**1. What is Linux?**

**LINUX stands for Lovable Intellect Not Using XP**

Linux is an Open-Source Operating System based on Unix. Linux was first introduced by Linus Torvalds. The main purpose of Linux was to provide free and low-cost Operating System for users who could not afford Operating Systems like Windows or iOS or Unix.

(OR)

Linux is a UNIX clone which has been written from scratch by Linus Torvalds it is an open source and community developed operating system for which it is capable of handling activities from multiple users at the same time

* firstly it's an open source operating system which basically means the source code is available to everybody which also means that when you use the Linux OS you can customize it according to the nature of your work
* Second Point Linux is highly secure it is so because it's easy to identify bugs and fix them whereas when we are talking about a widely distributed OS like Windows which has a large user base it becomes a target for developers of viruses and malware

### 2. Who invented Linux? Explain the history of Linux.

**Ans:**Linus Torvalds created Linux. Linus Torvalds was a student at the University of Helsinki, Finland in 1991. He started writing code on his own to get the academic version of Unix for free. Later on, it became popular as Linux Kernel.

### 3. What is the difference between Linux and Unix?

**Ans:**Here is the difference between Linux and Unix - mentioned below

|  |  |
| --- | --- |
| **Linux** | **Unix** |
| Both paid and free distributions are available. | Different paid structures for different levels of Unix. |
| Linux primarily uses GUI with an optional command-line interface | Unix uses the command-line interface |
| Linux OS is portable and can be executed on different hard drives | Unix OS is not portable. |
| Linux is developed by a worldwide Linux community. | Unix is developed by AT&T developers. |
| Linux is free. And it is download through the internet under GNU licenses. | Most Unix Like Operating Systems is not free. |
| Linux is used at home-based PC's, phones, etc. | Unix is used in server systems. |

And some other differences.

**Linux is a Unix clone**. But if you consider Portable Operating System Interface (POSIX) standards then Linux can be considered as UNIX.

* **Linux Is Just Kernal**

All Linux distributions include GUI system, GNU utilities, installation & management tools, GNU c/c++ Compilers, Editors (vi), and various applications like OpenOffice, Firefox.

UNIX operating systems are considered a complete OS as everything come from a single vendor.

* **Security And Firewall**

Linux comes with an open-source Netfilter and IPTables-based firewall tool to protect your server and desktop from crackers and hackers. UNIX operating systems come with their own firewall products.

* **Backup And Recovery**

UNIX and Linux come with their own set of tools for backing up data to tape and other backup media. However, both Linux and UNIX share some common tools such as tar, dump/restore, and cpio, etc.

### Is it legal to edit Linux Kernel?

Yes. You can edit Linux Kernel because it is released under General Public License (GPL) and anyone can edit it. It comes under the category of free and open source software.

**4. What are basic elements or components of Linux?**

Linux generally consists of five basic elements or components as given below:

**Kernel:** It is considered a core or main part of Linux and is generally responsible for all major activities of OS such as process management, device management, etc.

**System Library:** These are special functions or programs with the help of which application programs or system utilities can access features of the kernel without any requirement of code. It is simply used to implement the functionality of the OS.

**System Utility:** These are utility programs that are responsible to perform specialized and individual-level tasks. They are considered more liable and allow users to manage the computer.

**Hardware:** It is physical hardware that includes items such as a mouse, keyboard, display, CPU, etc.

**Shell:** It is an environment in which we can run our commands, shell scripts, and programs. It is an interface between user and kernel that hides all complexities of functions of the kernel from the user. It is used to execute commands.

**5. What is Kernel? Explain its functions.**

A kernel is considered the main component of Linux OS. It is simply a resource manager that acts as a bridge between hardware and software. Its main role is to manage hardware resources for users and is generally used to provide an interface for user-level interaction. A kernel is the first program that is loaded whenever a computer system starts. It is also referred to as low-level system software.

**Its other main functions include:**

Memory Management

Process Management

Device Management

Storage Management

Manage access, and use of various peripherals that are connected to the computer.

**6. What are two types of Linux User Mode?**

There are two types of Linux user mode as given below:

Command Line

GUI

**7. What is Linux Shell? What types of Shells are there in Linux?**

Linux shell is a user interface present between user and kernel. It is used for executing commands and communication with Linux OS. Linux shell is basically a program used by users for executing commands. It accepts human-readable commands as input and converts them into kernel understandable language.

