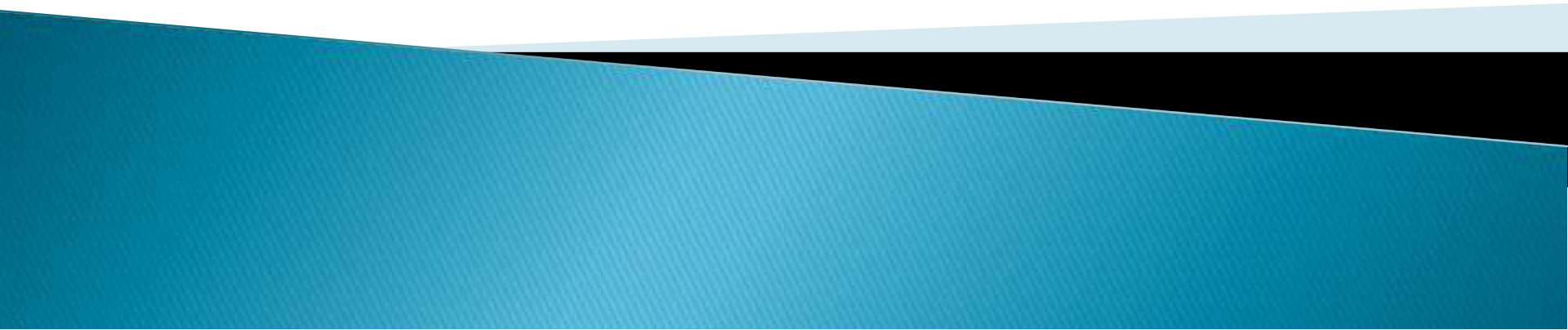
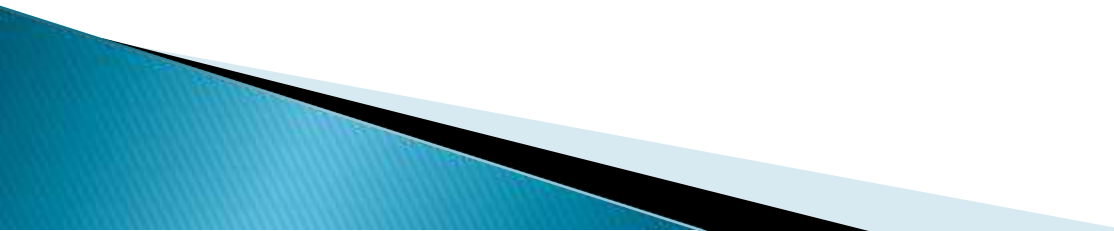


INTRODUCTION OF OPERATING SYSTEM(OS)



Objectives :

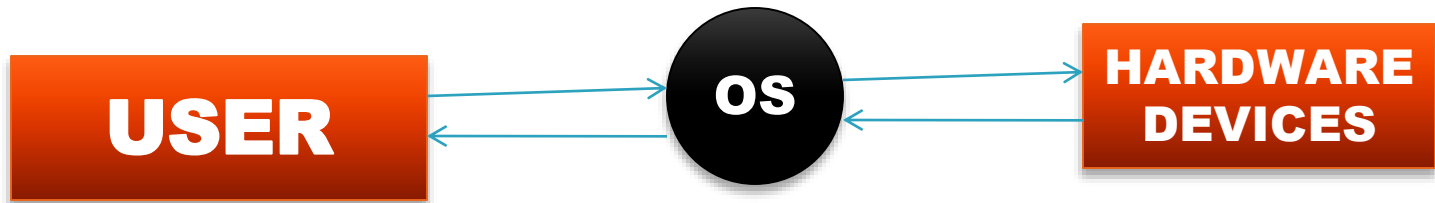
- ▶ **What Is Operating System**
 - ▶ **Structure Of OS**
 - ▶ **Functions And Components Of OS**
 - ▶ **Types Of OS**
- 

WHAT IS OPERATING SYSTEM?

