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RESEARCH PAPER ON OPERATING SYSTEM

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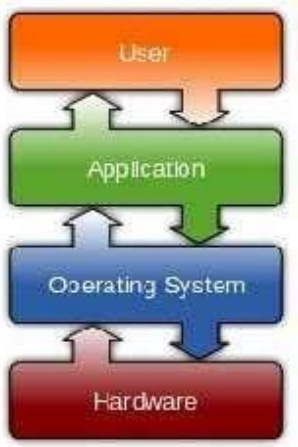
OPERATING SYSTEM

An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is an essential component of the system software in a computer system. Application programs usually require an operating system to function.

Time-sharing operating systems schedule tasks for efficient use of the system and may also include accounting software for cost allocation of processor time, mass storage, printing, and other resources.

For hardware functions such as input and output and memory allocation, the operating system acts as an intermediary between programs and the computer hardware, although the application code is usually executed directly by the hardware and will frequently make a system call to an OS function or be interrupted by it. Operating systems can be found on almost any device that contains a computer— from cellular phones and video game consoles to supercomputers and web servers.



Types of Operating Systems

Within the broad family of operating systems, there are generally four types, categorized based on the types of computers they control and the sort of applications they support. The categories are:

Real-time operating system (RTOS) -
Real-time operating systems are used to control machinery, scientific instruments and industrial systems. An RTOS typically has very little user interface capability, and no end-user utilities, since the system will be a "sealed box" when delivered for use. A very important part of an RTOS is managing the resources of the computer so that a particular operation executes in precisely the same amount of time, every time it occurs. In a complex machine, having a part move more quickly just because system resources are available may be just as catastrophic as having it not move at all because the system is busy.

Single-user, single task - As the name implies, this operating system is designed to manage the computer so that one user can effectively do one thing at a time. The Palm OS for Palm handheld computers is a good example of a modern single-user, single-task operating system.

Single-user, multi-tasking - This is the type of operating system most people use on their desktop and laptop computers today. Microsoft's Windows and Apple's MacOS platforms are both examples of operating systems that will let a single user have several programs in operation at the same time. For example, it's entirely possible for a Windows user to be writing a note in a word processor while downloading a file from the Internet while printing the text of an e-mail message.

Multi-user - A multi-user operating system allows many different users to take advantage of the computer's resources simultaneously. The operating system must make sure that the requirements of the various users are balanced, and that each of the programs they are using

has sufficient and separate resources so that a problem with one user doesn't affect the entire community of users. UNIX, VMS and mainframe operating systems, such as *MVS*, are examples of multi-user operating systems.

It's important to differentiate between multi-user operating systems and single-user operating systems that support networking. Windows 2000 and Novell Netware can each support hundreds or thousands of networked users, but the operating systems themselves aren't true multi-user operating systems. The **system administrator** is the only "user" for Windows 2000 or Netware. The network support and all of the remote user logins the network enables are, in the overall plan of the operating system, a program being run by the administrative user.

Functions of an operating system

Booting the computer

The process of starting or restarting the computer is known as booting. A cold boot is when you turn on a computer that has been turned off completely. A warm boot is the process of using the operating system to restart the computer.

Performs basic computer tasks

The operating system performs basic computer tasks, such as managing the various peripheral devices such as the mouse, keyboard and printers. For example, most operating systems now are plug and play which means a device such as a printer will automatically be detected and configured without any user intervention. **Provides a user interface**

A user interacts with software through the user interface. The two main types of user interfaces are: command line and a graphical user interface (GUI). With a command line interface, the user interacts with the operating system by typing commands to perform specific tasks. An example of a command line interface is DOS (disk operating system). With a graphical user interface, the user interacts with the operating system by using a mouse to access windows, icons, and menus. An example of a graphical user interface is Windows Vista or Windows **Handles system resources**

The operating system also handles system resources such as the computer's memory and sharing of the central processing unit (CPU) time by various applications or peripheral devices. Programs and input methods are constantly competing for the attention of the CPU and demand memory, storage and input/output bandwidth. The operating system ensures that each application gets the necessary resources it needs in order to maximize the functionality of the overall system.

