

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 – to add a new group

```
root@server:~# groupadd user
```

useradd -g user -s /bin/bash -d /home/user -m user – to create user that belongs to group user, have an opportunity to login through /bin/bash, his home directory is located in /home/user and his name is USER

```
root@server:~# useradd -g user -s /bin/bash -d /home/user -m user
```

passwd user – to create password for USER

```
root@server:~# passwd user
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
```

id user – to determine uid, gid and extra groups that belongs to USER

```
root@server:~# id user
uid=1001(user) gid=1001(user) groups=1001(user)
```

ls -ld /home/user – to show info about home directory of USER in long

```
root@server:~# ls -ld /home/user
drwxr-xr-x 2 user user 4096 Apr 18 18:29 /home/user
```

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

```
root@server:~# su user
user@server:/root$
```

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

```
root@server:~# usermod -s /bin/false user
root@server:~# su user
root@server:~# _
```

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

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

```
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
uidd:x:106:110:/run/uidd:/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/ssh:/usr/sbin/nologin
alex:x:1000:1000:Oleksii:/home/alex:/bin/bash
vboxadd:x:999:1:/var/run/vboxadd:/bin/false
user:x:1001:1001:/home/user:/bin/false
```

```
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,alex
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:alex
floppy:x:25:
tape:x:26:
sudo:x:27:alex
audio:x:29:
dip:x:30:alex
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
utmp:x:43:
video:x:44:
sasl:x:45:
plugdev:x:46:alex
staff:x:50:
```

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

```
root@server:~# cat /etc/group | grep root
root:x:0:
root@server:~# cat /etc/group | grep guest
root@server:~# cat /etc/group | grep user
users:x:100:
user:x:1001:
root@server:~# cat /etc/passwd | grep user
user:x:1001:1001::/home/user:/bin/false
root@server:~# cat /etc/passwd | grep guest
root@server:~# cat /etc/passwd | grep root
root:x:0:0:root:/root:/bin/bash
```

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

cut -f1 -d: /etc/passwd – to show first field with delimiter “:” from etc/password

```
root@server:~# 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
messagebusp" 55L, 733C
_lapt
lxd
uucidd
dnsmasq
landscape
pollinate
sshd
alex
vboxadd
user
```

cut -f1,2 -d: /etc/passwd – to show first and second fields with delimiter “:” from **/etc/password**

```

root@server:~# 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
alex:x
vboxadd:x
user:x

```

cut -f1,7 -d: /etc/passwd - – to show first and seventh fields with delimiter “:”
from /etc/password

```

root@server:~# 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
alex:/bin/bash
vboxadd:/bin/false
user:/bin/false

```

cut -f1 -d: /etc/group – to show first field with delimiter “:” from /etc/group

```
tape
sudo
audio
dip
www-data
backup
operator
list
irc
src
gnats
shadow
utmp
video
sasl
plugdev
staff
games
users
nogroup
systemd-journal
systemd-network
systemd-resolve
input
crontab
syslog
messagebus
lxd
mlocate
uudd
ssh
landscape
alex
vboxsf
microk8s
user
root@server:~#
```

cut -f1,2 -d: /etc/group – to show first and second fields with delimiter “:” from /etc/group

```
tape:x
sudo:x
audio:x
dip:x
www-data:x
backup:x
operator:x
list:x
irc:x
src:x
gnats:x
shadow:x
utmp:x
video:x
sasl:x
plugdev:x
staff:x
games:x
users:x
nogroup:x
systemd-journal:x
systemd-network:x
systemd-resolve:x
input:x
crontab:x
syslog:x
messagebus:x
lxd:x
mlocate:x
uudd:x
ssh:x
landscape:x
alex:x
vboxsf:x
microk8s:x
user:x
```

