

EPAM University Programs
DevOps external course
Module 4 Linux & Bash Essentials
TASK 4.6

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

(i) Create a new user *user*

groupadd user

useradd -g user -s /bin/bash -d /home/user -m user

passwd user

id user

ls -ld /home/user

```
root@mruletkin:~# userdel -r user
userdel: user mail spool (/var/mail/user) not found
root@mruletkin:~# usermod -s /bin/bash user
usermod: user 'user' does not exist
root@mruletkin:~# groupadd user
root@mruletkin:~# useradd -g user -s /bin/bash -d /home/user -m user
root@mruletkin:~# passwd user
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
root@mruletkin:~# id user
uid=1002(user) gid=1002(user) groups=1002(user)
root@mruletkin:~# ls -ld /home/user
drwxr-xr-x 2 user user 4096 Apr 22 09:22 /home/user
root@mruletkin:~#
```

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

```
root@mruletkin:~# su - user
user@mruletkin:~$ _
```

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

```
mykhailo_litvinov@mruletkin:~$ less /etc/passwd | grep user
user:x:1002:1002::/home/user:/bin/bash
mykhailo_litvinov@mruletkin:~$ sudo usermod -s /usr/sbin/nologin user
mykhailo_litvinov@mruletkin:~$ sudo su user
This account is currently not available.
mykhailo_litvinov@mruletkin:~$ less /etc/passwd | grep user
user:x:1002:1002::/home/user:/usr/sbin/nologin
mykhailo_litvinov@mruletkin:~$
```

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

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

```
mykhailo_litvinov@mruletkin:~$ less /etc/passwd
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
lxd:x:105:65534:/:/var/lib/lxd:/bin/false
uuidd:x:106:110:/:/run/uuidd:/usr/sbin/nologin
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112:/:/var/lib/landscape:/usr/sbin/nologin
pollinate:x:109:1:/:/var/cache/pollinate:/bin/false
sshd:x:110:65534:/:/run/sshd:/usr/sbin/nologin
mykhailo_litvinov:x:1000:1000:Mykhailo:/home/mykhailo_litvinov:/bin/bash
vboxadd:x:999:1:/:/var/run/vboxadd:/bin/false
vagrant:x:1001:1001:,,,:/home/vagrant:/bin/bash
user:x:1002:1002:/:/home/user:/usr/sbin/nologin
/etc/passwd (END)
```

```
mykhailo_litvinov@mruletkin:~$ less /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,mykhailo_litvinov
tty:x:5:
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:mykhailo_litvinov
floppy:x:25:
tape:x:26:
```

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

```
mykhailo_litvinov@mruletkin:~$ grep root /etc/passwd ; grep user /etc/passwd ; grep guest /etc/passwd
root:x:0:0:root:/root:/bin/bash
user:x:1002:1002::/home/user:/usr/sbin/nologin
mykhailo_litvinov@mruletkin:~$ _

mykhailo_litvinov@mruletkin:~$ grep root /etc/passwd ; grep user /etc/passwd ; grep guest /etc/passwd
root:x:0:0:root:/root:/bin/bash
user:x:1002:1002::/home/user:/usr/sbin/nologin
mykhailo_litvinov@mruletkin:~$ grep root /etc/group ; grep user /etc/group ; grep guest /etc/group
root:x:0:
microk8s:x:997:root
users:x:100:
user:x:1002:
mykhailo_litvinov@mruletkin:~$ _
```

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

cut -f1 -d: /etc/passwd

```
mykhailo_litvinov@mruletkin:~$ 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
_lapt
lxd
uidd
dnsmasq
landscape
pollinate
sshd
mykhailo_litvinov
vboxadd
vagrant
user
mykhailo_litvinov@mruletkin:~$
```

cut -f1,2 -d: /etc/passwd

```
mykhailo_litvinov@mruletkin:~$ 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
systemd-network:x
systemd-resolve:x
syslog:x
messagebus:x
_apt:x
lxd:x
uidd:x
dnsmasq:x
landscape:x
pollinate:x
sshd:x
mykhailo_litvinov:x
vboxadd:x
vagrant:x
user:x
mykhailo_litvinov@mruletkin:~$ _
```

cut -f1,7 -d: /etc/passwd

```
mykhailo_litvinov@mruletkin:~$ 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
messagebus:/usr/sbin/nologin
_apt:/usr/sbin/nologin
lxd:/bin/false
uidd:/usr/sbin/nologin
dnsmasq:/usr/sbin/nologin
landscape:/usr/sbin/nologin
pollinate:/bin/false
sshd:/usr/sbin/nologin
mykhailo_litvinov:/bin/bash
vboxadd:/bin/false
vagrant:/bin/bash
user:/usr/sbin/nologin
mykhailo_litvinov@mruletkin:~$ _
```

cut -f1 -d: /etc/group

```
mykhailo_litvinov@mruletkin:~$ cut -f1 -d: /etc/group
root
daemon
bin
sys
adm
tty
disk
lp
mail
news
uucp
man
proxy
kmem
dialout
fax
voice
cdrom
floppy
tape
sudo
audio
```

cut -f1,2 -d: /etc/group

```
mykhailo_litvinov@mruletkin:~$ 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
voice:x
cdrom:x
floppy:x
tape:x
sudo:x
audio:x
```

