



كلية المستقبل الجامعة الاهلية
قسم هندسة تقنيات الاجهزة الطبية
تطبيقات حاسوب
مرحلة اولى
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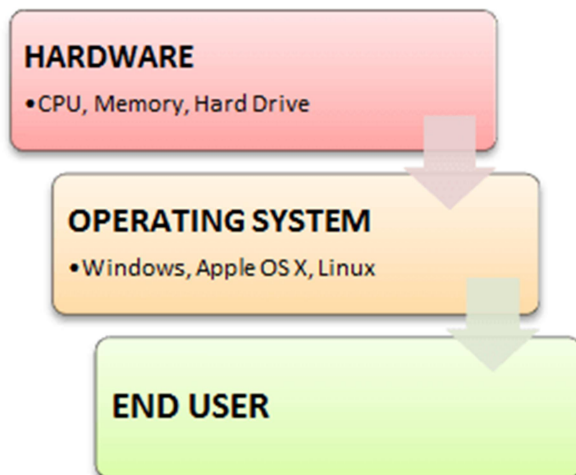
O.S

What is Operating System? Types of OS, Features and Examples

What is an Operating System?

An **Operating System (OS)** is a software that acts as an interface between computer hardware components and the user. Every computer system must have at least one operating system to run other programs. Applications like Browsers, MS Office, Notepad Games, etc., need some environment to run and perform its tasks.

The OS helps you to communicate with the computer without knowing how to speak the computer's language. It is not possible for the user to use any computer or mobile device without having an operating system.



Introduction to Operating System



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operating system (OS)

By

An operating system (OS) is the program that, after being initially loaded into the computer by a [boot](#) program, manages all of the other application programs in a computer. The application programs make use of the operating system by making requests for services through a defined application program interface ([API](#)). In addition, users can interact directly with the operating system through a user interface, such as a command-line interface (CLI) or a graphical UI (GUI).

Why use an operating system?

An operating system brings powerful benefits to computer software and software development. Without an operating system, every application would need to include its own UI, as well as the comprehensive code needed to handle all low-level functionality of the underlying computer, such as disk storage, network interfaces and so on. Considering the vast array of underlying hardware available, this would vastly bloat the size of every application and make software development impractical.

Instead, many common tasks, such as sending a network packet or displaying text on a standard output device, such as a display, can be offloaded to [system software](#) that serves as an intermediary between the applications and the hardware. The system software provides a consistent and repeatable



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way for applications to interact with the hardware without the applications needing to know any details about the hardware.

As long as each application accesses the same resources and services in the same way, that system software -- the operating system -- can service almost any number of applications. This vastly reduces the amount of time and coding required to develop and debug an application, while ensuring that users can control, configure and manage the system hardware through a common and well-understood interface.

In this OS..

What is an Operating System?

- **History Of OS**
- **Types of Operating System (OS)**
 - **Functions of Operating System**
- **Features of Operating System (OS)**
- **Advantage of using Operating System**
- **Disadvantages of using Operating System**
- **What is a Kernel?**
- **Difference between Firmware and Operating System**
- **Difference between 32-Bit vs. 64 Bit Operating System**

History Of OS

- **Operating systems were first developed in the late 1950s to manage tape storage**
- **The General Motors Research Lab implemented the first OS in the early 1950s for their IBM 701**
- **In the mid-1960s, operating systems started to use disks**
- **In the late 1960s, the first version of the Unix OS was developed**
- **The first OS built by Microsoft was DOS. It was built in 1981 by purchasing the 86-DOS software from a Seattle company**



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- **The present-day popular OS Windows first came to existence in 1985 when a GUI was created and paired with MS-DOS.**

Examples of Operating System with Market Share

Market Share of Operating Systems

Types of Operating System (OS)

Following are the popular types of Operating System:

- Batch Operating System
- Multitasking/Time Sharing OS
- Multiprocessing OS
- Real Time OS
- Distributed OS
- Network OS
- Mobile OS

Batch Operating System

Some computer processes are very lengthy and time-consuming. To speed the same process, a job with a similar type of needs are batched together and run as a group.

The user of a batch operating system never directly interacts with the computer. In this type of OS, every user prepares his or her job on an offline device like a punch card and submit it to the computer operator.

Multi-Tasking/Time-sharing Operating systems

Time-sharing operating system enables people located at a different terminal(shell) to use a single computer system at the same time. The processor time (CPU) which is shared among multiple users is termed as time sharing.

Real time OS



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A real time operating system time interval to process and respond to inputs is very small.
Examples: Military Software Systems, Space Software Systems are the Real time OS example.

Distributed Operating System

Distributed systems use many processors located in different machines to provide very fast computation to its users.

Network Operating System

Network Operating System runs on a server. It provides the capability to serve to manage data, user, groups, security, application, and other networking functions.

