linux cba

Explain the Linux File System structure with neat diagrams. Describe the purpose of the directories /bin, /etc, /home, /var and /root.

Diagram

```
/
├── bin   ├── etc   ├── home
├── var   ├── root  ├── usr
├── dev   ├── tmp   └── proc
```

Directory Purpose

- **/bin** – Basic user commands (ls, cp, mv, rm).
- **/etc** – System configuration files.
- **/home** – User home folders.
- **/var** – Variable data (logs, cache).
- **/root** – Home directory of root user.

What are Linux file naming conventions? Write the rules and give at least five valid and five invalid file name examples.

Rules

- Case-sensitive.
- Can use letters, numbers, `_` and `.`

- Avoid special chars (`? | /`).
- Max length 255 chars.
- Should not start with .

Valid

`notes.txt` , `data1` , `my_file` , `info.log` , `script.py`

Invalid

`my*file` , `a/b.txt` , `-hello` , `name?` , `test|code`

Explain the seven types of files in Linux with suitable examples and commands to identify each file type.

- **Regular file** – text, images → `file a.txt`
- **Directory** – folder → `file mydir/`
- **Character device** – keyboard → `/dev/tty`
- **Block device** – HDD → `/dev/sda`
- **FIFO (pipe)** → `mkfifo p1`
- **Socket** → `/var/run/docker.sock`
- **Symbolic link** → `ln -s a b`

Differentiate between root user, normal user and system user in Linux. How can you switch users? Give commands and examples.

- **Root user** – full control (UID 0).
- **Normal user** – limited permissions.
- **System user** – used by services (no login).

Switch users:

- `su username`
- `su -` (to root)
- `sudo -i`

Explain any five Linux directory commands (pwd, ls, cd, mkdir, rmdir) with syntax, example and output.

- **pwd** – show current directory → `pwd` → `/home/user`
- **ls** – list files → `ls` → `Documents Downloads`
- **cd** – change directory → `cd folder`
- **mkdir** – create folder → `mkdir test`
- **rmdir** – remove empty folder → `rmdir test`

Write the use, syntax and example for the following file commands: file, touch, cp, mv and rm.

- **file** – show file type → `file a.txt`
- **touch** – create empty file → `touch new.txt`
- **cp** – copy → `cp a b`
- **mv** – move/rename → `mv a b`
- **rm** – delete → `rm a.txt`

What is the purpose of the Linux man command? Explain its usage, navigation

keys, and give examples of checking help pages for two commands.

Purpose

Shows the manual/help for commands.

Usage

`man command`

Navigation

`Space` (next), `b` (back), `/` (search), `q` (quit)

Examples

`man ls`, `man mkdir`

Explain the working of the following Linux file content commands with examples and outputs: cat, tac, head, tail.

- **cat** – show file → `cat a.txt`
- **tac** – reverse file → `tac a.txt`
- **head** – first 10 lines → `head a.txt`
- **tail** – last 10 lines → `tail a.txt`

What is the Linux Filesystem Hierarchy Standard (FHS)? Explain the purpose of the directories /usr, /dev, /tmp, /proc, /mnt and /media.

FHS

Defines how Linux folders are organized.

- **/usr** – user apps, libraries
- **/dev** – device files
- **/tmp** – temporary files
- **/proc** – system info (virtual FS)
- **/mnt** – temporary mount point
- **/media** – USB, CD auto-mount

Differentiate between the following (any four):

a) cat vs tac

cat → normal order

tac → reverse order

b) cp vs mv

cp → copy

mv → move/rename

c) rm vs rmdir

rm → removes files

rmdir → removes empty folders

d) /home vs /root

/home → normal user homes

/root → root user home

e) /bin vs /sbin

/bin → basic commands

/sbin → system/admin commands
