

I'm not robot!

An operating system is a powerful and usually extensive program that controls and manages the hardware and other software on a computer. All computers and computer-like devices require operating systems, including your laptop, tablet, desktop, smartphone, smartwatch, and router. Not sure what operating system you're running? Use the Lifewire System Info Tool below to find out! Laptops, tablets, and desktop computers all run operating systems. You've probably heard of most of them. Some examples include versions of Microsoft Windows (like Windows 11, Windows 10, Windows 8, Windows 7, Windows Vista, and Windows XP), Apple's macOS (formerly OS X), Chrome OS, and various Unix and Linux distribution lists. (Unix and Linux are open-source operating systems.) Microsoft Windows 10. Your smartphone runs a mobile operating system, probably either Apple's iOS or Google's Android. Both are household names, but you may not have realized that they are the operating systems running on those devices. Servers such as those that host the websites you visit or serve the videos you watch typically run specialized operating systems designed and optimized to run the special software required to make them do what they do. Some examples include Windows Server, Linux, and FreeBSD. Linux Mint. Most software applications are designed to work with just one company's operating system, like just Windows (Microsoft) or just macOS (Apple). A piece of software will clearly say which operating systems it supports and will get very specific if necessary. For example, a video production software program might support Windows 11 and Windows 10 but not older versions like Windows Vista and XP. Software developers also often release other versions of their software that work with different operating systems. In the video production program example, that company might also release another version of the program with the same features, which only works with macOS. It's also crucial to know if you have Windows 64-bit or 32-bit for your operating system. It's a common question asked when downloading software. Special types of software called virtual machines can mimic "real" computers and run different operating systems from within them. There are many ways that an operating system itself can become corrupted or damaged, but these issues are relatively rare. In Windows, the most severe is the Operating System Not Found error message that implies an OS can't even be found! All modern operating systems have a built-in mechanism to keep the software updated. In Windows, this is through Windows Update. Other operating systems work similarly, like when you update the Android OS or download and install new iOS updates. Keeping an operating system up to date with the newest features is vital so that you're getting the most out of your money. Getting security fixes is another crucial reason to ensure your OS is up-to-date; this can help prevent hackers from getting into your device. FAQ How many operating systems are there? There are three main operating systems for computers: Windows, Apple, and Linux. The two main operating systems for mobile are Android and iOS. There are countless other operating systems made for specific devices, such as Samsung's One UI that only works on Samsung devices. What is the operating system for Chromebooks? Google Chromebooks typically run Chrome OS, which is optimized for use with Google's ecosystem of online tools (Google Docs, the Chrome browser, etc.) Some Chromebooks, however, can also run Android apps and Linux apps. What is the operating system for Amazon Fire tablets? Amazon Fire tablets run Fire OS, which is a modified version of Android. (Learn about the history of Fire OS and how it matches up to Android.) What operating system do smartwatches use? It can vary. Apple Watch runs on watchOS while most other smartwatches use the Wear operating system, Google's operating system for wearable products. Thanks for letting us know! Tell us why! Home Topics Topics Archive Microsoft - Windows operating system (OS) By Stephen J. Bigelow, Senior Technology Editor An operating system (OS) is the program that, after being initially loaded into the computer by a boot program, manages all of the other application programs in a computer. The application programs make use of the operating system by making requests for services through a defined application program interface (API). In addition, users can interact directly with the operating system through a user interface, such as a command-line interface (CLI) or a graphical UI (GUI). An operating system brings powerful benefits to computer software and software development. Without an operating system, every application would need to include its own UI, as well as the comprehensive code needed to handle all low-level functionality of the underlying computer, such as disk storage, network interfaces and so on. Considering the vast array of underlying hardware available, this would vastly bloat the size of every application and make software development impractical. Instead, many common tasks, such as sending a network packet or displaying text on a standard output device, such as a display, can be offloaded to system software that serves as an intermediary between the applications and the hardware. The system software provides a consistent and repeatable way for applications to interact with the hardware without the applications needing to know any details about the hardware. As long as each application accesses the same resources and services in the same way, that system software -- the operating system -- can service almost any number of applications. This vastly reduces the amount of time and coding required to develop and debug an application, while ensuring that users can control, configure and manage the system hardware through a common and well-understood interface. Once installed, the operating system relies on a vast library of device drivers to tailor OS services to the specific hardware environment. Thus, every application may make a common call to a storage device, but the OS receives that call and uses the corresponding driver to translate the call into actions (commands) needed for the underlying hardware on that specific computer. Today, the operating system provides a comprehensive platform that