

DEVOPS

COMSATS UNIVERISTY ISLAMABAD WAH



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Lab Assignment 2

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Lab 02

? General & File Operations

- pwd → Show current directory.
- $ls \rightarrow List files and folders.$
- cd → Change directory.
- mkdir → Create a directory.
- touch file.txt \rightarrow Create an empty file.
- cp src dest \rightarrow Copy files/folders.
- mv old new \rightarrow Move or rename files.
- rm file.txt \rightarrow Delete a file.
- rm -rf folder → Delete a folder recursively.
- cat file.txt \rightarrow Show file contents.
- echo "text" >> file.txt \rightarrow Append text to a file.
- head/tail file.txt \rightarrow Show first/last lines of file.
- nano file.txt/vim file.txt \rightarrow Edit file.
- sed -i 's/old/new/g' file.txt \rightarrow Replace text in file.

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Company Distribus Control Cont
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♣ User & Permission Management

• adduser user \rightarrow Add a new user.

- deluser user/userdel -r user → Delete a user.
- passwd user \rightarrow Set/change user password.
- usermod -aG group user \rightarrow Add user to a group.
- groupadd group \rightarrow Create a group.
- gpasswd -d user group \rightarrow Remove user from group.
- usermod -L user/usermod -U user \rightarrow Lock/unlock account.
- usermod -s /usr/sbin/nologin user \rightarrow Disable login shell.
- chmod 755 file \rightarrow Change file permissions.
- chown user:group file \rightarrow Change file ownership.
- sudo usermod -s /usr/sbin/nologin devuser
- 1s $-1 \rightarrow$ View file permissions.

```
toentwedestrop source year tops about abouter decides sudo] passiond for phoenix:

nfo: Adding user 'devuser' ...

nfo: Selecting UID/GID from range 1000 to 59999 ...

nfo: Adding new group 'devuser' (1002) ...

nfo: Adding new user 'devuser' (1002) with group 'devuser (1002)' ...

nfo: Creating home directory 'home/devuser' ...

nfo: Copying files from '/etc/skel' ...

etype new password:

etype new password:

asswd: password updated successfully

hanging the user information for devuser

nter the new value, or press ENTER for the default

Full Name []: 12

Work Phone []: 1

Home Phone []: 2

Is the information correct? [Y/n] y

info: Adding new user 'devuser' to supplemental / extra groups 'users' ...

hoenix@DESKTOP-SQ0G92V:~/Desktop$ sudo passwd devuser

lew password:
                oenix@DESKTOP-SQ9G92V:~/De
udo] password for phoenix:
         atype new password:
asswd: password updated successfully
hoenix@DESKTOP-509092Y:-/Desktop$ sudo groupadd devops
hoenix@DESKTOP-509092Y:-/Desktop$ user usermod -adG devops devuser
mamad 'user' not found, did you mean:
    command 'user' from deb ipmiutil (3.1.9-3)
    command 'user' from deb userv (1.2.4-beta4)
    command 'users' from deb coreutils (9.4-2ubuntu2)
    ry: sudo apt install <deb name>
hoenix@DESKTOP-509092Y:-/Desktop$ sudo usermod -adG devops devuser
sermod: homedir must be an absolute path
         noentregueskur 300027/7/Joenstons

sermod: homedir must be an absolute path

noentix@DESKTOP-509892V:-/Desktop$ ls

EADME.md app.py directory directory.sh docs.txt system.sh task.sh user

noentx@DESKTOP-509892V:-/Desktop$ ls -1
                                                                                                                 1 phoenix phoenix 9 Sep 14 22:31 README.md 1 devuser devops 9 Sep 14 22:31 app.py 2 phoenix phoenix 4096 Sep 8 19:09 directory 1 phoenix phoenix 6 Sep 8 15:59 directory. 1 phoenix phoenix 6 Sep 14 22:35 docs.txt 1 phoenix phoenix 6 Sep 14 22:35 docs.txt 1 phoenix phoenix 76 Sep 4 16:20 task.sh 1 phoenix phoenix 76 Sep 4 16:20 task.sh 1 phoenix phoenix 0 Sep 8 19:69 user sh 1 phoenix phoenix 0 Sep 8 19:69 user sh 1 phoenix phoenix 38 Sep 8 16:12 user.sh.sa SKTOP-SQSG2V:~/Desktop$ sudo usermod -U devuse SKTOP-SQSG2V:~/Desktop$ 1s -1
                                                                                                                              phoenix phoenix 0 Sep 14 22:31 README.md 0 Sep 14 22:31 app.py 2 phoenix phoenix 4996 Sep 8 19:09 directory 1 phoenix phoenix 4996 Sep 8 19:09 directory.sh 1 phoenix phoenix 5 Sep 8 19:09 directory.sh 1 phoenix phoenix 68 Sep 14 22:35 docs.txt 1 phoenix phoenix 76 Sep 16:29 system.sh 1 phoenix phoenix 76 Sep 16:20 task.sh 1 phoenix phoenix 68 Sep 18:590 user.sh 1 phoenix phoenix 8 Sep 8 19:00 user 1 phoenix phoenix 8 Sep 8 19:00 user 1 phoenix phoenix 8 Sep 8 19:00 user.sh 1 phoenix phoenix 3 Sep 8 16:20 user.sh 30 user.sh 1 phoenix phoenix 3 Sep 8 16:20 user.sh 30 user.sh 30
```

