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 in Linux OS.
* In a Linux, shell a command line interpreter that act as a bridge between user and kernel
* takes command entered by user, interprets them and then execute them.
* It also provides features like input/output
* Categories of shell

| **Command-Line Shells (CLI)** | **Graphical Shells (GUI)** |
| --- | --- |
| Bourne shell, borne – again shell, Korn shell, c shell, z shell | Gnome shell, KDE plasma shell |
| Test based, most commonly used in command line | Graphical interface that provides icons, panels and windows for interacting with the system |

* Bash shell
* Bash is a default shell in majority of Linux distribution
* It’s compatible with the original Bourne shell, so older script run without change
* Bash adds advanced feature like command history
* Script written in bash  
  run on almost all Linux system

1. What does the ls -Z command display?

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ ls -Z

? 'Android unlock’? Documents? file2.txt ? kumya.txt ? Pictures? stderr.log ? Videos

? changemac.sh ? Downloads? function.sh? log\_report.txt? project? stdout.log

? Desktop ? file1.txt ? function.sh~ ? Music ? Public ? Templates

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

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ ls -a

ls -a -> displays all (. Or ..) hidden files.

. .ICE authority .vboxclient-display-svga-x11-tty7-control.pid

.. .java .vboxclient-display-svga-x11-tty7-service.pid

* ┌──(kumya㉿sonic)-[~]

└─$ ls -A

Ls -A -> displays all ( non . or .. files ) hidden files.

'android unlock' function.sh~ Public Videos

.bash logout .function.sh.swp stderr.log .vim info

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

Answer->

| **Hard Link** | **Soft Link** |
| --- | --- |
| A direct reference to the data as the original | A separate file that links to different file or directory |
| Shares the same inode number as orignal | Has different inode number as connect to the path |
| Both files refers to same data of block | Points to the file name of target |
| If the original file is deleted then still the hard link  access it | If original file is deleted or moved it can’t be accessed |
| Normally not allowed to create a new hard link | Allowed to create soft link |
| Appears to be the same size of file | Symlink size is equal to size of path |
| ln file hardlinkname | ln -s file symlinkname |

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

Answer->

* -rwxr-x—x
* - -> types of file ( - =regular file , d = directory , l = link )
* rwx ->permission for owner.
* r-x -> permission for group.
* --x -> permission for others.

1. Write the command to change the group ownership of a file data.txt to group staff. ?

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ chgrp staff data.txt

* Chgrp -> changes group ownership
* Staff -> name of the group you want to assign.
* Data.txt -> file whose group ownership you are changing .

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

Answer->

* 777 , gives permission of read , write , and execute to owner , groups and others
* Security Risk  
  ⁕ Anyone can modify the file’s contents and potentially insert malicious code.

⁕ If it’s script or a program , someone could add commands to compromise the system.

* Loss of integrity

⁕ accidental deletion or modification by any user is possible .

⁕ you lose control over who can change the file .

* Privilege escalation
* A writable executable file can be replaced with malicious code and then execute by someone else .

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

Answer->

| **apropos (=man -k)** | **whatis (=man -f)** |
| --- | --- |
| Searches the short description like one line summery of all manual pages of keyword | Displays the short description for an exact command |
| When you don’t know the exact command but know the some word. | When you know the exact command and want a quick description |
| **Keyword search list all man pages entire whole description** | **Exact name matches – only shows entires for that command.** |
| May list many entires with selection number | Usually one line with selection number. |

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

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ ls /nonexistent 2> error.log

* ls -> ls command to list the files
* /nonexistent -> a directory that does not exist , so it will produce an error.
* 2> -> redirect a error message to file .
* error.log -> stores the error in the file.
* ┌──(kumya㉿sonic)-[~]

└─$ cat error.log

ls: cannot access '/nonexistent': No such file or directory

shows an error message when runner with cat error.log .

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

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ echo “Hello World “ | tee -a file1.txt

* echo -> anything that you need to store in file and print.
* | -> connects the first command to next .
* Tee -a file1.txt -> save the content to the file1.txt

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