Assignment 1

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Q1. Explain about etc /passwd file

Etc files

In the 1970s, the `/etc` directory became a part of early Unix versions. This was mostly used as a catch all for files that did not meet the categorical requirements to be placed in the other default directories like `/bin`, `/dev`, `/lib`, and `/usr`. Fast forward 50 or so years, and the `/etc` directory has made it onto all (or nearly all) iterations of Unix, Linux, and BSD since then.

As programs became more robust and started allowing administrators to apply changes by editing configuration files, the `/etc` directory gradually became known as the one stop directory to find all of the system's configuration files. These days, this still mostly remains true, and the `/etc` directory contains nearly all of the configuration files for the various programs on a Linux system.

Let's remember that "etc." means "et cetera." In the context of an operating system, this can basically mean "any file that would not belong somewhere else." This original meaning still holds true, too, and is why you will sometimes find more than just configuration files inside of the `/etc` directory. Unofficially, though, the `/etc` directory is principally reserved for configuration files.

As a Linux user or system administrator, you may find yourself digging through the `/etc` directory quite often. Editing configuration files is how you modify the behavior of the programs on your system.

Etc/Passwd files

There are several different authentication schemes that can be used on Linux systems. The most commonly used and standard scheme is to perform authentication against the `/etc/passwd` and `/etc/shadow` files.

`/etc/passwd` is a plain text-based database that contains information for all user accounts on the system. It is owned by root and has 644 permissions . The file can only be modified by root or users with sudo privileges and readable by all system users.

Modifying the `/etc/passwd` file by hand should be avoided unless you know what you are doing. Always use a command that is designed for the purpose. For example, to modify a user account, use the `usermod` command, and to add a new user account use the `useradd` command.

Assignment 1

Niranjan Kumbhar

`etc/passwd` Format

The `/etc/passwd` file is a text file with one entry per line, representing a user account. To view the contents of the file, use a text editor or a command such as `cat` :

```
$ cat /etc/passwd
```

Usually, the first line describes the root user, followed by the system and normal user accounts. New entries are appended at the end of the file.

Each line of the `/etc/passwd` file contains seven comma-separated fields

```
Output

mark:x:1001:1001:mark,,,:/home/mark:/bin/bash
[--] - [--] [--] [-----] [--------] [--------]
|    |   |    |     |         |        |
|    |   |    |     |         |        +-> 7. Login shell
|    |   |    |     |         +----------> 6. Home directory
|    |   |    |     +--------------------> 5. GECOS
|    |   |    +--------------------------> 4. GID
|    |   +-------------------------------> 3. UID
|    +-----------------------------------> 2. Password
+----------------------------------------> 1. Username
```

1. **Username**. The string you type when you log into the system. Each username must be a unique string on the machine. The maximum length of the username is restricted to 32 characters.
2. **Password**. In older Linux systems, the user's encrypted password was stored in the `/etc/passwd` file. On most modern systems, this field is set to `x`, and the user password is stored in the `/etc/shadow` file.
3. **UID**. The user identifier is a number assigned to each user. It is used by the operating system to refer to a user.
4. **GID**. The user's group identifier number, referring to the user's primary group. When a user creates a file , the file's group is set to this group. Typically, the name of the group is the same as the name of the user. User's secondary groups are listed in the `/etc/groups` file.

5. **GECOS or the full name of the user**. This field contains a list of comma-separated values with the following information:

    - User's full name or the application name.
    - Room number.
    - Work phone number.
    - Home phone number.
    - Other contact information.

6. **Home directory**. The absolute path to the user's home directory. It contains the user's files and configurations. By default, the user home directories are named after the name of the user and created under the `/home` directory.

7. **Login shell**. The absolute path to the user's login shell. This is the shell that is started when the user logs into the system. On most Linux distributions, the default login shell is Bash.

Conclusion

The `/etc/passwd` file keeps track of all users on the system

Q2. What is the usage of chage command in linux?

