

Introduction to OS & Linux

National University of Computer and Emerging Sciences, Lahore
Operating System Lab (spring 2021)

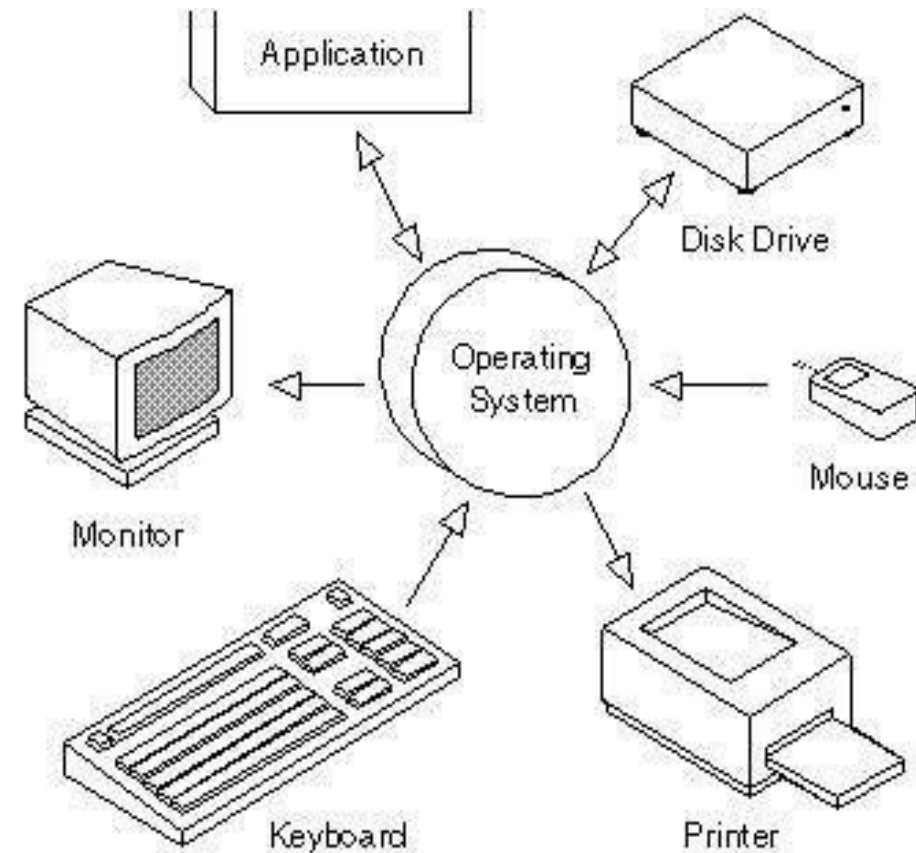
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On Computer Startup

- Power-on self test (POST) checks for errors
 - CPU
 - Memory
 - Basic input-output systems (BIOS)
- BIOS/firmware
 - Activates the computer's hard disk drives
- Bootstrap loader
 - First piece of the operating system
 - Has a single function to load the operating system into memory

Operating System

- What is Operating System?
Supports computer's basic functions
- What tasks an OS Perform?
 - Processor management
 - Memory management
 - Device management
 - Storage management
 - Application interface
 - User interface
- Types
 - Linux
 - Windows 8, Windows 7, Vista, XP
 - Mac



