



LINUX

shell

In last part we learn about kernel and understood it takes the command and request the hardware to execute them .

In this we will learn what is a shell ?

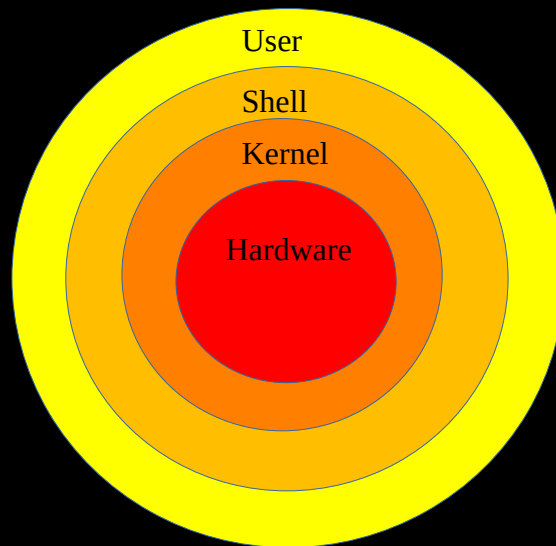
In very simple words shell is a program which take input from user and sends it to computer system to provide useful output.

We can relate it with the cmd we know in windows operating system.

Why do we need shell?

We need shell because kernel only understand machine language(binary) and as a user we can't give every command in machine language(binary). So here comes the shell , it take command from user in simple language and convert them into machine language(binary) and send to kernel for execution .

Also the output produced is in machine language(binary) so it converts back the produced output(that is in binary) to simple language that user can understand.



We can have full experience of shell when we use any OS in CLI(command line interpreter) mode running . Even in our GUI(graphical user interface) we can directly give command as in CLI mode using terminal emulator commonly known as terminal .

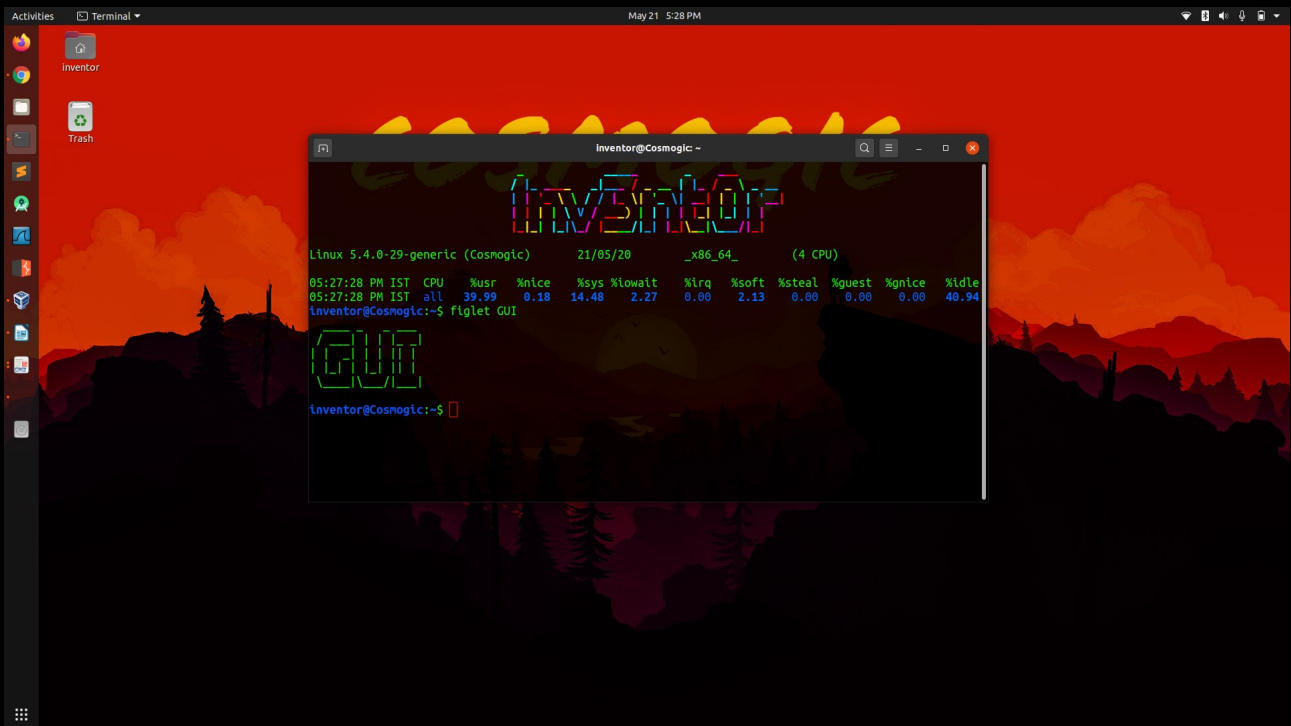
Terminal emulator is a software present in GUI version, use to run shell command interpreter.

GUI is not a part of kernel but it is a software present in our operating system ,they send request to shell to execute a program .