The **chage** command is used to view and change the user password expiry information. This command is used when the login is to be provided for a user for a limited amount of time or when it is necessary to change the login password from time to time. With the help of this command, we can view the ageing information of an account, the date when the password was previously changed, set the password changing time, lock an account after a certain amount of time etc.

```
niranjan@niranjan-VirtualBox:~/Desktop$ command chage
Usage: chage [options] LOGIN

Options:
  -d, --lastday LAST_DAY        set date of last password change to LAST_DAY
  -E, --expiredate EXPIRE_DATE  set account expiration date to EXPIRE_DATE
  -h, --help                    display this help message and exit
  -i, --iso8601                 use YYYY-MM-DD when printing dates
  -I, --inactive INACTIVE       set password inactive after expiration
                                to INACTIVE
  -l, --list                    show account aging information
  -m, --mindays MIN_DAYS        set minimum number of days before password
                                change to MIN_DAYS
  -M, --maxdays MAX_DAYS        set maximum number of days before password
                                change to MAX_DAYS
  -R, --root CHROOT_DIR         directory to chroot into
  -W, --warndays WARN_DAYS      set expiration warning days to WARN_DAYS
```

Assignment 1

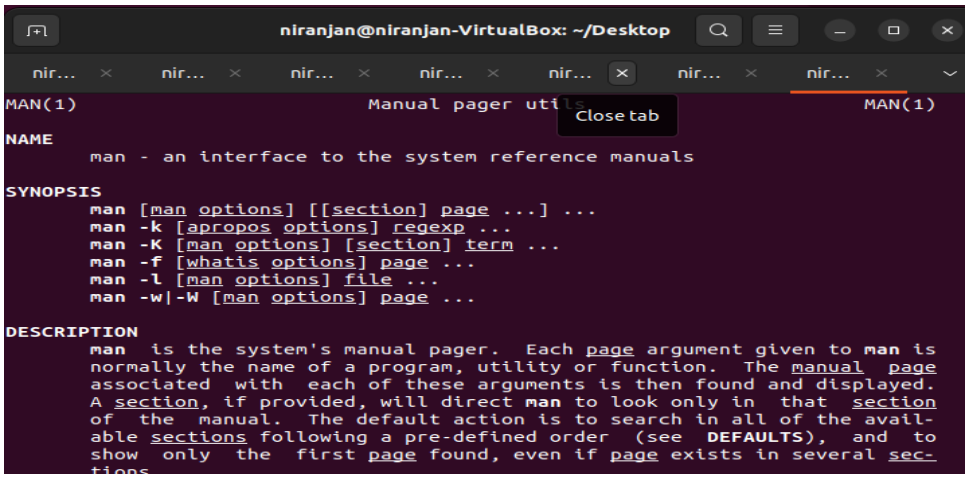
Niranjan Kumbhar

```
niranjan@niranjan-VirtualBox:~/Desktop$ chage -l niranjan
Last password change                                    : Sep 08, 2023
Password expires                                        : never
Password inactive                                       : never
Account expires                                         : never
Minimum number of days between password change          : 0
Maximum number of days between password change          : 99999
Number of days of warning before password expires       : 7
```

- **Last password change** indicates the date when the password was changed most recently.
- **Password expires** indicates the date when the password will expire.
- **Password inactive** will show how many days the account will remain inactive after the password is expired.
- **Minimum number of days between password change** indicates the minimum day break required between two password changes.
- **Maximum number of days between password change** will show how many days you are left to change your current password.

3. Run the following commands in your system and give the output.

I. Man



II. Cd (change directory)

```
niranjan@niranjan-VirtualBox:~/Desktop$ cd
niranjan@niranjan-VirtualBox:~$
```

III. Mkdir //unable to execute

IV. Rmdir //unable to execute

V. echo

```
niranjan@niranjan-VirtualBox:~$ echo --version
--version
niranjan@niranjan-VirtualBox:~$ echo C-DAC TVM
C-DAC TVM
```

Assignment 1

Niranjan Kumbhar

VI. Clear

```
niranjan@niranjan-VirtualBox:~$ echo C-DAC TVM
C-DAC TVM
niranjan@niranjan-VirtualBox:~$ clear
```

```
niranjan@niranjan-VirtualBox:~$
```

VII. history

```
niranjan@niranjan-VirtualBox: ~
nir...  nir...  nir...  nir...  nir...  nir...  nir...
  144  chag
  145  command chag
  146  command chage
  147  chage -l niranjan
  148  clear
  149  man
  150  man use
  151  man info
  152  man chage
  153  man man
  154  cd
  155  man cd
  156  cd l
  157  cd ls
  158  clear
  159  cd
  160  mkdir
  161  mkdir help
  162  man mkdir
  163  rmdir
  164  man cd
  165  ls
  166  history
niranjan@niranjan-VirtualBox:~$
```