Provides file management

The operating system also handles the organization and tracking of files and directories (folders) saved or retrieved from a computer disk. The file management system allows the user to perform such tasks as creating files and directories, renaming files, coping and moving files, and deleting files. The operating system keeps track of where files are located on the hard drive through the type of file system. The type two main types of file system are File Allocation table (FAT) or New Technology File system (NTFS).

Types of file system

- File Allocation table (FAT)
- New Technology file system (NTFS)

File Allocation table (FAT) uses the file allocation table which records, which clusters are used and unused and where files are located within the clusters.

NTFS is a file system introduced by Microsoft and it has a number of advantages over the previous file system, named FAT32 (File Allocation Table).

"One major advantage of NTFS is that it includes features to improve reliability. For example, the new technology file system includes fault tolerance, which automatically repairs hard drive errors without displaying error messages. It also keeps detailed transaction logs, which tracks hard drive errors. This can help prevent hard disk failures and makes it possible to recover files if the hard drive does fail. " **Linux is easy to install**

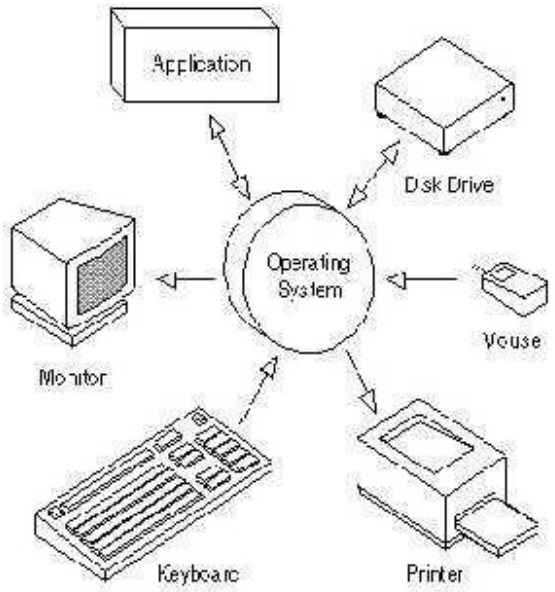
In many instances, it is actually easier to install Linux to your computer than Windows.

Linux is very stable

Linux systems rarely crash, and when they do, the whole system normally does not go down. The "blue screen of death" familiar to Windows users is not a worry for Linux users

Linux

Linux is a UNIX-based operating system. Its original creator was a Finnish student name **Linus Torvalds**, although being 'open source' it has change a great deal since its original conception. It belongs to nobody, and is free to download and use. Any changes to it are open for all to adopt, and as a result it has developed into a very powerful OS that is rapidly gaining in popularity worldwide, particularly among those seeking an alternative to Windows.



Advantages and Benefits of Linux

source, you have access to the source code and can

Disadvantages

Many Windows programs will not run in Linux.

iTunes, Microsoft Office, Internet Explorer and many other Windows programs will not run natively in Linux. The good news is that there are decent ways around most of these problems. For example, music libraries can be managed with an iPod using programs such as 43customize Linux to be whatever you want it to be; you can even create your own distro if you like!

Amarok, Banshee, or Rhythm box in Linux. Mozilla Firefox and Google Chrome are outstanding Internet browsers which can be used in the place of Internet Explorer. It is also possible to run iTunes in Linux using Wine, Virtual Box, or Parallels, though it is difficult to have good results. Libre Office and Open Office are excellent office suites which can be used in the place of Microsoft Office, but while overall compatibility in both suites is good with Microsoft Office formats, it is not perfect. Click here to learn more about Linux equivalents to software commonly used in Windows.

There is a smaller selection of peripheral hardware drivers for Linux.