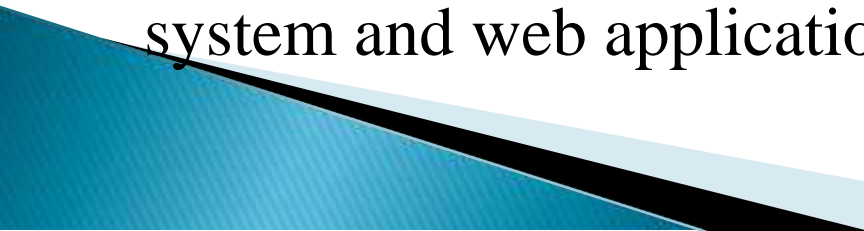
- Operating System is nothing but intermediate between user and system hardware resources.

or

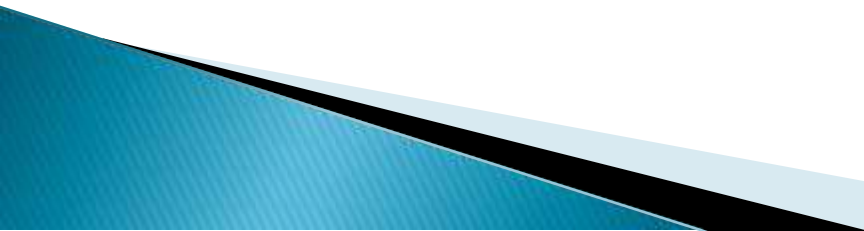
- An operating system is **a system software required to manage and operate a computing device** like smart phones, tablets, computers, supercomputers, web servers, cars, network towers, smart watches, etc. ... It is a layer of graphical user interface (GUI), which acts as a platform between the user and the computer hardware.



Advantages of Operating System

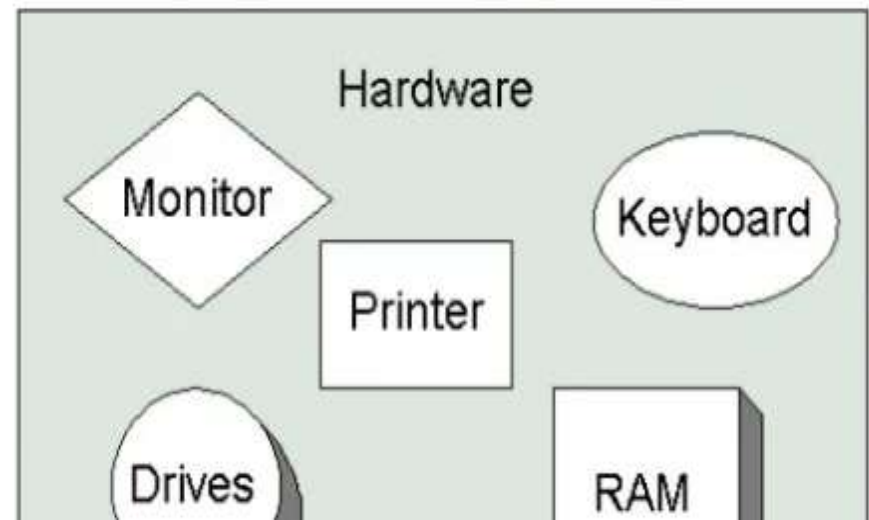
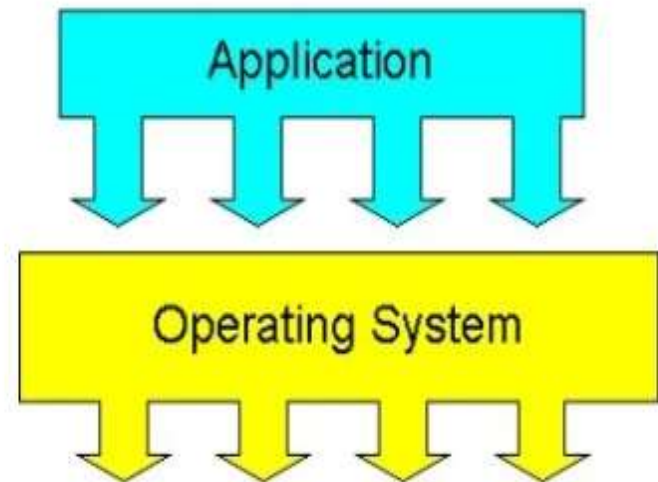
- ▶ It is helpful to monitor and regulate resources.
 - ▶ It can easily operate since it has a basic graphical user interface to communicate with your device.
 - ▶ It is used to create interaction between the users and the computer application or hardware.
 - ▶ The performance of the computer system is based on the CPU.
 - ▶ The response time and throughput time of any process or program are fast.
 - ▶ It can share different resources like fax, printer, etc.
 - ▶ It also offers a forum for various types of applications like system and web application.
- 

