot.kde.org/2015/07/25/plasma-mobile-free-mobile-platform>) . KDE.news. Retrieved April 28, 2019.
152. "KDE Reveals Plasma Mobile" (<https://www.linuxjournal.com/content/kde-reveals-plasma-mobile>) . linuxjournal.com.
153. Jensen, Dan Leinir Turthra (July 26, 2015). "Shashlik: Android Applications on Real Linux – Academy 2015 Program" (<https://conf.kde.org/en/academy2015/public/events/198>) . kde.org. Retrieved April 28, 2019.
154. Tung, Liam (November 30, 2018). "First truly open-source smartphone? Necuno unveils its KDE on Linux handset" (<https://www.zdnet.com/article/first-truly-open-source-smartphone-necuno-unveils-its-kde-on-linux-handset/>) . ZDNet. Archived (<https://web.archive.org/web/20190307013437/https://www.zdnet.com/article/first-truly-open-source-smartphone-necuno-unveils-its-kde-on-linux-handset/>) from the original on March 7, 2019. Retrieved March 7, 2019.
155. "FSF adds PureOS to list of endorsed GNU/Linux distributions – Free Software Foundation – Working together for free software" (<https://www.fsf.org/news/fsf-adds-pureos-to-list-of-endorsed-gnu-linux-distributions-1>) . www.fsf.org.
156. Byfield, Bruce (2018). "Librem 5 and the Challenge of the Free Phone" (<https://www.linux-magazine.com/Online/Features/Librem-5-and-the-Challenge-of-the-Free-Phone>) . Linux Magazine. Archived (<https://web.archive.org/web/20180904033844/https://www.tomshardware.com/news/purism-librem-5-january-2019,37216.html>) from the original on September 4, 2018. Retrieved August 29, 2018.
157. Holwerda, Thom (August 24, 2017). "Librem 5: a security and privacy focused GNU/Linux smartphone" (<https://www.osnews.com/story/29979/librem-5-a-security-and-privacy-focused-gnulinix-smartphone/>) . OSNews. Archived (https://web.archive.org/web/20180829124356/http://www.osnews.com/story/29979/Librem_5_a_security_and_privacy_focused_GNU_Linux_smartphone) from the original on August 29, 2018. Retrieved August 29, 2018.
158. Gripsg rd, Marius; Sprinz, Johannah (2017). "Ubuntu Touch is alive! Meet the UBports Community" (<https://spri.nz/talks/2017/ubucon-europe/>) . Ubucon Europe 2017. doi:10.13140/RG.2.2.31377.92004 (<https://doi.org/10.13140%2FRG.2.2.31377.92004>) .

159. Sprinz, Johannah (2018). "One year after the world ended - Ubuntu Touch today" (<https://spri.nz/talks/2018/ubucon-europe/>) . *Ubucon Europe 2018*. doi:10.13140/RG.2.2.25859.78886 (<https://doi.org/10.13140%2FRG.2.2.25859.78886>) .
160. Sprinz, Johannah (2019). "Exciting developments around Linux on Phones: Ubuntu Touch, Plasma Mobile, Halium, PinePhone, and VollaPhone" (<https://spri.nz/talks/2019/36c3-lightning/>) . *36th Chaos Communication Congress*. doi:10.13140/RG.2.2.19633.86884 (<https://doi.org/10.13140%2FRG.2.2.19633.86884>) .
161. Sprinz, Johannah (2019). "State of the Touch: Ubuntu on phones and tablets" (<https://spri.nz/talks/2019/ubucon-europe/>) . *Ubucon Europe 2019*. doi:10.13140/RG.2.2.19148.90248 (<https://doi.org/10.13140%2FRG.2.2.19148.90248>) .
162. "ContainerArchitecture" (<https://wiki.ubuntu.com/Touch/ContainerArchitecture>) . Archived (<https://web.archive.org/web/20161031024511/https://wiki.ubuntu.com/Touch/ContainerArchitecture>) from the original on October 31, 2016. Retrieved October 30, 2016.
163. "Ubuntu Touch • Linux Phone" (<https://devices.ubuntu-touch.io/>) . *devices.ubuntu-touch.io*. Retrieved February 3, 2022.
164. *UBports Installer* (<https://github.com/ubports/ubports-installer>) , UBports, February 2, 2022, retrieved February 3, 2022
165. Lunden, Ingrid (February 26, 2015). "Apple Took 89% Of Q4 Smartphone Profits With Android OEMs In A Race To The Bottom" (<https://techcrunch.com/2015/02/26/apple-eating-all-the-profits/>) . Archived (<https://web.archive.org/web/20170715110736/https://techcrunch.com/2015/02/26/apple-eating-all-the-profits/>) from the original on July 15, 2017.
166. "B2G – MozillaWiki" (<https://wiki.mozilla.org/B2G>) . mozilla.org. August 24, 2011. Archived (<https://web.archive.org/web/20110807222134/https://wiki.mozilla.org/B2G>) from the original on August 7, 2011. Retrieved September 7, 2011.
167. Paul, Ryan (July 25, 2011). "Mozilla eyes mobile OS landscape with new Boot to Gecko project" (<https://arstechnica.com/open-source/news/2011/07/mozilla-eyes-mobile-os-landscape-with-new-boot-to-gecko-project.ars>) . Arstechnica.com. Archived (<https://web.archive.org/web/20110912005225/http://arstechnica.com/open-source/news/2011/07/mozilla-eyes-mobile-os-landscape-with-new-boot-to-gecko-project.ars>) from the original on September 12, 2011. Retrieved September 7, 2011.