identifies, configures and manages a range of hardware, including processors; memory devices and memory management; chipsets; storage; networking; port communication, such as Video Graphics Array (VGA), High-Definition Multimedia Interface (HDMI) and Universal Serial Bus (USB); and subsystem interfaces, such as Peripheral Component Interconnect Express (PCIe). An operating system provides three essential capabilities: It offers a UI through a CLI or GUI; it launches and manages the application execution; and it identifies and exposes system hardware resources to those applications -- typically, through a standardized API. UI. Every operating system requires a UI, enabling users and administrators to interact with the OS in order to set up, configure and even troubleshoot the operating system and its underlying hardware. There are two primary types of UI available: CLI and GUI. The architecture of an OS The CLI, or terminal mode window, provides a text-based interface where users rely on the traditional keyboard to enter specific commands, parameters and arguments related to specific tasks. The GUI, or desktop, provides a visual interface based on icons and symbols where users rely on gestures delivered by human interface devices, such as touchpads, touchscreens and mouse devices. The GUI is most frequently used by casual or end users that are primarily interested in manipulating files and applications, such as double-clicking a file icon to open the file in its default application. The CLI remains popular among advanced users and system administrators that must handle a series of highly granular and repetitive commands on a regular basis, such as creating and running scripts to set up new personal computers (PCs) for employees. Application management. An operating system handles the launch and management of every application. This typically supports an array of behaviors, including timesharing multiple processes, or threads, so that various tasks can share the available processors' time; handling interruptions that applications produce to gain a processor's immediate attention, ensuring there is enough memory to execute the application and its corresponding data without interfering with other processes; carrying out error handling that can gracefully remove an application's processes; and performing memory management without disrupting other applications or the OS. An operating system can also support APIs that enable applications to utilize OS and hardware functions without the need to know anything about the low-level OS or hardware state. As an example, a Windows API can enable a program to obtain input from a keyboard or mouse; create GUI elements, such as dialog windows and buttons; read and write files to a storage device; and more. Applications are almost always tailored to use the operating system on which the application intends to run. Additionally, an operating system can perform the following services for applications: In a multitasking operating system, where multiple programs can be running at the same time, the OS determines which applications should run in what order and how much time should be allowed for each application before giving another application a turn. It handles input/output (I/O) to and from attached hardware devices, such as hard disks, printers and dial-up ports. It sends messages to each application or interactive user -- or to a system operator -- about the status of operation and any errors that may have occurred. It can offload the management of batch jobs -- for example, printing -- so that the initiating application is freed from this work. On computers that can provide parallel processing, an operating system can manage how to divide the program so that it runs on more than one processor at a time. All major computer platforms (hardware and software) require, and sometimes include, an operating system, and operating systems must be developed with different features to meet the specific needs of various form factors. Device management. An operating system is responsible for identifying, configuring, and providing applications with common access to underlying computer hardware devices. As the OS recognizes and identifies hardware, the OS will install corresponding device drivers that enable the OS and applications running on the OS to use the devices without any specific knowledge of the hardware or devices. An operating system is responsible for identifying the correct printer and installing the appropriate printer drivers so that an application needs to only make calls to the printer without having to use codes or commands that are specific to that printer -- that is the operating system's job. The situation is similar for other devices, such as USB ports; networking ports; graphics devices, such as graphics processing units (GPUs); motherboard chipsets; and storage devices, such as Serial-Attached SCSI (SAS) disk adapters and disks that are formatted with a suitable file system. The OS identifies and configures physical and logical devices for service and typically records them in a standardized structure, such as Windows Registry. Device manufacturers periodically patch and update drivers, and the OS should update them to ensure best device performance and security. When devices are replaced, the OS also installs and configures new drivers. Although the fundamental roles of an operating system are ubiquitous, there are countless operating systems that serve a wide range of hardware and user needs. General-purpose operating system. A general-purpose OS represents an array of operating systems intended to run a multitude of applications on a broad selection of hardware, enabling a user to run one or more applications or tasks simultaneously. A general-purpose OS can be installed on many different desktop and laptop models and run applications from accounting systems to databases to web browsers to games. General-purpose operating systems typically focus on process (thread) and hardware management to ensure that applications can reliably share the wide range of computing hardware present. Common desktop operating systems include the following: Windows is Microsoft's flagship operating system, the de facto standard for home and business computers. Introduced in 1985, the GUI-based OS has been released in many versions since