A
Seminar report
on

"Operating System"

Submitted in partial fulfillment of the requirement for the award of degree
of Bachelor of Technology in Computer Science.

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PREFACE

I have made this report file on the topic **Operating System,** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to ……..who assisting me throughout the prepration of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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Introduction

An operating system is an integrated set of programs that is used to manage the various resources and overall operations of a computer system. It is designed to support the activities of a computer installation. Its prime objective is to improve the performance and efficiency of a computer system and increase facility, the ease with which a system can be used. Thus, like a manager of a company, an operating system is responsible for the smooth and efficient operation of the entire computer system. Moreover, it makes the computer system user friendly. That is, it makes it easier for people to interface with and make use of the computer.

Operating system goes by many different names, depending on the manufacture of the computer, other terms used to describe the operating are: monitor, executive, supervisor, controller and master controller programs.

History

The 1940's - First Generations

The earliest electronic digital computers had no operating systems. Machines of the time were so primitive that programs were often entered one bit at time on rows of mechanical switches (plug boards). Programming languages were unknown (not even assembly languages). Operating systems were unheard of .

The 1950's - Second Generation

By the early 1950's, the routine had improved somewhat with the introduction of punch cards. The General Motors Research Laboratories implemented the first operating systems in early 1950's for their IBM 701. The system of the 50's generally ran one job at a time. These were called single-stream batch processing systems because programs and data were submitted in groups or batches.

The 1960's - Third Generation

The systems of the 1960's were also batch processing systems, but they were able to take better advantage of the computer's resources by running several jobs at once. So operating systems designers developed the concept of multiprogramming in which several jobs are in main memory at once; a processor is switched from job to job as needed to keep several jobs advancing while keeping the peripheral devices in use.

For example, on the system with no multiprogramming, when the current job paused to wait for other I/O operation to complete, the CPU simply sat idle until the I/O finished. The solution for this problem that evolved was to partition memory into several pieces, with a different job in each partition. While one job was waiting for I/O to complete, another job could be using the CPU.

Fourth Generation

With the development of LSI (Large Scale Integration) circuits, chips, operating system entered in the system entered in the personal computer and the workstation age. Microprocessor technology evolved to the point that it becomes possible to build desktop computers as powerful as the mainframes of the 1970s. Two operating systems have dominated the personal computer scene: MS-DOS, written by Microsoft, Inc. for the IBM PC and other machines using the Intel 8088 CPU and its successors, and UNIX, which is dominant on the large personal computers using the Motorola 6899 CPU family.

What is an Operating System?

An operating system (sometimes abbreviated as "OS") is the program that, after being initially loaded into the computer by a boot program, manages all the other programs in a computer. The other programs are called *applications* or application programs. 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 language or a graphical user interface (GUI).

An operating system performs these services for applications:

- In a multitasking operating system where multiple programs can be running at the same time, the operating system determines which applications should run in what order and how much time should be allowed for each application before giving another application a turn.
- It manages the sharing of internal memory among multiple applications.
- It handles input and output to and from attached hardware devices, such as hard disks, printers, and dial-up ports.
- It sends messages to each application or interactive user (or to a system operator) about the status of operation and any errors that may have occurred.
- It can offload the management of what are called *batch* jobs (for example, printing) so that the initiating application is freed from this work.
- On computers that can provide parallel processing, an operating system can manage how to divide the program so that it runs on more than one processor at a time.