168. "B2G OS and Gecko Announcement from Ari Jaaksi & David Bryant" (<https://groups.google.com/forum/#!msg/mozilla.dev.fxos/FoAwifahNPY/Lppm0VHVBAAJ>) . 27 September 2016. Archived (<http://arquivo.pt/wayback/20110122130054/https://groups.google.com/forum/#!msg/mozilla.dev.fxos/FoAwifahNPY/Lppm0VHVBAAJ>) from the original on 22 January 2011. Retrieved 27 September 2016.
169. "Introducing the Nokia N9: all it takes is a swipe! | Nokia Conversations – The official Nokia Blog" (<https://web.archive.org/web/20110624125835/http://conversations.nokia.com/2011/06/21/introducing-the-nokia-n9-all-it-takes-is-a-swipe/>) . Nokia. June 21, 2011. Archived from the original (<http://conversations.nokia.com/2011/06/21/introducing-the-nokia-n9-all-it-takes-is-a-swipe/>) on June 24, 2011. Retrieved September 7, 2011.
170. "MeeGo Not Dead Yet as LG Continues the Charge – Mobile Technology News" (<http://gigaom.com/mobile/meego-not-dead-yet-as-lg-continues-the-charge/>) . Gigaom.com. April 29, 2011. Archived (<https://web.archive.org/web/20110829160853/http://gigaom.com/mobile/meego-not-dead-yet-as-lg-continues-the-charge/>) from the original on August 29, 2011. Retrieved September 7, 2011.
171. "HP Confirms Discussions with Autonomy Corporation plc Regarding Possible Business Combination; Makes Other Announcements" (<http://www.hp.com/hpinfo/newsroom/press/2011/110818b.html?mtxs=rss-corp-news>) . HP. August 18, 2010. Archived (<https://web.archive.org/web/20111006182519/http://www.hp.com/hpinfo/newsroom/press/2011/110818b.html?mtxs=rss-corp-news>) from the original on October 6, 2011. Retrieved September 13, 2011.
172. "The next chapter for webOS" (<https://web.archive.org/web/20110924172749/http://developer.palm.com/blog/2011/08/the-next-chapter-for-webos/>) . HP webOS Developer Blog. August 19, 2010. Archived from the original (<http://developer.palm.com/blog/2011/08/the-next-chapter-for-webos/>) on September 24, 2011. Retrieved September 13, 2011.
173. "Open webOS::Roadmap" (<https://web.archive.org/web/20121029145336/http://www.openwebosproject.org/discover/roadmap#.UlgNYMXA-So>) . Open webOS Project. September 2012. Archived from the original (<http://www.openwebosproject.org/discover/roadmap#.UlgNYMXA-So>) on October 29, 2012. Retrieved October 24, 2012.
174. Samsung scraps Bada OS, folds it into Tizen – FierceMobileIT (<http://www.fiercemobilecontent.com/story/samsung-scraps-bada-os-folds-it-tizen/2013-02-25>) Archived (<https://web.archive.org/web/20130228062542/http://www.fiercemobilecontent.com/story/samsung-scraps-bada-os-folds-it-tizen/2013-02-25>) February 28, 2013, at the Wayback Machine. Fiercemobilecontent.com (February 25, 2013). Retrieved on December 9, 2013.