then. The user-friendly Windows 95 was largely responsible for the rapid development of personal computing. Mac OS is the operating system for Apple's Macintosh line of PCs and workstations. Unix is a multiuser operating system designed for flexibility and adaptability. Originally developed in the 1970s, Unix was one of the first operating systems to be written in the C language. Linux is a Unix-like operating system that was designed to provide PC users a free or low-cost alternative. Linux has a reputation as an efficient and fast-performing system. Mobile operating system. Mobile operating systems are designed to accommodate the unique needs of mobile computing and communication-centric devices, such as smartphones and tablets. Mobile devices typically offer limited computing resources compared to traditional PCs, and the OS must be scaled back in size and complexity in order to minimize its own resource use, while ensuring adequate resources for one or more applications running on the device. Mobile operating systems tend to emphasize efficient performance, user responsiveness and close attention to data handling tasks, such as supporting media streaming. Apple iOS and Google Android are examples of mobile operating systems. Embedded operating system. Not all computing devices are general purpose. A huge assortment of dedicated devices -- including home digital assistants, automated teller machines (ATMs), airplane systems, retail point of sale (POS) terminals and internet of things (IoT) devices -- includes computers that require an operating system. The principal difference is that the associated computing device only does one major thing, so the OS is highly stripped down and dedicated to both performance and resilience. The OS should run quickly, not crash, and handle all errors gracefully in order to continue operating in all circumstances. In most cases, the OS is provided on a chip that is incorporated into the actual device. A medical device used in a patient's life support equipment, for example, will employ an embedded OS that must run reliably in order to keep the patient alive. Embedded Linux is one example of an embedded OS. Network operating system. A network operating system (NOS) is another specialized OS intended to facilitate communication between devices operating on a local area network (LAN). A NOS provides the communication stack needed to understand network protocols in order to create, exchange and decompose network packets. Today, the concept of a specialized NOS is largely obsolete because other OS types largely handle network communication. Windows 10 and Windows Server 2019, for example, include comprehensive networking capabilities. The concept of a NOS is still used for some networking devices, such as routers, switches and firewalls, and manufacturers may employ proprietary NOSes, including Cisco Internetwork Operating System (IOS), RouterOS and ZyNOS. Real-time operating system. When a computing device must interact with the real world within constant and repeatable time constraints, the device manufacturer may opt to use a real-time operating system (RTOS). For example, an industrial control system may direct the operations of a sprawling factory or power plant. Such a facility will produce signals from myriad sensors and also send signals to operate valves, actuators, motors and countless other devices. In these situations, the industrial control system must respond quickly and predictably to changing real-world conditions -- otherwise, disaster may result. An RTOS must function without buffering, processing latencies and other delays, which are perfectly acceptable in other types of operating systems. Two examples of RTOSes include FreeRTOS and vxWorks. The differences between operating system types are not absolute, and some operating systems can share characteristics of others. For example, general-purpose operating systems routinely include the networking capabilities found in a traditional NOS. Similarly, an embedded operating system commonly includes attributes of an RTOS, while a mobile operating system can still typically run numerous apps simultaneously like other general-purpose operating systems. Compare the top mobile operating systems for developers What is the preferred developer operating system? Learn the main Linux OS components Compare Windows 10 OS editions to determine the best fit Is macOS Catalina stable enough for enterprise use? SearchNetworking network packet A network packet is a basic unit of data that's grouped together and transferred over a computer network, typically a ... virtual network functions (VNFs) Virtual network functions (VNFs) are virtualized tasks formerly carried out by proprietary, dedicated hardware. network functions virtualization (NFV) Network functions virtualization (NFV) is a network architecture model designed to virtualize network services that have ... SearchSecurity data breach A data breach is a cyber attack in which sensitive, confidential or otherwise protected data has been accessed or disclosed in an ... insider threat An insider threat is a category of risk posed by those who have access to an organization's physical or digital assets. data compliance Data compliance is a process that identifies the applicable governance for data protection, security, storage and other ... SearchCIO OODA loop The OODA loop (Observe, Orient, Decide, Act) is a four-step approach to decision-making that focuses on filtering available ... strategic management Strategic management is the ongoing planning, monitoring, analysis and assessment of all necessities an organization needs to ... resource allocation Resource allocation is the process of assigning and managing assets in a manner that supports an organization's strategic ... SearchHRSoftware SearchCustomerExperience implementation Implementation is the execution or practice of a plan, a method or any design, idea, model, specification, standard or policy for... first call resolution (FCR) First call resolution (FCR) is when customer service agents properly address a customer's needs the first time they call. customer intelligence (CI) Customer intelligence (CI) is the process of collecting and analyzing detailed customer data from internal and external sources ...





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