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Computer operating systems "Windows" redirects here. For the part of a building, see Windows (disambiguation). This article by adding citations to reliable sources. Unsourced material may be challenged and removed. Find sources: "Microsoft
Windows" - news · newspapers · books · scholar · JSTOR (December 2024) (Learn how and when to remove this message) Operating system WindowsLogo as of October 2021DeveloperMicrosoftSource modelClosed-sourceSource available (through Shared Source Initiative)Initial releaseNovember 20, 1985; 39 years ago (1985-11-20)Latest
release 24H2 (10.0.26100.4061) (May 13, 2025; 12 days ago (2025-05-13)[1]) [\pm] Latest preview Release Previ
ago (2025-05-19)[5]) [±] Canary Channel 10.0.27863.1000 (May 23, 2025; 2 days ago (2025-05-23)[6]) [±]Marketing targetPersonal computingAvailable in110 languagesUpdate methodWindows UpdateMicrosoft StoreWindows Server Update Services (WSUS)Package managerWindows Installer (.msi, .msp),[7] App Installer (.msix, .[8] msixbundle[9]
[10]), Microsoft Store (.appx, .appxbundle),[11] Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, ItaniumKernel type Windows Package ManagerPlatformsIA-32, x86-64, ARM64 Previously: 16-bit x86, DEC Alpha, MIPS, PowerPC, P
 interfaceWindows shellLicenseProprietary commercial softwareOfficial websitewindows.com Windows is a product line of proprietary graphical operating systems developed and marketed by Microsoft. It is grouped into families and subfamilies that cater to particular sectors of the computing industry - Windows (unqualified) for a consumer or
corporate workstation, Windows Server for a server and Windows IoT for an embedded system. Windows is sold as either a consumer retail product or licensed to third-party hardware manufacturers who sell products bundled with Windows Icitation needed The first version of Windows, Windows 1.0, was released on November 20, 1985, as a
graphical operating system shell for MS-DOS in response to the growing interest in graphical user interfaces (GUIs).[12] The name "Windows 9x, Windows 9x, Windows
 Mobile, Windows Phone, and Windows CE/Embedded Compact. Windows is the most popular desktop operating system in the world, with a 70% market share as of March 2023[update], according to StatCounter;[14] however when including mobile operating systems, it is in second place, behind Android.[15] The most recent version of Windows is
 Windows 11 for consumer PCs and tablets, Windows 11 Enterprise for corporations, and Windows Server 2025 for servers. Still supported are some editions of Windows Server 2008).[16][17] This section needs additional citations for verification. Please help
improve this article by adding citations to reliable sources in this section. Unsourced material may be challenged and removed. (December 2024) (Learn how and when to remove this message) As of 2025, [update] the only active top-level family is Windows NT.[citation needed] The first version, Windows NT 3.1, was intended for server computing and
corporate workstations. It grew into a product line of its own and now consists of four sub-families that tend to be released almost simultaneously and share the same kernel. Windows (unqualified): For a consumer or corporate workstation or tablet. The latest version is Windows 11.[citation needed] Its main competitors are macOS by Apple and
Linux for personal computers and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server computer and this sub-family of it. Windows Server: For a server computer and this sub-family of it. Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer and iPadOS and Android for tablets (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer share by category) and table share by category (cf. Usage share of operating systems § Market share by category). Of note: "Windows Server: For a server computer share by category (cf. Usage share of operating systems § Market share by category (cf. Usage share of operating systems § Market share by category (cf. Usage share of operating systems § Market share by category (cf. Usage share of operating systems § Market share by category (cf. Usage share of operating systems § Market share by category (cf. Usage share of operating systems § Market
naming scheme. The main competitor of this family is Linux. (cf. Usage share of operating systems § Market share by category) Windows PE: A lightweight version of its Windows sibling, meant to operate as a live operating system, used for installing Windows on bare-metal computers (especially on many computers at once), recovery, or
troubleshooting purposes. The latest version is Windows PE 10.[citation needed] Windows Ferver, the main competitor of this family is Linux. (cf. Usage share of operating systems § Market share by category)
 These top-level Windows families are no longer actively developed: Windows 9x: Intended exclusively for the consumer market. The first version was Windows 95, which was followed by Windows 95. Which was followed by Windows 98. The last version of the World was Windows 95, which was followed by Windows 95.
labeling it as "Mistake Edition" and placing it 4th in their list of Worst Tech Products in 2006[19]). All versions of the Windows 95. This line has since been defunct, with Microsoft now catering to the consumer market with Windows NT
starting with Windows XP.[citation needed] Windows Mobile: The predecessor to Windows Mobile 2003, was the first version to adopt the Windows Mobile trademark. The last published version was Windows Mobile 6.5.
Windows Phone: Sold only to smartphone manufacturers. The first version was Windows Phone 8.1. It was succeeded by Windows Phone 8.1. It was succeeded by Windows Phone 8.1. It was former name, Windows Phone 8.1. It was succeeded by Windows Phone 8.1. I
optimized for low power and memory systems, with OEMs able to modify the UI to suit their needs. The final version was Windows Embedded Compact 2013, and it is succeeded by Windows versions The term Windows collectively describes any
or all of several generations of Microsoft operating system products. These products are generally categorized as follows: Main articles: Windows 2.0, and Windows 2.0, and Windows 4.0, and Wind
system was one of the first to use graphical boxes to represent programs; in the industry, at the time, these were called "windows" and the underlying software was called "windows", but Windows" and the underlying software was called "windows" and the underlying software was called
 November 1985.[20] Windows 1.0 was to compete with Apple's operating system, but achieved little popularity. Windows 1.0 is a program known as the MS-DOS Executive. Components included Calculator, Calendar, Cardfile, Clipboard Viewer, Clock, Control
 Panel, Notepad, Paint, Reversi, Terminal and Write. Windows 1.0 does not allow overlapping windows are tiled. Only modal dialog boxes may appear over other windows are tiled. Only modal dialog boxes may appear over other windows are tiled. Only modal dialog boxes may appear over other windows are tiled.
was released in December 1987, and was more popular than its predecessor. It features several improvements to the user interface and memory management. [22] Windows 2.03 changed the OS from tiled windows to overlapping windows to overlapping windows to overlapping windows to overlapping windows 2.03 changed the OS from tiled windows to overlapping windows 2.03 changed the OS from tiled windows to overlapping windows 2.03 changed the OS from tiled windows 2.03 changed the OS from ti
copyrights (eventually settled in court in Microsoft's favor in 1993).[23][24] Windows 2.0 also introduced more sophisticated keyboard shortcuts and Could make use of expanded memory. Windows/386 uses the virtual 8086 mode of the Intel 80386 to multitask
several DOS programs and the paged memory would to emulate expanded memory using available extended memory using available extended memory would to emulate expanded memory area. [25] In addition to full Windows packages, there were runtime-only versions that
 shipped with early Windows software from third parties and made it possible to run their Windows are often thought of as graphical shells, mostly because they ran on top of MS-DOS and used it for file system services. [26] However, even the earliest
Windows versions already assumed many typical operating system functions; notably, having their own executable file format and providing their own device drivers (timer, graphics, printer, mouse, keyboard and sound). Unlike MS-DOS, Windows allowed users to execute multiple graphical applications at the same time, through cooperative
multitasking. Windows implemented an elaborate, segment-based, software virtual memory scheme, which allows it to run applications larger than available memory became scarce; data segments moved in memory when a given application had relinquished processor
control. Main articles: Windows 3.0 and Windows 3.0, released in 1990 Windows 3.0, released in 1990, improved the design, mostly because of virtual memory and loadable virtual device drivers (VxDs) that allow Windows 3.0, released in 1990, improved the design, mostly because of virtual memory and loadable virtual device drivers (VxDs) that allow Windows 3.0, released in 1990, improved the design, mostly because of virtual memory and loadable virtual device drivers (VxDs) that allow Windows 3.0, released in 1990, improved the design, mostly because of virtual memory and loadable virtu
run in protected mode, which gives them access to several megabytes of memory without the obligation to participate in the software virtual memory scheme. They run inside the same address space, where the segmented memory without the obligation to participate in the software virtual memory scheme. They run inside the same address space, where the segmented memory provides a degree of protection. Windows 3.0 also featured improvements to the user interface. Microsoft rewrote
critical operations from C into assembly. Windows 3.0 was the first version of Windows 5 had to be installed from floppy disks by end users (or in professional environments with a network installation); here Windows for Workgroups
with nine 3.5-inch-disks to be inserted sequentially. Windows 3.1, made generally available on March 1, 1992, featured a facelift. In October 1992, Windows 5.1 ended on December 31, 2001.[29]
Windows 3.2, released in 1994, is an updated version of the Chinese language version, as it fixed only issues related to the complex writing system of the Chinese language version, as it fixed only issues related to the complex writing system of the Chinese language. [31] Windows 3.1 [30] The update was limited to this language version, as it fixed only issues related to the complex writing system of the Chinese language.
