A Review on Microsoft's Windows 10 Operating System

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ABSTRACT-The paper based on the Microsoft Windows version Windows 10 operating system. Writing about the process management technology was used, how was the memory management system, and security of the operating system and when it was released? Also, we can acquire knowledge of file system. This article looks at why consumers prefer the Microsoft Windows operating system, as well as the features they used. My findings show that Windows users care more about the usability, familiarity, and availability of productivity tools than they do about the ideal resilience and security of their devices. According to the research, Windows 10 and Windows 7 have a lot of similarities. Windows 10 combines the best features of both Windows 7 and Windows 8.

KEYWORD: Brief History, Process control , Security, Architecture, Kernel, Process, Virtual Memory, Design Principle

I.INTRODUCTION: Operating System is a program that serves as a link between a computer user and the computer hardware. In 2021, Microsoft's Windows operating system was the most commonly used computer operating system in the world, with 71.06 % of the desktop, tablet, and console OS market [1]. Windows 11 is the most recent interpretation of the Windows operating system; prior to that, Windows 10, 8.1, 8, and so on were available. MS-DOS was Microsoft's initial operating system, released in 1981 [2]. Microsoft promoted and published Windows 10 as part of the Windows NT operating system family. The Microsoft Windows Server Operating System is a family of enterprise-class server operating systems that allow numerous users to share services while also allowing for substantial administrative control over data storage, applications, and corporate networks

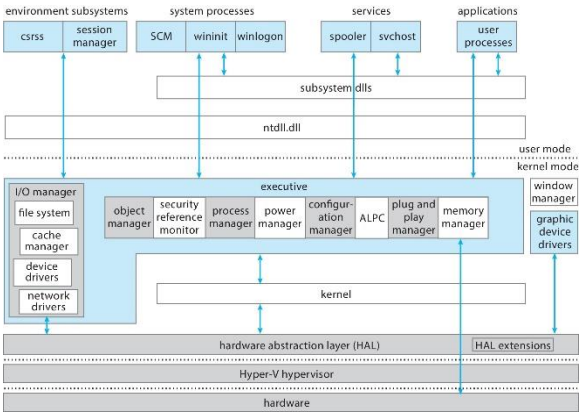
II. BRIEF HISTORY:

Microsoft's Windows 10 operating system is a collection of operating systems. In July of 2015, it was originally launched [3]. It's a graphical operating system developed in response to the rising popularity of graphical user interfaces (GUIs). Windows 10 is currently using on over 900 million devices worldwide [4]. Along the process, several versions of Windows have been released, including XP, Vista, 7, 8, and now 10. Windows is the most popular OS for computers today. Android accounted for most of the operating system market in 2014, thanks to the massive number of Android smartphones shipped. Both operating systems, on the other hand, are tailored to certain platforms. When compared to Android, Microsoft devices were 25% less popular .Many earlier versions are still in use, some of which are less secure and haven't been patched. Windows 10 is a preemptive multitasking operating system for Intel microprocessors that is available in 32-bit and 64-bit versions. Its purpose was to draw attention to Windows 8's UI problems. A virtual desktop system has been built, and the start menu has been restored. Furthermore, the Windows 10.

III.DESIGN PRINCIPLES:

Historically, Windows security was based on discretionary access controls. Access control lists protect system objects such as files, registry keys, and kernel synchronization objects. Extensibility is provided by layered architecture, which includes remote procedure calls and advanced local procedure calls. In terms of portability Windows 10 was created with portability in mind. Windows, like the UNIX operating system, is primarily written in C and C++. For each processor architecture, assembly language is used to write processor-specific portions. Platform specific code is contained in the hardware abstraction layer, a dynamic link library. Windows 10 relies on hardware protection for virtual memory and software protection measures for operating system resources to ensure its dependability. High-performance message forwarding allows Windows 10 components to communicate with one another. Low priority threads are preempted, allowing the system to react fast to external events and symmetrical multiprocessing. Windows 10's international support uses the national language support API to accommodate multiple locales. The dynamic tick feature, process lifespan management, desktop activity monitor, and

connected standby are all part of Windows 10's energy efficiency for portable devices.



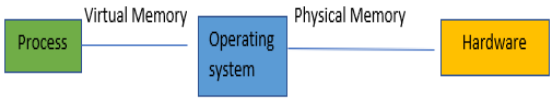
[5] Figure: Windows 10 architecture

IV. PROCESS MANAGEMENT TECHNOLOGY: Virtual addresses are autonomous spaces with data and code that are protected by other techniques. Each process contains one or more threats that can be performed individually. A thread operating within procedures can run application code, create additional threads, construct new processes that are independent of each other, govern communication, and perform line synchronization. Applications will have separate ad parallel jobs processing pages and a well-grafted connectivity with other network systems thanks to the operations management. The threads, which are the Widows' fundamental executable unit, are the technology employed in process management. The lines are organized based on a number of parameters, including the availability of resources such as the CPU and physical memory. Multiple processor systems have long been supported by Windows, which implies that the thread can be allocated to different processors inside the machine. From the perspective of the programmer, each Windows has an extra resource that includes, but is not limited to, multiple threads, virtual address space that is distinct from the address space of other processes, and many code separations that include the code in DLLs.

