

OPERATING SYSTEM

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Introduction

An Operating System is the Set of instructions which is provide the Conventional way between the Hardware and Software.

An operating system is program that acts as an interface between user and computer hardware and controls the execution of all kinds of program.

Architecture of Operating System –

Functions Of Operating System –

There are Various Type of Functions of Operating System-

1. Memory Management
2. Processor Management
3. Device Management
4. File Management
5. Security
6. Control over system performance
7. Job accounting
8. Error detecting aids
9. Coordination between other software and users

User

Software

O.S.

Hardware

Memory Management –

Memory management refers to management of Primary Memory or Main Memory. Main memory is a large array of words or bytes where each word or byte has its own address.

Main memory provides a fast storage that can be accessed directly by the CPU.

For a program to be executed, it must be in the main memory. An Operating System does the following activities for memory management.

- 1 Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.
- 2 In multiprogramming, the OS decides which process will get memory when and how much.
- 3 Allocates the memory when a process requests it to do so.
- 4 De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management -

In multiprogramming environment, the OS decides which process gets the processor when and for how much time. This function is called process scheduling. An Operating System does the following activities for processor management –

1. Keeps tracks of processor and status of process. The program responsible for this task is known as traffic controller.
2. Allocates the processor (CPU) to a process.
3. De-allocates processor when a process is no longer required.

Device Management -

An Operating System manages device communication via their respective drivers. It does the following activities for device management –

1. Keeps tracks of all devices. Program responsible for this task is known as the I/O controller.
2. Decides which process gets the device when and for how much time.
3. Allocates the device in the efficient way.
4. De-allocates devices.

File Management -

A file system is normally organized into directories for easy navigation and

usage. These directories may contain files and other directions.

An Operating System does the following activities for file management –

1. Keeps track of information, location, uses, status etc. The collective facilities are often known as file system.

2. Decides who gets the resources.

3. Allocates the resources.

4. De-allocates the resources.

Security Management – By means of password and similar other techniques, it prevents unauthorized access to programs and data.

Control over system performance – Recording delays between request for a service and response from the system.

Job accounting – Keeping track of time and resources used by various jobs and users.

Error detecting aids – Production of dumps, traces, error messages, and other debugging and error detecting aids.

Coordination between other software and users – Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

Evaluation Of Operating System –

1. The evolution of operating systems is directly dependent on the development of computer systems and how users use them. Here is a quick tour of computing systems through the past fifty years in the timeline.

Early Evolution

1. 1945: ENIAC, Moore School of Engineering, University of Pennsylvania.
2. 1949: EDSAC and EDVAC
3. 1949: BINAC - a successor to the ENIAC
4. 1951: UNIVAC by Remington
5. 1952: IBM 701
6. 1956: The interrupt
7. 1954-1957: FORTRAN was developed

Operating Systems - Late 1950s

1. By the late 1950s Operating systems were well improved and started supporting following usages:
 2. It was able to perform Single stream batch processing.
 3. It could use Common, standardized, input/output routines for device access.
 4. Program transition capabilities to reduce the overhead of starting a new job were added.
 5. Error recovery to clean up after a job terminated abnormally was added.
 6. Job control languages that allowed users to specify the job definition and resource requirements were made possible.

Operating Systems - In 1960s

1. 1961: The dawn of minicomputers
2. 1962: Compatible Time-Sharing System (CTSS) from MIT
3. 1963: Burroughs Master Control Program (MCP) for the B5000 system
4. 1964: IBM System/360
5. 1960s: Disks became mainstream
6. 1966: Minicomputers got cheaper, more powerful, and really useful.
7. 1967-1968: Mouse was invented.
8. 1964 and onward: Multics
9. 1969: The UNIX Time-Sharing System from Bell Telephone Laboratories.

Supported OS Features by 1970s

1. Multi User and Multi tasking was introduced.
2. Dynamic address translation hardware and Virtual machines came into picture.
3. Modular architectures came into existence.
4. Personal, interactive systems came into existence.

Accomplishments after 1970

1. 1971: Intel announces the microprocessor
2. 1972: IBM comes out with VM: the Virtual Machine Operating System
3. 1973: UNIX 4th Edition is published
4. 1973: Ethernet
5. 1974 The Personal Computer Age begins
6. 1974: Gates and Allen wrote BASIC for the Altair
7. 1976: Apple II
8. August 12, 1981: IBM introduces the IBM PC
9. 1983 Microsoft begins work on MS-Windows
10. 1984 Apple Macintosh comes out
11. 1990 Microsoft Windows 3.0 comes out

12. 1991 GNU/Linux
13. 1992 The first Windows virus comes out
14. 1993 Windows NT
15. 2007: iOS
16. 2008: Android OS