175. Arthur, Charles (September 29, 2014). "Ten things to know about BlackBerry – and how much trouble it is (or isn't) in" (<https://www.theguardian.com/technology/2014/sep/29/ten-things-to-know-blackberry-john-chen>) . *The Guardian*. Archived (<https://web.archive.org/web/20150528152319/http://www.theguardian.com/technology/2014/sep/29/ten-things-to-know-blackberry-john-chen>) from the original on May 28, 2015. Retrieved April 19, 2015.
176. McLaughlin, Kevin (December 17, 2009). "BlackBerry Users Call For RIM To Rethink Service" (<http://www.crn.com/news/client-devices/222002587/blackberry-users-call-for-rim-to-rethink-service.htm>) . CRN.com. Archived (<https://web.archive.org/web/20110907082336/http://www.crn.com/news/client-devices/222002587/blackberry-users-call-for-rim-to-rethink-service.htm>) from the original on September 7, 2011. Retrieved December 15, 2011.
177. O'RourkeJan, Patrick (January 4, 2017). "BlackBerry has no plans to release new BB10 devices [Update]" (<http://mobilesyrup.com/2017/01/04/blackberry-has-no-plans-to-release-new-bb10-devices/>) . Archived (<https://web.archive.org/web/20170105175452/http://mobilesyrup.com/2017/01/04/blackberry-has-no-plans-to-release-new-bb10-devices/>) from the original on January 5, 2017.
178. "Android and iOS Squeeze the Competition, Swelling to 96.3% of the Smartphone Operating System Market for Both 4Q14 and CY14, According to IDC" (<https://web.archive.org/web/20150225074430/http://www.idc.com/getdoc.jsp?containerId=prUS25450615>) . *IDC.com*. February 24, 2015. Archived from the original (<http://www.idc.com/getdoc.jsp?containerId=prUS25450615>) on February 25, 2015.
179. "BlackBerry 10 and BlackBerry OS Services FAQ – End of Life" (<https://www.blackberry.com/us/en/support/devices/end-of-life>) . Retrieved September 19, 2020.
180. "Microsoft is killing off Nokia's feature phones in favor of Windows Phone" (<https://www.theverge.com/2014/7/17/5912289/microsoft-kills-feature-phones-in-favor-of-windows-phone>) . July 17, 2014. Archived (<https://web.archive.org/web/20170808154613/https://www.theverge.com/2014/7/17/5912289/microsoft-kills-feature-phones-in-favor-of-windows-phone>) from the original on August 8, 2017.
181. Rodgers, Evan (June 26, 2013). "Windows 8.1: a first look at what Microsoft is changing" (<http://www.theverge.com/2013/6/26/4465888/windows-8-1-preview-video>) . *The Verge*. Vox Media. Retrieved August 6, 2013.
182. "Windows 8's delivery date: October 26" (<https://www.zdnet.com/article/windows-8s-delivery-date-october-26/>) . *ZDNet*. CBS Interactive. July 18, 2012. Retrieved September 17, 2012.

183. "Windows Reimagined" (<https://allthingsd.com/20121014/microsoft-starts-tv-advertising-countdown-to-windows-8-launch/?refcat=news>) . *All Things Digital*. Dow Jones & Company. Retrieved October 21, 2012.
184. Paul, Ian. "How to Take Screenshots in Windows 10, 8, and 7" (<https://www.lifewire.com/take-screenshot-windows-7-8-10-4049964>) . *Lifewire*. Retrieved April 7, 2023.
185. "64 million smart phones shipped worldwide in 2006" (<http://www.canalys.com/newsroom/64-million-smart-phones-shipped-worldwide-2006>) . Canalys, Inc. Archived (<https://web.archive.org/web/20120106153828/http://www.canalys.com/newsroom/64-million-smart-phones-shipped-worldwide-2006>) from the original on January 6, 2012. Retrieved January 13, 2012.
186. "Gartner Says Worldwide Sales of Smartphones Returned to Growth in First Quarter of 2018" (<http://www.gartner.com/en/newsroom/press-releases/2018-05-29-gartner-says-worldwide-sales-of-smartphones-returned-to-growth-in-first-quarter-of-2018>) . *Gartner, Inc.* Gartner. May 29, 2018. Retrieved August 25, 2018.
187. "Desktop vs Mobile vs Tablet vs Console Market Share Worldwide | StatCounter Global Stats" (<https://gs.statcounter.com/platform-market-share#monthly-201606-201709>) . *StatCounter Global Stats*. Retrieved October 20, 2017.
188. "Desktop vs Mobile vs Tablet vs Console Market Share Worldwide" (<https://web.archive.org/web/20170404045210/http://gs.statcounter.com/platform-market-share>) . *StatCounter Global Stats*. Archived from the original (<https://gs.statcounter.com/platform-market-share>) on April 4, 2017.
189. "Desktop vs Mobile vs Tablet vs Console Market Share Europe" (<https://web.archive.org/web/20170420235518/http://gs.statcounter.com/platform-market-share/all/europe/>) . *StatCounter Global Stats*. Archived from the original (<https://gs.statcounter.com/platform-market-share/all/europe/>) on April 20, 2017.
190. "India amongst world leaders in use of mobile to surf the internet" (<https://gs.statcounter.com/press/india-amongst-world-leaders-in-use-of-mobile-to-surf-the-internet>) (Press release). March 28, 2017. Archived (<https://web.archive.org/web/20170422123848/http://gs.statcounter.com/press/india-amongst-world-leaders-in-use-of-mobile-to-surf-the-internet>) from the original on April 22, 2017.
191. "Operating System Market Share India" (<https://web.archive.org/web/20170422033545/http://gs.statcounter.com/os-market-share/all/india/>) . *StatCounter Global Stats*. Archived from the original (<https://gs.statcounter.com/os-market-share/all/india/>) on April 22, 2017.