Disadvantage of the Operating System

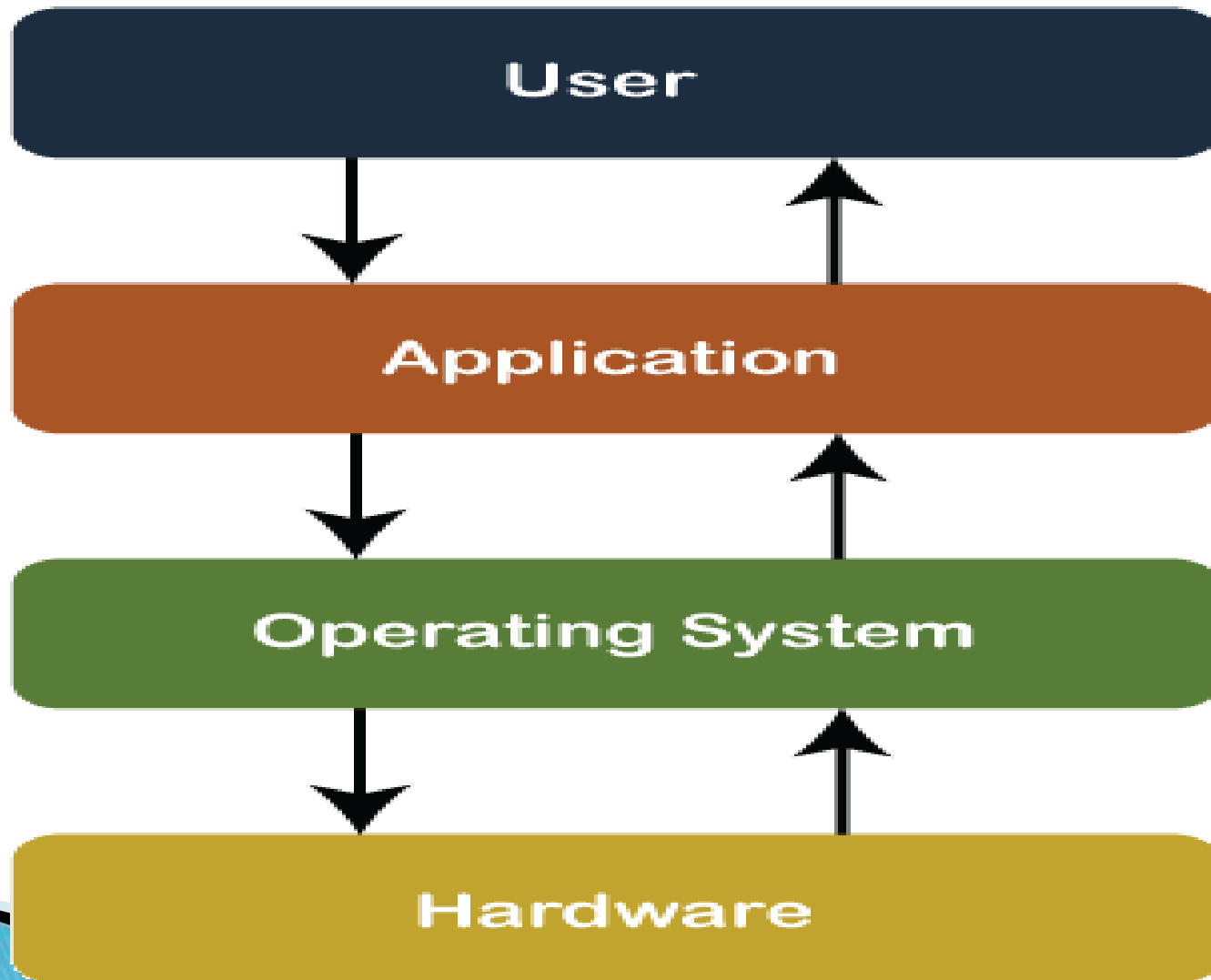
- ▶ It allows only a few tasks that can run at the same time.
 - ▶ If any error occurred in the operating system; the stored data can be destroyed.
 - ▶ It is a very difficult task or works for the OS to provide entire security from the viruses because any threat or virus can occur at any time in a system.
 - ▶ An unknown user can easily use any system without the permission of the original user.
 - ▶ The cost of operating system costs is very high.
- 

