

Unit: IV
Shell Introduction and Shell Scripting
Lecture: 1
Shell

What is a Kernel?

The kernel is a computer program that is the core of a computer's operating system, with complete control over everything in the system.

It manages following resources of the Linux system:

- File Management
- Process Management
- I/O Management
- Memory Management
- Device Management etc.

Kernel acts as a bridge between applications and data processing performed at hardware level using inter-process communication and system calls.

Kernel loads first into memory when an operating system is loaded and remains into memory until operating system is shut down again.

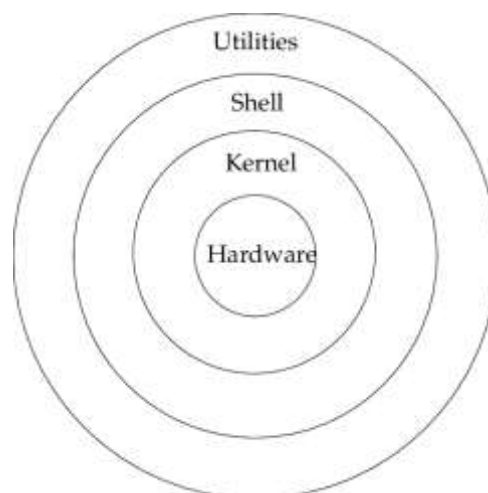
It decides which process should be allocated to processor to execute and which process should be kept in main memory to execute.

It basically acts as an interface between user applications and hardware.

What is Shell?

A shell is special user program which provide an interface to user to use operating system services.

- **Shell accept human readable commands from user and convert them into something which kernel can understand.**
- It is a command language interpreter that execute commands read from input devices such as keyboards or from files.
- The shell gets started when the user logs in or starts the terminal.

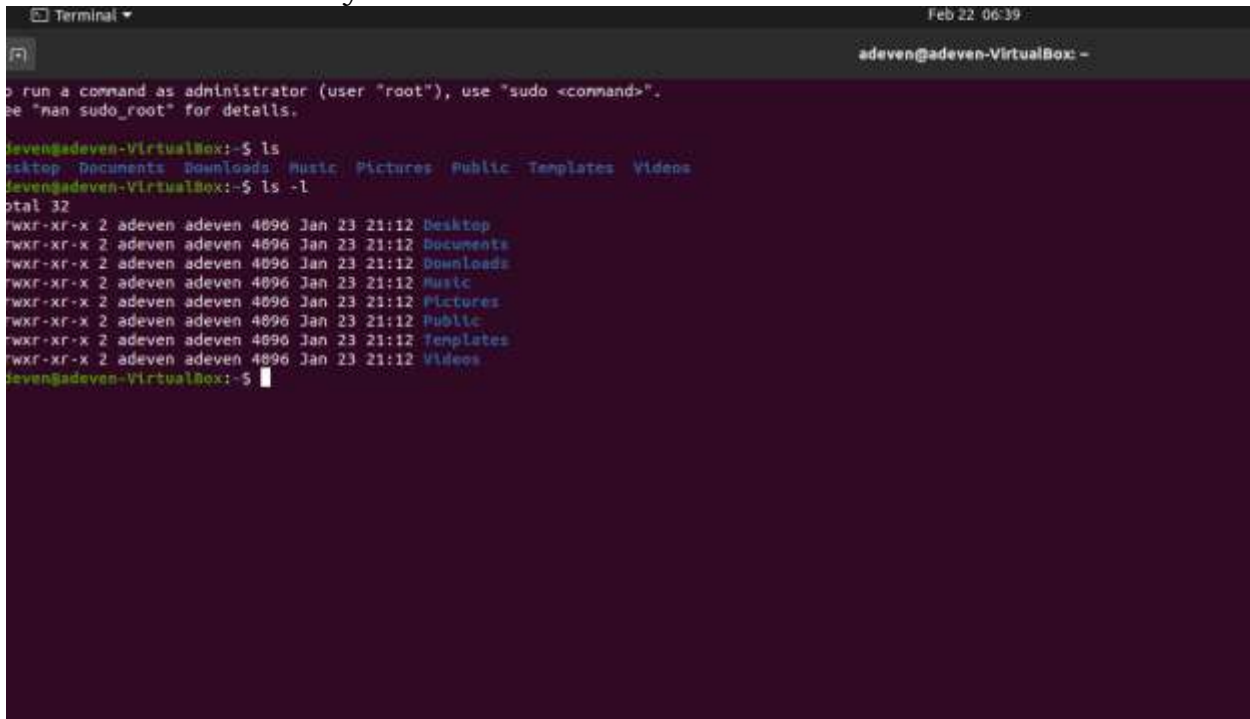


Shell is broadly classified into two categories:

- Command Line Shell
- Graphical Shell

Command Line Shell: Shell can be accessed by user using a command line interface. A special program called Terminal in linux/macOS or Command prompt in windows OS is provided to type in the human readable commands such as “cat”, “ls” etc and then it is being executed. The result is then displayed on the terminal to the user.

Terminal in ubuntu system:



```
Terminal Feb 22 06:39
adeven@adeven-VirtualBox: -
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
adeven@adeven-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
adeven@adeven-VirtualBox:~$ ls -l
total 32
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Desktop
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Documents
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Downloads
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Music
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Pictures
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Public
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Templates
-rwxr-xr-x 2 adeven adeven 4096 Jan 23 21:12 Videos
adeven@adeven-VirtualBox:~$
```

Graphical Shells: Graphical shells provide means for manipulating programs based on GUI, by allowing for operations such as opening, closing, moving and resizing windows, as well as switching focus between windows. Window OS and Ubuntu OS can be considered as good example which provide GUI to user for interacting with program. User do not need to type in command for every actions.

There are several shells available for Linux systems like:

- **BASH(Bourne Again Shell):** It is most widely used shell in Linux systems. It is used as default login shell in Linux systems and in macOS.
- **CSH (C Shell):** The C shell’s syntax and usage are very similar to the C programming language.
- **KSH (Korn Shell):** The Korn shell was the base for the POSIX Shell standard specifications etc.

Each shell does the same job but understands different commands and provide different built in functions.