МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
НАЦІОНАЛЬНИЙ АЕРОКОСМІЧНИЙ УНІВЕРСИТЕТ ім. М. Є. Жуковського «Харківський авіаційний інститут»

Факультет радіоелектроніки, комп'ютерних систем та інфокумунікацій

Кафедра комп'ютерних систем, мереж і кібербезпеки

Лабораторна робота №1

З дициплiни: «Технології DevOps»

Виконав:

студент 5 курсу групи №555 ім

Напряму підготовки

125 Кібербезпека та захист інформації

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Task1.Part1

1. Log in to the system as root.

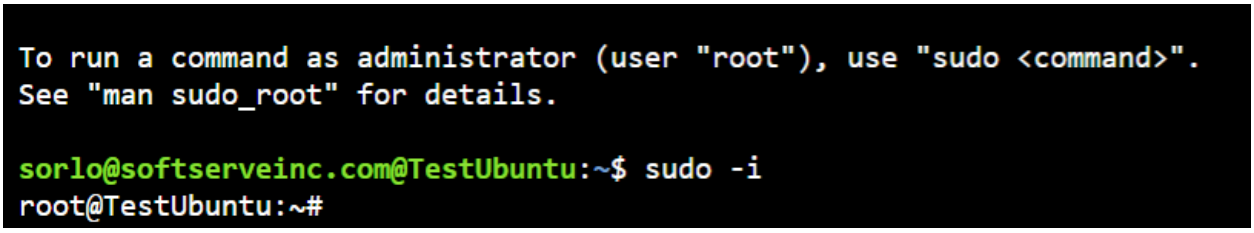

Рисунок 1 – авторизація у системі під Root користувачем

2. Use the passwd command to change the password. Examine the basic parameters of the command. What system file does it change *?

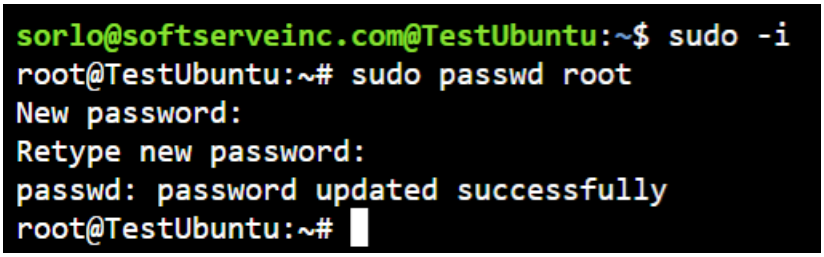

Рисунок 2 – зміна паролю командою passwd

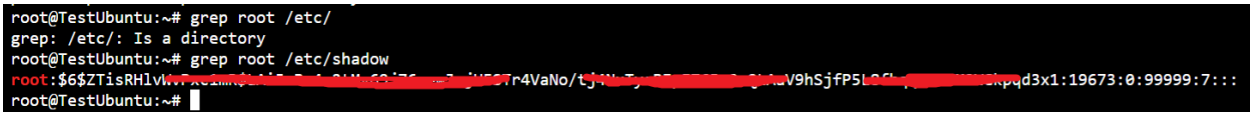

Рисунок 3 – перевірка файлу зі збереженими паролями користувачів

3. Determine the users registered in the system, as well as what commands they execute. What additional information can be gleaned from the command execution?

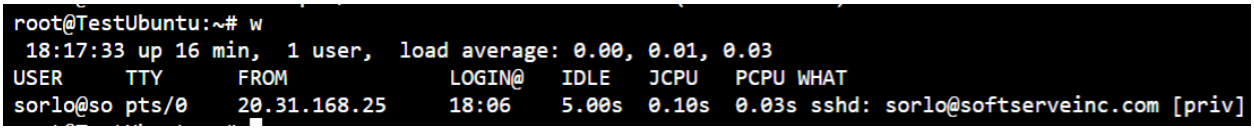

Рисунок 4 - Вивід команди who

4. Change personal information about yourself.

```
root@TestUbuntu:~# chfn sorlo@softserveinc.com
Changing the user information for sorlo@softserveinc.com
Enter the new value, or press ENTER for the default
        Full Name [Stanislav Orlov]: Stan Orlov
        Room Number []: 512
        Work Phone []: +380962414695
        Home Phone []: +380577000000
        Other []: Cat name is busya
```