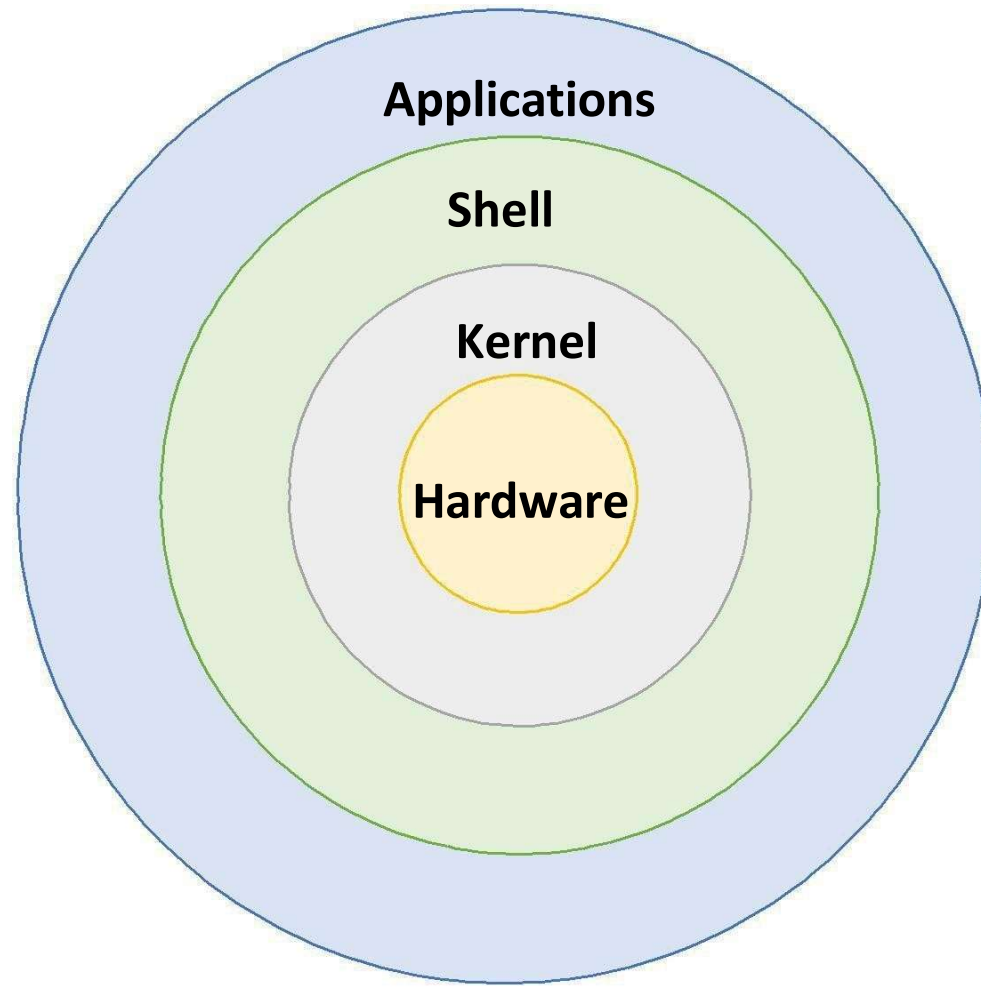
What is Linux?

- A fully-networked 32/64-Bit Unix-like Operating System
 - Compilers Like C, C++
- Multi-user, Multitasking
- Coexists with other Operating Systems
- Includes the Source Code
- Open Source

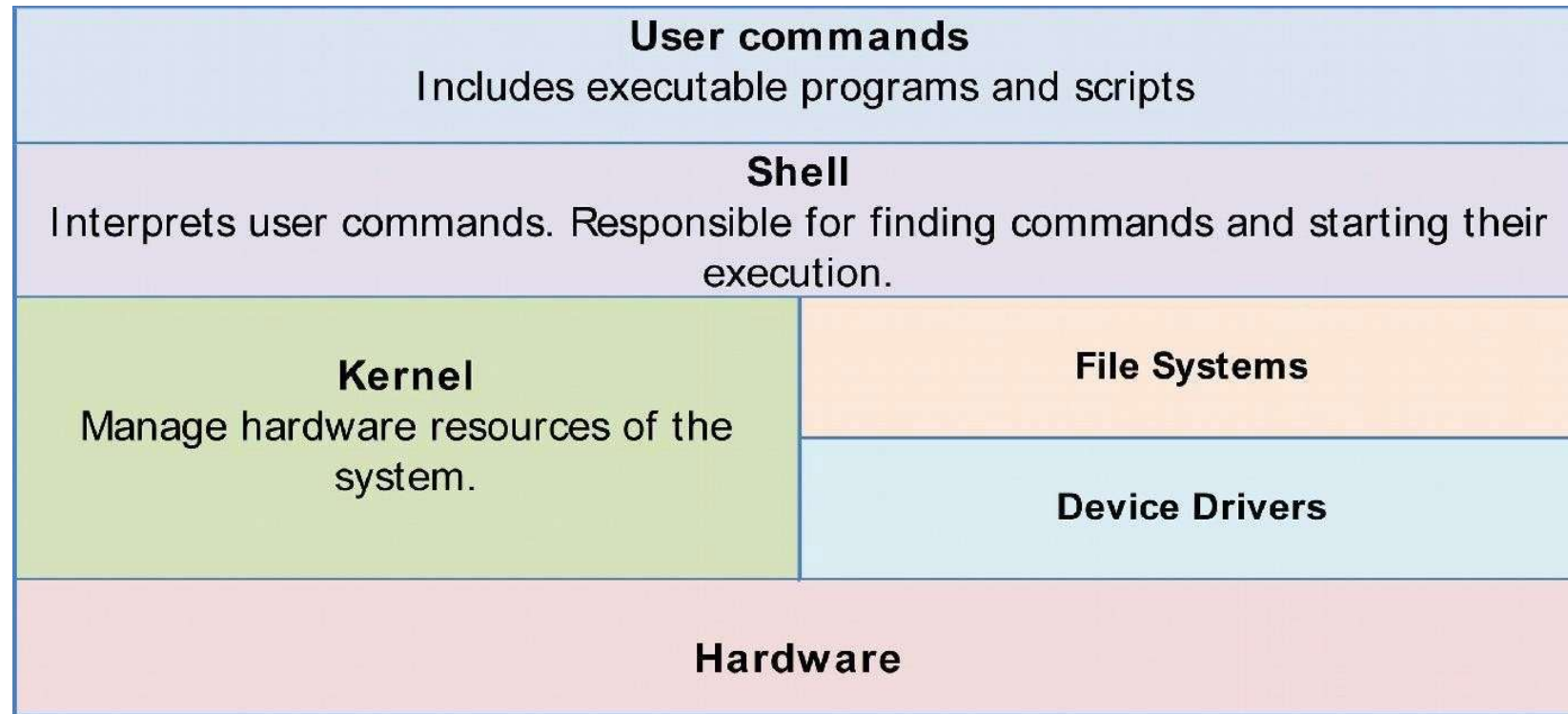
Why is it significant?