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

sudo less /etc/shadow

```
mykhailo_litvinov@mruletkin:~$ sudo less /etc/shadow
root:$6$gk5D1su4$Rywk6w.3z3XpY8KoejuxBGwgRjrYL1sTJDfa59BiGyk1inSmqZ280R.18Zgk01J3/FbggGU9UTHPE4RiHB1
Qf0:18351:0:99999:7:::
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:::
```

man -k shadow

```
mykhailo_litvinov@mruletkin:~$ 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
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
mykhailo_litvinov@mruletkin:~$ _
```


man 5 shadow

```
SHADOW(5)                                File Formats and Conversions                                SHADOW(5)

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.

    encrypted password
        Refer to crypt(3) for details on how this string is interpreted.

        If the password field contains some string that is not a valid result of crypt(3), for instance ! or *, the user will not be able to use a unix password to log in (but the user may log in the system by other means).

        This field may be empty, in which case no passwords are required to authenticate as the specified login name. However, some applications which read the /etc/shadow file may decide not to permit any access at all if the password field is empty.

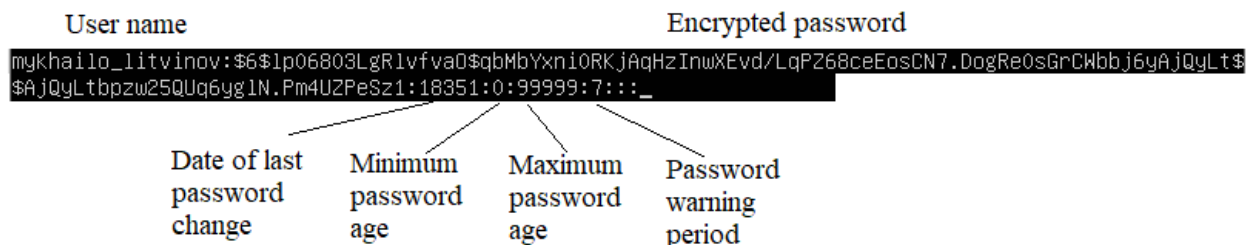
        A password field which starts with an exclamation mark means that the password is locked. The remaining characters on the line represent the password field before the password was locked.

    date of last password change
        The date of the last password change, expressed as the number of days since Jan 1, 1970.

Manual page shadow(5) line 1 (press h for help or q to quit)
```

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

- Having analysed content based on information of man 5 shadow I can say that **shadow** is a file which contains the password information for the system's accounts and optional aging information. Each line has 9 fields with information about: login name, encrypted password, date of last password change, minimum password age, maximum password age, password warning period, password inactivity period, account expiration date reserved date.



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

(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").

```
mykhailo_litvinov@mruletkin:~$ ls
color.txt  file.txt  name.txt  root_entries.txt  script.sh  setuid.txt  xaa  xab
mykhailo_litvinov@mruletkin:~$ chmod +x script.sh
mykhailo_litvinov@mruletkin:~$ ./script.sh
Drugs are bad MKAY?
mykhailo_litvinov@mruletkin:~$ cd /tmp
mykhailo_litvinov@mruletkin:/tmp$ mkdir testDir
mykhailo_litvinov@mruletkin:/tmp$ cd testDir
mykhailo_litvinov@mruletkin:/tmp/testDir$ echo "mygreatmystery" > secret.txt
mykhailo_litvinov@mruletkin:~$ chmod o-r /tmp/testDir
mykhailo_litvinov@mruletkin:~$ su user
Password:
user@mruletkin:/home/mykhailo_litvinov$ ls /tmp/testDir
ls: cannot open directory '/tmp/testDir': Permission denied
user@mruletkin:/home/mykhailo_litvinov$
```

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

```
mykhailo_litvinov@mruletkin:~$ chmod u-r /tmp/testDir
mykhailo_litvinov@mruletkin:~$ ls /tmp/testDir
ls: cannot open directory '/tmp/testDir': Permission denied
mykhailo_litvinov@mruletkin:~$ su user
Password:
user@mruletkin:/home/mykhailo_litvinov$ ls /tmp/testDir
secret.txt
user@mruletkin:/home/mykhailo_litvinov$ _
```