Рисунок 5 – вивід команди chfn для зміни інформації

5. Become familiar with the Linux help system and the man and info commands. Get help on the previously discussed commands, define and describe any two keys for these commands. Give examples.

```
root@TestUbuntu:~# help
GNU bash, version 5.0.17(1)-release (x86_64-pc-linux-gnu)
These shell commands are defined internally.  Type `help' to see this list.
Type `help name' to find out more about the function `name'.
Use `info bash' to find out more about the shell in general.
Use `man -k' or `info' to find out more about commands not in this list.

A star (*) next to a name means that the command is disabled.

 job_spec [&]                                                        history [-c] [-d offset] [n] or history -anrw [filename] or history -ps arg [arg...>
 (( expression ))                                                    if COMMANDS; then COMMANDS; [ elif COMMANDS; then COMMANDS; ]... [ else COMMANDS; >
 . filename [arguments]                                              jobs [-lnprs] [jobspec ...] or jobs -x command [args]
 :                                                                   kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or kill -l [sigspec]
 [ arg... ]                                                          let arg [arg ...]
 [[ expression ]]                                                    local [option] name[=value] ...
 alias [-p] [name[=value] ... ]                                      logout [n]
 bg [job_spec ...]                                                   mapfile [-d delim] [-n count] [-O origin] [-s count] [-t] [-u fd] [-C callback] [->
 bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u name] [-r keyseq] [-x keys> popd [-n] [+N | -N]
 break [n]                                                           printf [-v var] format [arguments]
 builtin [shell-builtin [arg ...]]                                   pushd [-n] [+N | -N | dir]
 caller [expr]                                                       pwd [-LP]
 case WORD in [PATTERN [| PATTERN]...) COMMANDS ;;]... esac          read [-ers] [-a array] [-d delim] [-i text] [-n nchars] [-N nchars] [-p prompt] [->
 cd [-L|[-P [-e]] [-@]] [dir]                                        readarray [-d delim] [-n count] [-O origin] [-s count] [-t] [-u fd] [-C callback] >
 command [-pVv] command [arg ...]                                    readonly [-aAf] [name[=value] ...] or readonly -p
 compgen [-abcdefgjksuv] [-o option] [-A action] [-G globpat] [-W wordlist]  [-F fun> return [n]
 complete [-abcdefgjksuv] [-pr] [-DEI] [-o option] [-A action] [-G globpat] [-W word> select NAME [in WORDS ... ;] do COMMANDS; done
 compopt [-o|+o option] [-DEI] [name ...]                            set [-abefhkmnptuvxBCHP] [-o option-name] [--] [arg ...]
 continue [n]                                                        shift [n]
 coproc [NAME] command [redirections]                                shopt [-pqsu] [-o] [optname ...]
 declare [-aAfFgilnrtux] [-p] [name[=value] ...]                     source filename [arguments]
 dirs [-clpv] [+N] [-N]                                              suspend [-f]
 disown [-h] [-ar] [jobspec ... | pid ...]                           test [expr]
 echo [-neE] [arg ...]                                               time [-p] pipeline
 enable [-a] [-dnps] [-f filename] [name ...]                        times
```

Рисунок 6 - вивід команди help

```
root@TestUbuntu:~# help pwd
pwd: pwd [-LP]
    Print the name of the current working directory.

    Options:
      -L        print the value of $PWD if it names the current working
                directory
      -P        print the physical directory, without any symbolic links

    By default, `pwd' behaves as if `-L' were specified.

    Exit Status:
    Returns 0 unless an invalid option is given or the current directory
    cannot be read.
```