O Process Management

- ps $-ef \rightarrow List all processes$.
- top / htop \rightarrow Monitor running processes.
- pgrep nginx \rightarrow Get PID of a process.
- pstree → Show process hierarchy.
- kill <PID> → Kill process by ID.
- pkill name \rightarrow Kill process by name.
- killall name \rightarrow Kill all processes with same name.
- jobs → List background jobs.
- fg $$1/bg $1 \rightarrow Bring job to foreground/background.$
- nohup ./script.sh & \rightarrow Run process that survives logout.
- nice -n 10 ./script.sh \rightarrow Run with lower priority.
- renice -n 5 -p <PID> → Change running process priority.
- $lsof \rightarrow List open files.$
- strace -p <PID> \rightarrow Trace system calls.

```
20 0 20104 11008
                                                             9216 S 0.0 0.3 0:00.27 systemd
                           9G92V:~/Desktop$ pstree
            dbus-daemon
             -dous-daemon
-init-systemd(Ub—SessionLeader—Relay(465)—bash—pstree
-init—{init}
-login—bash
-{init-systemd(Ub}
                             −3*[{rsyslogd}]
             -systemd——(sd-pam)
             —systemd——(su-pa
—systemd-journal
—systemd-logind
             -systemd-timesyn---{systemd-timesyn}
             -systemd-udevd
       __unal.tended-upgr__
wsl-pro-service__7*[{wsl-pro-service}]
ix@DESKTOP-SQ9G92V:~/Desktop$ pkill -f app.py
ix@DESKTOP-SQ9G92V:~/Desktop$ nice -n 10 ./app/py
  ce: './app/py': No such file or directory
 hoenix@DESKTOP-509692V:~/Desktop$ nice -n 10 ./app.py
hoenix@DESKTOP-509692V:~/Desktop$ renice -n 5 -p <PID>
bash: syntax error near unexpected token `newline'
phoenix@DESKTOP-SQ9G92V:~/Desktop$ lsof -p <PID>
-bash: syntax error near unexpected token `newline
  noenix@DESKTOP-SQ9G92V:~/Desktop$ strace -p <824>
 bash: syntax error near unexpected token `824'
```

```
oenix@DESKTOP-SQ9G92V:~/Desktop$ nohup ./app.py
nohup: ignoring input and appending output to 'nohup.out'
    enix@DESKTOP-SQ9G92V:~/Desktop$ nohup ./app.py &
hoenix@DESKTOP-SQ9G92V:~/<mark>Desktop$ nohup: ignoring input and appending output to 'nohup.out'</mark>
s -ef | grep app.py
hoenix
              826 465 0 22:48 pts/0 00:00:00 grep --color=auto app.py
1]+ Done
                                  nohup ./app.py
 noenix@DESKTOP-SQ9G92V:~/Desktop$ top
top - 22:49:16 up 22 min, 1 user, load average: 0.00, 0.00, 0.00

Tasks: 26 total, 1 running, 25 sleeping, 0 stopped, 0 zombie

4Cpu(s): 0.0 us, 0.2 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st

11B Mem : 3835.2 total, 3366.1 free, 470.5 used, 133.2 buff/cache

11B Swap: 1024.0 total, 1024.0 free, 0.0 used. 3364.7 avail Mem
                    PR NI VIRT RES SHR S %CPU %MEM
   PID USER
                                                                            TIME+ COMMAND
      1 root
                               21688
                                       12544
                                                 9344 S
                                                           0.0
                                                                          0:02.23 systemd
                    20
                          0
                                3072
                                        1664
                                                 1664 S
                                                                         0:00.03 init-systemd(Ub
      2 root
                                                           0.0
                                                                  0.0
                                                                         0:00.00 init
                    20
                         0
                                        1852
                                                 1792 S
                                                           0.0
                                                                  0.0
      7 root
                                3088
    65 root
                    19
                               66748 15588
                                               14564 S
                                                           0.0
                                                                  0.4
                                                                         0:00.93 systemd-journal
    110 root
                    20
                               25136
                                        6016
                                                4864 S
                                                           0.0
                                                                  0.2
                                                                         0:00.37 systemd-udevd
                               21452
                                               10624 S
                                                                         0:00.33 systemd-resolve
   166 systemd+
                    20
                                       12800
                                                           0.0
                                                                  0.3
   167 systemd+
                    20
                          0
                               91020
                                        7680
                                                 6912 S
                                                           0.0
                                                                         0:00.32 systemd-timesyn
                                                                  0.2
   180 root
                    20
                          0
                               4236
                                        2560
                                                 2432 S
                                                           0.0
                                                                  0.1
                                                                         0:00.05 cron
   181 message+
                    20
                          0
                               9624
                                        4736
                                                 4352 S
                                                           0.0
                                                                  0.1
                                                                         0:00.33 dbus-daemon
    217 root
                               17960
                                        8448
                                                 7552 S
                                                           0.0
                                                                  0.2
                                                                          0:00.26 systemd-logind
    226 root
                                                           0.0
                                                                          0:00.34 wsl-pro-service
```