 Simplified Chinese characters in basic output and some translated utilities. [citation needed] Main articles: Windows 95, Windows 96, and Windows 96, Windows 97, Windows 98, and Windows 98, Windows 98, and Windows 98, Wind
bit applications, plug and play hardware, preemptive multitasking, long file names of up to 255 characters, and provided increased stability over its predecessors. Windows 95 also introduced a redesigned, object oriented user interface, replacing the previous Program Manager with the Start menu, taskbar, and Windows Explorer shell. Windows 95
was a major commercial success for Microsoft; Ina Fried of CNET remarked that "by the time Windows 95, was finally ushered off the market in 2001, it had become a fixture on computer desktops around the world." [32] Microsoft published four OEM Service Releases (OSR) of Windows 95, each of which was roughly equivalent to a service pack. The
first OSR of Windows 95 was also the first version of Windows 95 ended on December 31, 2001.[34] Windows 95 ended on December 31, 2000, and extended support for Windows 95 ended on December 31, 2001.[34] Windows 95 ended on December 31, 2001.[35] Windows 95 ended on December 31, 200
which introduced the Windows Driver Model, support for USB composite devices, support for McPI, hibernation, and support for McPI, hibernation, and support for multi-monitor configurations. Windows 98 also included integration with Internet Explorer 4 through Active Desktop and other aspects of the Windows Driver Model, support for McPI, hibernation, and support for multi-monitor configurations.
 was also made available for Windows 95). In May 1999, Microsoft released Windows 98 Second Edition, an updated version of Windows 98 ended on June 30, 2002, and extended support for Windows 98 ended on
July 11, 2006.[35] On September 14, 2000, Microsoft released Windows Me (Millennium Edition), the last DOS-based version of Windows NT-based counterpart Windows Me incorporated visual interface enhancements from its Windows Me incorporated visual interface enhancements from its Windows NT-based counterpart Windows Me incorporated visual interface enhancements from its Windows NT-based counterpart Windows NT-based version of Windows NT-based version version of Windows NT-based version v
access a real mode DOS environment, removing compatibility with some older programs),[36] expanded multimedia functionality (including Windows Media Player 7, Windows Media Player 8, additional system utilities such as System File
 Protection and System Restore, and updated home networking tools.[37] However, Windows Me was faced with criticism for its speed and instability, along with hardware compatibility issues and its removal of real mode DOS support. PC World considered Windows Me to be one of the worst operating systems Microsoft had ever released, and the
fourth worst tech product of all time.[19] Main articles: Windows NT 3.1, Windows NT 3.5, Windows NT 3.5, Windows NT 3.5, Windows NT 3.5, Windows NT 3.6, Windows NT 3.6, Windows NT 3.7, Windows NT 3.7, Windows NT 3.7, Windows NT 3.8, Wind
Mark Lucovsky) began work on a revamped version of IBM and Microsoft's OS/2 operating system known as "NT OS/2". NT OS/2 was intended to be a secure, multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular, portable kernel with preemptive multi-user operating system with POSIX compatibility and a modular with preemptive multi-user operating system with preemptive multi-user operating system with preemptive multi-user operating system with preemptive multi-user operations and preemptive multi-user operations are not a modular with preemptive multi-user operations and preemptive multi-user operations are not a modular with preemptive multi-user operations and preemptive multi-user operations are not a modular with a modular with a modu
 successful release of Windows 3.0, the NT development team decided to rework the project to use an extended 32-bit port of the Windows APIs (allowing existing Windows applications to easily be ported to the platform), but also supported the
capabilities of the existing NT kernel. Following its approval by Microsoft's staff, development continued on what was now Windows NT, the first 32-bit version of Windows NT was the first Windows operating system based on a hybrid
kernel. The hybrid kernel was designed as a modified microkernel, influenced by the Mach microkernel developed by Richard Rashid at Carnegie Mellon University, but without meeting all of the criteria of a pure microkernel to associate it with Windows 3.1) was released in
July 1993, with versions for desktop workstations and support for Novell's NetWare, and was followed up by Windows NT 3.51 in May 1995, which included additional improvements and support for the PowerPC architecture. Windows NT 4.0 was
 released in June 1996, introducing the redesigned interface of Windows YF at this point in order to put a greater focus on the Windows brand.[39] Main article: Windows XP A variation of the 2001-2006 Windows logo
from 2003 using the Segoe typeface instead of the Franklin Gothic typeface. This variation was mainly used for branding purposes. The next major version of Windows XP, was released to manufacturing (RTM) on August 24, 2001, and to the general public on October 25, 2001. The introduction of Windows XP aimed to unify the
consumer-oriented Windows 9x series with the architecture introduced by Windows NT, a change which Microsoft promised would provide better performance over its DOS-based predecessors. Windows Explorer), streamlined
multimedia and networking features, Internet Explorer 6, integration with Microsoft's .NET Passport services, a "compatibility mode" to help provide backwards compatibility with software designed for previous versions of Windows, and Remote Assistance functionality.[40][41] At retail, Windows XP was marketed in two main editions: the "Home"
edition was targeted towards consumers, while the "Professional" edition was targeted towards business environments and power users, and included additional security and networking features. Home and Professional were later accompanied by the "Media Center" edition (designed for home theater PCs, with an emphasis on support for DVD
playback, TV tuner cards, DVR functionality, and remote controls), and the "Tablet PC" edition (designed for mobile devices meeting its specifications).[42][43][44] Mainstream support for Windows XP ended on April 14, 2009. Extended support ended on
 April 8, 2014.[45] After Windows 2000, Microsoft also changed its release schedules for server operating systems; the server counterpart of Windows Server 2003, was released in April 2003.[39] It was followed in December 2005, by Windows Server 2003 R2. Main article: Windows Vista After a lengthy development process, Windows Server 2004, was released in April 2003.[39] It was followed in December 2005, by Windows Server 2003 R2. Main article: Windows Vista After a lengthy development process, Windows Server 2004, was released in April 2003.[39] It was followed in December 2005, by Windows Server 2003 R2. Main article: Windows Vista After a lengthy development process, Windows Server 2004, was released in April 2003.[39] It was followed in December 2005, by Windows Server 2004, was released in April 2003.[39] It was followed in December 2005, by Windows Server 2004, was released in April 2004.
 Vista was released on November 30, 2006, for volume licensing and January 30, 2007, for consumers. It contained a number of new features. It was available in a number of different editions, and has been subject to some criticism,
 such as drop of performance, longer boot time, criticism of new UAC, and stricter license agreement. Vista's server 2008 R2 were released to manufacturing (RTM) and released to the public three months later on
October 22, 2009. Unlike its predecessor, Windows Vista, which introduced a large number of new features, Windows 7 was intended to be a more focused, incremental upgrade to the Windows Vista was already compatible. [46] Windows 7 has multi-touch
support, a redesigned Windows shell with an updated taskbar with revealable jump lists that contain shortcuts to files frequently used with specific application, [47] a home networking system called HomeGroup, [48] and performance improvements. Main articles: Windows 8 and Windows 8.1 Windows 
logo (2012-2015) Windows 8, the successor to Windows 8, including the introduction of a user interface based around Microsoft's Metro design language with optimizations for touch-based devices such as tablets and all-in-one PCs. These changes
include the Start screen, which uses large tiles that are more convenient for touch interactions and allow for the display of continually updated information, and a new class of apps which are designed primarily for use on touch-based devices. The new Windows version required a minimum resolution of 1024×768 pixels,[49] effectively making it unfit
for netbooks with 800×600-pixel screens. Other changes include increased integration with cloud services and other online platforms (such as social networks and Microsoft's own OneDrive (formerly SkyDrive) and Xbox Live services), the Windows Store service for software distribution, and a new variant known as Windows RT for use on devices that
utilize the ARM architecture, and a new keyboard shortcut for screenshots.[50][51][52][53][54][55][56] An update to Windows 8.1, [57] was released on October 17, 2013, and includes features such as new live tile sizes, deeper OneDrive integration, and many other revisions. Windows 8 and Windows 8.1 have been subject to some
criticism, such as the removal of the Start menu. Main article: Windows 10 Windows 10 Windows 10 Windows 10 Windows 10 Windows 11 Windows 11 Windows 12 Windows 12 Windows 13 Windows 14 Windows 15 Windows 16 Windows 18 Windows 18 Windows 18 Windows 18 Windows 18 Windows 18 Windows 19 Wi
the Start Menu, a virtual desktop system, and the ability to run Windows 7 with SP1, Windows 8.1 and Windows 8.1 a
Windows Update (Windows 7).[58] In February 2017, Microsoft announced the migration of its Windows source code repository, [59] By May 2017, 90 percent of its engineering team was using Git, in about 8500 commits and 1760 Windows builds per
day.[59] In June 2021, shortly before Microsoft updated their lifecycle policy pages for Windows 10, revealing that support for their last release of Windows 10 will end on October 14, 2025.[60][61] On April 27, 2023, Microsoft announced that version 22H2 would be the last of Windows 10.[62][63] Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last of Windows 10.[62][63] Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing that support for their last release of Windows 10, revealing the last release of Wi
logo (2021-present) Main article: Windows 11 On June 24, 2021, Windows 11 was announced as the successor to Windows 10 during a livestream. The new operating system was designed to be more user-friendly and understandable. It was released on October 5, 2021, [64][65] As of May 2022, [update] Windows 11 is a free upgrade to Windows 10 during a livestream.