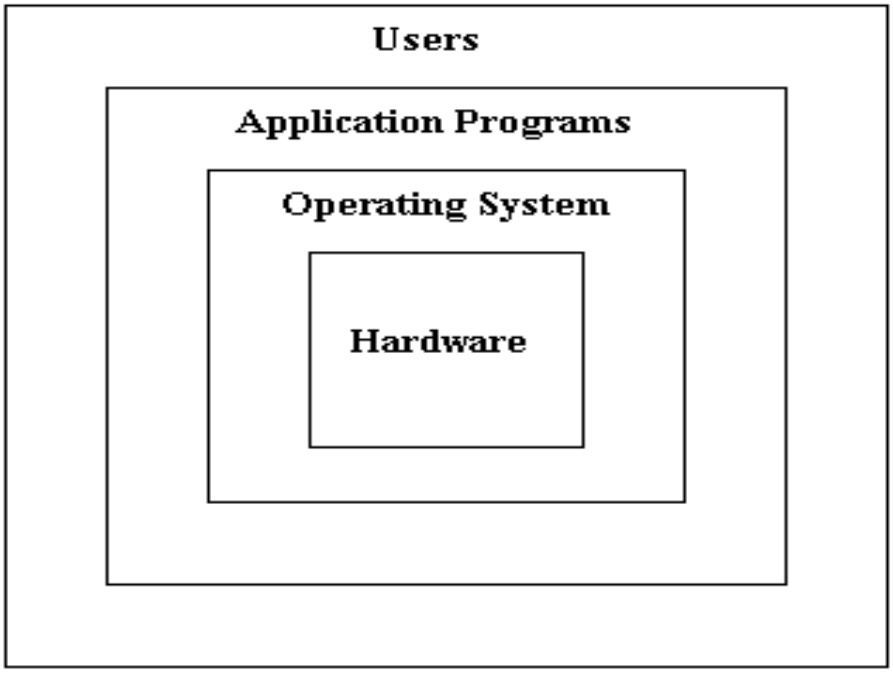
FUNCTIONS

Today most operating systems perform the following functions:

1. Processor management i.e. assignment of processors to different tasks being performed by the computer system.
2. Memory management, that is, allocation of main memory and other storage areas to the system programs as well as user programs and data.
3. Input/output management that is coordination and assignment of different input and output devices while one or more programs are being executed.
4. Automatic transition from job to job as directed by special control statements.
5. Maintenance of internal time clock and log of system usage foe all users.
6. Facilities easy communication between the computer system and computer operator.

An operating system performs a wide variety of jobs. Each of jobs are performed by one or more computer programs and all the computer programs and all the computer programs are jointly known as an operating system. Out of the complete operating system, normally, one control program resides in the main memory of the computer system. This control program is known as the residential program or resident routine. The other programs are stored on the disk and are called transient programs or transient routines. The control programs transfers these programs in to the main memory and executes them as and when they are need. It may be recalled here that the capacity of the main memory of any computer system is very small as compared to its secondary storage devices. This is the reason why only the control program is stored in main memory and the rest of the operating system is stored on disk.

The effect, besides the hardware, each computer system consists of an operating system that enables a user to effectively use the system.The operating system tends to insolate the hardware from the user. The user communicates with the operating system, supplies application programs and input data, and receives output results.



The in between software layers isolate the hardware of a computer system from its users

The operating system tends to isolate the hardware from the user. The user communicates with the operating system, supplies application programs and input data, and receives output results.

EVOLUTION OF OPERATING SYSTEM

It is believed the one of the first operating system was developed in the early 1950s for the IBM 701 computers. This operating system was elementary in nature and was not so powerful as the operating system of today's computers. Since then, lot of research work has been carried out in this direction with the result that today we have very powerful operating systems which are machine independent and can execute several jobs at a time on the same machine. The main aim of all the researchers involved in the development of operating system was to devise ways to minimize the idle time of the computer system and to use the computer system in the most efficient and economical way.

In the early days of computers, job to job transition was not automatic. For each and every job to be executed by the computer, the operator had to clear the main memory to remove any data remaining from previous job. After the completion of one job, the same process had to be repeated for the next job by the computer operator. The automatic job to job transition facility provided by the operating system reduced the idle time of the computer to a great extent. But still, there was another scope for reducing the idle time of CPU. The speed of CPU is much more as compared to the speed of Input/output devices. Hence, it was normally idle while a particular job was busy with some input/output operation. So the next attempt of operating system developers was to overcome this speed mis-match by executing more than one programs at the same time.

TYPES OF OPERATING SYSTEM

Within the broad family of operating systems, there are generally four types, categorized based on the types of computers they control and the sort of applications they support. The categories are:

- **Batch Processing**

Batch processing is one of the oldest methods of running programs that is still being employed by many data processing centers for processing their jobs. It is based on the idea of automatic job to job transition facility provided by almost all operating systems. In a batch mode, each user prepares his program off line and submits it at the computer centre. A computer operator collects the programs that have been punched on cards and stack one job on or program on top of another. When a batch of program is collected, the operator loads this batch of programs into the computer at one time where they are executed one after another.

- **Real-Time**

Real-time operating systems are used to control machinery, scientific instruments and industrial systems. An RTOS typically has very little user-interface capability, and no end-user utilities, since the system will be a "sealed box" when delivered for use. A very important part of an RTOS is managing the resources of the computer so that a particular operation executes in precisely the same amount of time, every time it occurs. In a complex machine, having a part move more quickly just because system resources are available may be just as catastrophic as having it not move at all because the system is busy.

