Mariia Markina

1. *User management*. Here we suppose there are at least two users, namely, root and guest.

(i) Create a new user *user*

groupadd user -creating new group named "user"

useradd -g user -s /bin/bash -d /home/user -m user – adding new user in a group "user", setting a shell for logging in, and setting a home directory (and saying, that this directory should be created), setting name "user" for user.

passwd user – setting a password for user "user".

id user – shows information about user and to which groups it belongs.

ls -ld /home/user – shows information about users home directory.

```
mariia@mariia-VirtualBox:~$ sudo groupadd user
[sudo] password for mariia:
mariia@mariia-VirtualBox:~$ useradd -g user -s /bin/bash -d /home/user -m user
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.
mariia@mariia-VirtualBox:~$ sudo useradd -g user -s /bin/bash -d /home/user -m user
mariia@mariia-VirtualBox:~$ sudo passwd user
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
mariia@mariia-VirtualBox:~$ id user
uid=1001(user) gid=1001(user) groups=1001(user)
mariia@mariia-VirtualBox:~$ ls -ld/home/user
ls: invalid option -- '/'
Try 'ls --help' for more information.
mariia@mariia-VirtualBox:~$ ls -ld /home/user
drwxr-xr-x 2 user user 4096 кві 20 16:57 /home/user
mariia@mariia-VirtualBox:~$
```

(ii) Log in to the system as "user" (hint use **su**).

```
mariia@mariia-VirtualBox:~$ sudo login
mariia-VirtualBox login: user
Password:
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 5.3.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

 * Kubernetes 1.18 GA is now available! See https://microk8s.io for docs or
   install it with:

     sudo snap install microk8s --channel=1.18 --classic

 * Multipass 1.1 adds proxy support for developers behind enterprise
   firewalls. Rapid prototyping for cloud operations just got easier.

     https://multipass.run/

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

52 packages can be updated.
4 updates are security updates.

Your Hardware Enablement Stack (HWE) is supported until April 2023.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

user@mariia-VirtualBox:~$ ▮
```

(ii) Edit **/etc/passwd** to prevent user *user* from logging in to the system.

```
user@mariia-VirtualBox:/etc$ su mariia
Password:
```

```
lxd:x:998:100::/var/snap/lxd/common/lxd:/bin/false
user:x:1001:1001::/home/user:/sbin/nologin
```

```
mariia@mariia-VirtualBox:/etc$ su user
Password:
Cannot execute /sbin/nologin: No such file or directory
```

2. *Content of* **/etc/passwd** and **/etc/group**.

(i) Look through **/etc/passwd** and **/etc/group** (hint: use **less** or **cat**).

```
mariia@mariia-VirtualBox:/$ cat /etc/passwd etc/group                          Examine
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
syslog:x:102:106::/home/syslog:/usr/sbin/nologin
messagebus:x:103:107::/nonexistent:/usr/sbin/nologin
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
uuidd:x:105:111::/run/uuidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117::/nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/:/usr/sbin/nologin
saned:x:114:119::/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
geoclue:x:119:124::/var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:120:65534::/run/gnome-initial-setup/:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
mariia:x:1000:1000:Mariia Markina,,,:/home/mariia:/bin/bash
vboxadd:x:999:1::/var/run/vboxadd:/bin/false
lxd:x:998:100::/var/snap/lxd/common/lxd:/bin/false
user:x:1001:1001::/home/user:/sbin/nologin
root:x:0:
daemon:x:1:
bin:x:2:
```

(ii) Get data from **/etc/passwd** and **/etc/group** about users: *root*, *guest*, *user*
(hint: filter by **grep**).

```
mariia@mariia-VirtualBox:/$ cat /etc/passwd etc/group | grep "root"
root:x:0:0:root:/root:/bin/bash
root:x:0:
mariia@mariia-VirtualBox:/$ cat /etc/passwd etc/group | grep "guest"
mariia@mariia-VirtualBox:/$ cat /etc/passwd etc/group | grep "user"
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
user:x:1001:1001::/home/user:/sbin/nologin
users:x:100:
user:x:1001:
mariia@mariia-VirtualBox:/$
```

(iii)Parse **/etc/passwd** and **/etc/group** with cut.