users who meet the system requirements.[66] See also: Azure Virtual Desktop Not to be confused with Microsoft announced it will start selling subscriptions to virtualized Windows desktops as part of a new Windows 365 service in the following month. The new service will allow for cross-platform usage,
aiming to make the operating system available for both Apple and Android users. It is a separate service will be accessible through any operating system with a web browser. The new service is an attempt at
 capitalizing on the growing trend, fostered during the COVID-19 pandemic, for businesses to adopt a hybrid remote work environment, in which "employees split their time between the office and home". As the service through Google Play or the
 Apple App Store.[68][69][70][71][72] Microsoft announced Windows 365 availability to business and enterprise customers on August 2, 2021.[73] See also: Multilingual User Interface Multilingual support has been built into Windows since Windows 3.0. The language for both the keyboard and the interface can be changed through the Region and
 Language Control Panel. Components for all supported input languages, such as Input Method Editors, are automatically installed during Windows installation (in Windows XP and earlier, files for East Asian languages, such as Chinese, and files for right-to-left scripts, such as Arabic, may need to be installed separately, also from the said Control
 Panel). Third-party IMEs may also be installed if a user feels that the provided one is insufficient for their needs. Since Windows NT have East Asian IMEs (such as Microsoft Pinyin IME and Micros
languages for the operating system are free for download, but some languages are limited to certain editions of Windows. Language Interface Packs (LIPs) are redistributable and may be downloaded from Microsoft's Download Center and installed for any edition of Windows (XP or later) - they translate most, but not all, of the Windows interface, and
require a certain base language (the language which Windows originally shipped with). This is used for most language racks, which translate the complete operating system, are only available for specific editions of Windows (Ultimate and Enterprise editions of Windows Vista and 7, and all editions of Windows 8,
language of installed applications is not affected by changes in the Windows 8 and Win
packs, regardless of type, can be downloaded from a central location. The PC Settings app in Windows Server 2012 R2 also includes a counterpart settings page for this. Changing the interface language also changes the language of preinstalled Windows Store apps (such as Mail, Maps and News) and certain other Microsoft-
developed apps (such as Remote Desktop). The above limitations for language packs are however still in effect, except that full language packs can be installed for any edition except Single Language, which caters to emerging markets. Windows NT included support for several platforms before the x86-based personal computer became dominant in
the professional world. Windows NT 4.0 and its predecessors supported PowerPC, DEC Alpha and MIPS R4000 (although some of the platforms, except the third generation x86 (known as IA-32) or newer in 32-bit mode. The client line of the
 Windows NT family still ran on IA-32 up to Windows 10[66] (the server line of the Windows Server 2008). With the introduction of the Intel Itanium architecture (IA-64), Microsoft released new versions of Windows Server 2008).
 same time as their mainstream x86 counterparts. Windows XP 64-Bit Edition (Version 2003), released in 2003, is the last Windows Server 2012; Windows Server 2018 R2 is the last Windows operating system to support Itanium.
architecture. On April 25, 2005, Microsoft released Windows XP Professional x64 editions to support x86-64 (or simply x64), the 64-bit version of Windows Vista was the first client version of Windows NT to be released simultaneously in IA-32 and x64 editions. As of 2024, x64 is still supported
An edition of Windows 8 known as Windows 8 known as
articles: Windows CE and Windows Phone Windows Embedded Compact), is an edition of Windows Embedded Compact is based on its own dedicated kernel, dubbed Windows CE kernel. Microsoft licenses
Windows CE to OEMs and device makers. The OEMs and device makers can modify and create their own user interfaces and experiences, while Windows CE was used in the Dreamcast along with Sega's own proprietary OS for the console. Windows CE was used in the Dreamcast along with Sega's own proprietary OS for the console. Windows CE was used in the Dreamcast along with Sega's own proprietary OS for the console. Windows CE was used in the Dreamcast along with Sega's own proprietary OS for the console.
 Windows NT kernel. Main article: Xbox system software Xbox OS is an unofficial name given to the version of Windows that runs on Xbox consoles. [75] From Xbox One onwards it is an implementation with an emphasis on virtualization (using Hyper-V) as it is three operating systems running at once, consisting of the core operating system, a second
 implemented for games and a more Windows-like environment for applications. [76] Microsoft updates Xbox One's OS every month, and these updates can be downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox Live service to the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox and subsequently installed, or by using offline recovery images downloaded from the Xbox and subsequently installed from the Xbox and subsequently installed
 kernel, and the latest version runs on an NT 10.0 base. This system is sometimes referred to as "Windows 10 on Xbox One".[78][79] Xbox One and Xbox Series operation hardware,[80] and the Xbox 360's system is
backwards compatible with the original Xbox.[81] Up to and including every version before Windows 2000, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released, Microsoft used an in-house version before Windows 2000 was released and the properties of the propertie
system could not keep up with the size of Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [84] The Windows (and Office) continued to rely on Source Depot. [85] The Windows (and Office) continued to rely on Source Depot. [85] The Windows (and Office) continued to rely on Source Depot. [85] The Windows (and Office) continued to rely on Source Depot. [85] The Windows (and Office) continued to rely on Source Depot
Windows.[87] Microsoft has been working on a new project called the Virtual File System for Git (VFSForGit) to address these challenges.[86] In 2021 the VFS for Git was superseded by Scalar.[88] Legend:Old version, not maintainedOld version, still maintainedOld version, still maintainedOld version Table of Windows versions Product
 name Latest version General availability date Codename Support until[89] Latest version of Mainstream Extended IE DirectX Edge Old version, not maintained: Windows 2.0\ 2.03\ December\ 9, 1987\ - Old version, not maintained: Windows 1.0\ 1.04\ November\ 20, 1985\ Interface\ Manager\ December\ 31, 2001\ - Old version, not maintained: Windows 1.0\ 1.04\ November\ 20, 1985\ Interface\ Manager\ December\ 31, 2001\ - Old version, not maintained: Windows 1.0\ 1.04\ November\ 20, 1985\ Interface\ Manager\ December\ 31, 2001\ - Old version, not maintained: Windows 1.0\ 1.04\ November\ 20, 1985\ Interface\ Manager\ December\ 31, 2001\ - Old version, not maintained: Windows 1.0\ 1.04\ November\ 20, 1985\ Interface\ Manager\ December\ 31, 1985\ Interface\ Manager\ 
Windows 2.1 2.11 May 27, 1988 — Old version, not maintained: Windows 3.0 3.0 May 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 1990 — Old version, not maintained: Windows NT 3.1 NT 3.1.528 July 27, 1993 — December 31, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000 22, 2000
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share As a percentage of desktop and laptop systems using Microsoft Windows 7 2.4% Windows 7 2.4% Windows 7 2.4% Windows 7 2.4% Windows 8 0.2% Windows 8 0.2% Windows 7 2.4% Windows 8 0.2% Windows 8 0.2
since early 2018.[94] For desktop and laptop computers, according to Net Applications and StatCounter (which track the use of operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), Windows was the most used operating systems in devices that are active on the Web), which was also active to the web active on the Web), which was also active to the web active on the Web).