Different types of shells are commonly used on typical Linux system as listed below:

CSH (C Shell)

KSH (Korn Shell)BASH (Bourne Again Shell)

TCSH

ZSH

Bourne Shel

### 8. What is BASH?

BASH (Bourne Again Shell) is basically a command language interpreter. It was written by Brian Fox for GNU OS and can be used in place of Bourne Shell. It is similar to Bourne Shell but includes some additional features such as command-line editing that make it easier and more convenient to use. It is the default user shell on most Linux installations. It is basically an interpreted and non-compiled process that can also run in the terminal window. It is also capable of reading commands from shell scripts

**9. What is LILO?**

LILO (Linux Loader) is basically a bootloader for Linux that is used to load Linux into memory and start the OS. It is also known as a boot manager that facilitates a dual boot of a computer. It can function as either a master boot program or secondary boot program and performs various functions such as locating kernel, identifying other supporting programs, loading memory, and starting the kernel. If you want to use Linux OS, then you need to install a special bootloader i.e., LILO for it as it allows fast boot of Linux OS.

**10. What is swap space?**

Swap space, as the name suggests, is basically a space on a hard disk that is used when the amount of physical memory or RAM is full. It is considered a substitute for physical memory. Its main function is to substitute disk space for RAM memory when real RAM does not have enough space to hold all programs that are executing, and more space is required. In simple words, it can be used as an extension of RAM by Linux.

**11. What do you mean by a Process States in Linux?**

Linux Process is a type of process that can be in a number of different states. The process enters these states from start till end. Process states in Linux are as follows:

* **New/Ready:** In this state, a new process is created and is ready to run.
* **Running:** In this state, the process is being executed.
* **Blocked/Wait:**In this state, the process is waiting for input from the user and if doesn't have resources to run such as memory, file locks, input, then it can remain in a waiting or blocked state.
* **Terminated/Completed:** In this state, the process has completed the execution or terminated by the OS.
* **Zombie:**In this state, the process is terminated but information regarding the process still exists and is available in the process table

**12. Name different types of modes used in VI editor.**

VI editor (Visual Editor) is basically a default text editor that usually comes with most of the Linux OS. There are basically three types of modes used in VI editor as given below:

* **Command Mode/Regular Mode:** It is the default mode for the vi editors. It is generally used to type commands that usually perform particular or specific vi functions. To enter this mode from another mode (Insert mode), one must press [esc]. In simple words, it lets you view the content.
* **Insertion Mode/Edit Mode:** This mode allows you to do text editing, or type text into a file. To enter this mode from another mode (command mode), one must press [esc]. In simple words, it lets you delete or insert text or content.
* **Ex Mode/Replacement Mode:** This mode is generally used to save the files and execution of the commands. It basically executes files with different parameters. To enter this mode, one must press [:]. In simple words, it lets you overwrite content or text

### 13. What is the difference between BASH and DOS?

**BASH (Bourne Again Shell)**: It is basically a powerful command shell and scripting language that is being developed from the Bourne shell used on UNIX systems. It runs on multiple OS and new features are added regularly. It can read and execute commands from a file known as a shell script.   
  
**DOS (Disk Operating System)**: It is basically an OS that runs from a hard disk drive. It was the first OS system used by IBM-compatible computers. It basically provides a command-line in which users are allowed to give instructions in the form of commands.

| **BASH** | **DOS** |
| --- | --- |
| In BASH, commands are case-sensitive. | In DOS, commands are not case-sensitive. |
| In this, / character are directory separator and \ acts as an escape character. | In this, \ is a directory separator and / acts as a command argument delimiter. |
| It can take input with its built-in “read” command. | It cannot take input during run time and one can only pass “/argument” during execution from the command line. |

### 14. What is CLI and GUI?

**CLI (Command Line Interface):** It is basically a command-line program that usually accepts text as input to execute or run functions of the operating system. It allows users to type declarative commands simply to give instructions to the computer to perform or execute operations. It usually requires less memory to use as compared to other interfaces as well as it does not require Windows and a low-resolution monitor can be used. It usually provides greater flexibility of use and can also be used to perform things easily that are most difficult to do with GUI.    
  
**GUI (Graphical User Interface):** It is basically a human-computer interface that allows users to interact with electronic devices through graphical icons and visual indicators. The use of these graphical elements or icons makes it easier for users to interact with the system. It is visually intuitive and allows higher productivity. It is usually a combination of graphical and textual interaction that uses menus, buttons, message boxes, etc

**15. Name some Linux variants.**

Some of the Linux commands are:

1) CentOS

2) Ubuntu

3) Redhat

4) Debian

5) Fedora

### 16. What is a root account?

The root account is like a system administrator account. It provides you full control of the system. You can create and maintain user accounts, assign different permission for each account, etc.