cut -f1 -d: /etc/passwd – displays everything from file /etc/passwd, that comes before first ":" symbol.

```
mariia@mariia-VirtualBox:/$ cut -f1 -d: /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
syslog
messagebus
_apt
uuidd
avahi-autoipd
usbmux
dnsmasq
rtkit
cups-pk-helper
speech-dispatcher
whoopsie
kernoops
saned
pulse
avahi
colord
hplip
geoclue
gnome-initial-setup
gdm
mariia
vboxadd
lxd
user
```

cut -f1,2 -d: /etc/passwd – displays everything from file /etc/passwd, that comes before second ":" symbol.

```
mariia@mariia-VirtualBox:/$ cut -f1,2 -d: /etc/passwd
root:x
daemon:x
bin:x
sys:x
sync:x
games:x
man:x
lp:x
mail:x
news:x
uucp:x
proxy:x
www-data:x
backup:x
list:x
irc:x
gnats:x
nobody:x
```

cut -f1,7 -d: /etc/passwd – displays first and seventh field between “:” symbol.

```
mariia@mariia-VirtualBox:/$ cut -f1,7 -d: /etc/passwd
root:/bin/bash
daemon:/usr/sbin/nologin
bin:/usr/sbin/nologin
sys:/usr/sbin/nologin
sync:/bin/sync
games:/usr/sbin/nologin
man:/usr/sbin/nologin
lp:/usr/sbin/nologin
mail:/usr/sbin/nologin
news:/usr/sbin/nologin
uucp:/usr/sbin/nologin
proxy:/usr/sbin/nologin
www-data:/usr/sbin/nologin
backup:/usr/sbin/nologin
list:/usr/sbin/nologin
irc:/usr/sbin/nologin
gnats:/usr/sbin/nologin
nobody:/usr/sbin/nologin
systemd-network:/usr/sbin/nologin
systemd-resolve:/usr/sbin/nologin
syslog:/usr/sbin/nologin
```

cut -f1 -d: /etc/group – displays everything from file /etc/group, that comes before first “:” symbol.

```
mariia@mariia-VirtualBox:/$ cut -f1 -d: /etc/group
root
daemon
bin
sys
adm
tty
disk
lp
mail
```

cut -f1,2 -d: /etc/group – displays first and second fields between ":" from file /etc/group

```
mariia@mariia-VirtualBox:/$ cut -f1,2 -d: /etc/group
root:x
daemon:x
bin:x
sys:x
adm:x
tty:x
disk:x
lp:x
mail:x
news:x
uucp:x
man:x
proxy:x
kmem:x
dialout:x
fax:x
```

(iv) Try to call **less** on **/etc/shadow** and invoke

sudo less /etc/shadow

```
root:!:18345:0:99999:7:::
daemon:*:18295:0:99999:7:::
bin:*:18295:0:99999:7:::
sys:*:18295:0:99999:7:::
sync:*:18295:0:99999:7:::
games:*:18295:0:99999:7:::
man:*:18295:0:99999:7:::
lp:*:18295:0:99999:7:::
mail:*:18295:0:99999:7:::
news:*:18295:0:99999:7:::
uucp:*:18295:0:99999:7:::
proxy:*:18295:0:99999:7:::
www-data:*:18295:0:99999:7:::
backup:*:18295:0:99999:7:::
list:*:18295:0:99999:7:::
irc:*:18295:0:99999:7:::
gnats:*:18295:0:99999:7:::
nobody:*:18295:0:99999:7:::
systemd-network:*:18295:0:99999:7:::
systemd-resolve:*:18295:0:99999:7:::
syslog:*:18295:0:99999:7:::
messagebus:*:18295:0:99999:7:::
_apt:*:18295:0:99999:7:::
uuidd:*:18295:0:99999:7:::
avahi-autoipd:*:18295:0:99999:7:::
usbmux:*:18295:0:99999:7:::
dnsmasq:*:18295:0:99999:7:::
rtkit:*:18295:0:99999:7:::
cups-pk-helper:*:18295:0:99999:7:::
speech-dispatcher:!:18295:0:99999:7:::
whoopsie:*:18295:0:99999:7:::
kernoops:*:18295:0:99999:7:::
saned:*:18295:0:99999:7:::
pulse:*:18295:0:99999:7:::
avahi:*:18295:0:99999:7:::
colord:*:18295:0:99999:7:::
hplip:*:18295:0:99999:7:::
geoclue:*:18295:0:99999:7:::
gnome-initial-setup:*:18295:0:99999:7:::
gdm:*:18295:0:99999:7:::
mariia:$6$yOa7nI7z$770JTc.W2EXUpr6xQDc98Ln3.jLJHy4Bz5DKpq.sMt1vNzaL6691lyvp.HSoPcULrxgpSegkr7XvKf1adtzMK/:18345:0:99999:7:::
vboxadd:!:18346::::::
lxd:!:18353::::::
user:$6$4pTFUJYm$QZE1nQVKFlDPblvV/hGjFu4OXlmC.4bmpNq0KQNUr5njqHNbofnhrHhfUj88hrbf5qDkkP/Hivm8/pIA6CdwP/:18372:0:99999:7:::
~
```