There is a smaller selection of peripheral hardware drivers (for printers, scanners, and other devices) in Linux as compared to Windows, though many new Linux hardware drivers are constantly being added. Closely related to this issue is the fact that not all Linux distros work with all sets of computer hardware, so a person may need to try more than one distro to find one which works well with his/her computer. When it comes to printers, some manufacturers offer better Linux support than others; for example, HP offers excellent printer support for Linux. Click here to learn more about Linux hardware compatibility.

There is a learning curve for people who are new to Linux.

Despite this, most Linux distros, especially the major ones, are very intuitive and user-friendly. Also, the desktop environments in Linux are in many ways similar to Windows in their appearance. One thing which should be emphasized is that there is also a learning curve for Windows XP users who switch to Windows 7 or Windows 8.

Microsoft Windows

Microsoft Windows is a series of graphical interface operating systems developed, marketed, and sold by Microsoft.

Microsoft introduced an operating environment named Windows on November 20, 1985 as a graphical operating system shell for MS-DOS in response to the growing interest in graphical user interfaces (GUI). Microsoft Windows came to dominate the world's personal computer market with over 90% market share, overtaking Mac OS, which had been introduced in 1984.

A history of Windows

1975–1981: Microsoft boots up

It’s the 1970s. At work, we rely on typewriters. If we need to copy a document, we likely use a mimeograph or carbon paper. Few have heard of microcomputers, but two young computer enthusiasts, Bill Gates and Paul Allen, see that personal computing is a path to the future.

In 1975, Gates and Allen form a partnership called Microsoft. Like most startups, 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.

1982–1985: Introducing Windows 1.0

Microsoft works on the first version of a new operating system. Interface Manager is the code name and is considered as the final name, but Windows prevails because it best describes the boxes or computing “windows” that are fundamental to the new system. Windows is announced in 1983, but it takes a while to develop. Skeptics call it “vaporware.”

1987–1992: Windows 2.0–2.11—More windows, more speed

On December 9, 1987 Microsoft releases Windows 2.0 with desktop icons and expanded memory. With improved graphics support, you can now overlap windows, control the screen layout, and use keyboard shortcuts to speed up your work. Some software developers write their first Windows–based programs for this release.

1990–1994: Windows 3.0–Windows NT— Getting the graphics

On May 22, 1990, Microsoft announces Windows 3.0, followed shortly by Windows 3.1 in 1992. Taken together, they sell 10 million copies in their first 2 years, making this the most widely used Windows operating system yet. The scale of this success causes Microsoft to revise earlier plans. Virtual Memory improves visual graphics. In 1990 Windows starts to look like the versions to come.

Windows now has significantly better performance, advanced graphics with 16 colors, and improved icons. A new wave of 386 PCs helps drive the popularity of Windows 3.0. With full support for the Intel 386 processor, programs run noticeably faster. Program Manager, File Manager, and Print Manager arrive in Windows 3.0.

Windows NT

When Windows NT releases on July 27, 1993, Microsoft meets an important milestone: the completion of a project begun in the late 1980s to build an advanced new operating system from scratch. "Windows NT represents nothing less than a fundamental change in the way that companies can address their business computing requirements," Bill Gates says at its release.

Unlike Windows 3.1, however, Windows NT 3.1 is a 32-bit operating system, which makes it a strategic business platform that supports high-end engineering and scientific programs.

1995–2001: Windows 95—the PC comes of age (and don't forget the Internet)

On August 24, 1995, Microsoft releases Windows 95, selling a record-setting 7 million copies in the first five weeks. It’s the most publicized launch Microsoft has

ever taken on. Television commercials feature the Rolling Stones singing "Start Me Up" over images of the new Start button. The press release simply begins: "It's here."

1998..2000: Windows 98, Windows 2000, Windows Me

Released on June 25, 1998, Windows 98 is the first version of Windows designed specifically for consumers. PCs are common at work and home, and Internet cafes where you can get online are popping up. Windows 98 is described as an operating system that "Works Better, Plays Better."