according to StatCounter.[96] Including personal computers of all kinds (e.g., desktops, laptops, mobile devices, and game consoles), Windows OSes accounted for 32.67% of usage share in August 2021, compared to Android (highest, at 46.03%), iOS's 13.76%, iPadOS's 2.81%, and macOS's 2.51%, according to Net Applications[97] and 30.73% of
usage share in August 2021, compared to Android (highest, at 42.56%), iOS/iPadOS's 16.53%, and macOS's 6.51%, according to StatCounter.[98] Those statistics do not include servers (including cloud computing, where Linux has significantly more market share than Windows) as Net Applications and StatCounter use web browsing as a proxy for all
use. This section needs to be updated. Please help update this article to reflect recent events or newly available information. (May 2020) Early versions of Windows were designed at a time where malware and networking were less common, and had few built-in security features; they did not provide access privileges to allow a user to prevent other
users from accessing their files, and they did not provide memory protection to prevent a process from reading or writing another process from code or data used by privileged-mode code. While the Windows 9x series offered the option of having profiles for multiple users with separate profiles and home
 folders, it had no concept of access privileges, allowing any user to edit others' files. In addition, while it ran separate 32-bit applications in separate address spaces, protecting an application's code and data from being read or written by another application, it did not protect the first megabyte of memory from userland applications for compatibility
reasons. This area of memory contains code critical to the functioning of the operating system, and by writing into this area of memory an applications could accidentally write into this region, potentially corrupting important operating system memory,
 which usually resulted in some form of system error and halt. [99] Windows NT was far more secure, implementing access privileges and full memory protection, and, while 32-bit programs meeting the DoD's C2 security rating, [100] yet these advantages were nullified [improper synthesis?] by the fact that, prior to Windows Vista, the default user
account created during the setup process was an administrator account; the user, and any program the user launched, had full access to the machine. Though Windows XP did offer an option of turning administrator accounts into limited accounts, the majority of home users did not do so, partially due to the number of programs which required
administrator rights to function properly. As a result, most home users still ran as administrator all the time. These architectural flaws, combined with Windows a frequent target of computer worm and virus writers.[101][102][103] Furthermore, although Windows NT and its successors are designed for security
 (including on a network) and multi-user PCs, they were not initially designed with Internet security in mind as much, since, when it was first developed in the early 1990s, Internet use was less prevalent.[104] In a 2002 strategy memo entitled "Trustworthy computing" sent to every Microsoft employee, Bill Gates declared that security should become
Microsoft's highest priority.[105][106] Windows Vista introduced a privilege elevation system called User Account Control.[107] When logging in as a standard user, a logon session is created and a token containing only the most basic privileges is assigned. In this way, the new logon session is incapable of making changes that would affect the entire
system. When logging in as a user in the Administrators group, two separate tokens are assigned. The first token contains all privileges typically awarded to an administrator, and the second is a restricted token similar to what a standard user would receive. User applications, including the Windows shell, are then started with the restricted token,
resulting in a reduced privilege environment even under an Administrator account. When an application requests higher privileges or "Run as administrator credentials if the account requesting the elevation is not a member of the administrators group),
start the process using the unrestricted token.[108] Leaked documents from 2013 to 2016 codenamed Vault 7 detail the capabilities of the CIA to perform electronic surveillance and cyber warfare,[109] such as the ability to compromise operating systems such as Windows.[110] In August 2019, computer experts reported that the BlueKeep security
vulnerability, CVE-2019-0708, that potentially affects older unpatched Windows versions via the program's Remote Desktop Protocol, allowing for the possibility of remote code execution, may include related flaws, collectively named DejaBlue, affecting newer Windows versions (i.e., Windows 7 and all recent versions) as well.[111] In addition, experts
reported a Microsoft security vulnerability, CVE-2019-1162, based on legacy code involving Microsoft CTF and ctfmon (ctfmon.exe), that affects all Windows VP to the then most recent Windows Update service
approximately once a month (usually the second Tuesday of the month), although critical updates are made available at shorter intervals when necessary.[113] Versions subsequent to Windows XP implemented automatic download and installation of updates, substantially increasing the number of users installing security
updates.[114] Windows integrates the Windows Defender antivirus, which is seen as one of the best available.[115] Windows SmartScreen. In July 2024, Microsoft signalled an intention to limit kernel access and improve
overall security, following a highly publicised CrowdStrike update that caused 8.5 million Windows PCs to crash.[116] Part of that initiative is to rewrite parts of Windows versions from Windows versions from Windows NT 3 have been based on a file system permission system referred to as AGDLP (Accounts, Global,
 Domain Local, Permissions) in which file permissions are applied to the file/folder in the form of a 'local groups or users depending on different Windows versions used. This system varies from other yendor products such as Linux and NetWare due to the
 'static' allocation of permission being applied directly to the file or folder. However using this process of AGLP/AGULP allows a small number of static permissions on the files and folders. [citation needed] Owing to the operating system's
popularity, a number of applications have been released that aim to provide compatibility with Windows applications, either as a compatibility layer for another operating system, or as a standalone system that can run software written for Windows API,
allowing one to run many Windows applications on x86-based platforms, including UNIX, Linux and macOS. Wine developers refer to it as a "compatibility layer"[118] and use Windows-style APIs to emulate Windows environment. CrossOver - a Wine package with licensed fonts. Its developers are regular contributors to Wine. Proton - A fork of Wine
by Valve to run Windows games on Linux and other Unix-like OS. ReactOS - an open-source OS intended to run the same software as Windows 7 compatibility. It has been in the development stage since 1996. Freedows OS - an open-source attempt at creating a Windows clone
 for x86 platforms, intended to be released under the GNU General Public License. Started in 1996 by Reece K. Sellin, the project was never completed, getting only to the stage of design discussions which featured a number of novel concepts until it was suspended in 2002.[119][120][121] Wintel ^ "May 13, 2025—KB5058411 (OS Build
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 estimated Windows' share of the shipped device market last year was 14%, and would decrease slightly to 13.7% in 2014. Android will dominate, Gartner said, with a 48% share this year ^ "Windows Server Premium Assurance SQL Server Premium Assurance" (PDF). Licensing School. Retrieved April 27, 2025. ^ Mackie, Kurt (July 13, 2018).
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Windows Blog Archived January 15, 2017, at the Wayback Machine Microsoft Windows Developer Center Archived June 28, 2021, at the Wayback Machine Microsoft Windows Developer Center Archived June 28, 2021, at the Wayback Machine Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived June 28, 2021, at the Wayback Machine Windows Developer Center Archived Developer Center 
History of Microsoft Windows Microsoft Windows Microsoft Business Software Solutions Archived December 5, 2019, at the Wayback Machine Retrieved from "20perating system from IBM "CP/DOS" redirects here. For the similarly named Digital Research operating system, see CP/M.
Operating system OS/2OS/2 Warp 4 desktop. This version was released on 25 September 1996.[1]DeveloperIBMMicrosoft (1.0-1.3)Written in C, C++ and assembly languageWorking stateHistorical, now developed as ArcaOSSource modelClosed sourceInitial releaseDecember 1987; 37 years ago (1987-12)Latest release4.52 / December 2001; 23 years
 ago (2001-12) Marketing targetProfessionals, serversAvailable inChinese, English, French, German, Italian, Japanese, Korean, Spanish, Slovenian, Portuguese, RussianPlatforms32-bit x86, PowerPCKernel typeHybrid kernelInfluenced byMS-DOS, IBM PC DOSDefaultuser interfaceWorkplace ShellLicenseProprietarySucceeded
byeComStationArcaOSOfficial websiteOS/2 Warp (Archived) OS/2 is a proprietary computer operating system for x86 and PowerPC based personal computers. It was created and initially developed jointly by IBM and Microsoft, under the leadership of IBM software designer Ed Iacobucci,[2] intended as a replacement for DOS. The first version was
released in 1987. A feud between the two companies beginning in 1990 led to Microsoft's leaving development solely to IBM, which continued development on its own. OS/2 Warp 4 in 1996 was the last major upgrade, after which IBM slowly halted the product as it failed to compete against Microsoft's Windows; updated versions of OS/2 were
released by IBM until 2001. The name stands for "Operating System/2", because it was introduced as a protected-mode successor of PC DOS targeting the Intel 80286 processor. Notably, basic system calls were
modelled after MS-DOS calls; their names even started with "Dos" and it was possible to create "Family Mode" applications - text mode applications that could work on both systems. [3] Because of this heritage, OS/2 shares similarities with Unix, Xenix, and Windows NT. OS/2 sales were largely concentrated in networked computing used by corporate
professionals. OS/2 2.0 was released in 1992 as the first 32-bit version as well as the first to be entirely developed by IBM, after Microsoft's new Windows 3.1 operating environment.[4][5] With OS/2 Warp 3 in 1994, IBM attempted to also target home consumers through a
multi-million dollar advertising campaign.[6] However it continued to struggle in the marketplace, partly due to strategic business measures imposed by Microsoft in the industry that have been considered anti-competitive.[7][8] Following the failure of IBM's Workplace OS project, OS/2 Warp 4 became the final major release in 1996; IBM
discontinued its support for OS/2 on December 31, 2006.[9] Since then, OS/2 has been developed, supported and sold by two different third-party vendors under license from IBM - first by Serenity Systems as eComStation from 2001 to 2011,[10] and later by Arca Noae LLC as ArcaOS since 2017.[11][12][13] This section needs additional citations for
verification. Please help improve this article by adding citations to reliable sources in this section. Unsourced material may be challenged and removed. (April 2012) (Learn how and when to remove this message) Logo of OS/2 1.xOS/2 1.0 featured a text-mode interface similar to MS-DOS. The development of OS/2 began when IBM and Microsoft
signed the "Joint Development Agreement" in August 1985.[14][15] It was code-named "CP/DOS" and it took two years for the first product to be delivered. OS/2's release was long delayed. It was widely believed that all IBM programmers used assembly language, and a rumor said that the delay was because they had to learn C.[16] OS/2 1.0 was
announced in April 1987 and released in December. The original release only ran in text mode, and a GUI was introduced with OS/2 1.1 about a year later. OS/2 features an API for controlling the video display (VIO) and handling keyboard and mouse events so that programmers writing for protected mode need not call the BIOS or access hardware
directly. Other development tools included a subset of the video and keyboard APIs as linkable libraries so that family mode programs are able to run under MS-DOS,[citation needed] and, in the OS/2 Extended Edition v1.0, a database engine called Database Manager or DBM (this was related to DB2, and should not be confused with the DBM family
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of database engines for Unix and Unix-like operating systems).[17] A task-switcher named Program Selector was available through the Ctrl-Esc hotkey combination, allowing the user to select among multitasked text-mode sessions (or screen groups; each can run multiple programs).[18] Communications and database-oriented extensions were delivered in 1988, as part of OS/2 1.0 Extended Edition: SNA, X.25/APPC/LU 6.2, LAN Manager, Query Manager, SQL. OS/2 1.1 was the first version to feature the Presentation Manager, was introduced with OS/2 1.1 in October 1988.[19] It had a similar user interface to Windows 2.1, which

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was released in May of that year. (The interface was replaced in versions 1.2 and 1.3 by a look closer in appearance to Windows 3.0.) The Extended Edition of 1.1, sold only through IBM sales channels, introduced distributed database support to IBM mainframe networks. In 1989, Version 1.2
introduced Installable Filesystems and, notably, the HPFS filesystem. HPFS provided a number of improvements over the older FAT file system, including long filenames and a form of alternate data streams called Extended Attributes. [20] In addition, extended attributes were also added to the FAT file system. [21] Installation Disk A of Microsoft OS/2
1.3 (3½-inch floppy disk) The Extended Edition of 1.2 introduced TCP/IP and Ethernet support. OS/2- and Windows-related books of the late 1980s from both Microsoft's Gordon Letwin and his IBM counterpart Ed Iacobucci acknowledged the existence of both systems and promoted OS/2 as the system of the future.[22][16] Logo of Microsoft's OS/2
until the breakup The collaboration between IBM and Microsoft unravelled in 1990, between the releases of Windows 3.0 and OS/2 1.3. During this time, Windows 3.0 became a tremendous success, selling millions of copies in its first year. [23] Much of its success was because Windows 3.0 and OS/2 1.3. During this time, Windows 3.0 became a tremendous success, selling millions of copies in its first year.