Рисунок 7 – вивід команди help для команди pwd

6. Explore the more and less commands using the help system. View the contents of files .bash* using commands.

```
root@TestUbuntu:~# help cd
cd: cd [-L|[-P [-e]] [-@]] [dir]
    Change the shell working directory.

    Change the current directory to DIR.  The default DIR is the value of the
    HOME shell variable.

    The variable CDPATH defines the search path for the directory containing
    DIR.  Alternative directory names in CDPATH are separated by a colon (:).
    A null directory name is the same as the current directory.  If DIR begins
    with a slash (/), then CDPATH is not used.

    If the directory is not found, and the shell option `cdable_vars' is set,
    the word is assumed to be  a variable name.  If that variable has a value,
    its value is used for DIR.

    Options:
      -L        force symbolic links to be followed: resolve symbolic
                links in DIR after processing instances of `..'
      -P        use the physical directory structure without following
                symbolic links: resolve symbolic links in DIR before
                processing instances of `..'
      -e        if the -P option is supplied, and the current working
                directory cannot be determined successfully, exit with
                a non-zero status
      -@        on systems that support it, present a file with extended
                attributes as a directory containing the file attributes

    The default is to follow symbolic links, as if `-L' were specified.
    `..' is processed by removing the immediately previous pathname component
    back to a slash or the beginning of DIR.
```

Рисунок 8 – вивід команди help

Creating .bash file

```
  GNU nano 4.8
#!/bin/bash
# My Hello, World! script
echo "Hello, World!"
```

Рисунок 9 – створення і приклад .bash файлу

View the contents of files .bash* using commands:

```
root@TestUbuntu:~# cat *.bash
#!/bin/bash
# My Hello, World! script
echo "Hello, World!"
echo "Hello world"
echo "from custom file"

root@TestUbuntu:~#
```

Рисунок 10 – вивід змісту .bash файлу з попереднього прикладу

Task1.Part2

1. Examine the tree command. Master the technique of applying a template, for example, display all files that contain a character c, or files that contain a specific sequence of characters. List subdirectories of the root directory up to and including the second nesting level.

```
root@TestUbuntu:~# tree
.
├── hello_world.bash
├── less
├── simplebash.bash
├── simplebash.bashMAM-A
├── simplebash.sh
└── snap
    └── lxd
        ├── 24061
        ├── common
        └── current -> 24061

5 directories, 5 files
root@TestUbuntu:~#
```

Рисунок 11 - Вивід команди tree усіх директорій та папок

```
root@TestUbuntu:~# tree -L 1
.
├── hello_world.bash
├── less
├── simplebash.bash
├── simplebash.bashMAM-A
├── simplebash.sh
└── snap

1 directory, 5 files
```

Рисунок 12 - Вивід команди tree усіх директорій та папок першого рівня

2. What command can be used to determine the type of file (for example, text or binary)? Give an example.

```
root@TestUbuntu:~# file hello_world.bash
hello_world.bash: Bourne-Again shell script, ASCII text executable
root@TestUbuntu:~# file snap
snap: directory
root@TestUbuntu:~#
```

Рисунок 13 - Вивід команди file

3. Master the skills of navigating the file system using relative and absolute paths. How can you go back to your home directory from anywhere in the filesystem?

```
stanislav [ ~ ]$ ls
clouddrive
stanislav [ ~ ]$ cd clouddrive
stanislav [ ~/clouddrive ]$ ls
stanislav [ ~/clouddrive ]$ cd ~
stanislav [ ~ ]$ ls
clouddrive
stanislav [ ~ ]$
```

Рисунок 14 – навігація до home директорії через команду «~»

```
stanislav [ ~ ]$ ls
clouddrive  labs
stanislav [ ~ ]$ cd labs
stanislav [ ~/labs ]$ mkdir lab1
stanislav [ ~/labs ]$ cd lab1
stanislav [ ~/labs/lab1 ]$ cd ~
stanislav [ ~ ]$ ls
clouddrive  labs
stanislav [ ~ ]$
```