With Windows 98, you can find information more easily on your PC as well as the Internet. Other improvements include the ability to open and close programs more quickly, and support for reading DVD discs and universal serial bus (USB) devices. Another first appearance is the Quick Launch bar, which lets you run programs without having to browse the Start menu or look for them on the desktop.

2001–2005: Windows XP—Stable, usable, and fast

On October 25, 2001, Windows XP is released with a redesigned look and feel that's centered on usability and a unified Help and Support services center. It's available in 25 languages. From the mid-1970s until the release of Windows XP, about 1 billion PCs have been shipped worldwide.

2006–2008: Windows Vista—Smart on security

Windows Vista is released in 2006 with the strongest security system yet. User Account Control helps prevent potentially harmful software from making changes to your computer.

In Windows Vista Ultimate, BitLocker Drive Encryption provides better data protection for your computer, as laptop sales and security needs increase. Windows Vista also features enhancements to Windows Media Player as more and more people come to see their PCs as central locations for digital media. Here you can watch television, view and send photographs, and edit videos.

2009: Windows 7

Windows 7 was built for the wireless world that arose in the late 2000s. By the time it was released, laptops were outselling desktops, and it had become common to connect to public wireless hotspots in coffee shops and private networks in the home.

Windows 7 included new ways to work with windows—like Snap, Peek, and Shake—which both improved functionality and made the interface more fun to use. It also marked the debut of Windows Touch, which let touchscreen users browse the web, flip through photos, and open files and folders.

2012: Windows 8

Windows 8 is Windows reimagined from the chipset to the user experience. It functions as both a tablet for entertainment and a full-featured PC for getting things

done. It introduces a totally new interface that works smoothly for both touch and mouse and keyboard.

Windows 8 also includes enhancements of the familiar Windows desktop, with a new taskbar and streamlined file management.

Windows 10

Windows 10 is the most recent version of the operating system from Microsoft. Officially it was released in 2015 and was initially offered free of charge to legitimate users of Windows 7 and Windows 8.1. This new version combines features from those two previous instalments to suit the users in a better way for both desktop/laptop computers as well as mobile devices.

Windows 8.1

Windows 8.1 is a personal computer operating system that was produced by Microsoft and released as part of the Windows NT family of operating systems. It was released to manufacturing on August 27, 2013, and reached general availability on October 17, 2013, about a year after the retail release of its predecessor.

Advantages of using Linux over Windows

Cost

The most obvious advantage of using Linux is the fact that it is free to obtain, while Microsoft products are available for a hefty and sometimes recurring fee.

Security

In line with the costs, the security aspect of Linux is much stronger than that of Windows. Why should you have to spend extra money for virus protection software? The Linux operating system has been around since the early nineties and has managed to stay secure in the realm of widespread viruses, spyware and adware for all these years.

Choice (Freedom)

The power of choice is a great Linux advantage. With Linux, you have the power to control just about every aspect of the operating system. Two major features you have control of are your desktops look and feel by way of numerous Window Managers, and the kernel.

Software

There are so many software choices when it comes to doing any specific task. You could search for a text editor on Fresh meat and yield hundreds, if not thousands of results.

Hardware - Linux is perfect for those old computers with barely any processing power or memory you have sitting in your garage or basement collecting dust. Install Linux and use it as a firewall, a file server, or a backup server.

Flexibility

You don't have to deal with anti-piracy schemes and additional "hoop jumping".

Conclusion

There is no single operating system that is the right choice for every organization and every application. Many organizations find that the best approach is to run multiple operating systems. Linux and Windows are only two choices--there are many others. That said, for organizations that are deciding between Windows and Linux, what is the best way to decide?

When evaluating Windows versus Linux as a server operating system, our survey provides insights on the relative advantages of each operating system for following eight criteria. IT managers can use these insights to make informed decisions on the operating system that best meets the particular needs and priorities of their organizations.

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