[24] OS/2, on the other hand, was available only as an additional stand-alone software package. In addition, OS/2 lacked device drivers for many common devices such as printers, particularly non-IBM hardware. [25] Windows, on the other hand, supported a much larger variety of hardware.
 shift its development focus from cooperating on OS/2 with IBM to building its own business based on Windows.[26] Several technical and practical reasons contributed to this breakup. The two companies had significant differences in culture and vision. Microsoft favored the open hardware system approach that contributed to its success on the PC.
IBM sought to use OS/2 to drive sales of its own hardware, and urged Microsoft to drop features, such as fonts, that IBM's bureaucracy and its use of lines of code to measure programmer productivity. [27] IBM developers complained about the terseness and lack of
 comments in Microsoft's code, while Microsoft developers complained that IBM's code was bloated. [28] The two products have significant differences in API. OS/2 was announced when Windows API already defined. However, IBM requested that this API be significantly changed for OS/2. [29] Therefore,
 issues surrounding application compatibility appeared immediately. OS/2 designers hoped for source code conversion tools, allowing complete migration of Windows application source code to OS/2 at some point. However, OS/2 1.x did not gain enough momentum to allow vendors to avoid developing for both OS/2 and Windows in parallel. OS/2 1.3
 was the final 16-bit only version of OS/2, and the last to be sold by Microsoft. OS/2 1.x targets the Intel 80286 processor, with its 16-bit segmented memory mode, because of commitments made to customers who had purchased many 80286-based PS/2s as a result of
IBM's promises surrounding OS/2.[30] Until release 2.0 in April 1992, OS/2 ran in 16-bit protected mode and therefore could not benefit from the Intel 80386's much simpler 32-bit flat memory model and virtual 8086 mode features. This was especially painful in providing support for DOS applications. While, in 1988, Windows/386 2.1 could run
several cooperatively multitasked DOS applications, including expanded memory (EMS) emulation, OS/2 1.3, released in 1991, was still limited to one 640 kB "DOS box". Given these issues, Microsoft started to work in parallel on a version of Windows which was more future-oriented and more portable. The hiring of Dave Cutler, former VAX/VMS
architect, in 1988 created an immediate competition with the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, as Cutler did not think much of the OS/2 team, 
 Initially, the companies agreed that IBM would take over maintenance of OS/2 1.0 and development of OS/2 3.0. In the end, Microsoft decided to recast NT OS/2 3.0 as Windows NT, leaving all future OS/2 development to IBM. From a business perspective, it was logical to concentrate on a
consumer line of operating systems based on DOS and Windows, and to prepare a new high-end system to develop, Microsoft would still receive licensing money from Xenix and OS/2 sales. Windows NT's OS/2 heritage can be
 seen in its initial support for the HPFS filesystem, text mode OS/2 1.x applications, and OS/2 LAN Manager network support. Some early NT materials even included OS/2 1.x support is in the WIN2K resource kit. Windows NT could also support OS/2 1.x
 Presentation Manager and AVIO applications with the addition of the Windows NT Add-On Subsystem for Presentation Manager. [32] OS/2 2.0 was the first to feature the Workplace Shell. OS/2 2.0 was the first to feature the Workplace Shell. OS/2 2.0 was the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first to feature the Workplace Shell. OS/2 2.0 was the first to feature the Workplace Shell. OS/2 2.0 was the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first to feature the Workplace Shell. OS/2 2.0 was the first 32-bit release of OS/2, and the first 32-bit release of OS/2, and the first 32-bit release of OS/2 and the first 32-bit 
OS/2 2.0 provided a 32-bit API for native programs, though the OS itself still contained some 16-bit code and drivers. It also included a new OOUI (object-oriented interface) called the Workplace Shell. This was a fully object-oriented interface that was a significant departure from the previous GUI. Rather than merely providing an environment
for program windows (such as the Program Manager), the Workplace Shell provided an environment in which the user could manage programs, files and devices by manipulating objects on the screen. With the Workplace Shell provided an environment in which the user could manage programs, files and devices by manipulating objects on the screen. With the Workplace Shell provided an environment in which the user could manage programs, files and devices by manipulating objects on the screen.
better Windows than Windows".[34] It managed this by including the fully-licensed MS-DOS 5.0, which had been patched and improved upon. For the first time, OS/2 was able to run more than one DOS application at a time. This was so effective that it allowed OS/2 to run a modified copy of Windows 3.0, itself a DOS extender, including Windows 3.0
applications. Because of the limitations of the Intel 80286 processor, OS/2 1.x could run only one DOS program at a time, and did this in a way that allowed the DOS program to have total control over the computer. A problem in DOS mode could run only one DOS program at a time, and did this in a way that allowed the DOS program to have total control over the computer. A problem in DOS mode could run only one DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and did this in a way that allowed the DOS program at a time, and the DOS program at a time, 
 processor to create a much safer virtual machine in which to run DOS programs. This included an extensive set of configuration options to optimize the performance and capabilities given to each DOS programs. This included an extensive set of configuration options to optimize the performance and capabilities given to each DOS programs. This included an extensive set of configuration options to optimize the performance and capabilities given to each DOS programs.
direct hardware access limitations. The OS/2 2.0 upgrade box Like most 32-bit environments, OS/2 could not run protected-mode DOS programs written according to DPMI. (Microsoft discouraged the use of VCPI under Windows 3.1, however, due to
performance degradation.)[35] Unlike Windows NT, OS/2 always allowed DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts, so any DOS programs the possibility of masking real hardware interrupts.
 leveraged the enhancements of newer Intel 80486 and Intel Pentium processors—the Virtual Interrupt Flag (VIF), which was part of the Virtual Mode Extensions (VME)—to solve this problem. To accommodate those who wanted to have multiple operating systems on their machine, Boot Manager was introduced that allowed for the creation of
 separate partitions on the boot drive which could be used to install different versions of DOS, Windows and OS/2 and give the user a choice of which partition to boot from.[36] Further information: VME (CONFIG.SYS directive) OS/2 2.1 was released in 1993. This version of OS/2 achieved compatibility with Windows 3.0 (and later Windows 3.1) by
 adapting Windows user-mode code components to run inside a virtual DOS machine (VDM). Originally, a nearly complete version of Windows 3.1 in OS/2 2.1. Later, IBM developed versions of OS/2 that would use whatever Windows version the user had installed previously,
patching it on the fly, and sparing the cost of an additional Windows programs would appear directly on the OS/2 desktop. The process containing Windows was given fairly extensive access to hardware, especially video, and the result was
that switching between a full-screen WinOS/2 session and the Workplace Shell could occasionally cause issues. [38] Because OS/2 only runs the user-mode system components of Windows applications run by default in a single Windows session
 - multitasking cooperatively and without memory protection - just as they would under native Windows 3.x. However, to achieve true isolation between Windows in parallel, with each copy residing in a separate VDM. The user can then optionally place each program either in its own
Windows session - with preemptive multitasking and full memory protection between sessions, though not within them - or allow some applications in one or more separate Windows sessions. At the cost of additional hardware resources, this approach can
protect each program in any given Windows session (and each instance of Windows session).[39] Whether Windows session (though not from other programs running in any separate Windows session (though not from other programs running in any separate Windows session).