man -k shadow – searches information about shadow in manuals

```
mariia@mariia-VirtualBox:/$ man -k shadow
gpasswd (1)          - administer /etc/group and /etc/gshadow
grpconv (8)          - convert to and from shadow passwords and groups
grpunconv (8)        - convert to and from shadow passwords and groups
gshadow (5)          - shadowed group file
login.defs (5)       - shadow password suite configuration
ppmshadow (1)        - add simulated shadows to a portable pixmap image
pwconv (8)           - convert to and from shadow passwords and groups
pwunconv (8)         - convert to and from shadow passwords and groups
shadow (5)           - shadowed password file
shadowconfig (8)     - toggle shadow passwords on and off
update-passwd (8)    - safely update /etc/passwd, /etc/shadow and /etc/group
vigr (8)             - edit the password, group, shadow-password or shadow-group file
vipw (8)             - edit the password, group, shadow-password or shadow-group file
```

man 5 shadow – searches manual about shadow in fifth section (file formats and conversions)

```
SHADOW(5)                                           File Formats and Conversions

NAME
       shadow - shadowed password file

DESCRIPTION
       shadow is a file which contains the password information for the system's accounts and optional aging information.

       This file must not be readable by regular users if password security is to be maintained.

       Each line of this file contains 9 fields, separated by colons (":"), in the following order:

       login name
            It must be a valid account name, which exist on the system.
```

Analyze content of **/etc/shadow** based on what you've found in **man** 5 shadow.

Shadow contains information about passwords, dates when they are going to be expired, etc. First field between ":" shows login name, second – encrypted password, third – time since the last password change (days since Jan, 1st, 1970), then there is information about minimum and maximum age of the password as well as other information about aging, and reserved field.

3. Dealing with **chmod**.

(i) An executable script. Open your favorite editor and put these lines into a file

#!/bin/bash

echo "Drugs are bad MKAY?"

Give name "script.sh" to the script and call to

chmod +x script.sh

Then you are ready to execute the script:

./script.sh

```
mariia@mariia-VirtualBox:~$ nano
mariia@mariia-VirtualBox:~$ chmod +x script.sh
mariia@mariia-VirtualBox:~$ ./script.sh
Drugs are bad MKAY?
mariia@mariia-VirtualBox:~$ 
```

(ii) Suppose, you have logged in to the system as *guest*. Create directory "testDir"
in the **/tmp**; put some file into testDir and prohibit user *user* from visiting this
directory (i.e. "testDir").

```
mariia@mariia-VirtualBox:/tmp$ mkdir testDir
mariia@mariia-VirtualBox:/tmp$ cd testDir
mariia@mariia-VirtualBox:/tmp/testDir$ nano
mariia@mariia-VirtualBox:/tmp/testDir$ ls -l
total 4
-rw-r--r-- 1 mariia mariia 18 квi 21 15:44 MashaHello.txt
mariia@mariia-VirtualBox:/tmp/testDir$
```

```
mariia@mariia-VirtualBox:/tmp$ chmod -R 700 /tmp/testDir/
mariia@mariia-VirtualBox:/tmp$
```

```
user@mariia-VirtualBox:/tmp$ cd testDir
bash: cd: testDir: Permission denied
```

In this case only owner of the folder (mariia) has full access to it, no one else,
including user, can`t do anything with this directory.

(iii) Test, if it possible to forbid an owner of some file to read to or write from this
file.

```
mariia@mariia-VirtualBox:/tmp/testDir$ ls -l
total 8
-rwx------ 1 mariia mariia 18 квi 21 15:44 MashaHello.txt
-rw-r--r-- 1 mariia mariia 35 квi 21 15:53 NoWrite.txt
mariia@mariia-VirtualBox:/tmp/testDir$ chmod 577 NoWrite.txt
mariia@mariia-VirtualBox:/tmp/testDir$ ls -l
total 8
-rwx------ 1 mariia mariia 18 квi 21 15:44 MashaHello.txt
-r-xrwxrwx 1 mariia mariia 35 квi 21 15:53 NoWrite.txt
mariia@mariia-VirtualBox:/tmp/testDir$ nano NoWrite.txt
```

```
  GNU nano 2.9.3                 NoWrite.txt                    Modified

fgreg wouldn`t be able to write here (




                   [ Error writing NoWrite.txt: Permission denied ]
```

Yes, in this case I have forbidden to write in the file for its owner. Now, I can`t
write there, however, I can save this file with the different name and write there.
It is also possible to take away permissions to read and execute.