

## Linux Programming: Assignment-5

1. What is a shell in Linux OS? How many categories of shell is currently exists in Linux? Why bash shell is very popular in Linux distribution?

Answer: Shell is a software that acts as an interface between user and kernel for Linux. It reads the user's instructions and runs them.

The Linux shells fall into two main categories:

command-line shells like Bash, Zsh, T

Graphical shells (e.g., GNOME Shell, Plasma Shell from KDE) The Bash (Bourne Again Shell) is most familiar because it offers command history, scripting, aliases, tab completion, and portability between distributions.

2. What does the ls -Z command display?

Answer: The ls -Z command displays SELinux security context information for files and directories, including user, role, type, and level.

Example:

```
ls -Z /home/user
```

3. Write a command to list all hidden files in the current directory.

Answer:

```
ls -a
```

4. Explain the difference between hard links and soft links (symbolic links) in Linux.

Answer:

Hard Link: It simply references the inode of the file. Deletion of the original file doesn't affect the hard link.

Soft Link (Symbolic Link): It is another form of shortcut, a reference to the file name. If the original file is removed, then the link is lost.

Example:

`ln file1.txt file2.txt # Hard link`

`ln -s file1.txt link.txt # Soft link`

5. A file has permissions `-rwxr-x--x`. Explain who can read, write, and execute it.

Answer:

- Owner: Can read, write, and execute.
- Group: Can read and execute.
- Others: Can only execute.

6. Write the command to change the group ownership of a file `data.txt` to group `staff`.

Answer:

`chgrp staff data.txt`

7. Why is it dangerous to give `777` permissions to a file? Explain with an example.

Answer: `777` means everyone (owner, group, others) can read, write, and execute the file.

This is risky because anyone can modify or delete the file.

Example:

`chmod 777 system.sh # Not recommended for sensitive files`

8. What is the difference between `apropos` (i.e., `man -k`) and `whatis` (i.e., `man -f`)?

Answer:

`whatis`: Shows a one-line description of a command.

`apropos`: Searches command descriptions for a keyword.

Example:

`whatis ls`

apropos copy

9. Write a command to redirect the error output of a command to a file named error.log.

Answer:

command\_name 2> error.log

10. How can you use the tee command to append output to a file instead of overwriting it?

Answer:

command\_name | tee -a output.txt

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