VIII. ls

```
niranjan@niranjan-VirtualBox:~$ ls
Desktop    Downloads  Music     Public  Templates
Documents  help       Pictures  snap    Videos
```

IX. pwd (print name of current /working directory

```
niranjan@niranjan-VirtualBox:~$ pwd
/home/niranjan
niranjan@niranjan-VirtualBox:~$
```

X. cp //unable to execute

XI. mv //unable to execute

XII. touch

```
niranjan@niranjan-VirtualBox:~$ touch ngk.txt
niranjan@niranjan-VirtualBox:~$ ls -l ngk.txt
-rw-rw-r-- 1 niranjan niranjan 0 Sep 10 12:02 ngk.txt
niranjan@niranjan-VirtualBox:~$
```

Assignment 1

Niranjan Kumbhar

XIII. cat (concatenate files and print on the standards output)

```
niranjan@niranjan-VirtualBox:~$ cat --version
cat (GNU coreutils) 8.32
Copyright (C) 2020 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Torbjorn Granlund and Richard M. Stallman.
```

XIV. who (shows who logged on)

```
niranjan@niranjan-VirtualBox:~$ who
niranjan tty2         2023-09-09 14:58 (tty2)
```

XV. w (who logged on and what they are doing)

```
niranjan@niranjan-VirtualBox:~$ w
 12:07:45 up  5:47,  1 user,  load average: 0.07, 0.03, 0.06
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
niranjan tty2     tty2             Sat14   20:13m  0.03s  0.03s /usr/libexec/g
```

XVI. Cal

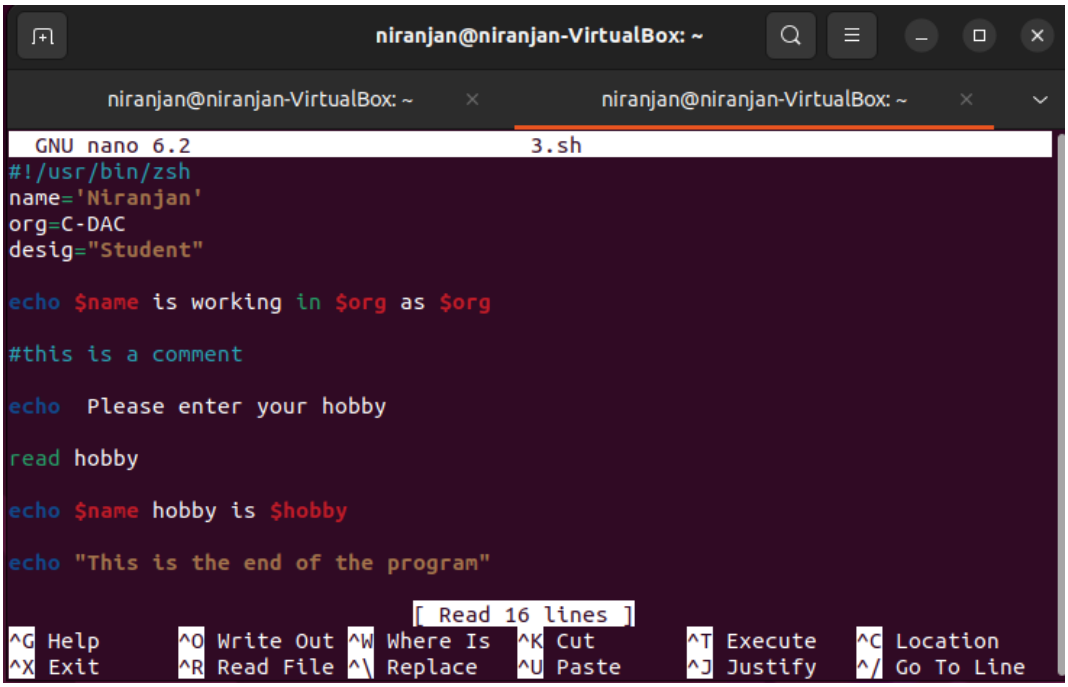
```
niranjan@niranjan-VirtualBox:~$ cal 9 2023
   September 2023
Su Mo Tu We Th Fr Sa
                1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
```