What is an Operating System (OS)

- ▶ An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is a vital component of the system software in a computer system. Application programs usually require an operating system to function.



Structure Of OS



Functions of OS

- Providing a user interface
- Running applications
- Support for built in utility programs.
- Control to the computer hardware



Components of OS

- Process Management
- Memory management
- I/O Device management
- Network management
- Network services
- User Interface

Operating System interface

- ▶ Command line interface
- ▶ Graphical user interface

```
C:\Program Files\OpenSSH\bin>ping 129.144.82.20
```

```
Pinging 129.144.82.20 with 32 bytes of data:
```

```
Reply from 129.144.82.20: bytes=32 time=93ms TTL=59
```

```
Reply from 129.144.82.20: bytes=32 time=78ms TTL=59
```

```
Reply from 129.144.82.20: bytes=32 time=93ms TTL=59
```

```
Reply from 129.144.82.20: bytes=32 time=78ms TTL=59
```

```
Ping statistics for 129.144.82.20:
```

```
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
    Minimum = 78ms, Maximum = 93ms, Average = 85ms
```

```
C:\Program Files\OpenSSH\bin>ssh -l root 129.144.82.20
```

```
root@129.144.82.20's password:
```

```
Last login: Thu Jan  1 00:12:53 1970 from 129.148.184.203
```

```
Linux 129.144.82.20 2.4.22 #12 Fri Jun 17 09:34:52 PDT 2005 ypc GNU/Linux
```

```
root@129.144.82.20:~#
```

My Computer



Computer



Joshua &
Shanon



E-mail



Recycle Bin

Work Station



Desktop Files



Picture Frame [...]

Games



Hearts



Solitaire

Program Files



The Faith
Database



Customize
Fences



TweetDeck



Mozilla
Firefox



Launch
Cooliris



Adobe
Photoshop



Twitter



iTunes

Record "LOST"
Wednesday Night!