**17. What is the role of the bootloader in Linux?**

The bootloader is responsible for loading the operating system into the memory. It also provides a menu to choose between different operating systems, if they are installed

**1. What is a process in Linux?**

A process is a running instance of a program in Linux. It has its own memory space, system resources, and process ID (PID).

**2. How do you check system performance in Linux?**

You can check system performance in Linux using various tools, such as top, htop, vmstat, iostat, sar, and nmon. These tools show CPU usage, memory usage, disk I/O, and network traffic.

**3. What is a daemon in Linux?**

A daemon is a background process that runs continuously in Linux. It performs various tasks, such as managing system services, logging, and scheduling.

**4. What is a shell script in Linux?**

A shell script is a program written in a shell language, such as Bash or Csh. It consists of a series of commands that can be executed by the shell.

**5. How do you manage users and permissions in Linux?**

You can manage users and permissions in Linux using various tools, such as useradd, userdel, usermod, passwd, chown, and chmod. These tools allow you to create, delete, modify users, and set file permissions.

**6. What is a package manager in Linux?**

A package manager is a tool that allows you to install, update, and remove software packages in Linux. It resolves dependencies and ensures that the software is installed correctly.

**7. How do you configure network settings in Linux?**

You can configure network settings in Linux using various tools, such as ifconfig, ip, route, and netstat. These tools allow you to set IP addresses, DNS servers, network interfaces, and routing tables.

**8. What is a cron job in Linux?**

A cron job is a scheduled task that runs automatically at specific times or intervals in Linux. It is managed by the cron daemon and can be configured using the crontab command.

**9. How do you monitor system logs in Linux?**

You can monitor system logs in Linux using various tools, such as tail, grep, and less. These tools allow you to filter and view log files, such as /var/log/messages, /var/log/syslog, and /var/log/auth.log.

**10. What is a virtual machine in Linux?**

A virtual machine is a software emulation of a computer system that runs on top of another operating system, such as Linux. It allows you to run multiple operating systems on the same physical machine, with isolation and resource allocation.

These questions can help assess the candidate's knowledge and experience with Linux administration and usage.

**11 Explain the difference between a process and a thread in Linux.**

Answer: A process is an independent program with its own memory space, while a thread is a lightweight process that shares the same memory space with other threads in the same process.

**12. How do you change file permissions in Linux?**

Answer: The chmod command is used to change file permissions. For example, chmod 755 filename gives read, write, and execute permissions to the owner, and read and execute permissions to others.

**13. What is the purpose of the grep command?**

Answer: grep is used to search for specific patterns or text within files. For example, grep 'pattern' filename will display lines containing the specified pattern in the given file.

**14. Explain the role of the passwd command.**

Answer: The passwd command is used to change a user's password. Users can change their own password, and superusers can change the password for any user.

**15 How do you check the available disk space in Linux?**

Answer: The df command is used to display disk space usage. For example, df -h shows disk space in a human-readable format.

**16. What is a symbolic link in Linux?**

Answer: A symbolic link, or symlink, is a reference to another file or directory. It acts as a shortcut or pointer to the target file or directory.

**17. Explain the purpose of the ps command.**

Answer: The ps command is used to display information about running processes. For example, ps aux shows a detailed list of all processes.

**18. How do you find and kill a process in Linux?**

Answer: The pgrep command is used to find the process ID (PID) of a specific process, and the kill command is used to terminate it. For example, kill -9 PID forcefully terminates a process.

**19. What is the purpose of the scp command?**

Answer: scp (Secure Copy) is used to securely transfer files between a local and a remote host. It uses the SSH protocol for encryption.

**20. Explain the difference between a hard link and a soft link.**

Answer: A hard link points directly to the data on the disk, and changes to the file are reflected in all hard links. A soft link (symbolic link) is a separate file that points to the target file by its name.

**21. How do you update system packages in Ubuntu?**

Answer: In Ubuntu, the sudo apt update command refreshes the package list, and sudo apt upgrade upgrades the installed packages to their latest versions.

**22. What is the purpose of the journalctl command?**

Answer: journalctl is used to query and display messages from the journal, which includes system logs and messages from various services.

**23. How do you add a user to a group in Linux?**

Answer: The usermod command is used to add a user to a group. For example, sudo usermod -aG groupname username.