XVII. Date

```
niranjan@niranjan-VirtualBox:~$ date
Sunday 10 September 2023 12:04:41 PM IST
```

4. Write a shell program to display your details read hobby from keyboard.

//unable to execute



Assignment 1

Niranjan Kumbhar

5. Explain about Linux file system.

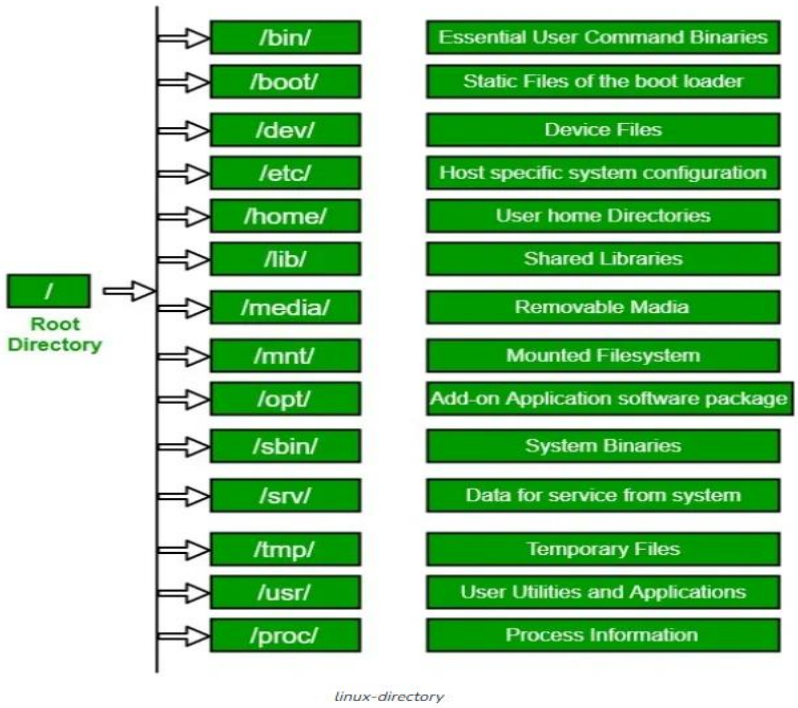
Directory	Description
/	The root directory is denoted by a forward slash (“/”) and serves as the starting point of the entire file system. All other directories and files stem from the root directory.
/bin	The /bin directory contains essential binary executables (commands) that are available to all users. These commands are crucial for basic system operations.
/boot	The /boot directory houses files related to the system’s boot process. It includes the Linux kernel, bootloader configuration, and other boot-related files.
/etc	The /etc directory contains system-wide configuration files. These files control various aspects of the system, such as network settings, user authentication, and software configurations.
/home	Each user on the system has a dedicated directory within /home where personal files and user-specific settings are stored.
/lib and /lib64	The /lib and /lib64 directories store shared libraries that are required by various programs and system utilities. These libraries provide essential functionality to the applications installed on the system.
/opt	The /opt directory is used to store optional or third-party software packages. It provides a designated location to install software that is not part of the core Linux distribution.
/tmp	The /tmp directory serves as a temporary storage location for files. It is typically used by applications to store temporary data that is required during the system’s operation.
/usr	The /usr directory contains user-related programs, libraries, and documentation. It is one of the important directories in the file system and holds a vast range of applications and system resources.
/var	The /var directory holds variable data files, such as log files, spool files, and temporary storage for system processes. It stores information that changes frequently during the system’s operation.

Assignment 1

Niranjan Kumbhar

Directory	Example
/	N/A
/bin	/bin/ls – List files and directories in the current directory
/boot	The directory /boot/grub2/ is a significant directory related to the GRUB (Grand Unified Bootloader) boot loader
/etc	/etc/passwd – Stores user account information
/home	/home/john/Documents – John's personal documents directory
/lib and /lib64	/lib/x86_64-linux-gnu/libc.so.6 – Shared library for the C programming language
/opt	/opt/google/chrome/chrome – Executable file for Google Chrome browser
/tmp	/tmp/myfile.txt – Temporary file created by a text editor
/usr	/usr/bin/gcc – The GNU Compiler Collection for compiling programs
/var	/var/log/syslog – System log file containing various system events

The Linux file system is organized in a hierarchical structure, starting from



the root directory ("/") and branching out into different directories. Each directory serves a specific purpose, making it easier to organize and locate files and resources.

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