

OS = Operating System

Define the OS !!!

Program = Finite set of instructions

Software = Is a set of programs

System Software = s/w that work along with the system , may be to manage or interact with the system

Ex = OS, Drivers ,Compilers, Interpreters , Loaders, Linkers ,Network Adaptors

Application Software = s/w that works to solve user's problems

Ex = MS OFFICE, Browsers, Players, notepad, GAMES, Calculator, Hotel Menu , Maths Util , Railway Reservation, Library mgmt, Speech Recognition, to do list, complaint portal, blood bank, text to speech synth , shopping...

WHAT IS OS ?

OS is a System Software

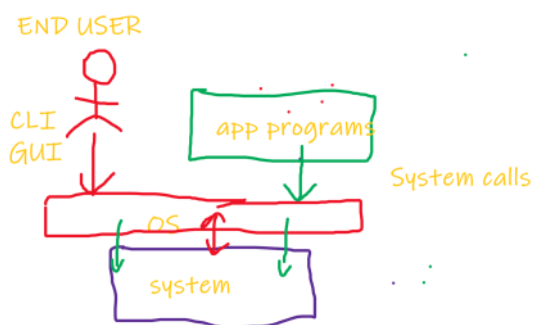
OS is a middle layer or an interface that interacts between

1. System and **End User (human)- CLI (command line interface) or GUI (graphical user interface)**

2. System and Program User (application software) - **system calls**

OS performs system management through following modules

1. memory management
2. Process management
3. disk and IO management (Drivers)
4. Security (Authentication and Authorization)



BIT = Binary digIT = 0 , 1

8 bits = 1byte

1024 bytes = 1Kb (Kb = Kilo bytes , KB = Kilo Bits)

1024 Kb = 1Mb

1024 Mb = 1 Gb

1024 Gb = 1Tb

WHAT is a SYSTEM ? HARDWARE

1. Secondary Storage

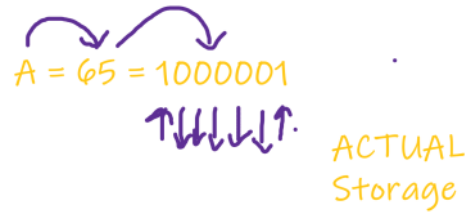
HDD = Hard Disk Drive

SSD = Solid State Device

Non volatile storage = VALUES are retained even if power shuts down or power on

Capacity = 1TB of Hard disk , 512 GB

Material HDD = Al disk coated with Fe (**magnetic material ---- magnetic dipoles**)



HW ---- Find out how the data is stored in SSD , material of SSD

Access time is much slower than primary storage!!!!

2. Primary Storage - RAM (Random Access Memory) , Memory , Primary Memory, Main Memory

Volatile storage = Value is retained ONLY till power on. Lost of power off

Capacity = 4Gb , 8Gb, 16 Gb

Access time is much faster than the secondary storage

Material = flip flops , capacitors , Semiconductor

1. CPU - Central Processing Unit

i. Storage ----- REGISTERS = FAST ACCESS STORAGE

Small = 32 bits = 4 bytes OR 64 bit = 8 bytes or

128bit = 16bytes

IR = Instruction Register = One instruction is stored at a time

PC = Program Counter = address of the next instruction in RAM

DR0/DR1 = Data Register 0 and 1 = each data register holds the data (operands of the instruction)

ADR0, ADR1 = Address of Data 0 and 1

li) Executor ----- ALU = Arithmetic and Logic Unit

Types of Instructions

a. CPU Instructions

These are the instructions that ALU(electronic circuits) can execute

1. Arithmetic Instruction = + - * / %

2. Logical Instruction = && || & | ^ !

3. Relational instructions= == < > <= >= != ? :

b. IO Instructions

printf()
scanf()

CPU can execute only cpu instructions ----- ONE instruction at a time

Statement is in the RAM	3 + 4
IR	+
DRO	3
DR1	4
Accumulator	7

2. IO Devices = Input devices = mouse keyboard joystick pd , camera , mic , scanner (finger print, retina , face , barcode) , card readers

output devices = screen , pd , speaker , charger, printer , modem, projector

IO Instruction = read from Input device , write to output device

These are handled by another processor = IOProcessor , DMA

(Direct Memory Access) controller (without using CPU

directly data is moved from Input device to RAM and RAM to o/p device)

Input device ----->RAM-----> Output device

1. Cache Storage
2. Connecting Cables

