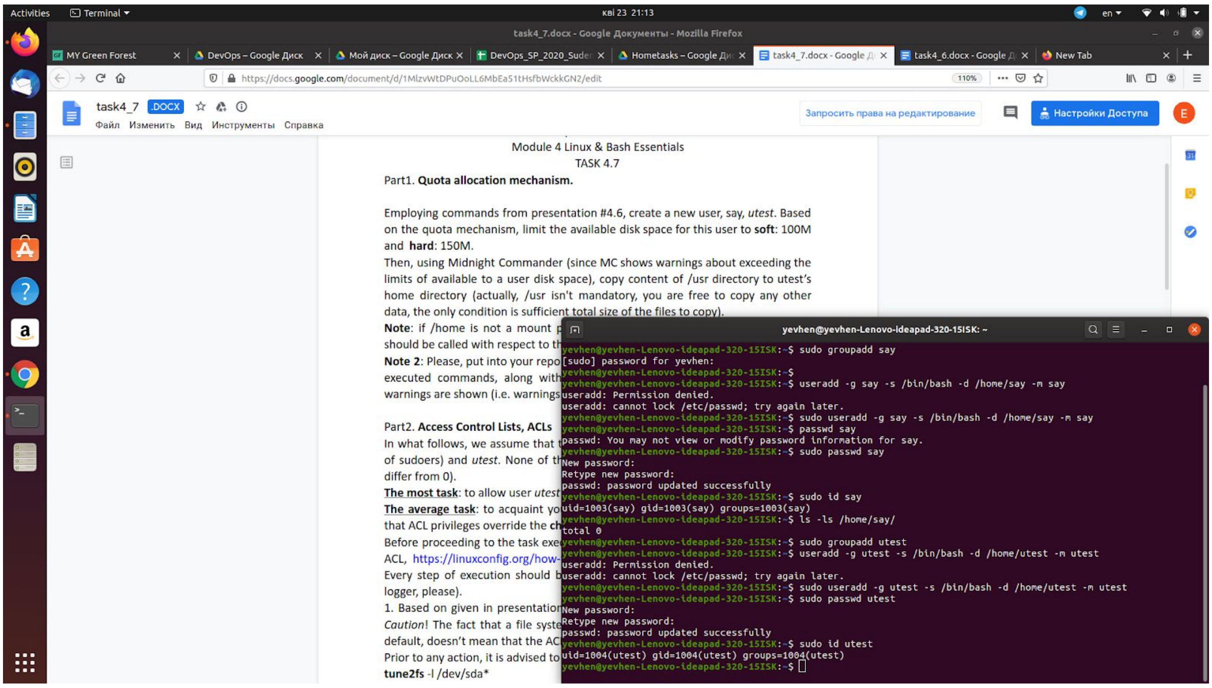
Linux & Bash Essentials

1. Quota allocation mechanism.

Create a new user, say, utest, limit the available disk space for this user to soft: 100M and hard: 150M.


task4_7.docx - Google Документы - Mozilla Firefox
https://docs.google.com/document/d/1MlzvWtDPuOoLL6MbEa51tHsfbWckkGN2/edit
task4_7 .DOCX
Файл Изменить Вид Инструменты Справка
Запросить права на редактирование
Настройки Доступа
yevhen@yevhen-Lenovo-Ideapad-320-15ISK: ~

