

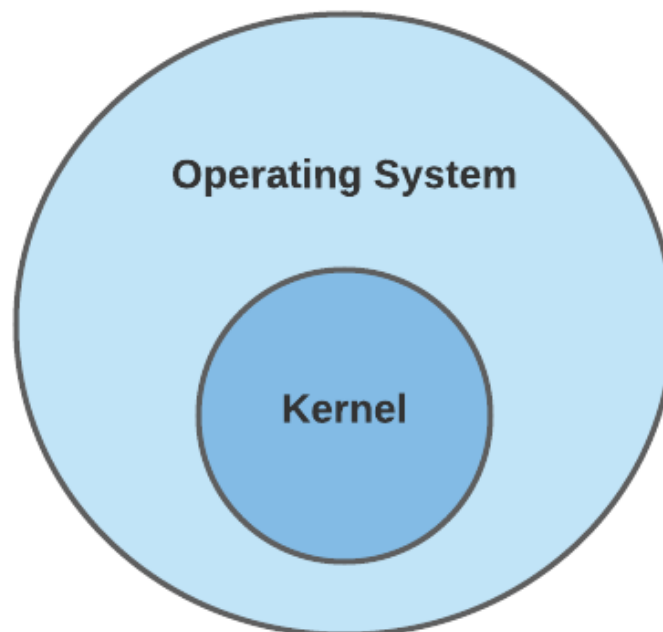
## Why is an Operating System called a kernel?

“The one program running at all times on the computer” is the kernel. Part of the operating system that loads first, and it remains in main memory. The kernel code is usually loaded into a protected area of memory to prevent it from being overwritten by programs or other parts of the operating system.

Typically, the kernel is responsible for memory management, process and task management, and disk management. The kernel connects the system hardware to the application software.

The kernel is **the most important part of the operating system**. It is the **primary interface** between the hardware and the processes of a computer. The kernel connects these two in order to adjust resources as effectively as possible.

It is named a kernel because it operates inside the OS, just like a seed inside a hard shell. **The figure below shows its place in an OS.** It controls all of the main functions of the hardware, whether it's a tablet, desktop, server, or any other kind of device:



### Explain the type-1 and type-2 hypervisor.

Type 1 hypervisor is a hypervisor that runs directly on the host's hardware to control the hardware and to manage guest operating systems while Type 2 hypervisors run on a conventional operating system just as other computer programs do. Thus, this is the main difference between Type 1 and Type 2 Hypervisor.

### What is a System Call used for?

A system call is a way for programs to **interact with the operating system**. A computer program makes a system call when it makes a request to the operating system's kernel. System call **provides** the services of the operating system to the user programs via Application Program Interface (API).

### Explain the Monolithic Modular Operating System Architecture.

A monolithic kernel is **an operating system architecture where the entire operating system is working in kernel space**. The monolithic model differs from other operating system architectures (such as the microkernel architecture) in that it alone defines a high-level virtual interface over computer hardware.

One of the major advantages of having a monolithic kernel is that it **provides CPU scheduling, memory management, file management, and other operating system functions through system calls**. The other one is that it is a single large process running entirely in a single address space.

### What are the uses of trap and interrupt?

A trap is a software-generated interrupt. An interrupt can be used to signal the completion of an I/O to obviate the need for device polling. A trap can be used to call operating system routines or to catch arithmetic errors.