 several, it is possible to use DDE between OS/2 and Windows applications, and OLE between Windows applications only.[40] IBM's OS/2 for Windows product (codename Ferengi), also known as "OS/2, Special Edition", was interpreted as a deliberate strategy "of cashing in on the pervasive success of the Microsoft platform" but risked confusing
consumers with the notion that the product was a mere accessory or utility running on Windows such as Norton Desktop for Windows when, in fact, it was "a complete, modern, multi-tasking, pre-emptive operating system", itself hosting Windows when, in fact, it was "a complete, modern, multi-tasking, pre-emptive operating system", itself hosting Windows instead of running on it. Available on CD-ROM or 18 floppy disks, the product documentation reportedly
suggested Windows as a prerequisite for installing the product, also being confined to its original FAT partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installing the product, also being confined to its original FAT partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition, whereas the product apparently supported the later installation of Windows running from an HPFS partition whereas the product apparently supported the later installation of Windows running from an HPFS partition whereas the later installation of Windows running from an HPFS partition whereas the later installation in the later installation whereas the later installation in the later installation whereas the lat
reportedly broken by the release of Windows 3.11, prompting accusations of arbitrary changes to Windows in order to perpetrate "a deliberate act of Microsoft sabotage" against IBM's product.[39] Wordmark of OS/2 Warp Connect 3.0, showing the Windows 3.1 Program Manager, QBASIC in a DOS window, and the LaunchPad (bottom
center) Released in 1994, OS/2 version 3.0 was labelled as OS/2 Warp to highlight the new performance benefits, and generally to freshen the product image. "Warp" had originally been the internal IBM name for the release: IBM claimed that it had used Star Trek terms as internal names for prior OS/2 releases, and that this one seemed appropriate
for external use as well. At the launch of OS/2 Warp in 1994, Patrick Stewart was to be the Master of Ceremonies; however Kate Mulgrew[41] of the then-upcoming series Star Trek: Voyager substituted for him at the last minute.[42][43] OS/2 Warp offers a host of benefits over OS/2 2.1, notably broader hardware support, greater multimedia
 capabilities, Internet-compatible networking, and it includes a basic office application suite known as IBM Works. It was released in two versions: the less expensive "Red Spine" and the more expensive "Blue Spine" and the more expensive "Red Spine" and the more expensive "Blue Spine" and the more expensive "Red Spine" and the mo
installation of Windows on the computer's hard drive. "Blue Spine" includes Windows support in its own installation. As most computers were sold with Microsoft Windows applications without a Windows installation. As most computer was the more popular product. [44] OS/2 Warp Connect—
which has full LAN client support built-in—followed in mid-1995. Warp Connect was nicknamed "Grape".[19] In OS/2 2.0, most performance-sensitive subsystems, including the graphics (Gre) and multimedia (MMPM/2) systems, were updated to 32-bit code in a fixpack, and included as part of OS/2 2.1. Warp 3 brought about a fully 32-bit windowing
system, while Warp 4 introduced the object-oriented 32-bit GRADD display driver model. Main article: Workplace OS. This was an entirely new product, brand new code, that borrowed only a few sections of code from both the existing OS/2 and AIX products
 It used an entirely new microkernel code base, intended (eventually) to host several of IBM's operating systems (including OS/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities". It also included major new architectural features including os/2) as microkernel "personalities".
 POWER platforms, and IBM intended to market a full line of PowerPCs in an effort to take over the market from Intel. A mission was formed to create prototypes of these machines and they were disclosed to several corporate customers, all of whom raised issues with the idea of dropping Intel. Advanced plans for the new code base would eventually
include replacement of the OS/400 operating system by Workplace OS, as well as a microkernel product that would have been used in industries such as telecommunications and set-top television receivers. A partially functional pre-alpha version of Workplace OS was demonstrated at Comdex, where a bemused Bill Gates stopped by the booth. The
second and last time it would be shown in public was at an OS/2 user group in Phoenix, Arizona; the pre-alpha code refused to boot. It was released in 1995. But with $990 million being spent per year on development of this as well as Workplace OS, and no possible profit or widespread adoption, the end of the entire Workplace OS and OS/2 product
line was near. Firefox 3.5.4 for OS/2 Warp 4 Wordmark of OS/2 Warp 4 desktop after installation In 1996, Warp 4 added Java and speech recognition software. [46] IBM also released server editions of Warp 4 which bundled IBM's LAN Server product directly into the operating system installation. A personal version of Lotus
 Notes was also included, with a number of template databases for contact management, brainstorming, and so forth. The UK-distributed free demo CD-ROM of OS/2 Warp essentially contained the entire OS and was easily, even accidentally, cracked[clarification needed], meaning that even people who liked it did not have to buy it. This was seen as
 backdoor tactic to increase the number of OS/2 users, in the belief that this would increase sales and demand for third-party applications, and thus strengthen OS/2's desktop numbers. [citation needed] This suggestion was bolstered by the fact that this demo version had replaced another which was not so easily cracked, but which had been released
 with trial versions of various applications. [citation needed] In 2000, the July edition of Australian Personal Computer magazine bundled software CD-ROMs, included a full version of Warp 4 also included symmetric multiprocessing (SMP) support.
OS/2 sales were largely concentrated in networked computing used by corporate professionals; however, by the early 1990s, it was overtaken by Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably technically superior to Microsoft Windows NT. While OS/2 was arguably superior to Microsoft Windows NT. While OS/2 was arguably superior to Microsoft Windows NT. While OS/2 was arguably superior to Microsoft Windows NT. While OS/2 was arguably supe
reports that it could not be installed properly on IBM's own Aptiva series of home PCs.[47] Microsoft made an offer in 1994 where IBM would receive the same terms as Compaq (the largest PC manufacturer at the time) for a license of Windows 95, if IBM ended development of OS/2 completely. IBM refused and instead went with an "IBM First"
strategy of promoting OS/2 Warp and disparaging Windows, as IBM aimed to drive sales of its own software as well as hardware. By 1995, Windows 95 negotiations between IBM and Microsoft, which were already difficult, stalled when IBM purchased Lotus SmartSuite, which would have directly competed with Microsoft Office. As a result of the
dispute, IBM signed the license agreement 15 minutes before Microsoft's Windows 95 launch event, which was later than their competitors and this badly hurt sales of IBM PCs. IBM officials later conceded that OS/2 would not have been a viable operating system to keep them in the PC business.[48][49] This section does not cite any sources. Please
help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. (March 2013) (Learn how and when to remove this message) A project was launched internally by IBM to evaluate the looming competitive situation with Microsoft Windows 95. Primary concerns included the major code quality
issues in the existing OS/2 product (resulting in over 20 service packs, each requiring more diskettes than the original installation), and the ineffective and heavily matrixed development organization in Boca Raton (where the consultants reported that "basically, everybody") and Austin. That study, tightly classified as "Registered
Confidential" and printed only in numbered copies, identified untenable weaknesses and failures across the board in the Personal Systems Division as well as a whole. This resulted in a decision being made at a level above the Division as well as across IBM as a whole. This resulted in a decision being made at a level above the Division as well as across IBM as a whole.
Workplace OS), eliminate the Boca Raton development individuals (as well as sales and marketing efforts of the product, and lay off over 1,300 development individuals (as well as sales and support personnel). $990 million had been spent in the last full year. Warp 4 became the last distributed version of OS/2. Although a small and dedicated community remains
faithful to OS/2,[50] OS/2 failed to catch on in the mass market and is little used outside certain niches where IBM traditionally had a stronghold. For example, many bank installations, especially automated teller machines, run OS/2 with a customized user interface; French SNCF national railways used OS/2 1.x in thousands of ticket selling machines.
[citation needed] Telecom companies such as Nortel used OS/2 in some voicemail systems. Also, OS/2 was used for the host PC used to control the Satellite Operations Support System equipment installed at NPR member stations from 1994 to 2007, and used to receive the network's programming via satellite. [citation needed] Although IBM began
 indicating shortly after the release of Warp 4 that OS/2 would eventually be withdrawn, the company did not end support until December 31, 2006, [51] with sales of OS/2 stopping on December 2001. IBM is still delivering defect
 support for a fee.[51][52] IBM urges customers to migrate their often highly complex applications to e-business technologies such as Java in a platform-neutral manner. Once application migration is completed, IBM recommends migration to a different operating system, suggesting Linux as an alternative.[53][54][55] Main articles: eComStation and