- **Time sharing**

Time sharing operating system is a operating system in which available CPU time is divided into equal slots. then these slots are assigned to all the users connected to the system. any user can use the system only for the specified time slot. if he finishes his work within the given time slot, thats fine but if he still got some work pending then he will again wait for his turn to complete the remaining work.

The time slots of CPU are distributes to all the connected users in first come first serve basis and then their turn comes in round robin fashion. but the CPU processes info so fast that you will hardly know when your turn comes and goes :) generally time sharing operating system are used when a powerfull server computer serves several client computers.

- **Single-user, single task**

As the name implies, this operating system is designed to manage the computer so that one user can effectively do one thing at a time. The Palm OS for Palm handheld computers is a good example of a modern single-user, single-task operating system.

- **Single-user, multi-tasking**

This is the type of operating system most people use on their desktop and laptop computers today. Microsoft's Windows and Apple's MacOS platforms are both examples of operating systems that will let a single user have several programs in operation at the same time. For example, it's entirely possible for a Windows user to be writing a note in a word processor while downloading a file from the Internet while printing the text of an e-mail message.

- **Multi-user**

A multi-user operating system allows many different users to take advantage of the computer's resources simultaneously. The operating system must make sure that the requirements of the various users are balanced, and that each of the programs they are using has sufficient and separate resources so that a problem with one user doesn't affect the entire community of users. Unix, VMS and mainframe operating systems, such as *MVS*, are examples of multi-user operating systems.

It's important to differentiate between multi-user operating systems and single-user operating systems that support networking. Windows 2000 and Novell Netware can each support hundreds or thousands of networked users, but the operating systems themselves aren't true multi-user operating systems. The **system administrator** is the only "user" for Windows 2000 or Netware. The network support and all of the remote user logins the network enables are, in the overall plan of the operating system, a program being run by the administrative user.

With the different types of operating systems in mind, it's time to look at the basic functions provided by an operating system.

Uses of Operating System

- The main use of an operating system is to ensure that a computer can be used and does exactly what the user wants it to, the commands that are given by the user need to be understood by the operating system that is in place do the computer or device can act accordingly. The ability to have one single operating system makes everything much easier as there don't have to be too many different processes for the technology to do what it is told.

- Problems can be avoided and taken care of as quickly as possible with an operating system as it can control everything. It is simple, if there wasn't an operating system in place with all different types of technology, and then they would not work as they are supposed to and therefore technology would not have advanced as much as it currently has.

- All you need to know is that the necessity of having an operating system is very important and you would not be able to have the technology working as you wanted it to without the system in place. Resources and documents are also taken care of by the system so there are going to be no problems when it comes to keep important documents and using them when you need to. You can keep many different resources and be sure that the operating system will ensure that they are not going to be removed by the device unless you tell it to.

- With an operating system you can be in complete control without any worries of the technology failing you. Without and operating system all of the computers and devices that we have would not be as resourceful or as reliable as they currently are in today's society.

Advantages

- The main advantage of using an operating system is that it enables users to run their own computer without any knowledge of coding. Without an operating system, your hardware would not work at all, until you wrote your own code for the hardware telling it what to do.

- An operating system (OS) is software, consisting of programs and data that runs on computers, managing computer hardware resources and providing services for various application software.

- For hardware functions such as input and output and memory allocation, the operating system acts as an intermediary between application programs and the computer hardware, although the application code is usually executed directly by the hardware and will frequently call the OS or be interrupted by it. Operating systems are found on almost any device that contains a computer; from cellular phones and video game consoles to supercomputers and web servers. Examples of popular modern operating systems are: BSD, Linux, Mac OS X, Microsoft Windows and UNIX.

- An operating system consists of many parts. One of the most important components is the kernel, which controls low-level processes that the average user usually cannot see; it controls how memory is read and written, the order in which processes are executed, how information is received and sent by devices like the monitor, keyboard and mouse and decides how to interpret information received from networks. The user interface is a component that interacts with the computer user directly, allowing them to control and use programs. The user interface may be graphical with icons and a desktop or textual, with a command line. Application programming interfaces provide services and code libraries that let application developers write modular codes, reusing well defined programming sequences in user space libraries or in the operating system itself.

CONCLUSION

In last we can conclude that operating system makes the computer user friendly, this means it makes it easier for people to interface with and make use of the computer. Apart from that operating system performs a wide variety of jobs. The functions of operating system are transparent to the user. The user communicates with the operating system supplies application program and input data and receives output results. This shows that operating system is very important part of computer.