- Growing popularity
- Powerful
 - Runs on multiple hardware platforms
 - Users like its speed and stability
 - No requirement for latest hardware
 - It is free
 - Licensed under GPL (General Public License)

System Structure

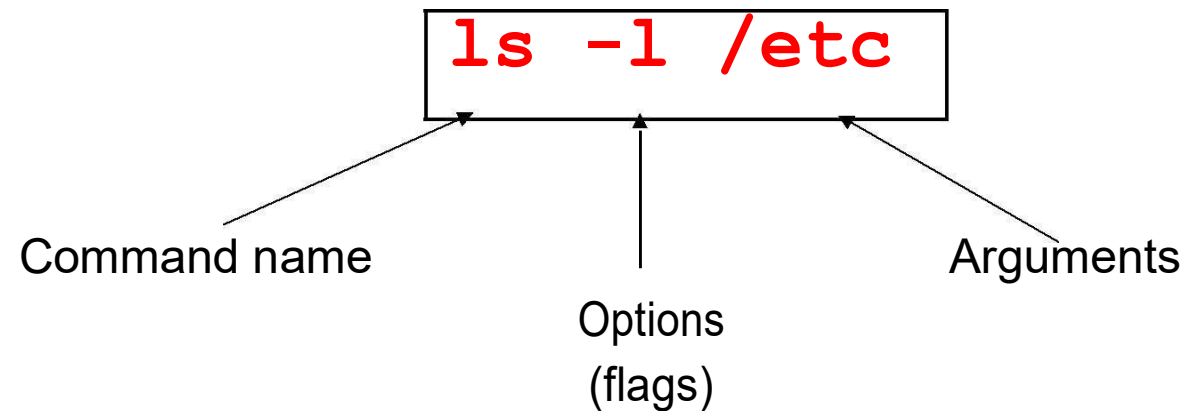


The Linux System



Linux Command Basics

- To execute a command, type its name and arguments at the command line
- *<command_name><space><options><space><arguments>*