9/10



Spider
Solitaire



Freecell



Mahjong
Titans



Chess Titans



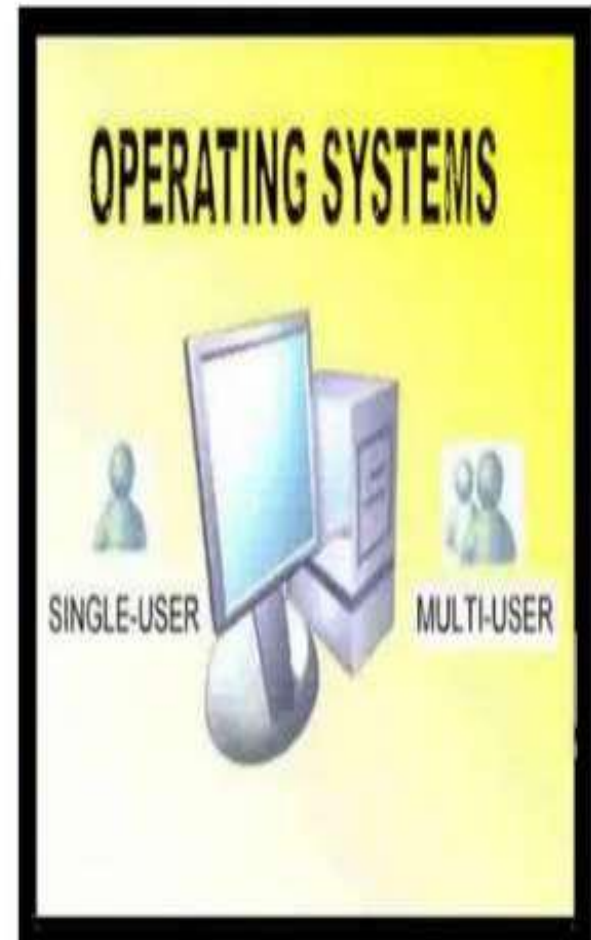
InkBall



Minesweeper

Types of OS

- ▶ Single user, Single Task
- ▶ Single user, Multi-tasking
- ▶ Multi user, Multi-tasking.



Single user Single tasking

- ▶ This type of operating system only has to deal with one person at a time, running one user application at a time.
- ▶ An example of a this kind of operating

Single User Multi-tasking

Single User Multi-tasking

Single user multi-tasking os allows user to perform one or more than one task at same time

Commonly os are

MS windows

Apples macintosh



Single user Multi tasking Example

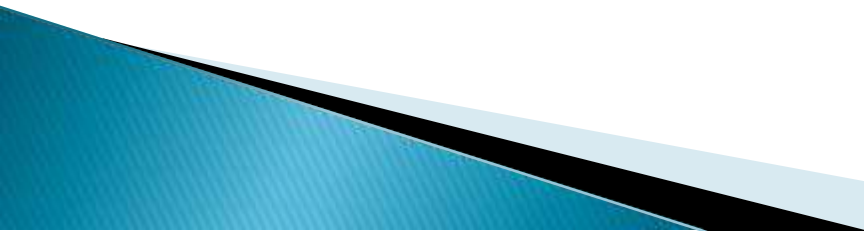
- ▶ **Microsoft Windows:**
- ▶ Windows is a series of operating systems developed by Microsoft. Each version of Windows includes a graphical user interface, with a desktop that allows users to view files and folders in windows. For the past two decades, Windows has been the most widely used operating system for personal computers PCs.

SYSTEM CALLS IN OPERATING SYSTEM

A **system call** is a method for a computer program to request a service from the kernel of the operating system on which it is running. A system call is a method of interacting with the operating system via programs. A system call is a request from computer software to an operating system's kernel.

- ▶ A system call function may create and use kernel processes to execute the asynchronous processing.
- ▶ A system call has greater authority than a standard subroutine. A system call with kernel-mode privilege executes in the kernel protection domain.
- ▶ System calls are not permitted to use shared libraries or any symbols that are not present in the kernel protection domain.
- ▶ The code and data for system calls are stored in global kernel memory

Why do you need system calls in Operating System?

- ▶ It is must require when a file system wants to create or delete a file.
 - ▶ Network connections require the system calls to sending and receiving data packets.
 - ▶ If you want to read or write a file, you need to system calls.
 - ▶ If you want to access hardware devices, including a printer, scanner, you need a system call.
 - ▶ System calls are used to create and manage new processes.
- 

Process	Windows	Unix
Process Control	CreateProcess() ExitProcess() WaitForSingleObject()	Wait() Fork() Exit()
File Manipulation	CreateFile() ReadFile() WriteFile() CloseHandle()	Close() Open() Read() Write()
Device Management	SetConsoleMode() ReadConsole() WriteConsole()	Write() ioctl() Read()
Information Maintenance	GetCurrentProcessID() SetTimer() Sleep()	Sleep() Getpid() Alarm()
Communication	CreatePipe() CreateFileMapping() MapViewOfFile()	Mmap() Pipe() Shmget()
Protection	SetFileSecurity() InitializeSecurityDescriptor() SetSecurityDescriptorgroup()	C

SYSTEM CALL INTERFACE

Most programming languages provides a system call interface.

