

## 1. What is Linux, and how does it differ from other operating systems like Windows and macOS?

- Linux: is an open-source operating system like Unix and there is some operating system like Linux.
- The differences:
  1. Linux is an open-source system and that means you can see the source code and make change on the operating system.
    - You can see the source code on macOS or on Windows.
  2. The interface:
    - Linux support many environments of desktop like (GNOME,KDE), but windows and macOS have their default interfaces.
  3. Package management:
    - Linux use a variety of package managers like (APT, YUM) to install software, but Windows use only .exe file and macOS use only .dmg file.

## 2.Name three popular Linux distributions and briefly describe one of them.

1-kali Linux

2-Fedora

3-Ubuntu

4- Debian

### ▪ Ubuntu

- Ubuntu is a user-friendly operating system because it is easy to use and it has good GUI and it is extensive support community. the distribution based on Debian. also, it has play to download the application easily.

3. What is the root directory in Linux, and what is its significance?

- **The root directory:** is the top-level directory in the Linux file system and it is the starting point for all the file system and it contains all other directories and file system.
- **The significance:** it is the base from which all absolute paths are defined.

4. Explain the difference between an absolute path and a relative path in Linux.

- **Absolut path:** it specifies the full path to a fill or directory from the root directory.
- **Relative path:** it is the path where you are working right now. or it is the current working directory.

5. What command would you use to update the package list on a Debian-based system?

**sudo apt update**

6. Write the command to display the current working directory.

**pwd**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]
$ pwd
/home/kali/Mohammed_Alhrazy
```

7. How do you change to the `/etc` directory from your current location?

**cd /etc**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]
$ cd /etc
```

8. List the contents of the `/home` directory, including hidden files, in a detailed list format.

**ls -la /home**

```
(kali@kali)-[/etc]
$ ls -la /home
total 12
drwxr-xr-x  3 root root 4096 May 27 15:18 .
drwxr-xr-x 18 root root 4096 Aug  6 04:52 ..
drwx----- 17 kali kali 4096 Aug  7 10:02 kali
```

9. Explain the purpose of the `ls -l` command and what information it provides?

The purpose is to show all the files and directories about the current directory except hidden folders.

• The information:

- File and folder name.
- The time of change or update that files and folders.
- The size of those files and folders but in (unreadable size)
- The permission of that file or folders.

10. What command can be used to return to your home directory from any location in the file system?

**cd ~**

```
(kali@kali)-[/etc]
$ cd ~
```



11. Write the command to create an empty file named `testfile.txt`.

**touch testfile.txt**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]  
$ touch testfile.txt
```

12. How do you create a directory named `testdir`?

**mkdir testdir**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]  
$ mkdir testdir
```

13. Write the command to copy `testfile.txt` to `backup\_testfile.txt`.

```
(kali㉿kali)-[~/Mohammed_Alhrazy]  
$ cp testfile.txt backup_testfile.txt
```

**cp testfile.txt backup\_testfile.txt**

14. What command would you use to move (rename) `testfile.txt` to `newfile.txt`?

**mv testfile.txt newfile.txt**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]  
$ mv testfile.txt newfile.txt
```

15. Write the command to remove the directory `testdir` and its contents?

**rm -r testdir**

```
(kali㉿kali)-[~/Mohammed_Alhrazy]  
$ rm -r testdir
```

## 16. How can you list all existing users on the system?

**cat /etc/passwd**

```
(kali@kali)-[~/Mohammed_Alhrazy]
$ cat /etc/passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
systemd-timesync:x:992:992:systemd Time Synchronization:/:/usr/sbin/nologin
messagebus:x:100:102::/nonexistent:/usr/sbin/nologin
tss:x:101:104:TPM software stack,,,:/var/lib/tpm:/bin/false
strongswan:x:102:65534::/var/lib/strongswan:/usr/sbin/nologin
tcpdump:x:103:105::/nonexistent:/usr/sbin/nologin
sshd:x:104:65534::/run/sshd:/usr/sbin/nologin

