

Best Operating Systems

5.1 Introduction: An operating system, or "OS," is software that communicates with the hardware and allows other programs to run. It is comprised of system software, or the fundamental files your computer needs to boot up and function. Every desktop computer, tablet, and smartphone includes an operating system that provides basic functionality for the device.

Common desktop operating systems include Windows, Mac OS X, and Linux. While each OS is different, they all provide a graphical user interface, or GUI, that includes a desktop and the ability to manage files and folders. They also allow you to install and run programs written for the operating system. While Windows and Linux can be installed on standard PC hardware, Mac OS X can only run on Macintosh computers. Therefore, the hardware you choose affects what operating system(s) you can run.

Mobile devices, such as tablets and smartphones also include operating systems that provide a GUI and can run applications. Common mobile OSes include Android, iOS, and Windows Phone. These OSes are developed specifically for portable devices and therefore are designed around touchscreen input. While early mobile operating systems lacked many features found in desktop OSes, they now include advanced capabilities, such as the ability to run third-party apps and run multiple apps at once.

Since the operating system serves as a computer's fundamental user interface, it significantly affects how you interact with the device. Therefore, many users prefer to use a specific operating system. For example, one user may prefer to use a computer with Mac OS X instead of a Windows-based PC. Another user may prefer an Android-based smartphone instead of an iPhone, which runs the iOS.

When software developers create applications, they must be write and compile them for a specific operating system. This is because each OS communicates with the hardware differently and has a specific application program interface, or API, that the programmer must use. While many popular programs are crossplatform, meaning they have been developed for multiple OSes, some are only available for a single operating system. Therefore, when choosing a computer, it is important to make sure the operating system supports the programs you want to run.

A layman can think of an Operating System as the soul of a computer. It is a Software - so it cannot be seen, just like a soul! All the fancy hardware a computer has will be of no use without the Operating System, just like a human body - which, no matter how powerful, is of no use without a soul inside it.

Operating System works as an intermediary between the application programs and the computer hardware, and also peripheral hardware and the computer hardware. It is not just computers which have OS's - even cellular phones and gaming consoles have them. Because the operating system is at the root of your PC, upgrading automatically means losing all information on the hard drive. So do back up all your information when you're thinking of changing your OS.

5.2 Best Operating Systems for Home Users

This is not a top 10, because there really are only 3 main OS's

So which are the Best Operating Systems available for Home Users? The choices are pretty cool and can be divided into thread broad categories :

Microsoft Windows Operating Systems : Certainly the most popular among PC and Laptop users. The latest offering is Windows 8. It is revolutionary, having been designed for both desktops, laptops, phones and tablets. Windows 7 will be hard to push out of the market: it has received better reviews than the Vista Operating System. However, Vista is still available. XP has been supported way longer than expected, but will no longer be updated starting 2014. In 1975, Gates and Allen form a partnership called Microsoft. Like most start-ups, Microsoft begins small, but has a huge vision—a computer on every desktop and in every home. During the next years, Microsoft begins to change the ways we work.

The dawn of MS-DOS

In June 1980, Gates and Allen hire Gates' former Harvard classmate Steve Ballmer to help run the company. The next month, IBM approaches Microsoft about a project code-named "Chess." In response, Microsoft focuses on a new operating system—the software that manages, or runs, the computer hardware and also serves to bridge the gap between the computer hardware and programs, such as a word processor. It's the foundation on which computer programs can run. They name their new operating system "MS-DOS."

When the IBM PC running MS-DOS ships in 1981, it introduces a whole new language to the general public. Typing "C:" and various cryptic commands gradually becomes part of daily work. People discover the backslash (\) key.

Macintosh Operating Systems : Mac OSX 10.6 Snow Leopard is the latest product in this category. Mac users are waiting eagerly for 10.7 Lion Version. Previous versions of the OS X are pretty popular too.

The original operating system was first introduced in 1984 as being integral to the original Macintosh, and referred to as the "System". Referred to by its major revision starting with "System 6 and "System 7", Apple rebranded version 7.6 as "Mac OS" as part of their Macintosh clone program in 1996. The Macintosh, specifically its system software, is credited with having popularized the early graphical user interface concept.

Macintosh operating systems have been released in two major series. Up to major revision 9, from 1984 to 2000, it is historically known as Classic Mac OS. Major revision 10, from 2001 to present, is branded OS X (originally referred to as Mac OS X).^[5] Major revisions to the Macintosh OS are now issued as point revisions, such that, for example, 10.2 is substantially different from 10.5. Both series share a general interface design, and there has been some overlap with shared application frameworks and virtual machine technology for compatibility; but the two series also have deeply different architectures.