192. "Comparison from W34 to W45 2015" (<https://gs.statcounter.com/#all-comparison-ww-weekly-201634-201645>) . *StatCounter Global Stats*. Archived (<https://web.archive.org/web/20170420175502/http://gs.statcounter.com/#all-comparison-ww-weekly-201634-201645>) from the original on April 20, 2017.
193. "StatCounter Global Stats – Browser, OS, Search Engine including Mobile Usage Share" (<http://gs.statcounter.com/#all-comparison-ww-weekly-201645-201645-map>) . Archived (https://archive.today/20120526/http://gs.statcounter.com/%23mobile_browser-ww-monthly-201012-201111-bar#all-comparison-ww-weekly-201645-201645-map) from the original on May 26, 2012.
194. "Operating System Market Share Puerto Rico" (<https://web.archive.org/web/20170623104625/http://gs.statcounter.com/os-market-share/all/puerto-rico>) . *StatCounter Global Stats*. Archived from the original (<https://gs.statcounter.com/os-market-share/all/puerto-rico/>) on June 23, 2017.
195. "StatCounter Global Stats – Browser, OS, Search Engine including Mobile Usage Share" (<http://gs.statcounter.com/#all-comparison-ww-daily-20160628-20161114>) . Archived (https://archive.today/20120526/http://gs.statcounter.com/%23mobile_browser-ww-monthly-201012-201111-bar#all-comparison-ww-daily-20160628-20161114) from the original on May 26, 2012.
196. "StatCounter Global Stats – Browser, OS, Search Engine including Mobile Usage Share" (<http://gs.statcounter.com/#all-comparison-ww-daily-20161024-20170430>) . *statcounter.com*. Archived (https://archive.today/20120526/http://gs.statcounter.com/%23mobile_browser-ww-monthly-201012-201111-bar#all-comparison-ww-daily-20161024-20170430) from the original on May 26, 2012. Retrieved March 22, 2017.
197. "Mobile and tablet Internet usage exceeds desktop for first time worldwide" (<http://gs.statcounter.com/press/mobile-and-tablet-internet-usage-exceeds-desktop-for-first-time-worldwide>) . *StatCounter* (Press release). Archived (<https://web.archive.org/web/20161101170640/http://gs.statcounter.com/press/mobile-and-tablet-internet-usage-exceeds-desktop-for-first-time-worldwide>) from the original on November 1, 2016.
198. "IDC Worldwide Smartphone Forecast 2023-2027" (<https://www.idc.com/getdoc.jsp?containerId=prUS51434423>) . *IDC*. Retrieved September 9, 2024.
199. "Smartphone Shipments Fall 18% in Q4 2022" (<https://www.canalys.com/newsroom/smartphone-shipments-Q4-2022>) . *Canalys*. Retrieved September 9, 2024.
200. "Global Smartphone Market Rebounded Strongly in 2021" (<https://www.counterpointresearch.com/global-smartphone-market-tracker/>) . *Counterpoint Research*. Retrieved September 9, 2024.

201. "Gartner Says Worldwide Smartphone Sales Declined 12.5% in 2020" (<https://www.gartner.com/en/newsroom/press-releases/2021-02-22-gartner-says-worldwide-smartphone-sales-declined-12-5-percent-in-2020>) . *Gartner*. Retrieved September 9, 2024.
202. "Gartner Says Worldwide Smartphone Sales Declined for the First Time in 2019" (<https://www.gartner.com/en/newsroom/press-releases/2020-02-25-gartner-says-worldwide-smartphone-sales-declined-for-the-first-time-in-2019>) . *Gartner*. Retrieved September 9, 2024.

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- [Apple \(https://www.apple.com/\)](https://www.apple.com/)
- [Update Your Mobile Operating System \(https://www.techtadka.online/2023/12/how-to-Update-Your-Mobile-Operating-System.html\)](https://www.techtadka.online/2023/12/how-to-Update-Your-Mobile-Operating-System.html)