Basic Components of linux(5):  
1. Kernel: core part of linux, generally responsible for all major activities of OS such as process management, device management. It is lowest level of software that can interface with computer hardware. Linux kernel are monolithic.

2. 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.

3. 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.

4. Hardware: includes mouse, keyboard, display, CPU etc.

5. Shell: It is an envi. In which we can run our commands, shell scripts.

Monolithic means that OS runs in kernel mode, i.e no part of OS runs in user mode. Size of OS increases, execution becomes faster.  
ADV: provides CPU scheduling, memory management and other functions through system calls. Runs in single address space  
DISADV: if any service fails it leads to an entire system failure. If user has to add any new service, then need to modify the entire OS.

BASH: (Bourne Again Shell) It is a command language interpreter.

Bash script is a series of commands written in a file. File extension 🡪 .sh however they can run fine without extension. First line of script is a shebang i.e, #! /bin/bash, it is an absolute path to bash interpreter.

There are 2 types of linux user mode: Command line, GUI.

LILO(Linux Loader): used to load linux into memory. It locates the kernel, identify other supporting programs, load memory and starts kernel.

Swap space: space on hard disk that is used when the amount of physical memory is full.

Maximum length for a filename under linux is 255 bytes.

There are three owners in the Linux System i.e., user, group, and others. These owners have three types of permissions defined as listed below:

* **Read (r):** It allows the user to open and read the file or list the directory.
* **Write (w):** It allows the user to open and modify the file. One can also add new files to the directory.
* **Execute (x):** It allows the user to execute or run the file.  One can also lookup a specific file within a directory.

LVM(Logical volume management):

 ctrl-z sequence **suspends the current process**. You can bring it back to life with the fg (foreground) command or have the suspended process run in the background by using the bg command

/proc file system: it is a pseudo or virtual file system that provides an interface to kernel data structure. Also can be used to change some kernel parameters at runtime.

Daemons: also referred to as background process, is a long running linux program that runs in background. These are the processes that are generally started when the system is bootstrapped and terminate or end only when the system is shut down.

Zombie process: also referred as dead process, that has finish execution, but its entry remains in the process table. It usually happens due to a lack of correspondence between parent and child processes. This process occurs for the child process because the parent process needs to read the status of the child process. Once it is completed using the wait system call, this process is removed from the process table.

**Cron:**It is a program in Linux that is used to execute tasks at a scheduled time. It works effectively on machines that run continuously.

**Anacron:**It is a program in Linux that is used to execute tasks at certain intervals.

**Inode:** It is a data structure that keeps track of all files and directories within a LINUX file system. So every file is identified by an integer known as inode number.

**Hard Links:** It is a special kind of file that points to the same underlying inode as another file.

**Soft Links:** symbolic links. Usually point to another file. It does not contain the actual contents but contains the location of the original file.

**Sticky bit:** it restricts file deletion. Only owner of file can remove the file within that directory.

**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.

**NIC(Network Interface Card)**

| **Service** | **Port** |
| --- | --- |
| DNS | 53 |
| SMTP | 25 |
| FTP | 20 (Data transfer), 21 (Connection established) |
| SSH | 22 |
| DHCP | 67/UDP (dhcp server), 68/UDP (dhcp client) |
| squid | 3128 |

SSH (Secure Shell): It is a protocol that is being used to securely connect to remote servers and enables 2 systems to communicate. It transmits data over encrypted channels. To connect to a remote server via SSH we need to have own domain name and IP address.

ssh [UserName@SSHserver.example.com](mailto:UserName@SSHserver.example.com)  
allows client to connect to server named server.ex.com, using the user id username.   
SSH keys provides single sign on so that user can move between their accounts without typing password each time.

Pipe: it is a form of redirection that is used to send the output of one command to another cmd for further processing.

COMMANDS

Ping 🡪 used to check connection status between source and destination

Wc 🡪 counts no of characters in file

Grep 🡪 global regular expression print, used to global search for a string of characters in specific file. grep -c "linux" interview.txt

Env 🡪 print list of current environmental variables.

Pwd 🡪 used to print the complete path of current working directory starting from root.(print wor. dire.)

Free 🡪 used mostly to check memory status, also top cmd.

Cat 🡪 read a text file. See contents of file.

Less 🡪 it opens files in pages.

Touch 🡪 create new files

Nano 🡪 edit files

Ps 🡪 check and handle processes. Ps aux 🡪 to see all processes running by all users

Top 🡪 gives real time view of the processes and the system resource consumption.

Lsblk 🡪 lists disks and partition

Fdisk 🡪 list and manage disk and partition.

Find 🡪 search for files.

Kill 🡪 terminate processes

Chmod 🡪 change file permissions

Lshw 🡪 get the hardware details

Uptime 🡪 current time, how long sys is running, how many users are currently logged on, sys load avg for past 1, 5, 15 min