Design concept

Apple's original concept for the Macintosh deliberately sought to minimize the user's conceptual awareness of the operating system. Tasks which required more operating system knowledge on other systems would be accomplished by mouse gestures and graphic controls on a Macintosh. This would differentiate it from then current systems, such as MS-DOS, which used a command line interface consisting of tersely-abbreviated textual commands.

The core of the system software was held in ROM, with updates originally provided on floppy disk, freely copyable at Apple dealers. The user's involvement in an upgrade of the operating system was also minimized to running an installer, or replacing system files using the file manager. This simplicity meant that the early releases lacked any access controls, in effect giving its single user root privileges at all times

Versions

Early versions of Mac OS were compatible only with Motorola 68000-family Macintoshes. As Apple introduced computers with PowerPC hardware, the OS was ported to support this architecture. Mac OS 8.1 was the last version that could run on a "68K" processor (the 68040). OS X, which has superseded the "Classic" Mac OS, is compatible with only PowerPC processors from version 10.0 ("Cheetah") to version 10.3 ("Panther"). Both PowerPC and Intel processors are supported in version 10.4 ("Tiger", Intel only supported after an update) and version 10.5 ("Leopard"). 10.6 and later versions support only Intel processors.^[6]

The early Macintosh operating system initially consisted of two pieces of software, called "System" and "Finder", each with its own version number.^[7] System 7.5.1 was the first to include the Mac OS logo (a variation on the original Happy Mac startup icon), and Mac OS 7.6 was the first to be named "Mac OS".

Before the introduction of the later PowerPC G3-based systems, significant parts of the system were stored in physical ROM on the motherboard. The initial purpose of this was to avoid using up the limited storage of floppy disks on system support, given that the early Macs had no hard disk (only one model of Mac was ever actually bootable using the ROM alone, the 1991 Mac Classic model). This architecture also allowed for a completely graphical OS interface at the lowest level^[clarify] without the need for a text-only console or command-line mode. Boot time errors, such as finding no functioning disk drives, were communicated to the user graphically, usually with an icon or the distinctive Chicago bitmap font and a Chime of Death or a series of beeps. This was in contrast to computers of the time, which displayed such messages in a mono-spaced font on a black background, and required the use of the keyboard, not a mouse, for input. To provide such niceties at a low level, Mac OS depended on core system software in ROM on the motherboard, a fact also used to ensure that only Apple computers or licensed clones (with the copyright-protected ROMs from Apple) could run Mac OS.

"Classic" Mac OS (1984–2001)

The "classic" Mac OS is characterized by its monolithic system. Versions of Mac OS up through System 4 only ran one application at a time. Even so, it was noted for its ease of use. Mac OS gained cooperative multitasking with System 5, which ran on the Mac SE and Macintosh II. It was criticized for its very limited memory management, lack of protected memory, no access controls, and susceptibility to conflicts among operating system "extensions" that provide additional functionality

(such as networking) or support for a particular device. Some extensions didn't work properly together, or only worked when loaded in a particular order. Troubleshooting Mac OS extensions could be a time-consuming process of trial and error.

The Macintosh originally used the Macintosh File System (MFS), a flat file system with only one level of folders. This was quickly replaced in 1985 by the Hierarchical File System (HFS), which had a true directory tree. Both file systems are otherwise compatible.

Most file systems used with DOS, Unix, or other operating systems treat a file as simply a sequence of bytes, requiring an application to know which bytes represent what type of information. By contrast, MFS and HFS give files two different "forks". The data fork contains the same sort of information as other file systems, such as the text of a document or the bitmaps of an image file. The resource fork contains other structured data such as menu definitions, graphics, sounds, or code segments. A file might consist only of resources with an empty data fork, or only a data fork with no resource fork. A word processor file could contain its text in the data fork and styling information in the resource fork, so that an application which doesn't recognize the styling information can still read the raw text.

On the other hand, these forks would provide a challenge to interoperability with other operating systems: how does one copy a dual-forked file into a different file system, or across a file-transfer system, or embed it into email? In copying or transferring a MacOS file to a non-Mac system, the default implementations would simply strip the file of its resource fork. Most data files contained only nonessential information in their resource fork, such as window size and location, but program files would be inoperative without their resources. This necessitated such encoding schemes as BinHex and MacBinary, which allowed a user to encode a dual-forked file into a single stream, or inversely take a single stream so-encoded and reconstitute it into a dual-forked file usable by MacOS.

