

Key Point: *The operating system (OS) is the most important program that runs on a computer. The OS manages and controls a computer's activities.*

Popular operating systems include Microsoft Windows, Mac OS, and Linux. Application programs, such as a Web browser or a word processor, cannot run unless an operating system is installed on the computer.

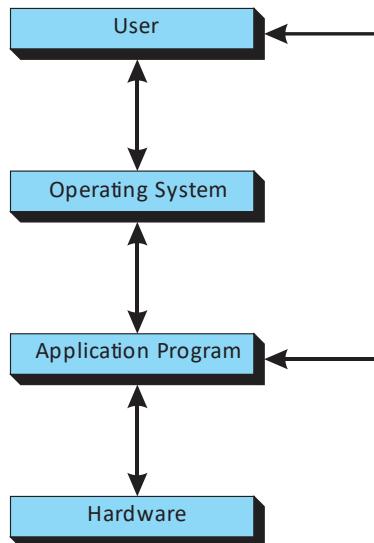


Figure 1.10 Users and application access the computer's hardware via the operating system

The major tasks of the operating system are:

- Controlling and monitoring system activities
- Allocating and assigning system resources
- Scheduling operation

1.4.1 Controlling and Monitoring System Activities

Activities

- recognizing keyboard input
- sending output to the display monitor
- keeping track of files and folders or storage devices
- managing and controlling peripheral devices like printers, scanners, and mice

Operating systems coordinate determine which application is executing.

Operating systems are responsible for security and ensure that unauthorized users and programs do not access the system.

1.4.2 Allocating and Assigning System Resources

The operating system allocates resources for programs including CPU time, memory, disk storage, and input and output devices.

1.4.3 Scheduling Operations

The operating system is responsible for scheduling the activities of programs. The operating system employs *multiprogramming*, *multithreading*, and *multiprocessing* to increase system performance.

- *Multiprogramming*

Allows multiple programs such as Microsoft Word, E-Mail, and a web browser to run simultaneously: these programs share the same CPU.

- *Multithreading*
Allows a single program to execute multiple tasks at the same time. A word-processor can edit and save text at the same time.
- *Multiprocessing*
Multiprocessing is the act of running multiple programs concurrently using multiple processors.