TOPIC :- Services in Operating System, System Call in OS.

OBJECTIVES:-

OUTCOME:-

Service in Operating System -

An operating system provides services to both the user and to the programs.

- It provides programs an environment to execute.
- It provides user the services to execute the programs in a convenient manner.

An operating system provides an environment for the execution of programs. It provides certain services to programs and to the users of those programs. The specific services provided by an operating system -

1. User Interface - Almost all operating systems have a user Interface. This Interface can take several forms. One is a Command-line interface. Most commonly, a graphical user Interface is used. the interface is a system with a pointing device to direct I/O.

2. Program execution - The system must be able to load a programm into memory and to run that programm. The program must be able to end its execution, either indicating error

3. I/O Operations : A running programm may require I/O, which may involve a file or an I/O device. for specific devices, specially functions may be desired.

4. file-system manipulation - Programms need to read and write files and directories. They need to create and delete them by name, search for a given file and list information. Some programms include permissions management to allow or deny access to files or directories based on file ownership.

5. Error detection - The operating system needs to be constantly aware of possible errors. Error may occur in the CPU and memory hardware, in I/O devices. The operating system should take the appropriate action to ensure correct and Consisted computing.

6. Resource allocation - When there are multiple users or multiple job running at the same time, resources must be allocated to each of them. Many different type of resources are managed by operating system. They may also be routines to allocates printers, modems, USB storage device and other peripheral devices.

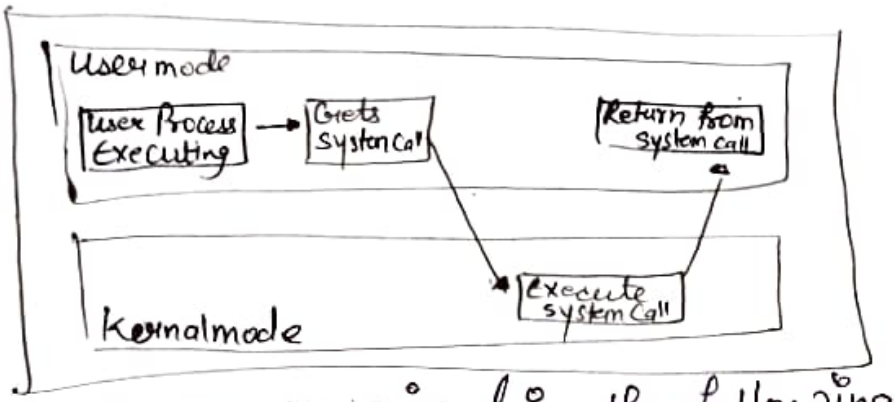
7. Protection - A computer system having multiple users and concurrent execution of multiple processes, the various processes must be protected from each other's activites. following are the major activities of an operating system with respect to protection -

1. The OS ensures that all the access to system resource is controlled.
2. The OS provides authentication features for each user by means of passwords.

8. Accounting - We want to keep track of which users use how much and kind of resources. This record keeping may be used for accounting and simply accumulating usage statistics.

System Call :

The interface b/w a process and an operating system is provided by system calls. System calls are avaliable as assembly language instructions. They are also included in the manuals used by assembly level programms. System calls are usually made when a process in user mode require access to a resource.



System calls are required in the following situation-

- If a file system requires the creation or deletion of files. Reading and writing from files also require a system call.
- Creation and management of new processes.
- Network connections also require system calls. This includes sending and receiving packets.
- Access to a hardware device such as a printer, scanner etc require a system call.

Types of System Call

There are mainly five types of system calls-

1. Process Control

These system calls deals with with processes such as process creation, process termination etc.

2. Communication
These system calls are useful for inter process communication. They also deal with creating and deleting a communication connection.

3. File Management
These system calls are responsible for file manipulation such as creating a file, reading a file, writing into a file etc.

4. Device management
These system calls are responsible for device manipulation. such reading from device buffers, writing into device buffers.

5. Information Maintenance
These system calls handle information and its transfer b/w the operating system and user programm.

Some of the example of above type of system calls in Windows and Linux.

Types of system call	Windows	Linux
Process Control	Create Process() Exit Process() Wait for Singleobject()	fork() exit() wait()
File Management	CreateFile() Read file() Write file() Close handle()	open() read() write() close()
Device Management	SetConsole Mode() Read Console() Write Console()	ioctl() read() write()

Information Maintenance	GetProcessID() SetTimmer() Sleep()	getpid() alarm() Sleep()
Communication	CreatePipe() CreateFileMapping() Mapview of file()	pipe() mmap() shmget()

Utility Programm: Utility program is a system application that execute a specific task, generally to optimal maintenance or operation of system resource.
Utility programs to maintain and execute different utility function such as formatting, scanning, exploring and etc.

Common task Performed by Utility Programs:

1 Disk Defragmentation
2 Disk clean-up
3 file management
4. Disk management
5. Antivirus

Advantages:

1. Efficiently manage your data files with proper storage.
2. Enhance your system's security by protecting it from virus and attacks.
3. Find your lost files and folders with file recovery software and recover any data loss.