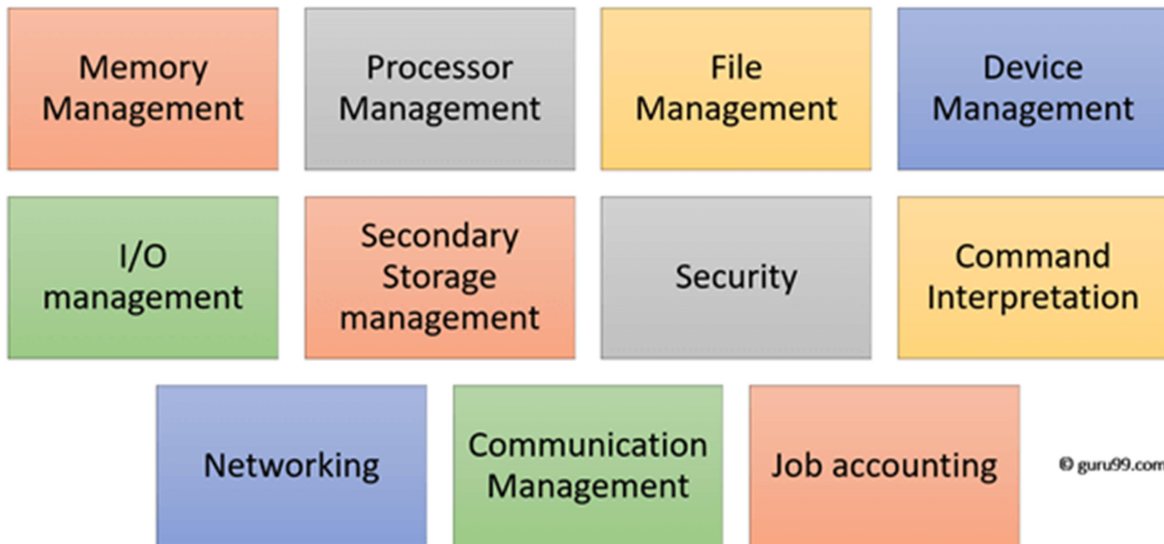
Mobile OS

Mobile operating systems are those OS which is especially that are designed to power smartphones, tablets, and wearables devices.

Some most famous mobile operating systems are Android and iOS, but others include BlackBerry, Web, and watchOS.

Functions of Operating System

Below are the main functions of Operating System:



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Functions of Operating System



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In an operating system software performs each of the function:

1. **Process management:-** Process management helps OS to create and delete processes. It also provides mechanisms for synchronization and communication among processes.
2. **Memory management:-** Memory management module performs the task of allocation and de-allocation of memory space to programs in need of this resources.
3. **File management:-** It manages all the file-related activities such as organization storage, retrieval, naming, sharing, and protection of files.
4. **Device Management:** Device management keeps tracks of all devices. This module also responsible for this task is known as the I/O controller. It also performs the task of allocation and de-allocation of the devices.
5. **I/O System Management:** One of the main objects of any OS is to hide the peculiarities of that hardware devices from the user.
6. **Secondary-Storage Management:** Systems have several levels of storage which includes primary storage, secondary storage, and cache storage. Instructions and data must be stored in primary storage or cache so that a running program can reference it.
7. **Security:-** Security module protects the data and information of a computer system against malware threat and authorized access.
8. **Command interpretation:** This module is interpreting commands given by the and acting system resources to process that commands.
9. **Networking:** A distributed system is a group of processors which do not share memory, hardware devices, or a clock. The processors communicate with one another through the network.
10. **Job accounting:** Keeping track of time & resource used by various job and users.
11. **Communication management:** Coordination and assignment of compilers, interpreters, and another software resource of the various users of the computer systems.

Features of Operating System (OS)

Here is a list important features of OS:

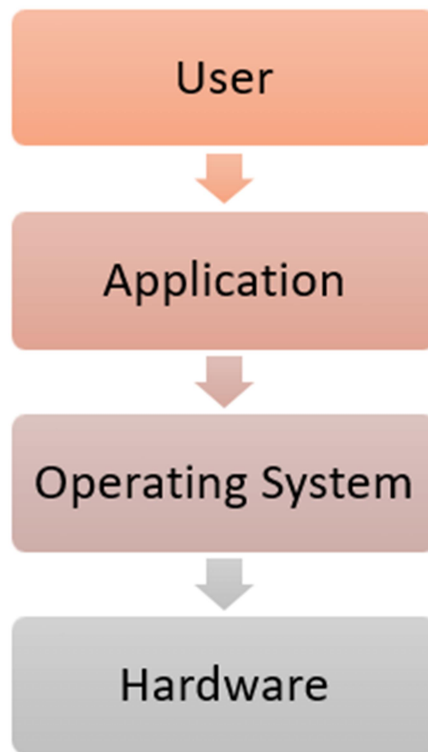
- Protected and supervisor mode



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- Allows disk access and file systems Device drivers Networking Security
- Program Execution
- Memory management Virtual Memory Multitasking
- Handling I/O operations
- Manipulation of the file system
- Error Detection and handling
- Resource allocation
- Information and Resource Protection



Advantage of using Operating System •

- Allows you to hide details of hardware by creating an abstraction
 - Easy to use with a GUI

Offers an environment in which a user may execute programs/applications

The operating system must make sure that the computer system convenient to use

Operating System acts as an intermediary among applications and the hardware components

It provides the computer system resources with easy to use format

Acts as an intermediator between all hardware's and software's of the system



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Disadvantages of using Operating System

If any issue occurs in OS, you may lose all the contents which have been stored in your system
Operating system's software is quite expensive for small size organization which adds burden on them.
Example Windows

It is never entirely secure as a threat can occur at any time

What is a Kernel?

The kernel is the central component of a computer operating systems. The only job performed by the kernel is to manage the communication between the software and the hardware. A Kernel is at the nucleus of a computer. It makes the communication between the hardware and software possible. While the Kernel is the innermost part of an operating system, a shell is the outermost one.

Difference between 32-Bit vs. 64 Bit Operating System

Parameters	32. Bit	64. Bit
Architecture and Software	Allow 32 bit of data processing simultaneously	Allow 64 bit of data processing simultaneously
Compatibility	32-bit applications require 32-bit OS and CPUs.	64-bit applications require a 64-bit OS and CPU.
Systems Available	All versions of Windows 8, Windows 7, Windows Vista, and Windows XP, Linux, etc.	Windows XP Professional, Vista, 7, Mac OS X and Linux.
Memory Limits	32-bit systems are limited to 3.2 GB of RAM.	64-bit systems allow a maximum 17 Billion GB of RAM.