Рисунок 15 – приклад навігації по директоріям

4. Become familiar with the various options for the ls command. Give examples of listing directories using different keys. Explain the information displayed on the terminal using the -l and -a switches.

```
stanislav [ ~ ]$ ls -l
total 4
lrwxrwxrwx 1 stanislav stanislav   22 Nov 12 19:12 clouddrive -> /usr/csuser/clouddrive
drwxr-xr-x 3 stanislav stanislav 4096 Nov 12 19:15 labs
```

Рисунок 16 - лістинг директорій за допомогою ls

```
stanislav [ ~ ]$ ls -a
.  ..  .azure  .bash_history  .bash_logout  .bash_profile  .bashrc  clouddrive  labs  .ssh  .tmux.conf  .zshrc
```

Рисунок 17 - лістинг діректорій за допомогою ls

5. Perform the following sequence of operations:

- create a subdirectory in the home directory;

```
stanislav [ ~ ]$ mkdir subdir
stanislav [ ~ ]$ ls
clouddrive  labs  subdir
stanislav [ ~ ]$
```

Рисунок 18 – створення підкаталогу та його вивід

- in this subdirectory create a file containing information about directories located in the root directory (using I/O redirection operations);
- view the created file

```
stanislav [ ~ ]$ ls -ld subdir > ~/subdir/info.txt
stanislav [ ~ ]$ cat ~/subdir/info.txt
drwxr-xr-x 2 stanislav stanislav 4096 Nov 12 19:23 subdir
stanislav [ ~ ]$
```

Рисунок 19 – створення файлу з інформацією про каталог

- copy the created file to your home directory using relative and absolute addressing

```
stanislav [ ~/subdir ]$ cp -v info.txt ..
'info.txt' -> '../info.txt'
```

Рисунок 20 – копіювання до рутовою директорії

- delete the previously created subdirectory
- delete the file copied to the home directory

```
stanislav [ ~ ]$ rm -rf ~/subdir
stanislav [ ~ ]$ rm -f ~/info.txt
stanislav [ ~ ]$ la
bash: la: command not found
stanislav [ ~ ]$ ls
clouddrive  labs
stanislav [ ~ ]$
```

Рисунок 21 – видалення створених директорій

6. Perform the following sequence of operations:

- create a subdirectory test in the home directory;
-

```
stanislav [ ~ ]$ mkdir ~/test
```

Рисунок 22 – створення директорії test

- copy the .bash_history file to this directory while changing its name to labwork2;

```
stanislav [ ~ ]$ cd ~/test
stanislav [ ~/test ]$ cp ~/.bash_history labwork2
```

Рисунок 23 – копіювання файлу bash_history

- create a hard and soft link to the labwork2 file in the test subdirectory;

```
stanislav [ ~/test ]$ ln -fs labwork2 soft
stanislav [ ~/test ]$ ln -f labwork2 hard
```

Рисунок 24 – створення лінок

- rename the hard link file to hard_lnk_labwork2;

```
stanislav [ ~/test ]$ mv hard hard_lnk_labwork2
```

Рисунок 25 – переймування hard лінки

- rename the soft link file to symb_lnk_labwork2 file;

```
stanislav [ ~/test ]$ mv soft symb_lnk_labwork2
```

Рисунок 26 – переймування soft лінки

- then delete the labwork2.

```
stanislav [ ~/test ]$ rm -f labwork2
```

Рисунок 27 - видалення

```
stanislav [ ~/test ]$ ls -l
total 4
-rw------- 1 stanislav stanislav 745 Nov 12 19:31 hard_lnk_labwork2
lrwxrwxrwx 1 stanislav stanislav   8 Nov 12 19:32 symb_lnk_labwork2 -> labwork2
stanislav [ ~/test ]$ ls -i
212994 hard_lnk_labwork2  212995 symb_lnk_labwork2
```

Рисунок 28 – перевірка видалених лінок

7. Using the locate utility, find all files that contain the squid and traceroute sequence

```
stanislav [ ~ ]$ locate trace traceroute
stanislav [ ~ ]$
```

Рисунок 29 – вивід команди locate trace

8. Determine which partitions are mounted in the system, as well as the types of these partitions.

Рисунок 30 – вивід інформації про розділи

9. Count the number of lines containing a given sequence of characters in a given file.
10. Using the find command, find all files in the /etc directory containing the host character sequence.
11. List all objects in /etc that contain the ss character sequence. How can I duplicate a similar command using a bunch of grep?

