

Operating Systems

What is OS?

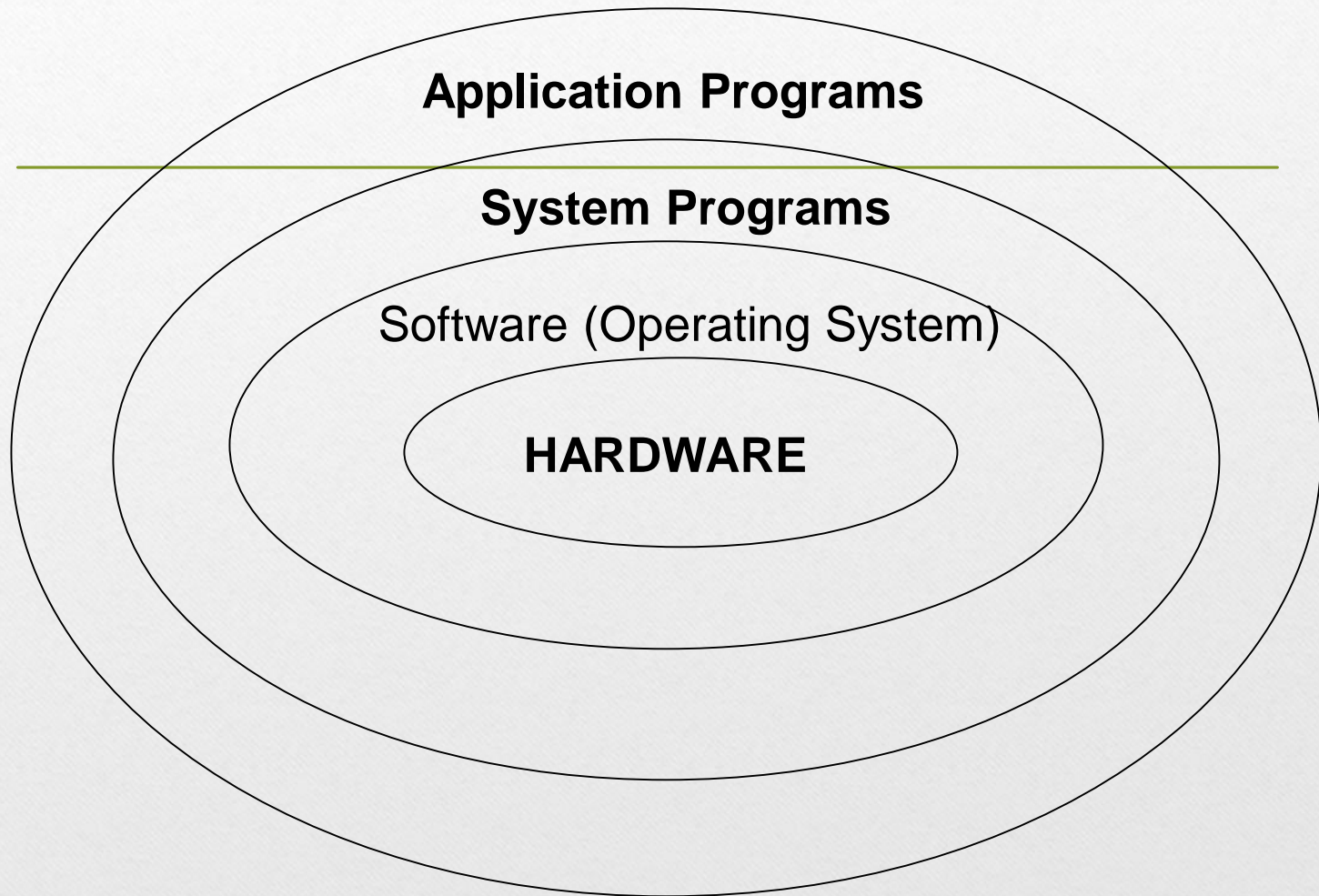
- Operating System is a software, which makes a computer to actually work.
- It is the software that enables all the programs we use.
- The OS organizes and controls the hardware.
- OS acts as an interface between the application programs and the machine hardware.
- Examples: Windows, Linux, Unix and Mac OS, etc.,

What OS does?

An operating system performs basic tasks such as,

- controlling and allocating memory,
- prioritizing system requests,
- controlling input and output devices,
- facilitating networking and
- managing file systems.

Structure of Operating System:



Operating Systems functions:

- Main Memory Management
- Processor Management
- Device Management
- File Management

Main Memory Management

- In charge of main memory
 - Random Access Memory (RAM)
- Responsibilities include:
 - Preserving space in main memory occupied by operating system
 - Checking validity and legality of memory space request
 - Setting up memory tracking table
 - Tracks usage of memory by sections
 - Needed in multiuser environment
 - Deallocating memory to reclaim it

Processor Management

- In charge of allocating **Central Processing Unit (CPU)**
- Tracks **process** status
 - An instance of program execution
- Two levels of responsibility:
 - Handle jobs as they enter the system
 - Handled by Job Scheduler
 - Manage each process within those jobs
 - Handled by Process Scheduler

Device Management

- In charge of monitoring all resources
 - Devices, channels, and control units
- Responsibilities include:
 - Choosing most efficient resource allocation method
 - Printers, ports, disk drives, etc.
 - Based on scheduling policy
 - Allocating the device
 - Starting device operation
 - Deallocating the device

File Management

- In charge of tracking every file in the system
 - Data files, program files, compilers, application programs
- Responsibilities include:
 - Enforcing user/program resource access restrictions
 - Uses predetermined access policies
 - Controlling user/program modification restrictions
 - Read-only, read-write, create, delete
 - Allocating resource
 - Opening the file
 - Deallocating file (by closing it)

Types of OS:

Operating System can also be classified as,-

- **Single User Systems**
- **Multi User Systems**

Single User Systems:

- Provides a platform for only one user at a time.
- They are popularly associated with Desk Top operating system which run on standalone systems where no user accounts are required.
- Example: DOS

Multi-User Systems:

- Provides regulated access for a number of users by maintaining a database of known users.
- Refers to computer systems that support two or more simultaneous users.
- Another term for *multi-user* is *time sharing*.
- Ex: All mainframes and are multi-user systems.
- Example: Unix