Adam Collins

Mrs. Dodge

CIS 111

15 December 2023

What is an Operating System?

Introduction

Today, operating systems are in thousands of different types of electronic devices. From your PC to your phone, an operating system is a collection of programs which provide an interface between the hardware and applications of a computer (Houser and O’Boyle 5). Without an operating system your computer would have no way to interpret any information and connect to devices, making them a necessary part of your computer. There are many operating systems that are used today, with the most popular being Windows, Linux, macOS, and Chrome OS. In this essay I will discuss what purpose an operating system serves for a computer, the versions of Microsoft Windows that have been provided throughout the years, an introduction to file systems, and briefly discuss the Linux operating system.

What is an operating system?

An Operating System, or OS for short, is what manages the hardware and software on a computer, such as the OS on your iPhone or Gaming Laptop (Houser and O’Boyle 5). According to Docter, et al., authors of CompTIA a+ Complete Study Guide, “operating systems have many different, complex functions, but two of them jump out as being critical: interfacing with the hardware and providing a platform on which other applications can run” (Docter, et al. 219). An application is the programs on your computer, like Microsoft Word, that are built to be used for a specific task (220). Applications are built to work with the operating systems that they are designed to run on and when they want to access the computer’s RAM, they ask the operating system to do it for them (220). Additionally, the OS comes with programs called “drivers” that send instructions to the OS on how to use the hardware connected to it, such as a printer or USB thumb drive (220). The operating system provides the interface that allows users to communicate with the computer hardware and software (219). Without one, it is clear that you would not be able to do anything of use on your computer. You wouldn’t be able to plug in a USB drive to back up your important files and you wouldn’t be able to type an essay on Word because there is no OS to communicate them with the rest of the computer.

One of the important functions an OS does for you is that it provides a GUI (Houser and O’Boyle 11). The GUI stands for graphical user interface, and it contains the graphical objects that you can work with when you are on your computer (14). When you use a GUI, you interact with it via your keyboard and mouse (14). This would be clicking a shortcut to productivity application, such as Microsoft Word, via your computer’s mouse or typing information into an excel spreadsheet with your keyboard. There are many devices that you can use to work with your operating system’s GUI; they are known as peripheral devices (18). Peripheral devices are the external devices that connect to your computer; they expand the functionality of what you can do with your computer (18). Your keyboard and mouse are peripheral devices (18). Some people may choose to use a trackball instead of a mouse because of its ergonomic design (18). A trackball is very similar to a mouse but instead of moving it to navigate the GUI you move a ball that you control via your thumb (18). This makes it so you don’t have to move your wrists as much, preventing carpel tunnel syndrome.

Another way the OS allows you to work with your computer is via the CLI. The CLI stands for Command Line interface (Houser and O’Boyle 11). It is also referred to as the command-driven interface, or CDI for short (11). The CLI is text-based, meaning you have to input information with your keyboard into the CLI in order to tell your computer what you would like it to do (11). People who are tech savvy use the CLI because it is arguably more efficient than using the GUI, allowing you to perform tasks in a faster period (12). If you are interested in using the CLI on your computer to perform tasks more efficiently you will have to take some time to learn the ropes necessary to be able to meet the requirements in order to do so. The CLI in different operating systems speak in different languages, so if you are using a PC with Windows 10 the language it’s CLI will speak will be different from the MacBook’s CLI (11). We will dive further into the CLI as we continue on into the next few pages of this essay. Some operating systems, such as Linux, are strategically designed to use the command line interface to help it’s users perform tasks.

Microsoft Windows throughout the years

Microsoft Windows is one of the most used operating systems today (“Operating Systems” 1:50-3:02). In its earliest forms it was named MS-DOS, short for Microsoft Disk Operating System (Houser and O’Boyle 13). MS-DOS was text based, so it would require you to use its CLI (13). Many of the notable versions of Windows are Windows 7, Windows 8, Windows 8.1, and Windows 10 (Meyers, et al. 111). Windows 7 provides its users with a GUI (111). The web browser that comes with Windows 7 is called Internet Explorer, which you can open by clicking it’s icon in the taskbar (111). The taskbar is at the bottom of Window’s 7’s “desktop” (111). The desktop is basically the homepage of the GUI, allowing you to navigate to everything else. It is the first thing you see after logging into your Windows machine. An interesting thing about Windows 7 is that they offered transparency around the borders of applications and a Start button which took you to a menu allowing you to quickly navigate to anywhere in the OS (111). This made this OS unique from the others and a fan favorite (111).

After Windows 7 came Windows 8. Windows 8 brought a lot of huge changes to the functionality of their operating system (Meyers, et al. 113). They removed the Start button and replaced it with something known as the Start screen (113). The Start screen did not show everything installed on the computer and instead only showed a select few apps that the user could pin to use later (113). Windows 8 also brought touch screen functionality with it, allowing their users to tap on applications to start them like a tablet (113). Even though Windows 8 brought some cool features like touch screen capabilities it was still not enough to make up for removing the Start menu; this caused their users to feel enraged because the start menu they have known and loved was now gone (114). To make up for this Microsoft created Windows 8.1, which included both touch screen and the familiar Start button (114). This caused many of their user’s to be happy because their Start button was now back and there to stay.