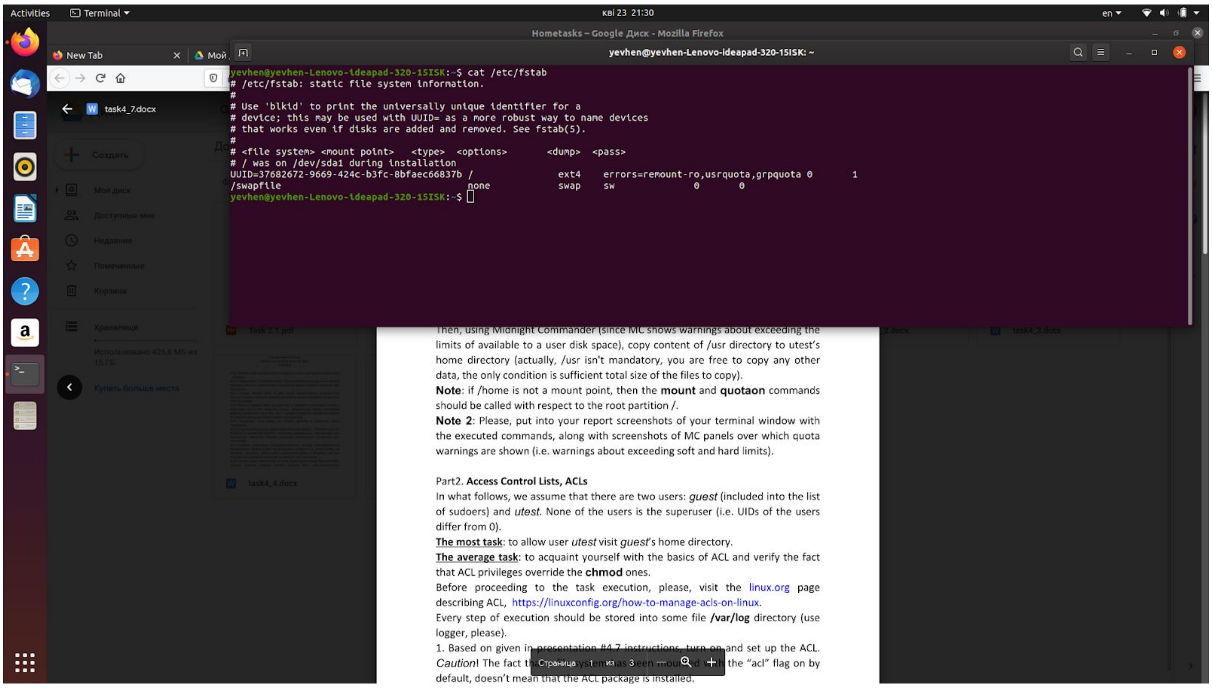
Module 4 Linux & Bash Essentials
TASK 4.7

Part1. **Quota allocation mechanism.**

Employing commands from presentation #4.6, create a new user, say, *utest*. Based on the quota mechanism, limit the available disk space for this user to **soft**: 100M and **hard**: 150M.

Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

```
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo groupadd say
[sudo] password for yevhen:
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ useradd -g say -s /bin/bash -d /home/say -m say
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo useradd -g say -s /bin/bash -d /home/say -m say
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ passwd say
passwd: You may not view or modify password information for say.
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo passwd say
New password:
Retype new password:
passwd: password updated successfully
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo id say
uid=1003(say) gid=1003(say) groups=1003(say)
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ ls -ls /home/say/
total 0
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo groupadd utest
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ useradd -g utest -s /bin/bash -d /home/utest -m utest
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo useradd -g utest -s /bin/bash -d /home/utest -m utest
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo passwd utest
New password:
Retype new password:
passwd: password updated successfully
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo id utest
uid=1004(utest) gid=1004(utest) groups=1004(utest)
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```


Hometasks – Google Диск - Mozilla Firefox
yevhen@yevhen-Lenovo-ideapad-320-15ISK: ~
task4_7.docx
Страница 1 из 3

```
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=37682672-9669-424c-b3fc-8bfaec66837b /               ext4    errors=remount-ro,usrquota,grpquota 0       1
/swapfile                                 none            swap    sw              0       0
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```

Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

Note: if /home is not a mount point, then the **mount** and **quotaon** commands should be called with respect to the root partition /.

Note 2: Please, put into your report screenshots of your terminal window with the executed commands, along with screenshots of MC panels over which quota warnings are shown (i.e. warnings about exceeding soft and hard limits).

