Assignment - 4

1. A system has a file /etc/passwd. How would you use grep + tee to extract usernames and save them to a file while also displaying them on screen?

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ grep -o '^[^:]+' /etc/passwd | tee file.txt

* Grep -> used to search text pattern in file.
* -o -> tells the grep to print output that print only the text that matches with pattern.
* ‘^[^:]+’ -> (^) start of line .  
   ([^:]) any character expect colon.  
   (+) one or more of the character.
* | -> sends the list of user name from grep to tee.
* tee file.txt ->saves them in to a file called file.txt

1. A binary isn’t found in $PATH. How would you use commands (which, find, locate) to troubleshoot and fix the issue?

Answer->

When a binary is not found in $PATH , it means that the shell cannot find the file.

This usually happens if the package is not installed.

* ┌──(kumya㉿sonic)-[~]

└─$which myprogram

Which shows full path of command if it exist in $PATH

* ┌──(kumya㉿sonic)-[~]

└─$ sudo find / -type f -name file1.txt 2>/dev/null

[sudo] password for kumya:

/home/kumya/file1.txt

/home/kumya/project/file1.txt

This search all directory for file1.txt and displays the full path of files

* ┌──(kumya㉿sonic)-[~]

└─$ locate file1.txt

/home/kumya/project/file1.txt

Search is user prebuilt data base.

1. Write a command pipeline that finds all .log files modified in the last 24 hours in /var/log and saves results into log\_report.txt.?

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ find /var/log -type f -name "\*.log" -mtime -1 | tee log\_report.txt

find: ‘/var/log/inetsim’: Permission denied

find: ‘/var/log/lightdm’: Permission denied

find: ‘/var/log/speech-dispatcher’: Permission denied

/var/log/Xorg.0.log

/var/log/macchanger.log

find: ‘/var/log/private’: Permission denied

/var/log/chkrootkit/chkrootkit-daily.log

/var/log/boot.log

* Find /var/log -> starts to find the file in /var/log directory.
* -type -> look only for regular file.
* -name “\*.log” -> matches files which has .log
* -mtime -1 -> searches the file that modified in1 day(24 hours).
* Tee log\_report.txt -> saves the information in log\_report.txt

1. What is the difference between shutdown -r now and reboot?

Answer->

| **shutdown -r now** | **reboot** |
| --- | --- |
| Performs an orderly shutdown and then reboots the system | Directly reboots the system. |
| Notifies the logged in user that the shutdown is scheduled | Simply invokes the reboot command |
| Now means reboot immediately | Always reboots immediately ,it is not scheduled. |
| Sends warning message to user. | Does not send warning. |

1. How can you use the tee command to debug a script that generates both standard output and error messages?

Answer->

When a shell script produces both the output then u can use tee command.

* ┌──(kumya㉿sonic)-[~]

└─$ ./myscript.sh > >(tee stdout.log) 2> >(tee stderr.log >&2)

* ./myscript.sh -> runs the script.
* > >(tee stdout.log) -> sends the output to tee and also prints it in terminal.
* 2> >(tee stderr.log>&2) -> does the same with error message ,>&2 ensures the error message is displayed as error on screen.

1. Explain any three real-world applications of Linux in industries.

Answer->

* Web hosting and server

Linux is widely used to run web servers because of its stability, security and cost effectiveness. Popular web server like Apache nigun and lighted are often deployed on Linux . companies like google, Facebook, and amazon rely on Linux servers also support technologies such as PHP, Python etc.

* Embedded systems and iot devices

Linux powers a variety of embedded systems and internet of things devices. which includes smart TV ,router, industrial tools, automotive etc.

It’s a open source nature allows developers to customize the operating system for specific hardware and optimize performance .for instant android.

* Supercomputing and high-performance computing (HPC)

Most of the world’s top supercomputers run linux because it is scalable. Flexible and support parallel computing frameworks.industries like weather forecasting ,scientific research , financial modeling , and oil exploration rely on Linux powered HPC systems to perform complex simulations and data analysis efficiently . linux allows fine grained control over hardware resources

1. Differentiate application, system and utility software in the context of Linux environment.

Answer->

| **Application Software** | **System Software** | **Utility Software** |
| --- | --- | --- |
| Program designed to perform specific task | Program that manages control and hardware | Program that helps to maintain and manage computer |
| Libera office like firefox website or other applications | Linux kernal,destop environment and systemcm | grep, find, tar, top, df, fsck. |
| Helps user to perform specific task | Provides an inter face blw user and the application that user is using | Assist in system management and file management |
| Direct interaction with user | Indirect interaction with user which runs in the background | Can be runed by user to perform specific task or a mentainance. |

1. What are the key differences between open-source and proprietary operating systems?

Answer->

| **Open-Source OS** | **Proprietary OS** |
| --- | --- |
| Operating system whose source code is freely available | Operating system whose source code of closed and controlled by company |
| Full access given to user, can modify | No access is given to user to modify |
| Usually free like ubuntu,linux | These are paid like windows ,microsoft |
| Highly customizable. | Limited customizable |
| Community driven support. | Official wender support. |
| Often considered more secure. | Security depends on wender update. |
| Linux, FreeBSD, OpenSolaris | Windows, macOS, IBM AIX |

1. Write the command to display the system’s kernel version.?

Answer->

* ┌──(kumya㉿sonic)-[~]

└─$ uname -r

6.12.33+kali-amd64

* Uname -> displays the “Unix name” of system
* -r -> displays the kernel version

1. What is the difference between head and tail commands in text processing?

Answer->

| **head** | **tail** |
| --- | --- |
| Displays the first 10 lines of file | Displays the last 10 lines of file |
| Displays the first part of file | Displays the end part of file |
| Head file1.txt -> shows the first 10 lines of file | Tail file1.txt -> shows the last 10 lines of file |
| Quickly preview the start of log. | Monitor the recent log files. |
| Not sutable for continuous monitoring | With tail -f file1.txt you can follow the file in current real time. |

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