H Package Management

Debian/Ubuntu

- sudo apt update → Update package index.
- sudo apt upgrade → Upgrade all packages.
- sudo apt install $pkg \rightarrow Install package$.
- sudo apt remove pkg \rightarrow Remove package.
- apt search name \rightarrow Search for package.
- dpkg -i file.deb \rightarrow Install.deb file.

Universal

- snap install app/snap remove app \rightarrow Manage snap apps.
- flatpak install app → Install flatpak package

```
phoenix@DESKTOP-SQ9G92V: ~
218 clear
219 nohup ./app.py
220 nohup ./app.py &
221 ps -ef | grep app.py
222 top
223 htop
224 pstree
225 pkill -f app.py
226 nice -n 10 ./app/py
227 nice -n 10 ./app.py
228 renice -n 5 -p <PID>
229 lsof -p <PID>
230 strace -p <824>
231 clear
232 ls
234 claer
235 clear
236 sudo apt update
237 sudo apt update -y
238 sudo apt install nginx git htop -y
239 sudo yum install nginx git -y
240 sudo install nginx git -y
241 cat history
242 cat history.txt
243 ls
244 cd
245 cat history.txt
246
     history
```

★ Service Management (systemd)

- systemctl start service \rightarrow Start a service.
- systemctl stop service \rightarrow Stop a service.
- systemctl restart service \rightarrow Restart service.
- systemctl reload service → Reload config without restart.
- systemctl status service → Check service status.
- systemctl enable service → Enable service at boot.
- systemctl disable service → Disable service at boot.
- journalctl -u service → View service logs.