lightdm:x:109:112:Light Display Manager:/var/lib/lightdm:/bin/false
saned:x:110:114::/var/lib/saned:/usr/sbin/nologin
polkitd:x:991:991:User for polkitd:/:/usr/sbin/nologin
rtkit:x:111:115:RealtimeKit,,,:/proc:/usr/sbin/nologin
colord:x:112:116:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
nm-openvpn:x:113:117:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
nm-openconnect:x:114:118:NetworkManager OpenConnect plugin,,,:/var/lib/NetworkManager:/usr/sbin/nologin
_galera:x:115:65534::/nonexistent:/usr/sbin/nologin
mysql:x:116:120:MariaDB Server,,,:/bin/false
stunnel4:x:990:990:stunnel service system account:/var/run/stunnel4:/usr/sbin/nologin
_rpc:x:117:65534::/run/rpcbind:/usr/sbin/nologin
geoclue:x:118:122::/var/lib/geoclue:/usr/sbin/nologin
Debian-snmpp:x:119:123::/var/lib/snmpp:/bin/false
sslm:x:120:124::/nonexistent:/usr/sbin/nologin
ntpsvc:x:121:127::/nonexistent:/usr/sbin/nologin
redsocks:x:122:128::/var/run/redsocks:/usr/sbin/nologin
rwhod:x:123:65534::/var/spool/rwho:/usr/sbin/nologin
_gophish:x:124:130::/var/lib/gophish:/usr/sbin/nologin
iodine:x:125:65534::/run/iodine:/usr/sbin/nologin
miredo:x:126:65534::/var/run/miredo:/usr/sbin/nologin
statd:x:127:65534::/var/lib/nfs:/usr/sbin/nologin
redis:x:128:131::/var/lib/redis:/usr/sbin/nologin
postgres:x:129:132:PostgreSQL administrator,,,:/var/lib/postgresql:/bin/bash
mosquitto:x:130:133::/var/lib/mosquitto:/usr/sbin/nologin
inetsim:x:131:134::/var/lib/inetsim:/usr/sbin/nologin
_gvm:x:132:135::/var/lib/openvas:/usr/sbin/nologin
kali:x:1000:1000:::/home/kali:/usr/bin/zsh
Debian-exim4:x:133:139::/var/spool/exim4:/usr/sbin/nologin

(kali@kali)-[~/Mohammed_Alhrazy]
```



17. Write the command to create a new user with the username `newuser`.

**sudo adduser newuser**

```
(kali@kali)-[~/Mohammed_Alhrazy]
$ sudo adduser newuser
[sudo] password for kali:
info: Adding user `newuser' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `newuser' (1001) ...
info: Adding new user `newuser' (1001) with group `newuser (1001)' ...
info: Creating home directory `/home/newuser' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for newuser
Enter the new value, or press ENTER for the default
  Full Name []:
  Room Number []:
  Work Phone []:
  Home Phone []:
  Other []:
Is the information correct? [Y/n] y
info: Adding new user `newuser' to supplemental / extra groups `users' ...
info: Adding user `newuser' to group `users' ...
```

18. How do you create a new group named `newgroup`?

**sudo groupadd newgroup**

```
(kali@kali)-[~/Mohammed_Alhrazy]
$ sudo groupadd newgroup
```



19. Write the command to add the user `newuser` to the group `newgroup`.

**sudo usermod -aG newgroup newuser**

```
(kali@kali)-[~/Mohammed_Alhrazy]
$ sudo usermod -aG newgroup newuser
```

20. What command would you use to change the password for the user `newuser`?

**sudo passwd newuser**

```
(kali@kali)-[~/Mohammed_Alhrazy]
$ sudo passwd newuser
New password:
Retype new password:
passwd: password updated successfully
```

21. Describe the steps you would take to install a Linux distribution on a virtual machine.

1-you have to download the distribution and unzip the distribution.

2-open VMware and click open virtual machine.

3-you will choose the distribution from the path you have unzip on.

4-after that you can specifies some setting like-->the

ram chips, processor, memory size and adapter network (on bridge or Nat ...) or by default the VMware will make that process.

5-click power on to running the distribution.

22. If you are in the `/home/user` directory, what command would you use to navigate to `/var/log`?

**cd /var/log**

```
(kali㉿kali)-[/home]
$ cd /var/log

(kali㉿kali)-[/var/log]
$
```

23. How do you display the contents of the current directory in a human-readable format?

**Using the command --> ls -lh**

24. Explain what the following command does: ``cp -r /home/user/docs /home/user/docs_backup``.

It copies the folder docs into docs\_backup and if the folder docs\_backup is not located it will be created.

25. What is the difference between the ``rm`` and ``rm -r`` commands?

`rm` --> will just delete the files.

`rm -r` will delete the folder or directory with its component.

26. Explain the significance of the ``/etc`` directory in Linux.

- It contains the important file and folders and configuration setting and it contain about file and folders of users and password, in short it is an important directory the contain everything important about operating system.