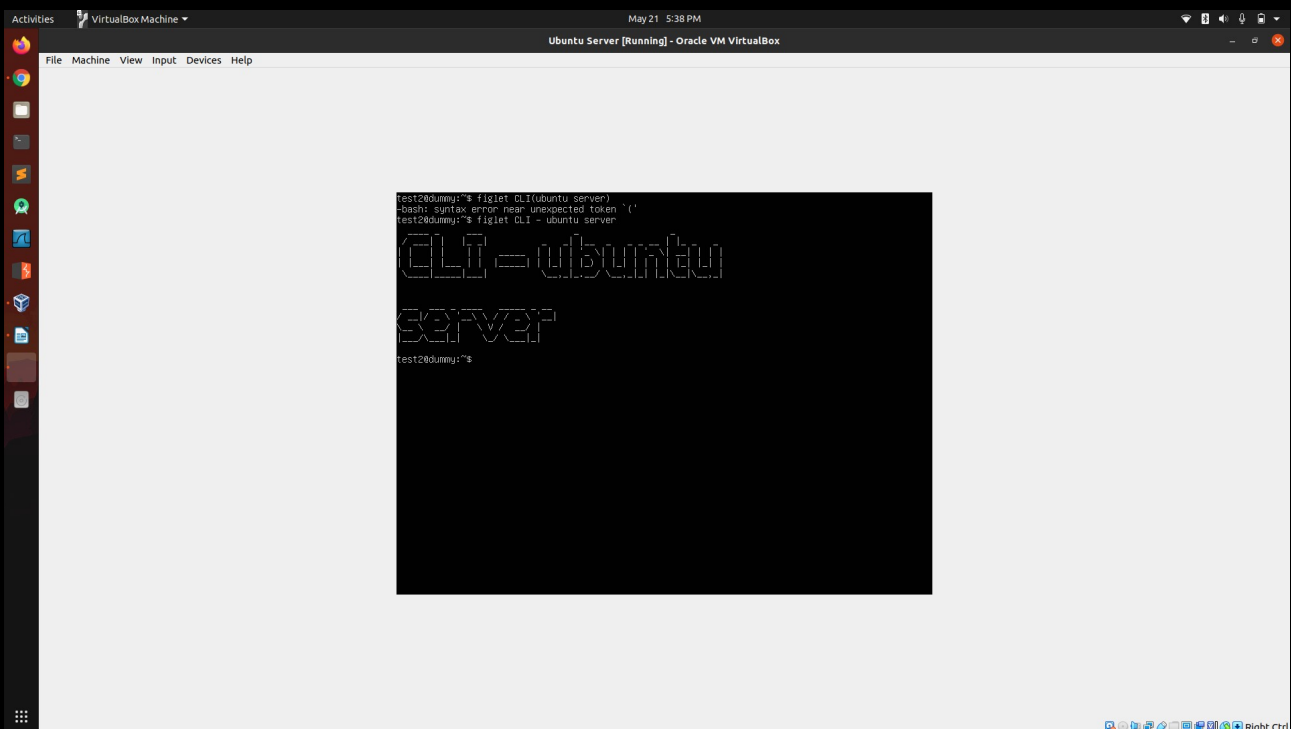
The flow is like (in Ubuntu or Debian like system) :-

user → X server → video driver → display

here X server give input to shell to gain useful output



Terminal in GUI version



shell in CLI mode (Ubuntu server)

Different type of shell :-

### 1. The Bourne Shell

The Bourne shell (sh), written by Steve Bourne at AT&T Bell Labs, is the original UNIX shell. It is the preferred shell for shell programming because of its compactness and speed. A Bourne shell drawback is that it lacks features for interactive use, such as the ability to recall previous commands (history). The Bourne shell also lack built-in arithmetic and logical expression handling.

The Bourne shell is the OS default shell. It is the standard shell for system administration scripts. For the Bourne shell the:

- Command full-path name is /bin/sh and /sbin/sh.
- Non-root user default prompt is \$.
- Root user default prompt is #.

## 2. The C shell (csh):

- Is a UNIX enhancement written by Bill Joy at the University of California at Berkeley.
- Incorporated features for interactive use, such as aliases and command history.
- Includes convenient programming features, such as built-in arithmetic and a C-like expression syntax.

For the C shell the:

- Command full-path name is `/bin/csh`.
- Non-root user default prompt is `hostname %`.
- Root user default prompt is `hostname #`.

### 3. The Korn shell

The Korn shell (ksh):

- Was written by David Korn at AT&T Bell Labs
- Is a super set of the Bourne shell.
- Supports everything in the Bourne shell.
- Has interactive features comparable to those in the C shell.
- Includes convenient programming features like built-in arithmetic and C-like arrays, functions, and string-manipulation facilities.
- Is faster than the C shell.
- Runs scripts written for the Bourne shell.

For the Korn shell the:

- Command full-path name is `/bin/ksh`.

- Non-root user default prompt is \$.

- Root user default prompt is #.

#### 4. The GNU Bourne-Again shell (bash):

- Is compatible to the Bourne shell.

- Incorporates useful features from the Korn and C shells.

- Has arrow keys that are automatically mapped for command recall and editing.

For the GNU Bourne-Again shell the:

- Command full-path name is /bin/bash.

- Default prompt for a non-root user is bash-x.xx\$. (Where x.xx indicates the shell version number. For example, bash-5.50\$)

- Root user default prompt is bash-x.xx#. (Where x.xx indicates the shell version number. For example, bash-5.50#)

Thank you

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