ArcaOS ArcaOS is the most recent OS/2-based operating system development of IBM. After IBM discontinued development of the operating system. The OS/2 software vendor Stardock made such a proposal to IBM in 1999, but it was not followed through by the
company.[56] Serenity Systems succeeded in negotiating an agreement with IBM, and began reselling OS/2 as eComStation in 2011.[58] In 2015, Arca Noae, LLC announced that they had secured an agreement with IBM to resell OS/2.[11] They released the
first version of their OS/2-based operating system in 2017 as ArcaOS.[13] As of 2023, there have been multiple release OS/2 or a significant part of it as open source. Petitions were held in 2005 and 2007, but IBM refused them, citing legal and
technical reasons.[60] It is unlikely that the entire OS will be open at any point in the future because it contains third-party code to which IBM does not have copyright, and much of this code is from Microsoft. IBM also once engaged in a technology transfer with Commodore, licensing Amiga technology for OS/2 2.0 and above, in exchange for the
REXX scripting language.[61][unreliable source?] This means that OS/2 may have some code that was not written by IBM, which can therefore prevent the OS from being re-announced as open-sourced in the future.[62][failed verification][63] On the other hand, IBM donated Object REXX for Windows and OS/2 to the Open Object REXX project
maintained by the REXX Language Association on SourceForge. [64] There was a petition, arranged by OS2World, to open parts of the improved JFS file system, which was ported from the OS/2 code base. As IBM didn't release
the source of the OS/2 JFS driver, developers ported the Linux driver back to eComStation and added the functionality to boot from a JFS partition. This new JFS driver has been integrated into eComStation v2.0, and later into ArcaOS 5.0. Release dates refer to the US English editions unless otherwise noted.[65][66] Date Version December 1987
OS/2 1.0 November 1988 OS/2 1.1 October 1994 OS/2 2.1 July 1994 OS/2 2.1 SMP October 1994 OS/2 2.1 SMP October 1994 OS/2 2.1 SMP October 1995 OS/2 Warp 3 May 1995 OS/2 Warp Connect
December 1995 OS/2 Warp, PowerPC Edition February 1996 OS/2 Warp Server 4 September 1996 OS/2 Warp Server 4 September 1998 WorkSpace On-Demand 1.0 October 1998 WorkSpace On-Demand 2.0 April 1999 OS/2 Warp Server for e-Business (version 4.50) November 2000 OS/2 Convenience Pack
1 (version 4.51) November 2001 OS/2 Convenience Pack 2 (version 4.52) The graphic system has a layer named Presentation Manager that manages windows, fonts, and icons. This is similar in functionality to a non-networked version of X11 or the Windows GDI. On top of this lies the Workplace Shell (WPS) introduced in OS/2 2.0. WPS is an object-
 oriented shell allowing the user to perform traditional computing tasks such as accessing files, printers, launching legacy programs, and advanced object oriented tasks using built-in and third-party application objects that extended the shell in an integrated fashion not available on any other mainstream operating system. WPS follows IBM's Common
 User Access user interface standards. WPS represents objects such as disks, folders, files, program objects, and printers using the System Object Model (SOM), which allowed objects on different computers to
communicate. DSOM is based on CORBA. The object oriented aspect of SOM is similar to, and a direct competitor to, Microsoft's Component Object Model, though it is implemented in a radically different manner; for instance, one of the most fundamental
concepts of OO programming)—COM does not have such support. SOM and DSOM are no longer being developed. The multimedia capabilities of OS/2 are accessible through Media Control Interface commands. The last update (bundled with the IBM version of Netscape Navigator plugins) added support for MPEG files. Support for newer formats
such as PNG, progressive JPEG, DivX, Ogg, and MP3 comes from third parties. Sometimes it is integrated with the multimedia system, but in other offers it comes as standalone applications. OS/2 Window (cmd.exe) on Microsoft OS/2 Version 1.3 The following list of commands is supported by cmd.exe on OS/2.[67][68] ansi append assign attrib
backup boot break cache call cd chcp chdir chkdsk cls cmd codepage command comp copy createdd date ddinstal debug del detach dir diskcomp diskcopy doskey dpath eautil echo endlocal erase exit extproc fdisk fdiskpm find for format fsaccess goto graftabl help if join keyb keys label makeini md mem mkdir mode more move patch path pause
picview pmrexx print prompt pstat rd recover rem ren rename replace restore rmdir set setboot setcom40 setlocal share shift sort spool start subst syslevel syslog time trace tracebuf tracefmt tree type undelete unpack ver verify view vmdisk vol xcopy This section needs expansion. You can help by adding to it. (April 2019) The TCP/IP stack is based
on the open source BSD stack as visible with SCCS what compatible tools. IBM included tools such as ftp and telnet and even servers for both commands. IBM sold several networking extensions including NFS support and an X11 server. Architecture of OS/2 Warp under x86 Hardware vendors were reluctant to support device drivers for alternative
operating systems including OS/2, leaving users with few choices from a select few vendors. To relieve this issue for video cards, IBM licensed a reduced version of the Scitech's modular driver design. [69] Document detailing OS/2's architecture. OS/2
for eComStation.[71] VirtualPC from Microsoft (originally Connectix) has been able to run OS/2 without hardware virtualization support for many years. It also provided with the current version of VirtualPC, but the version last included with a
release may still be used with current releases. At one point, OS/2 was a supported host for VirtualPC in addition to a guest. Note that OS/2 runs only as a guest on those versions of VirtualPC for Mac). VirtualPC for Mac). VirtualPC in addition to a guest. Note that OS/2 runs only as a guest on those versions of VirtualPC in addition to a guest.
Sun) supports OS/2 1.x, Warp 3 through 4.5, and eComStation as well as "Other OS/2" as guests. However, attempting to run OS/2 and eComStation and only ACP2/MCP2 is reported to work in a reliable manner.[72] ArcaOS
supports being run as a virtual machine guest inside VirtualBox, VMware ESXi and VMWare Workstation.[73] It ships with VirtualBox Guest Additions, and driver improvements to improve performance as a guest operating system.[74] The difficulties in efficiently running OS/2 have, at least once, created an opportunity for a new virtualization
company. A large bank in Moscow needed a way to use OS/2 on newer hardware that VMware was not a possibility, it hired a group of Russian software developers to write a host-based
 hypervisor that would officially support OS/2. Thus, the Parallels, Inc. company and their Parallels Workstation product was born.[75] OS/2 has few native computer viruses; [76] while it is not invulnerable by design, its reduced market share appears to have discouraged virus writers. There are, however, OS/2-based antivirus programs, dealing with
 DOS viruses and Windows viruses that could pass through an OS/2 server.[77] Some problems were classic subjects of comparison with other operating systems: Synchronous input queue (SIQ): if a GUI application was not servicing its window messages, the entire GUI system could get stuck and a reboot was required. This problem was considerably
reduced with later Warp 3 fixpacks and refined by Warp 4, by taking control over the application after it had not responded for several seconds. [78][79]: 565 No unified object handles (OS/2 v2.11 and earlier): The availability of threads probably led system designers to overlook mechanisms which allow a single thread to wait for different types of
asynchronous events at the same time, for example the keyboard and the mouse in a "console" program. Even though select was added later, it only worked on network sockets. In case of a console program, dedicating a separate thread for waiting on each source of events made it difficult to properly release all the input devices before starting other
programs in the same "session". As a result, console programs usually polled the keyboard and the mouse alternately, which resulted in wasted CPU and a characteristic "jerky" reactivity to user input. In OS/2 3.0 IBM introduced a new call for this specific problem.[80] This section needs additional citations for verification. Please help improve this
article by adding citations to reliable sources in this section. Unsourced material may be challenged and removed. (June 2011) (Learn how and when to remove this message) OS/2 has been widely used by Iran Export Bank (Bank Saderat Iran) in their teller machines, ATMs and local servers (over 35,000 working stations). As of 2011, the bank moved
to virtualize and renew their infrastructure by moving OS/2 to Virtual Machines running over Windows. OS/2 was widely used by Brazilian banks. Banco do Brasil had a peak 10,000 machines running over Windows. OS/2 was used in automated teller machines and attendant
computers have been migrated to Linux.[81] An ATM in Australia revealing during a reboot that it is based on OS/2 was widely as late as 2002. ATMs at Perisher Blue used OS/2 as late as 2009, and even the turn of the decade.[82] OS/2 was widely
 adopted by accounting professionals and auditing companies. In mid-1990s native 32-bit accounting software were well developed and serving corporate markets. OS/2 ran the faulty baggage handling system at Denver International Airport. The OS was eventually scrapped, but the software written for the system led to massive delays in the opening
of the new airport. The OS itself was not at fault, but the software written to run on the OS was. The baggage handling system was eventually removed. OS/2 was used by radio personality Howard Stern. He once had a 10-minute on-air rant about OS/2 was used by radio personality Howard Stern. He once had a 10-minute on-air rant about OS/2 was used by radio personality Howard Stern. He once had a 10-minute on-air rant about OS/2 was used by radio personality Howard Stern. He once had a 10-minute on-air rant about OS/2 was used by radio personality Howard Stern.