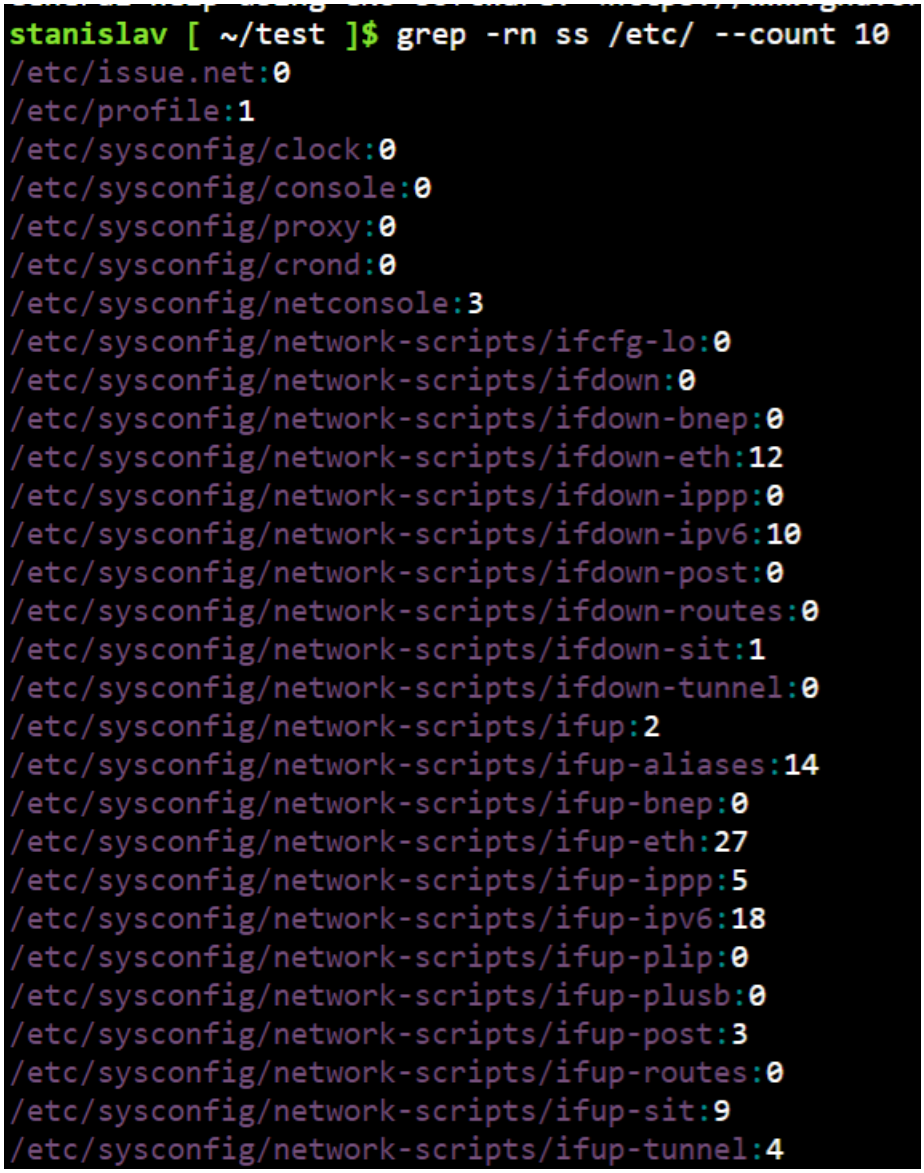

Рисунок 31 – вивід файлів у /etc директорії які мають ss послідовність

12. Organize a screen-by-screen print of the contents of the /etc directory. Hint: You must use stream redirection operations.

