Dayananda Sagar University – Linux Programming Assignment

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Subject: Linux Programming

1. What is a shell in Linux OS? How many categories of shell currently exist in Linux? Why is bash shell very popular in Linux distribution? (CO2)

A shell in Linux is a program that allows users to communicate with the operating system by typing commands. It acts as an interface between the user and the system kernel.

Different types of shells available in Linux are:
• Bourne Shell (sh)
• C Shell (csh)
• Korn Shell (ksh)
• Bash Shell (bash)
• Z Shell (zsh)

Among these, Bash (Bourne Again Shell) is the most popular because it is the default shell in most Linux distributions, supports command history, scripting, and backward compatibility with the Bourne shell.

2. What does the ls -Z command display? (CO1)

The command `ls -Z` shows the SELinux security context of each file and directory. It displays information like user, role, type, and level assigned to the files under SELinux security.

3. Write a command to list all hidden files in the current directory. (CO1)

Command:
ls -a

This command lists all files, including hidden files that start with a dot (.).

4. Explain the difference between hard links and soft links (symbolic links) in Linux. (CO1)

Hard links point directly to the data of a file and continue to work even if the original file is deleted, while soft links point to the file name or path and will break if the original file is removed.

Hard links:
• Point to the same inode as the original file.
• Cannot cross file systems.

Soft links:
• Point to the file path.
• Can cross file systems but may become invalid if the target is deleted.

5. A file has permissions -rwxr-x--x. Explain who can read, write, and execute it. (CO1)

• Owner: rwx → can read, write, and execute.
• Group: r-x → can read and execute.
• Others: --x → can only execute.

Therefore, the owner has full access, group members can read and execute, and others can only execute the file.

6. Write the command to change the group ownership of a file data.txt to group staff. (CO1)

Command:
chgrp staff data.txt

This command changes the group ownership of the file 'data.txt' to the group named 'staff'.

7. Why is it dangerous to give 777 permissions to a file? Explain with an example. (CO1)

Giving 777 permission means everyone can read, write, and execute the file. This can be dangerous because any user can modify, delete, or run the file.

Example:
If a website file like /var/www/html/index.html has 777 permission, any user can delete or change it, causing the website to stop working.

8. What is the difference between apropos (i.e., man -k) and whatis (i.e., man -f)? (CO1)

The 'whatis' command gives a one-line description of a specific command, while 'apropos' lists all commands and manual pages that are related to a particular keyword.

Example:
whatis ls → Displays a short summary about the ls command.
apropos list → Lists all commands related to the keyword 'list'.

9. Write a command to redirect the error output of a command to a file named error.log. (CO1)

Command:
command 2> error.log

Here, '2>' redirects the standard error (stderr) to the file named error.log.

10. How can you use the tee command to append output to a file instead of overwriting it? (CO4)

Command:
command | tee -a filename.txt

The ‘-a’ option is used to append the output to the specified file rather than overwriting its content.