**What Is Linux? What Is Its Structure?**

I want to make clear the various operating system pieces we’re talking about this evening. Many (most?) of you probably only have a vague idea of how the software on your devices is layered and managed.

***Show:***

<https://www.ssla.co.uk/wp-content/uploads/2020/07/linux-operating-system-300x246.png>



Local Network (LAN), Wide Area Network (WAN), Web Browser, Internet, and The CLOUD.

 <-- May be Applications or Shell Layer

***Article:***

**Linux Operating System**

*The architecture of the Linux operating system*

<https://www.ssla.co.uk/linux-operating-system/>

**Shell and system utility in Linux operating system.**

A shell is a special software program that provides the software with an interface to access the operating system resources. Shell embraces user understandable human commands and transforms them into anything the kernel can recognize. This is an interpretation of the command language which executes read instructions from input devices including such a keyboard or documents. Once the user signs in or starts the terminal the shell gets underway.

* **The kernel in the Linux operating system.**

The kernel seems to be the origin of the Linux-based Shell. It provides the virtual machine the device’s common hardware components for providing its virtualized networks to each operation. This makes the whole process look like it is the only process that runs on the computer. This is also the kernel that is responsible for stopping and conflict resolution between procedures. Specific kernel forms are monolithic kernels, hybrid kernels, small kernels and kernels from Exo. (Don’t ask me what Exo is!)

* **The hardware layer in the Linux operating system.**

That is the physical hardware that your device consists of; that includes items like your mouse and keyboard, the graphics chipset and display, and, if you do have one, your network interface card. Certain hardware parts that are not so evident are the Processor as well as the RAM inside your device.

* **The application and utility layer in the Linux operating system.**

A Linux-based [system](https://en.wikipedia.org/wiki/Linux) will typically arrive with such a set of established Unix-like utility services; these were all generally basic functions used in day-to-day operating system usage, and also specific devices and applications. This is usually software that was published and released under the open-source license by the GNU Project, therefore the software can be openly downloaded, updated, and redistributed to all. Some instances would have been the commands that allow users to share and modify files and folders, generate data as well as do jobs such as backup files.”

A Virtual Machine operates in the Application Layer. It is treated as an Application. A very sophisticated Application, but an Application nonetheless. The Host OS handles all Guest OS calls which require resources from the Host OS Shell and Kernel Layers. This can cause some issues. (The details are beyond the scope of this presentation.)

(Correct me if I am wrong about this point.)

So we can see that in a VM, the Guest OS is not running its kernel the way it would in a single-boot or dual-boot install. Usually the differences are minuscule and not noticeable to the end-user. But sometimes the true power of Linux, and its inherent stability, get lost in a VM environment. This kind of experience has caused many people to misjudge and prematurely dismiss Linux as an alternative operating system to Windows (or Mac).