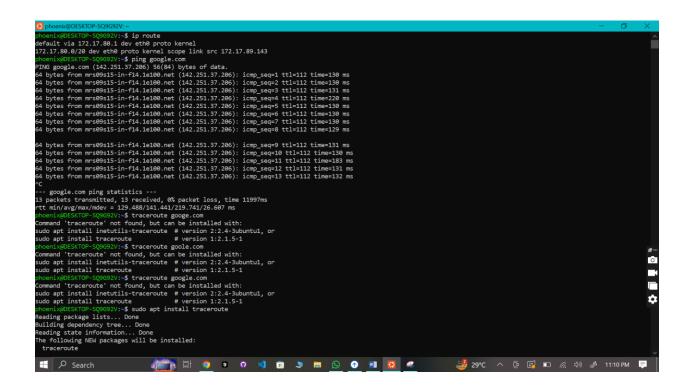
® Network Management

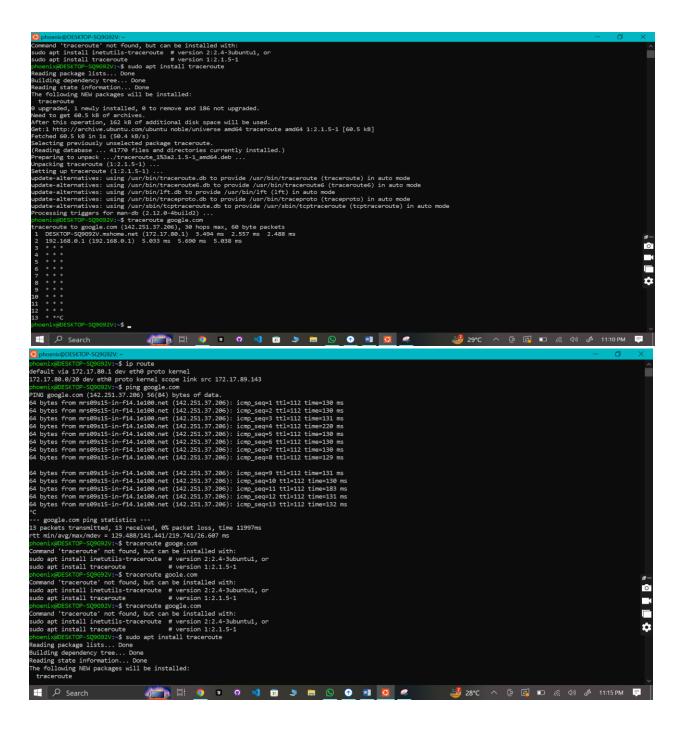
- ip a / ifconfig → Show network interfaces.
- ip route → Show routing table.
- hostname $-I \rightarrow Show IP addresses$.
- ping host → Test connectivity.
- traceroute host \rightarrow Show path to host.
- dig host/nslookup host \rightarrow DNS lookup.
- curl url/wget url \rightarrow Test HTTP request.

• ss -tuln / netstat -tulnp → Show listening ports.

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- nmap host \rightarrow Scan open ports.
- scp file user@host:/path \rightarrow Copy file to remote server.
- rsync -av src/ user@host:dest/ \rightarrow Sync directories.
- ssh user@host \rightarrow Remote login.
- ufw allow 22/firewall-cmd --add-port=8080/tcp → Open firewall ports.



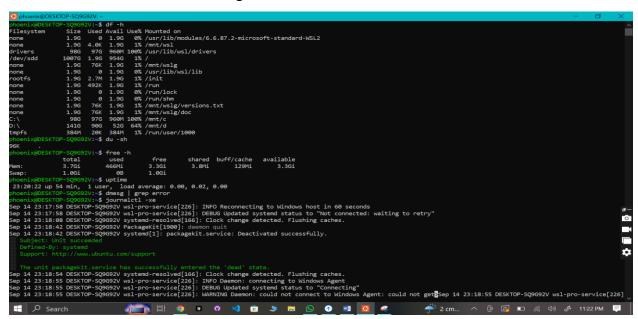




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| Comparison | Com
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★ Troubleshooting & Monitoring

- df $-h \rightarrow Disk$ usage by filesystem.
- du -sh $\star \rightarrow$ Size of directories.
- lsblk → List block devices.
- free $-h \rightarrow Show memory usage$.
- uptime → Show load averages.



- dmesg | grep error \rightarrow Kernel logs.
- journalctl $-xe \rightarrow System logs$.
- tail -n 50 /var/log/syslog \rightarrow Last 50 log lines.
- systemctl restart networking \rightarrow Restart network service.
- fsck /dev/sda1 \rightarrow Check/repair filesystem.
- mount /dev/sdb1 /mnt → Mount storage device.