PowerPC versions of OS X up to and including OS X v10.4 Tiger (support for Classic was dropped by Apple with v10.5 Leopard's release and it is no longer included) include a compatibility layer for running older Mac applications, the Classic Environment. This runs a full copy of the older Mac OS, version 9.1 or later, in an OS X process. PowerPC-based Macs shipped with Mac OS 9.2 as well as OS X. Mac OS 9.2 had to be installed by the user—it was not installed by default on hardware revisions released after the release of OS X 10.4 Tiger. Most well-written "classic" applications function properly under this environment, but

compatibility is only assured if the software was written to be unaware of the actual hardware, and to interact solely with the operating system. The Classic Environment is not available on Intel-based Macintosh systems due to the incompatibility of Mac OS 9 with the x86 hardware.

Users of the classic Mac OS generally upgraded to OS X, but many criticized it as being more difficult and less user-friendly than the original Mac OS, for the lack of certain features that had not been re-implemented in the new OS, or for being slower on the same hardware (especially older hardware), or other, sometimes serious incompatibilities with the older OS.^[8] Because drivers (for printers, scanners, tablets, etc.) written for the older Mac OS are not compatible with OS X, and due to the lack of OS X support for older Apple machines, a significant number of Macintosh users continued using the older classic Mac OS.

In June 2005, Steve Jobs announced at the Worldwide Developers Conference keynote that Apple computers would be transitioning from PowerPC to Intel processors and thus dropping compatibility on new machines for Mac OS Classic. At the same conference, Jobs announced Developer Transition Kits that included beta versions of Apple software including OS X that developers could use to test their applications as they ported them to run on Intel-powered Macs. In January 2006, Apple released the first Macintosh computers with Intel processors, an iMac and the MacBook Pro, and in February 2006, Apple released a Mac mini with an Intel Core Solo and Duo processor. On May 16, 2006, Apple released the MacBook, before completing the Intel transition on August 7 with the Mac Pro. To ease the transition for early buyers of the new machines, Intel-based Macs included an emulation technology called Rosetta, which allows them to run OS X software that was compiled for PowerPC-based Macintosh models. Rosetta runs transparently, creating a user experience identical to running the software on a PowerPC machine, though execution is typically slower than with native code. Rosetta was an optional installation in OS X 10.6 Snow Leopard and is not available at all in OS X 10.7 Lion.

Linux Based Operating Systems : In the past few years - Linux Based Operating Systems have become very popular. **Linux** is a Unix-like and mostly POSIX-compliant computer operating system assembled under the model of free and open-source software development and distribution. The defining component of Linux is the Linux kernel, an operating system kernel first released on 5 October 1991 by Linus Torvalds.

Linux was originally developed as a free operating system for Intel x86-based personal computers. It has since been ported to more computer hardware platforms than any other operating system. It is a leading operating system on servers and other big iron systems such as mainframe computers and supercomputers. As of June 2013, more than 95% of the world's 500 fastest supercomputers run some variant of Linux, including all the 44 fastest. Linux also runs on embedded systems, which are devices whose operating system is typically built into the firmware and is highly tailored to the system; this includes mobile phones, tablet computers, network routers, facility automation controls, televisions and video game consoles. Android, which is a widely used operating system for mobile devices, is built on top of the Linux kernel.

The development of Linux is one of the most prominent examples of free and open-source software collaboration. The underlying source code may be used, modified, and distributed—commercially or non-commercially—by anyone under licenses such as the GNU General Public License. Typically, Linux is packaged in a format known as a *Linux distribution* for desktop and server use. Some popular mainstream Linux distributions include Debian, Ubuntu, Linux Mint, Fedora, openSUSE, Arch Linux, and the commercial Red Hat Enterprise Linux and SUSE Linux Enterprise Server. Linux distributions include the Linux kernel, supporting utilities and libraries and usually a large amount of application software to fulfill the distribution's intended use.

A distribution oriented toward desktop use will typically include X11, Wayland or Mir as the windowing system, and an accompanying desktop environment such as GNOME or the KDE Software Compilation. Some such distributions may include a less resource intensive desktop such as LXDE or Xfce, for use on older or less powerful computers. A distribution intended to run as a server may omit all graphical environments from the standard install, and instead include other software to set up and operate a solution stack such as LAMP. Because Linux is freely redistributable, anyone may create a distribution for any intended use.