used as part of the Satellite Operations Support System (SOSS) for NPR's Public Radio Satellite System. SOSS was introduced in 1994 using OS/2 3.0, and was retired in 2007, when NPR switched over to its successor, the
ContentDepot. OS/2 was used to control the SkyTrain automated light rail system in Vancouver, Canada until the late 2000s when it was replaced by Windows XP. OS/2 was used in the London Underground Jubilee Line Extension Signals Control System (JLESCS) in London, England. This control system delivered by Alcatel was in use from 1999 to
2011 i.e. between abandonment before opening of the line's unimplemented original automatic train operation only manual train supervision. Six OS/2 local site computers were distributed along the railway between Stratford and Westminster, the shunting tower
at Stratford Market Depot, and several formed the central equipment located at Neasden Depot. It was once intended to cover the rest of the line between Green Park and Stanmore but this was never introduced. OS/2 has been used by The Co-operative Bank in the UK for its domestic call centre staff, using a bespoke program created to access
customer accounts which cannot easily be migrated to Windows. OS/2 has been used by the Stop & Shop supermarket chain (and has been used on ticket machines for Tramlink in outer-London. OS/2 has been used in New York City's subway system for MetroCards.[83] Rather than
interfacing with the user, it connects simple computers and the mainframes. When NYC MTA finishes its transition to contactless payment, OS/2 was used by Trenitalia, both for the desktops at Ticket Counters and for the Automatic Ticket Counters up to
2011. Incidentally, the Automatic Ticket Counters with OS/2 were more reliable than the current ones running a flavor of Windows.[citation needed] OS/2 was used as the main operating system for Abbey National General Insurance motor and home direct call centre products using the PMSC Series III insurance platform on DB2.2 from 1996 to
BYTE in 1989 listed OS/2 as among the "Excellence" winners of the BYTE Awards, stating that it "is today where the Macintosh was in 1984: It's a development platform in search of development platform in search 
 —deservedly—supersede DOS. But even as it stands, OS/2 is a milestone product".[85] In March 1995 OS/2 won seven awards [86] InfoWorld Product of the Year award. CHIP Magazine - Innovation of the Year awards [86] InfoWorld Product of the Year. [87] Five Awards at CeBIT. PC Professional Magazine - Innovation of the Year awards [86] InfoWorld Product of the Year awa
 Warp the Operating System of the Year. 1+1 Magazine awarded it with the Software Marketing Quality award. Industrie Forum awarded it with its Design Excellence. SPA Best Business Software Award. IBM has used OS/2 in a wide variety of hardware products, effectively as a form of embedded operating system. Product Product type Usage of
OS/2 IBM 2074 Console support controller Used to connect 3270 sessions to host via ESCON channels. Introduced in September 2000 as a replacement for local, non-SNA 3174 Controller (OSA ICC).[88] IBM 3494 Tape library Used as the
operating system for the Library Manager (LM) that controlled the tape accessor (robot)[89] IBM 3745 Communications controller Used as the operating system for the Service Processor (NNP).[90] IBM 3890 Document processor (NNP).[90] IBM 3890 Document processor (NNP).[90] IBM 3890 Document processor (NNP).[90] IBM 3745 Communications controller Used as the operating system for the Service Processor (NNP).[90] IBM 3890 Document processor (NNP).[9
the operating system for the Hardware Management Console (HMC) and Support Element (SE).[93] Was also used in later mainframe models such as the IBM 2064. History of the graphical user interface Multiple Virtual DOS Machine (MVDM) - OS/2 virtual DOS machine and seamless Windows integration OpenDoc - Software standard System
Object Model - Programming frameworkPages displaying short descriptions of redirect targets Team OS/2 Windows Libraries for OS/2 LAN Manager ^ Matthew Nawrocki (26 February 2013). "Preview: eComStation 2.2 Beta, the legacy of OS/2 lives on". TechRepublic.com. Archived from the original on 2 September 2022. Retrieved 22 September
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Technical details of OS/2 OS/2 Warp 4 Installation and Update Manual; with boot disks and many links Retrieved from "3 This is the talk page for discussion of the article's subject. Put new text under old text. Click here to start a new topic. New to Wikipedia? Welcome
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project page, where you can join the discussion and see a list of open tasks. Technology Technology
Ars Technica. Condé Nast. ESR has a good resume of history of OS/2 in The Art of Unix Programming: see The Art of Unix Programming Davidme — Preceding undated comment added 07:53, 29 June 2007 (UTC)[reply] Someone(s) should flesh out the following summary of a neglected part of the OS/2 history. I can contribute, but certain
authoritative references might take considerable effort to obtain. IBM was a member of the Open Software Foundation, and participated with Digital Equipment Corp. on the OSF Research Institute's OSF/1 Mach kernel (OSFMK 7.3 kernel) microkernel design. That microkernel was derived from both the CMU CS Mach microkernel and the CMU CS
Alpha real-time microkernel. Alpha's contributions were primarily application-specific scheduling algorithms and distributed threads. IBM Boca and Austin (VP Larry Loucks) decided to base the microkernel of Workplace OS for Power PC on that OSF microkernel. DEC had acquired most of the key Alpha designers, and was developing a real-time OS
product based on MK7.3A. IBM contracted with the DEC Real-Time Business Unit to consult on the design and implementation of the WPOS/PPC microkernel. That collaboration included some key Alpha and MK7.3A designers at the OSF/RI. The IBM WPOS/PPC microkernel. That collaboration included some key Alpha and MK7.3A designers at the OSF/RI. The IBM WPOS/PPC microkernel.
being the Object Management Group, dissolving the RI (its key MK7.3A designer went to Apple), and DEC's Real-Time Business Unit was terminated when Compag purchased DEC. E Douglas Jensen (talk) 21:13, 28 January 2023 (UTC)[reply] during the mid 90s, os/2 was still under development and was a new thing, a coming soon thing, the article
also says that protected mode was present in the 286 processors. it was not. i tested protected mode, this is not a joke 84.212.100.141 (talk) 14:58, 1 April 2023 (UTC)[reply] I am unsure as to what specifically your objection "during the mid 90s, os/2 was still under
development and was a new thing. a coming soon thing. refers, but feel free to be more specific as to what sections or sentences you feel are incorrect or inappropriate. As to the 286 to enter protected mode, but it certainly seemed like it was very difficult to use in
practice, and one of it's main criticisms was especially the fact that you could not escape protected mode without resetting the 286. This thread on stackexchange explains in detail how to put a 286 in protected mode without resetting the 286. This thread on stackexchange explains in detail how to put a 286 in protected mode without resetting the 286. This thread on stackexchange explains in detail how to put a 286 in protected mode without resetting the 286. This thread on stackexchange explains in detail how to put a 286 in protected mode without resetting the 286.
RM). I think the OP was trying to run 386 PM software on a 286 which isn't going to work for obvious reasons. 57.135.233.22 (talk) 15:37, 8 May 2024 (UTC)[reply] The commands list (OS/2#Commands) seems to break up the general flow and seems to provide excessive information considering the rest of the article. Seems out of place, placing
{{summarize section}} tag until further input has been received on what should be done with this section. Vghfr (talk) 04:53, 8 January 2024 (UTC)[reply] This section heading seems fundamentally wrong - Windows 3.0 compatibility already shipped in 1992's OS/2 2.0, as the text of this section itself confirms. OS/2 2.1 brought about improved
Windows compatibility (i.e. support for Windows 3.1 as opposed to Windows 3.0), but Windows support was already there in 1992's OS/2 2.0 SomethingForDeletion (talk) 07:47, 6 April 2025 (UTC)[reply] Retrieved from "4 The following pages link to Talk:OS/2 External tools (link count transclusion count sorted list). See help page for transcluding
these entries Showing 26 items. View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500) Talk:OS/2/Archive 1 (transclusion) (links | edit) User:Blaxthos/IBM (links | edit) User:Blaxthos/IBM/Articles/Software (l
(links | edit) User:Saikat 2012/sandbox (links | edit) User:Becky Sayles/sandbox (links | edit) User talk: Davidgothberg/Archive 6 (links | edit) User talk: Davidgothberg/Archive 6 (links | edit) User talk: Davidgothberg/Archive 2 (links | edit) User talk: Davidgothberg/Archive 6 (links | edit) User talk: Davidgothberg/Archive 2 (links | edit) User talk: Davidgothberg/Archive 6 (links | edit) User talk: Davidgothberg/Archive 2 (links | edit) User talk: Davidgothberg/Archive 3 (links | edit) User talk: Davidgothberg/Archive 4 (links | edit) User talk: Davidgothberg/Archive 5 (links | edit) User talk: Davidgothberg/Archive 6 (links | edit) 
talk:Tom29739/Archive 5 (links | edit) User talk:Doniago/Archive 70 (links | edit) User talk:Doniago/Archive 25 (links | edit) Wikipedia:Subpages (links | edit) Wikipedia:Subpages (links | edit) Wikipedia:WikiProject Spam/LinkSearch/groups.google.com (links | edit) Wikipedia:Bot requests/Archive 22 (links | edit) Wikipedia:Village pump
(technical)/Archive 89 (links | edit) Wikipedia:Redirects for discussion/Log/2014 January 5 (links | edit) Wikiped
Information: Title: Autodesk AutoCAD 2014 Full Keygen GratisDate Released: 2013Version: I.18.0.0Category: Engineering Software DesignPublisher: Autodesk AutoCAD 2014 Full Keygen merupakan software desainer untuk menggambar objek 2D dan 3D suatu
objek, misalnya seperti gedung ataupun jembatan. Software ini sudah banyak digunakan oleh insiyur maupun arsitek terkenal. Software ini mempunyai fitur dan performa yang lebih baik dibandingkan software ini mempunyai fitur dan performa yang lebih baik dibandingkan software ini sudah support untuk Windows 8. Issue: This article provides the system requirements for AutoCAD 2014.
Note: AutoCAD 2014 is the final version of AutoCAD 2014 Windows® 8 and Windows® 8 and Windows® 8 and Windows® 8 and Windows® 8.1 Standard, Enterprise, or Professional, or Home Premium edition (compare Windows versions), or
Windows XP® Professional or Home edition (SP3 or later) operating system For Windows® 8.1, and Window
recommended) 6 GB free disk space for installation 1,024 x 768 display resolution with true color (1,600 x 1,050 recommended) Microsoft® Internet Explorer® 7 or later web browser Installation of the Model Documentation hotfix) Standard,
Enterprise, or Professional edition, Windows 7 Enterprise, Ultimate, Professional, or Home Premium edition (compare Windows XP Professional, or Home Premium 4 SSE2 technology, AMD Opteron™ processor with SSE2 technology, Intel® Xeon® processor with Intel EM64T support and SSE2 technology, or Pentium 4
with Intel EM64T support and SSE2 technology 2 GB RAM (4 GB recommended) Internet Explorer 7 or later Install from download or DVD Additional requirements for large datasets, point clouds, and 3D modeling (all configurations) Pentium 4
or Athlon processor, 3 GHz or greater, or Intel or AMD dual-core processor, 2 GHz or greater 4 GB RAM or more 6 GB hard disk space available in addition to free space required for installation 1,280 x 1,024 true color video display adapter 128 MB or greater, Pixel Shader 3.0 or greater, Microsoft® Direct3D®-capable workstation-class graphics
card Virtualization Minimum Citrix® XenApp™ 6.5 FP1 Citrix® XenApp™ 6.5 FP1 Citrix® XenDesktop™ 5.6 DONASI VIA PAYPAL Bantu berikan donasi jika artikelnya dirasa bermanfaat. Donasi akan digunakan untuk memperpanjang domain . Terima kasih. Postingan Lebih Baru Postingan Lebih Baru Postingan Lama Postingan Lama
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