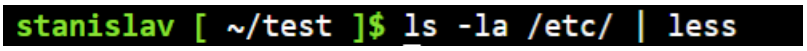

Рисунок 32 – вивід команди

```
drwxr-xr-x 1 root  root    4096 Nov 12 19:12 .
drwxr-xr-x 1 root  root    4096 Nov 12 18:54 ..
drwxr-xr-x 1 root  root    4096 Oct 11 17:32 alternatives
-rw------- 1 root  root     541 Oct  4  2022 anacrontab
drwxr-xr-x 2 root  root    4096 Oct 11 17:32 apparmor
drwxr-xr-x 8 root  root    4096 Oct 11 17:32 apparmor.d
drwxr-x--- 4 root  root    4096 Oct 11 17:32 audit
-rw-r--r-- 1 root  root    1217 Sep 24 01:30 bash.bashrc
drwxr-xr-x 2 root  root    4096 Oct 26 18:05 bash_completion.d
-rw-r--r-- 1 root  root     535 Aug 24  2022 bindresvport.blacklist
drwxr-xr-x 2 root  root    4096 Jul 21 18:42 binfmt.d
drwxr-xr-x 2 root  root    4096 Sep 24 02:12 chkconfig.d
drwxr-xr-x 1 root  root    4096 Oct 11 17:32 containerd
drwx------ 2 root  root    4096 Oct 11 17:32 cron.d
drwx------ 2 root  root    4096 Oct  4  2022 cron.daily
-rw-r--r-- 1 root  root       0 Oct  4  2022 cron.deny
drwx------ 2 root  root    4096 Oct 11 17:32 cron.hourly
drwx------ 2 root  root    4096 Oct  4  2022 cron.monthly
drwx------ 2 root  root    4096 Oct  4  2022 cron.weekly
drwxr-xr-x 3 root  root    4096 Oct 11 17:32 dbus-1
drwxr-xr-x 2 root  root    4096 Oct 11 17:32 default
-rw-r--r-- 1 root  root    4304 Sep 24 01:30 dircolors
-rw-r--r-- 1 root  root     685 Aug 24  2022 e2scrub.conf
-rw-r--r-- 1 root  root     149 Apr 23  2022 environment
-rw-r--r-- 1 root  root    1362 Dec  2  2019 ethertypes
drwxr-xr-x 3 root  root    4096 Oct 11 17:32 fonts
-rw-r--r-- 1 root  root       0 Jul 21 17:35 fstab
-rw-r--r-- 1 root  root      35 Oct 11 17:32 gitconfig
drwxr-xr-x 2 root  root    4096 Oct 11 17:32 gnutls
-rw-r--r-- 1 root  root     687 Nov 12 19:12 group
-rw-r--r-- 1 root  root     669 Oct 11 17:32 group-
-r-------- 1 root  root     592 Nov 12 19:12 gshadow
```

Рисунок 33 – вивід команди

13. What are the types of devices and how to determine the type of device? Give examples.
14. How to determine the type of file in the system, what types of files are there?
15. * List the first 5 directory files that were recently accessed in the /etc directory.

```
stanislav [ ~/test ]$ find /etc -type d -printf "%T+ %p\n" 2>/dev/null | sort | head -5
2022-04-23+09:56:23.0000000000 /etc/security/limits.d
2022-04-23+09:56:25.0000000000 /etc/security/namespace.d
2022-04-23+10:01:49.0000000000 /etc/pkcs11/modules
2022-04-23+10:44:16.0000000000 /etc/request-key.d
2022-04-23+13:42:22.0000000000 /etc/security/pwquality.conf.d
```

Рисунок 34 – 5 останніх видвідуваних директорій

ВИСНОВКИ

У ході виконання даної лабораторної роботи ознайомився з базовими командами роботи з операційною системою, командою help, ознайомився з командами роботи з файлами/папками та елементами навігації.