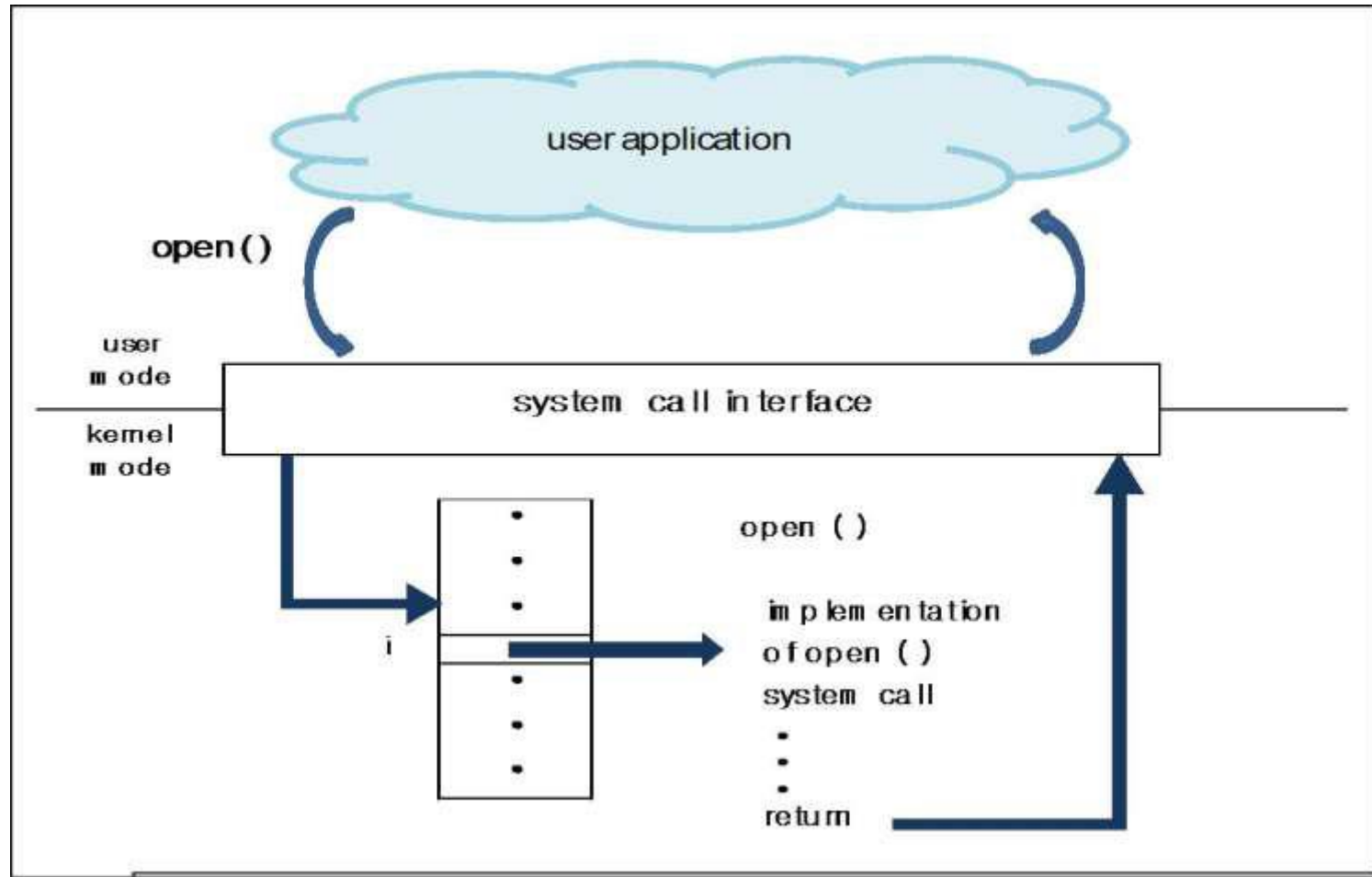
It serves as the link to system calls made available by the operating system.

It intercepts function calls in the API and invokes the necessary system call within the operating system.

Most of the details of the operating system interfaces are hidden from the programmer by the API.