V. MEMORY MANAGEMENT:

The process of guaranteeing control and coordination of computer memory is known as memory management in the operating system. Locks are components that are allocated to various operating applications in order to improve and optimize the overall performance of the system. Hardware, operating system programs, and applications are all involved in memory management. The windows use cluster demand paging, which means that pages appear in memory only when they are needed. Upon request, it packages them all together ad rig eight. Windows employs a notion that is unaffected by the amount of memory available. It contains pages that belong to the same memory. The First in First Out (FIFO) algorithm is employed in the windows. In comparison to other operating systems,

Linux employs demand paging, which prevents unnecessary pages from being swapped into memory

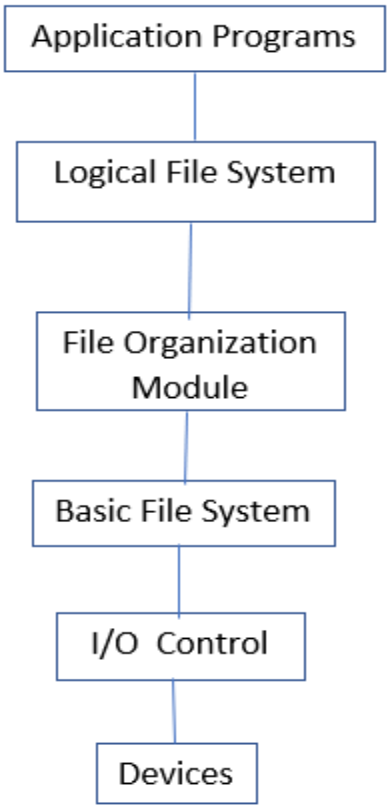


[6] Figure: Virtual memory

The operating system serves as a stage by interfacing all processes through its Virtual Memory, and by mapping the processes in Virtual Memory to Physical Memory, the OS is able to run these processes on the hardware. This requires all processes to be OS-specific, preventing programs from communicating directly with the hardware, which remains insulated and under the sole control of the Operating System. This makes the processes Platform Independent, which means they will always operate regardless of the hardware platform on which the Operating System is installed. To bypass the size constraint of Physical memory, the operating system's Virtual Memory management employs unique paging techniques called Disc Paging and Demand Paging.

V. FILE SYSTEMS:

To store the data that is fed into the designs, the operating systems employ various file management systems. Windows has a drive letter C, and it manages files using FAT and NTFS. The file explorer is a Windows OS program that allows you to traverse directories and files.



[7] **Figure:** Layered file system

Device drivers and specific software packages make up "I/O Control." In terms of obtaining and saving raw blocks of data, the "basic file system" level interacts directly with device drivers. Files and their logical blocks, as well as how they translate to physical blocks on the disk, are known to "the file organization module." "All of the meta

data associated with a file is dealt with by the logical file system."

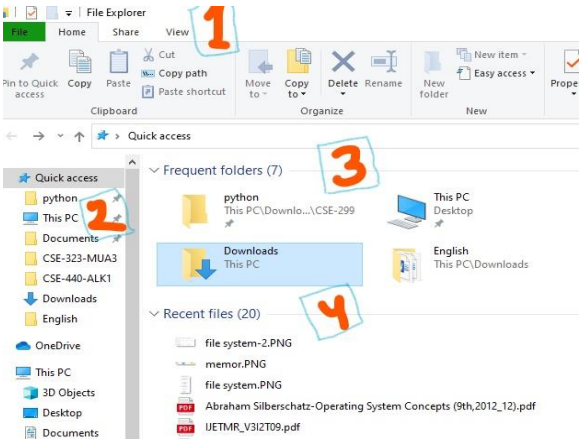


Figure: File Explorer

The file explorer features many components, such as the file explorer ribbon, which resembles the Office ribbon. The ribbon contains pads or buttons that are utilized for routine operations in the file and folder handling procedures. There's also a navigation window that gives you access to the information libraries, which are saved as dements and used in the software. [8] network devices In addition, there are frequently used directories for convenient access, and the current file area displays the open files. All of this is seen in Fig. File Explorer above.

V. SECURITY SYSTEM:

Windows 10 includes certain unique features that make the user and the company more comfortable. Other tools are used by operating systems to improve computer privacy and security. Some of the procedures used in the operating system are utilized with these tools to harden the machine. Hardening, in which security mechanisms are configured, is one of the security measures used in Windows 10 operating systems. As a result, viruses, hackers, and other cyberattacks are unlikely [9]. The hardening of the PC is like to shutting the home door, making entrance difficult for anybody without auto-logins or from a distant location. Other parts include installing antivirus software that continuously scans the hardware injected into the computer for file transfers, as well as ensuring that disks and other devices are virus-free before the machine executes them. For instance, check the drives using Windows Defender advanced threat prevention and other applications such as Kaspersky. There's also a method in which the computer switches on automated operating system upgrades. As a result, features and apps may be continuously screened, scanned, and updated. Encryptions and file backups are also available; if the machine fails, the contents can be recovered.

CONCLUSION:

We may infer that the most version of Microsoft Windows, Windows 10, is a user-

friendly operating system. Microsoft's newest fixes and security updates are available for Windows 10. This implies that the systems will be current. Furthermore, Windows 10 comes with more robust built-in security protections than prior Windows operating systems, ensuring that your network is safe from external attacks. However, it is not ideal for some devices, such as those with slow processors and limited RAM. Rely on your hardware, a direct upgrade from Windows 7 to 10 may provide certain advantages. These begin with smoother and, in certain cases, quicker operations, more efficient use of memory and disk space, enhanced security, and the incorporation of OneDrive cloud storage [10].. The system refresh and reset options make it easier to keep your PC in good working order. You may also use your PC to search the internet. In 2018, Windows 10 has 39.22% of the desktop Operating System market share, compared to 36.9% for Windows 7. Many people favor Microsoft Windows because it is said to be compatible with a wide range of other programs. Because Microsoft created many of the computer applications, they work best on Microsoft Windows.

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