Part2. **Access Control Lists, ACLs**

In what follows, we assume that there are two users: *guest* (included into the list of sudoers) and *utest*. None of the users is the superuser (i.e. UIDs of the users differ from 0).

The most task: to allow user *utest* visit *guest*'s home directory.

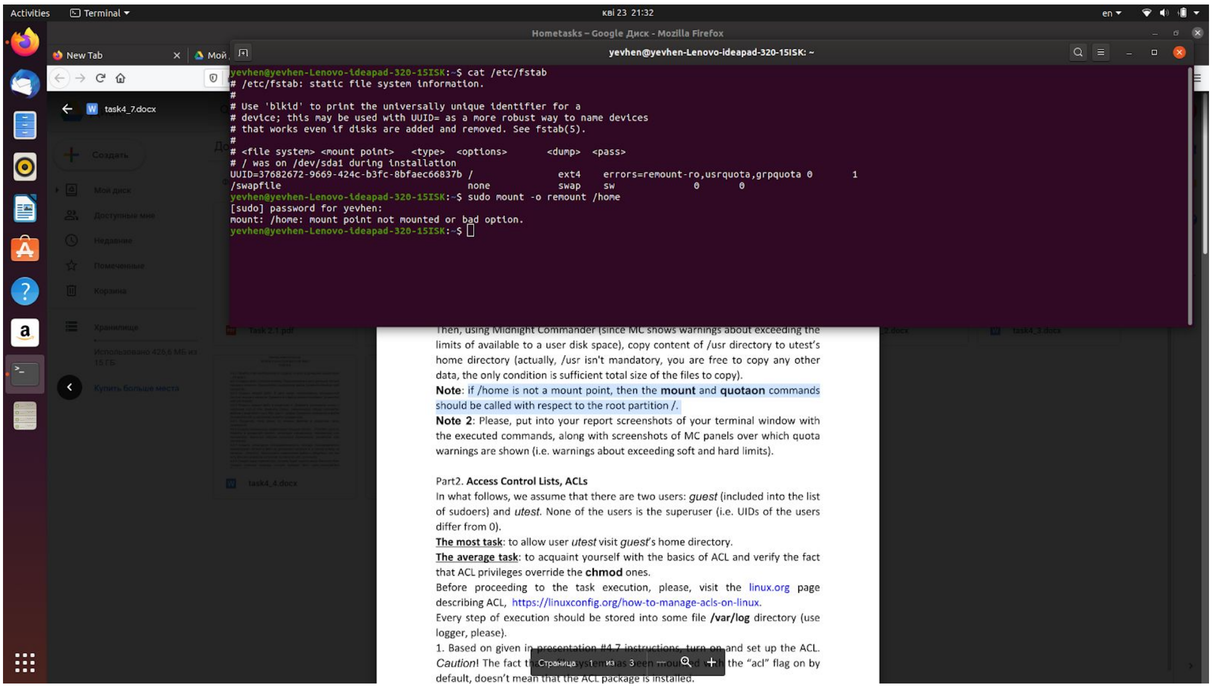
The average task: to acquaint yourself with the basics of ACL and verify the fact that ACL privileges override the **chmod** ones.

Before proceeding to the task execution, please, visit the linux.org page describing ACL, https://linuxconfig.org/how-to-manage-acls-on-linux.

Every step of execution should be stored into some file **/var/log** directory (use logger, please).

1. Based on given in presentation #4.7 instructions, turn on and set up the ACL. *Caution*! The fact that a file system has been mounted with the "acl" flag on by default, doesn't mean that the ACL package is installed.

/home is not a mount point, then the mount and quotaon commands called with respect to the root partition /.