SYSTEM CALL INTERFACE



OPERATING SYSTEM GENERATIONS

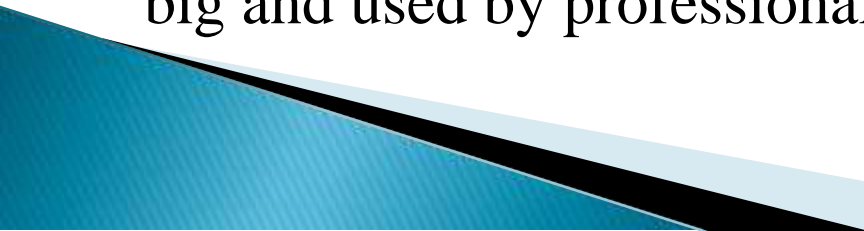
OPERATING SYSTEM GENERATIONS **FOUR** TYPES:

1. **The First Generation (1940 to early 1950s)**
2. **The Second Generation (1955 - 1965)**
3. **The Third Generation (1965 - 1980)**
4. **The Fourth Generation (1980 - Present Day)**

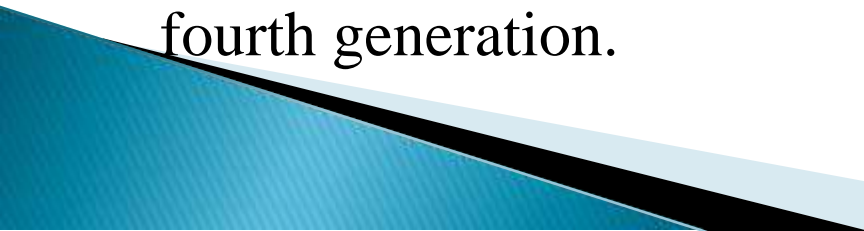
The First Generation (1940 to early 1950s)

- ▶ When the first electronic computer was developed in 1940, it was created without any operating system.
- ▶ In early times, users have full access to the computer machine and write a program for each task in absolute machine language. The programmer can perform and solve only simple mathematical calculations during the computer generation, and this calculation does not require an operating system.

The Second Generation (1955 - 1965)

- ▶ The first operating system (OS) was created in the early 1950s and was known as **GMOS**. **General Motors** has developed OS for the **IBM** computer.
 - ▶ The second-generation operating system was based on a single stream batch processing system because it collects all similar jobs in groups or batches and then submits the jobs to the operating system using a punch card to complete all jobs in a machine.
 - ▶ At each completion of jobs (either normally or abnormally), control transfer to the operating system that is cleaned after completing one job and then continues to read and initiates the next job in a punch card.
 - ▶ After that, new machines were called mainframes, which were very big and used by professional operators.
- 

The Third Generation (1965 - 1980)

- ▶ During the late 1960s, operating system designers were very capable of developing a new operating system that could simultaneously perform multiple tasks in a single computer program called multiprogramming.
 - ▶ The introduction of **multiprogramming** plays a very important role in developing operating systems that allow a CPU to be busy every time by performing different tasks on a computer at the same time.
 - ▶ During the third generation, there was a new development of minicomputer's phenomenal growth starting in 1961 with the DEC PDP-1.
 - ▶ These PDP's leads to the creation of personal computers in the fourth generation.
- 

The Fourth Generation (1980 - Present Day)

- ▶ The fourth generation of operating systems is related to the development of the personal computer. However, the personal computer is very similar to the minicomputers that were developed in the third generation. The cost of a personal computer was very high at that time; there were small fractions of minicomputers costs. A major factor related to creating personal computers was the birth of Microsoft and the Windows operating system. Microsoft created the first **window** operating system in 1975. After introducing the Microsoft Windows OS, Bill Gates and Paul Allen had the vision to take personal computers to the next level. Therefore, they introduced the **MS-DOS** in 1981; however, it was very difficult for the person to understand its cryptic commands. Today, Windows has become the most popular and most commonly used operating system technology. And then, Windows released various operating systems such as Windows 95, Windows 98, Windows XP and the latest operating system, Windows 7. Currently, most Windows users use the Windows 10 operating system. Besides the Windows operating system, Apple is another popular operating system built in the 1980s, and this operating system was developed by Steve Jobs, a co-founder of Apple. They named the operating system Macintosh OS or Mac OS.