After Windows 8.1, Microsoft created Windows 10 (Britannica para. 5). Windows 10 brought many of the same features as Windows 8.1 but improved upon it by adding Cortona and replaced their web browser, Internet Explorer, with a newer browser called Microsoft Edge (para. 5). Cortona is very similar to the Siri you know from your iPhone because it allows you to communicate with it via your voice and helps assist you with your computer related needs (para. 5. In addition, Windows 10 combined many of the features that Windows 7 and 8 had to offer (Meyers, et al 118). The start screen was changed back to a start menu being strategically similar to the look of Windows 7’s start menu because of the abundant amount of people who enjoyed using that in the past. (118). However, the new and improved start menu also included Windows 8.1’s customizable tiles, accommodating users who enjoyed using that feature as well (118). Microsoft Windows is one of the most well-known operating systems today, without it the way we think of computers would be entirely different. Windows provides features to their users that help them perform tasks more efficiently on their computer. Overall, Windows is arguably essential for the average person to be able to use their computer with ease.

File Systems

In order for operating systems to function they must contain file systems. A file system allows data to be organized and stored, allowing your computer to be able to access data when need be (“FAT32 vs exFAT” 2:00-2:26). A file system would function with the storage you have installed inside your computer. This would allow you to store music, videos, photos, documents and more; allowing your computer to be able to find them and put them to good use with ease. We will be discussing various versions of the Windows file systems that have been around throughout the years. One of Windows’ oldest file systems, created with Windows 95, is known as FAT32 (2:52). Being one of the most compatible file systems, it is used to this day because of the fact that it will work with many older versions of Windows OS and other operating systems made by different companies (2:59). A downside of FAT32 is that it only supports files that are no greater than 4 GB (3:23).

After FAT32, in 2006 Microsoft created exFAT, short for Extended file allocation table (4:04). It was an upgrade to FAT32 allowing file size to basically be unlimited (4:25). A big downside with using exFAT is that older versions of Windows won’t work with it (4:47). By default, newer versions use NTFS today for their file system (5:03). Like exFAT, file size can pretty much be endless as long as the storage system using NTFS is large enough (5:23). A huge advantage to using NTFS is that it brought file protection, allowing you to encrypt and set permissions on your files (5:47-6:40). This is beneficial because it allows you to protect your important files from criminals, such as passwords, family photos, insurance information, and more. Like exFAT, NTFS does not support older versions of Windows, notably ones that don’t use NTFS (6:07). It also is read only on Macs (6:43). Overall, file systems are extremely important for you to access information on your computer and throughout the years Windows has created plenty of file systems to help suit user’s needs.

Linux

If you are tech savvy, then Linux might be the operating system for you. Created in the 1980s, the Linux operating system provides the benefits of being free, open source, and provides a large community of users dedicated to helping people who are new with using Linux (“Operating Systems” 3:00-4:52; “What is Linux?” para. 3). Linux is used in many home appliances such as your thermostats or refrigerators (“What Is Linux?” para. 3). There are multiple distributions available that can be chosen from, such as Ubuntu and Debian (“Operating Systems” 3:00-4:52). It is strongly recommended that one starts with Ubuntu first because from my own personal experience people are more willing to help if you start with that as it is more beginner friendly. An advantage to using Linux is that it is very secure and reliable causing many to choose it to run their servers on (“What is Linux” para 4). But a downside of using Linux is that some device drivers that work with Windows may not work with Linux (“Operating Systems” 3:00-4:52). Linux has a steep learning curve because many of the tasks you would normally be able to perform via the GUI would have to be learned via the CLI. This discourages many from wanting to learn how to use Linux. But if one decides to take the time to learn how, they have opened a wide range of opportunities for what they can achieve when using their computer.

Conclusion

An operating system is essential in order for us to be able to use our computers. It provides us with a graphical user interface, allowing us to work with the objects we see on our computer’s screen. Furthermore, operating systems such as Microsoft Windows have additional features that give their users more freedom to do more with their computer, such as the Start Menu and the tile feature that it provides. In addition, operating systems give us a file system that allows us to store and retrieve data, without this there would be no way for a computer to properly hold on to anything. Finally, Linux has been a top choice amongst web developers, penetration testers, programmers, and more. It provides users with the flexibility of being able to perform tasks efficiently via their command line interface. Operating systems are an integral part of the computer, and computers can’t be left without them.

Works Cited

Britannica, The Editors of Encyclopaedia. "Microsoft Windows". Encyclopedia Britannica, 1 Dec. 2023, https://www.britannica.com/technology/Microsoft-Windows. Accessed 2 December 2023.

Docter, Quentin, et al. CompTIA a+ Complete Study Guide : Exams 220-701 (Essentials) and 220-702 (Practical Application), John Wiley & Sons, Incorporated, 2009. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/greatbay-ebooks/detail.action?docID=468754.

“FAT32 vs exFAT vs NTFS - Windows File Systems.” Youtube, uploaded by PowerCert Animated Videos, 21 April 2023, https://youtu.be/bYjQakUxeVY?si=OV5ZI3zzXGcVIpMC

Houser, Tcat, and Helen O’Boyle. Examinsight for A+ Operating Systems Technology (Exam 220-222), TotalRecall Publications, 2002. ProQuest Ebook Central, https://ebookcentral.proquest.com/lib/greatbay-ebooks/detail.action?docID=3410563.

Meyers, Mike, Scott Jernigan and David Lachance. ITF+ CompTIA IT Fundamentals All-in-One Exam Guide, Second Edition (Exam FC0-U61) McGraw Hill LLC. Kindle Edition, 2018.

“Operating Systems Overview - CompTIA A+ 220-1102 - 1.8.” YouTube, uploaded by Professor Messer, 23 June 2022, <https://www.youtube.com/watch?v=KrbhX7sRLXg>

“What Is Linux?” Linux.Com, www.linux.com/what-is-linux/. Accessed 7 Dec. 2023.