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

sudo less /etc/shadow – to show content of **/etc/shadow**

```
root:$6$G0S8HV1M$TSz2I.J3.SrsezXy0EBbcmM12AIJ6Hq5Rf6t060s9t0d0xI2V6hPSy00BmN9ng1Jnr1D6eXV5hmjUvMbNr
jX.:18355:0:99999:7:::
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:::
lxd*:18295:0:99999:7:::
uidd*:18295:0:99999:7:::
dnsmasq*:18295:0:99999:7:::
landscape*:18295:0:99999:7:::
pollinate*:18295:0:99999:7:::
sshd*:18355:0:99999:7:::
alex:$6$6PG8vxfAUhyrRHGQ$5IsN0i01dTGy/rU9UHLqg2UZNNeAfhnQvR4DB4LAU3CGzUdgLKlBskF711Eyq3zXZa0BEIKrF87
mYToByYtC/:18355:0:99999:7:::
vboxadd!:18355:::
user:$6$WpmGW50i$.oAq6FLutTkrSwNHPskpp5LIrceJMZokvxH14ZozVdpME0TpnAag39v5SenWxmS8Usx0IA1300CW10VwMKQ
th1:18370:0:99999:7:::
```

man -k shadow – to find man page using keyword

```
root@server:~# 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
pwnconv (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 – to open man page about 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**.

Answer: File **/etc/shadow** contains user's password info which is separated by delimiter ":" in 9 fields:

- Login name – username;
- Encrypted password - contains encrypted password of user. But "!" and "*" in this field means user will not be able to log in at this account using password. This field can be empty;
- Data of last password change – expressed in days after January 1-st, 1970. Value 0 means that user should change his password. Empty field means this feature is deactivated;
- Minimum password age – means number of days you have to wait to change your password. Empty field or 0 means that you don't have any restrictions to change your password;
- Maximum password age – means number of days user will have to change user's password. Empty field or 0 means that you don't have any password warning period;
- Password warning period – the number of days before a password is going to expire. Empty field or 0 means that you don't have Password warning period;
- Password inactivity period – the number of days before a password has expired. Empty field or 0 means that you don't have Password inactivity period;
- Account Expiration date – the number of days which means when user will not be able to login in shell. Empty field or 0 means that account don't have Account Expiration date;
- Reserved field – for future use.

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?"

```
~
~
~
"script.sh" 2L, 39C written
root@server:~# ls
script.sh  snap
root@server:~# cat script.sh
#!/bin/bash
echo "Drugs are bad MKAY?"
root@server:~# _
```

Give name “script.sh” to the script and call to

chmod +x script.sh – to give right to make executions for this file

```
root@server:~# chmod +x script.sh
```

Then you are ready to execute the script:

./script.sh - to start script executing

```
root@server:~# ./script.sh
Drugs are bad MKAY?
```

(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”).

```
root@server:~# usermod -s /bin/bash user
root@server:~# su user
user@server:~$ su guest
Password:
guest@server:/home/user$ cd /tmp/testDir
bash: cd: /tmp/testDir: No such file or directory
guest@server:/home/user$ cd /tmp/
guest@server:/tmp$ mkdir testDir
guest@server:/tmp$ cd testDir
guest@server:/tmp/testDir$ touch [ OK ] Started Daily apt download activities.
myfile
guest@server:/tmp/testDir$ ls
myfile
guest@server:/tmp/testDir$ cd ..
guest@server:/tmp$ chmod 770 /tmp/testDir
guest@server:/tmp$ su user
Password:
user@server:/tmp$ cd /tmp/testDir
bash: cd: /tmp/testDir: Permission denied
```

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

```
guest@server:/tmp$ su -
Password:
root@server:~# cd /tmp/testDir
root@server:/tmp/testDir# ls
myfile
root@server:/tmp/testDir# chmod 110 myfile
root@server:/tmp/testDir# su guest
guest@server:/tmp/testDir$ cat myfile
cat: myfile: Permission denied
guest@server:/tmp/testDir$ _
```

```
~
~
~
~
~
~
"myfile" [Permission Denied] 0,0-1 All
```

```
guest@server:/tmp/testDir$ su -
Password:
root@server:~# cd /tmp/testDir
root@server:/tmp/testDir# cat myfile
hello everybody
root@server:/tmp/testDir#
```