

Linux assignment- 4

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- 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?**

Ans: `grep -o '^[^:]*' /etc/passwd | tee usernames.txt`

`grep -o '^[^:]*' /etc/passwd`

`^` → start of the line

`[^:]*` → match one or more characters that are not a colon (i.e., the username)

`-o` → only output the matched part

`| tee usernames.txt`

tee outputs the result to the screen and saves it to usernames.txt

- 2) **A binary isn't found in \$PATH. How would you use commands (which, find, locate) to troubleshoot and fix the issue?**

Ans: `locate <binary_name>`

What it does: Searches the file database for the binary.

Tip: Run `sudo updatedb` first if the database is outdated.

Use `find` if `locate` doesn't help

`sudo find / -type f -name <binary_name> 2>/dev/null`

After this we have to add to path

`export PATH=$PATH:/usr/local/bin`

- 3) **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**

Ans: You can do this with the find command and tee to both display and save the output:

```
( find /var/log -type f -name "*.log" -mtime -1 | tee log_report.txt )
```

Here

find /var/log → search in /var/log directory
-type f → only regular files
-name "*.log" → only files ending with .log
-mtime -1 → modified in the last **24 hours**
| tee log_report.txt → displays the results on screen **and** saves them to log_report.txt

4) What is the difference between shutdown -r now and reboot?

Ans:

“ Shutdown -r now ”

this command cuts the system’s power, then flips it right back on. Here’s how it rolls:

shutdown – does the whole “power off safely” thing.

-r – tells it, “Nah, don’t stay down. Reboot after!”

now – do it instantly, quit waiting around.

In this command

Sends warning messages to logged-in users

Terminates all processes gracefully

Unmounts filesystems properly

Then reboots the system

“ reboot ”

It directly reboot the system, and may or may not send warnings to logged-in users depending on the system. It terminates processes and unmounts filesystems, but handled internally

Syntax: **sudo reboot**

5) How can you use the tee command to debug a script that generates both standardoutput and error messages?

Ans:

With the tee command, you can actually watch your script's output scroll by on your screen *and* save it to a file for later—nice little multitasker. If your script spits out both regular stuff and those pesky error messages, tee's got your back for both.

Example: (./myscript.sh 2>&1 | tee output.log)

- * ./myscript.sh → runs your script
- * 2>&1 → combines **error messages** (stderr) with **normal output** (stdout)
- * | tee output.log → shows everything on the screen **and** saves it to output.log

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

Ans: the main three applications are

1. Web Servers:

Linux runs some web servers like Apache and Nginx. Plenty of major websites and online services run on Linux because it is stable, secure and free.

2. Embedded Systems:

Linux powers everyday devices such as smart TVs, routers and IOT gizmos. “It’s light, easy to customize and very reliable” for small devices, it is favored by industries.

3. Cloud and Supercomputing:

Nearly all cloud infrastructures, from AWS and Google Cloud on down, and even most supercomputers, run on Linux. It is a tool companies turn to in order to swiftly process big data and make complex calculations.

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

1. Application software

The people which use compute program daily

Example the in Linux: LibreOffice, Firefox , VLC and etc.

It runs on the top of the system software and is mainly used to help the user.

2. System Software

It is a core software which this controls the hardware and allows applications to run.

In linux system, this includes the kernel

Without a system software, applications can not be able to access or use the hardware.

3. Utility Software

Small helper tools created to maintain and manage the system.

Examples in Linux: top , gzip , fdisk , rsync .

They are not full applications but useful programs that they keep the system running smoothly and accurately and efficiently.

8) What are the key differences between open-source and proprietary operating systems?

1. Source Code

the source code is openly available. Anyone can read it in the open source code.

But in the proprietary systems, the source code is locked. Only company can access or modify that it.

2. Cost

Open-source operating systems are free to download and use.

Proprietary operating systems usually need to buy a license or pay money to use them.

3. Customization

Open-source can be easily changed or customised according to user

Proprietary systems allow limited customization and most of them are not modifiable.

4. Support

Open-source systems depend on community support

Proprietary systems provide official support and customer service from the company

5. Examples are

For Open-source : **Linux, Ubuntu.**

For Proprietary : **Windows, macOS.**

9) Write the command to display the system's kernel version

Ans: “**uname -a**” to know all information about kernel.

10) What is the difference between head and tail commands in text processing

Ans:

1. **head** command:-

It will shows the first few lines of a file (by the default 10 lines).

And it is useful when want to quickly access the beginning of a file.

Example: “**head -n 5 filename.txt**” .

2. **tail** command:-

It will shows **last few lines** of the file (by the default 10 lines).

It is useful to check recent entries, like in log files.

Example: “ **tail -n 5 filename.txt** ”