Both operating system is commonly used in today's computer The windows was introduced at 1985 The MacOS was introduced at 1984 Both Operating System What is windows & MacOS are used in personal and enterprise level. Windows is closed source code operating Windows & MacOS system its source code is not open to public. Shared Source code MacOS is partially open-source code which mean its source code is public for some components like MacOS kernel code etc Linux was introduced in 1991, and more versions come out in the 90s, And is opensource operating system. Linux More information at "Linux Essentials" Both Android & IOS operating system are for mobile devices, Operating System Android was introduced in 2008 & IOS was Mostly Mobile Operating System have Android & IOS security concerns. Android is open-source & IOS is partially open-source like some components. A Legacy operating system is an operating system that is outdated but still in used. some organization used this legacy operating system because of their own reasons like is not compatible with their Software etc. Legacy operating system Operating system are like bridge. >> They connect Software application to hardware The Operating System at works to do stuff. 1.User: You as a user, want to do something on the computer. Right Now, you are the user since you are reading this. When Computer is turn on, A tiny chip is 2. Application: Application is like a tools computer called BIOS (Basic Input/output system) or UEFI (unified Extensible which Used to accomplish the tasks. if need to calculate the used the calculator firmware interface) trigger. application, if need to write then used the notepad application. BIOS is older version found in older system and UEFI is the newer version that does 3,Operating System: The operating system the same thing but in advance way found is like a manager, when the user uses an in modern device. application, the operating system takes care of everything behind the scenes. it BIOS and UEFI are both there to help your coordinates with computer hardware to computer get going. Before 2007, BIOS execute the user request and ensue that was the main player, but since then, UEFI Let break down the computer process in everything runs fine from managing has taken the stage. Nowadays, UEFI is simple terms. computer resource to display the results. more popular because it's better at keeping your computer safe. Boot Beginning 4.Hardware: The hardware is where the real work takes place. It's like the engine of Inside these chips, there are different sets your computer. When you want to do a of instructions. One of these checks if all calculation, the CPU does the math. When the computer's hardware is working you save a file, the hard drive stores it. properly. 5.Output: Ones the hardware does it job it Then comes the final instruction: waking gives the results to Operating system, then up the bootloader. This is special software operating system display in the that kicks off the operating system. Once application. So it can be visible as an that's up and running, your computer is output. good to go. A computer within a computer is also called as Virtual Machine (VM). it like a magic clone spell. In Naruto it like Clone Jutsu. Virtualization is like using special software to create these virtual machine versions of real machine and cool part is these virtual machines exist in digital word not as a physical hardware that can be touch. Virtualization (Computer in a Computer) Instead of separating physical part virtual machine use software to create virtual machine version of things like CPUs and storage. So, inside a virtual machine it found Virtual CPUs and Virtual Storage and all sorts of virtual hardware. it is like building a computer out of code instead of actual parts. 1. Enhanced Security: Picture virtualization as setting up little safety bubbles inside your computer. Each virtual machine is like its own bubble, separate from the others and the main computer. So, if one of these bubbles gets infected with When dealing with virtual machines, its malware, it's like the other bubbles are need a special kind of software called a safe from the germ! Security folks can even hypervisor to keep everything in check. use these virtual machines to study Hypervisors are like the managers of the malware without risking the main virtual world. They help you handle computer. multiple virtual machines and make sure they play nice with the real hardware of Note: Even though virtual machines are your computer. great for security, there's still a tiny chance that bad stuff could sneak out of a virtual One standout hypervisor is called Kernelmachine and mess with the main based Virtual Machine (KVM). It's like the computer. So, while they're super helpful, rockstar of the virtual world, especially it's best not to put all your trust in them. among Linux fans. KVM comes built-in with most major Linux systems, so you Manage Virtual Machine 2. Improved Efficiency: Virtual machines don't need to download anything extra to are like multitasking wizards. You can have use it. It's like having a superhero built a bunch of them running at once and right into your computer's software, ready switch between them like flipping through to create virtual machines whenever you channels on TV. This makes it really easy to need them. Advantage of Virtual Machine handle security stuff, like testing out different apps. Think of a virtual machine like a big city bus. It can carry lots of people at once, making transportation way more efficient. Without buses, everyone would need their own car, which would waste a lot more gas and resources. Similarly, with virtual machines, you can do a bunch of stuff on one computer without needing a separate computer for each task. It's like having a whole team of helpers right there on your computer! 1.Efficiency: CLI users often appreciate its speed and agility, especially those skilled in its operation. While newcomers might find Graphical User Interfaces (GUIs) more intuitive, CLI can be quicker for experienced users. Graphical User Interface (GUI): A GUI 2. Multitasking: CLI shines when handling presents icons on the screen for managing multiple tasks simultaneously. For various computer tasks. Think of the icons example, performing repetitive tasks like on your desktop or taskbar that you click creating multiple files is faster and more to launch programs. streamlined in CLI compared to GUI. Command-Line Interface (CLI): A CLI is text-3. History Records: Linux CLI maintains a based, utilizing commands to interact with detailed history of all commands and the computer. actions executed, which is crucial in Advantages of CLI in Cybersecurity cybersecurity. This history feature ensures Appearance: GUIs boast graphics and accurate execution of commands, aiding Interfaces: GUI vs. CLI icons, while CLIs stick to plain text, akin to in troubleshooting and reviewing actions lines of code. following security incidents. Functionality: These interfaces also differ in 4.Action Tracing: In the event of a security how they operate. GUIs handle one breach, the CLI's history file can help trace request at a time, while CLIs allow the activities of an attacker, providing simultaneous execution of multiple valuable insights for incident response and requests. forensic analysis.

1. Trade of Tools

Behind the Scenes: Think of a computer like a car. You might not see everything going on inside, but you feel it moving when you press the gas pedal. Similarly, the operating system does important work behind the scenes to make your tasks happen, just like a chef in a kitchen

making your food without you watching.

Downloading a File Example: Let's see how this works when you download a file from

the internet:

website and click the download button.

2.The browser tells the operating system what you want to do.

1.You decide to download a file from a

3.The operating system gets the hardware ready to download the file.

4.The hardware starts downloading, and the operating system lets the browser know what's happening. The browser tells

This process, like the car or restaurant analogy, involves different parts working together to give you the result you want.