

Operating Systems

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- An Operating System (OS) is the software of a computer system that sits between the hardware and the application programs. It provides an environment in which programs can execute.
- An OS is a layer that simplifies and standardizes the use of a computer.
- An OS may be viewed either as the resource manager or resource provider for the computer system.
- A good operating system should perform its tasks: efficiently, reliably, securely, conveniently, and socially.



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What is an Operating System?

"An OS is a program that controls the execution of application programs and acts as an interface between applications and the computer hardware. It can be thought of as having three objectives:

Convenience :

Efficiency :

Ability to evolve : ... "

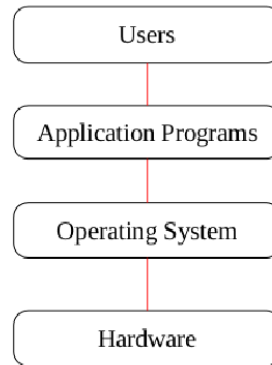
- Stalling, Operating Systems Internals and Design Principles by William Stalling 6th ed 2008

What is an Operating System?

"The OS is a collection of one or more software modules that manages and controls the resources of a computer or other computing and electronic device, and gives users and programs an interface to utilize these resources." Elmasri, Carrick, and Levine, Operating Systems - A Spiral Approach

Or more informally Elmasri et al. states "The operating system provides services to users and programmers that make it possible to utilize a computer without having to deal with the low-level, difficult-to-use hardware commands."

An abstract view of a computer system:



Operating systems may be viewed as a resource manager. As they provide a way of sharing both abstract and physical resources.

Physical resources include resources such as: CPU, memory, keyboard, monitor, ... etc.

Abstract resources include: files, file systems, windows, semaphores, locks, processes, threads, ... etc.

Resources may either be:

- Space-multiplexed, or
- Time-multiplexed.