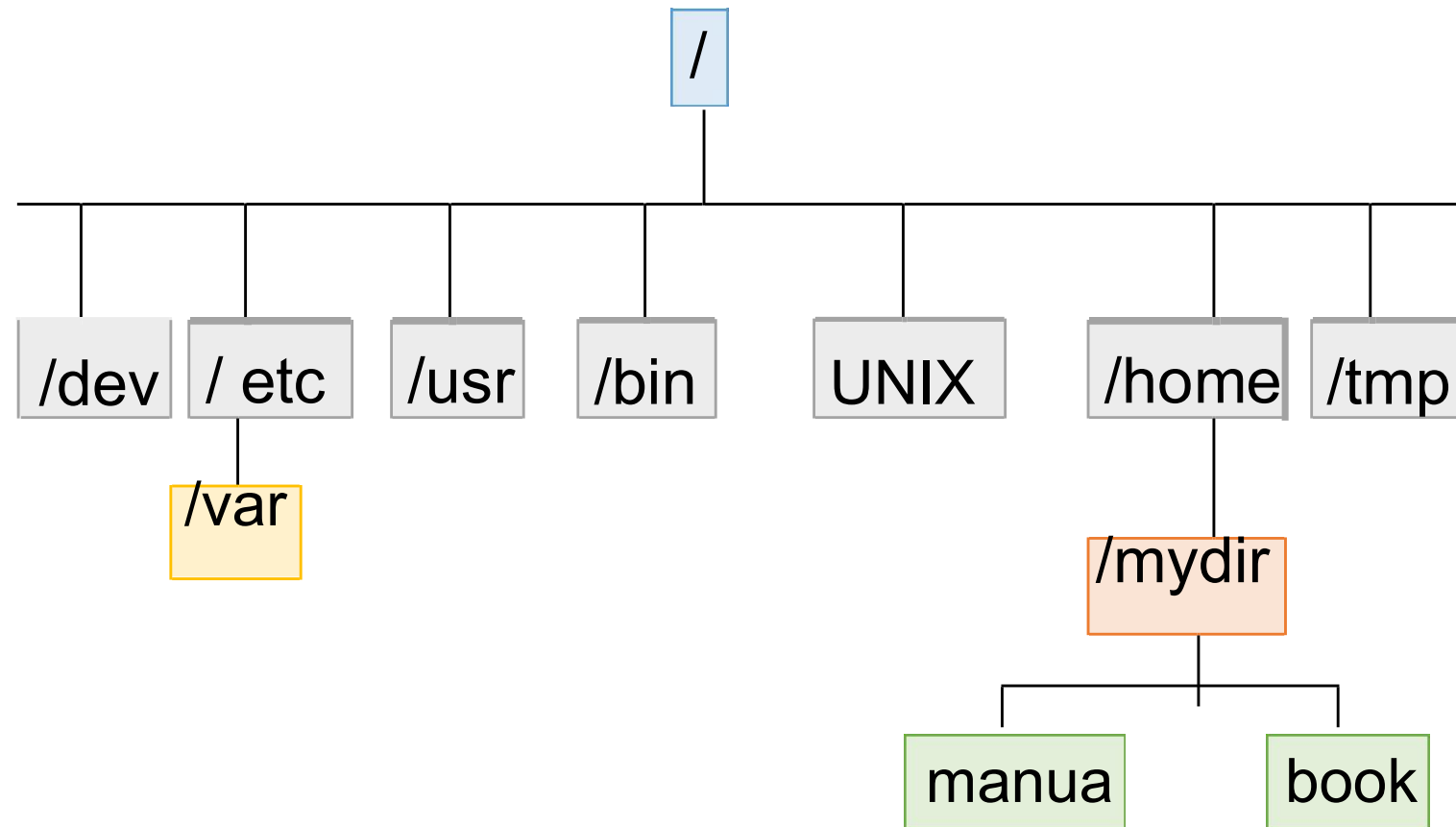


Editors

Several choices available:

- **vi** Standard UNIX editor
- **the** XEDIT-like editor
- **xedit** X windows text editor
- **emacs** Extensible, Customizable Self-Documenting Display Editor
- **pico** Simple display-oriented text editor
- **nedit** X windows Motif text editor

The file system



Special Files

- `/home` - all users' home directories are stored here
- `/bin`, `/usr/bin` - system commands
- `/etc` - all sorts of configuration files
- `/var` - logs, spool directories etc.
- `/dev` - device files
- `/proc` - special system files

Windows

- The directories in MS-DOS path are separated by '\'
- File names are case insensitive.
- Where DOS/Windows had various partitions and then directories under those partitions.
- An executable is one with an extension of .exe, .com or .bat.
- You can set attributes to make file read only, hidden.

Linux

- Paths are separated by '/'.
- File names are case sensitive.
- .There is only a single hierarchal directory structure (resembles a tree). Everything starts from the root directory, represented by '/', and then expands into sub-directories.
- Any file whose execute permission is turned on is executable
- You can set permissions on a file

Virtual Machine

- What is a virtual machine?
 - VirtualBox and VMWare
- ISO files – Ubuntu ISO file
- Ubuntu installation on VirtualBox or VMware

Some commands for Beginners

- Clear the console
 - `clear`
- Changing working Directory
 - `cd Desktop`
 - `cd Home`
- List all files in directory
 - `ls`
- Copy all files of a directory within the current work directory
 - `cp dir/* .`
- Copy a directory within the current work directory
 - `cp -a tmp/dir1 .`
- Look what these commands do
 - `cp -a dir1 dir2`
 - `cp filename1 filename2`

Commands Cont...

To make archive of existing folder or files

- `tar cvf archive_name.tar dirname/`
- `tar cvf alldocs.tar *.txt`

Extract from an existing tar archive.

- `tar xvf archive_name.tar`

View an existing tar archive.

- `tar tvf archive_name.tar`

Commands Cont...

- ls show files in current position
- cd change directory
- cp copy file or directory
- mv move file or directory
- rm remove file or directory
- pwd show current position
- mkdir create directory
- rmdir remove directory
- less, more, cat display file contents
- man read the online manual page for a command
- whatis give brief description of a command

Commands Cont...

- su switch user
- passwd change password
- useradd create new user account
- userdel delete user account
- mount mount file system
- umount unmount file system
- df show disk space usage
- shutdown reboot or turn off machine