Activities
Terminal
кві 23 21:32
Hometasks – Google Диск - Mozilla Firefox
New Tab
Мой
task4_7.docx
yevhen@yevhen-Lenovo-ideapad-320-15ISK: ~
Страница 1 из 3

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#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=37682672-9669-424c-b3fc-8bfaec66837b /               ext4    errors=remount-ro,usrquota,grpquota 0       1
/swapfile                                 none            swap    sw              0       0
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo mount -o remount /home
[sudo] password for yevhen:
mount: /home: mount point not mounted or bad option.
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```

Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

Note: if /home is not a mount point, then the **mount** and **quotaon** commands should be called with respect to the root partition /.

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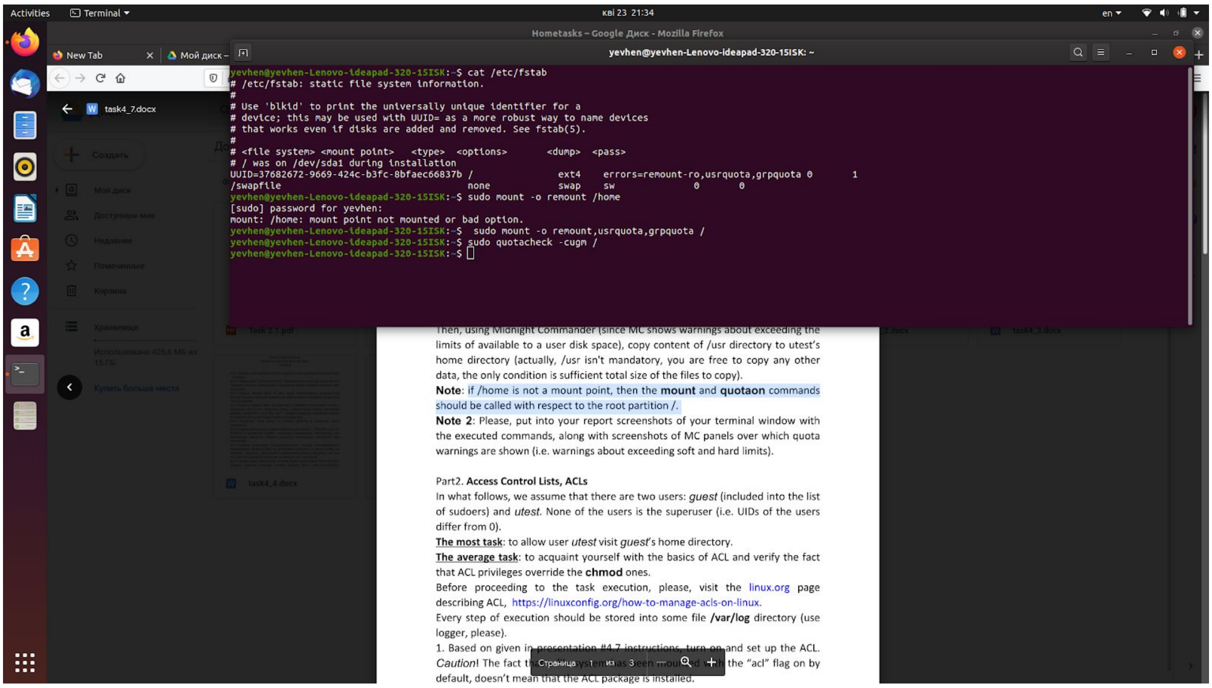
Activities
Terminal
кві 23 21:34
Hometasks – Google Диск - Mozilla Firefox
New Tab
Мой диск –
task4_7.docx
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Страница 1 из 3

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# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/sda1 during installation
UUID=37682672-9669-424c-b3fc-8bfaec66837b /               ext4    errors=remount-ro,usrquota,grpquota 0       1
/swapfile                                 none            swap    sw              0       0
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[sudo] password for yevhen:
mount: /home: mount point not mounted or bad option.
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$  sudo mount -o remount,usrquota,grpquota /
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo quotacheck -cugm /
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```

Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

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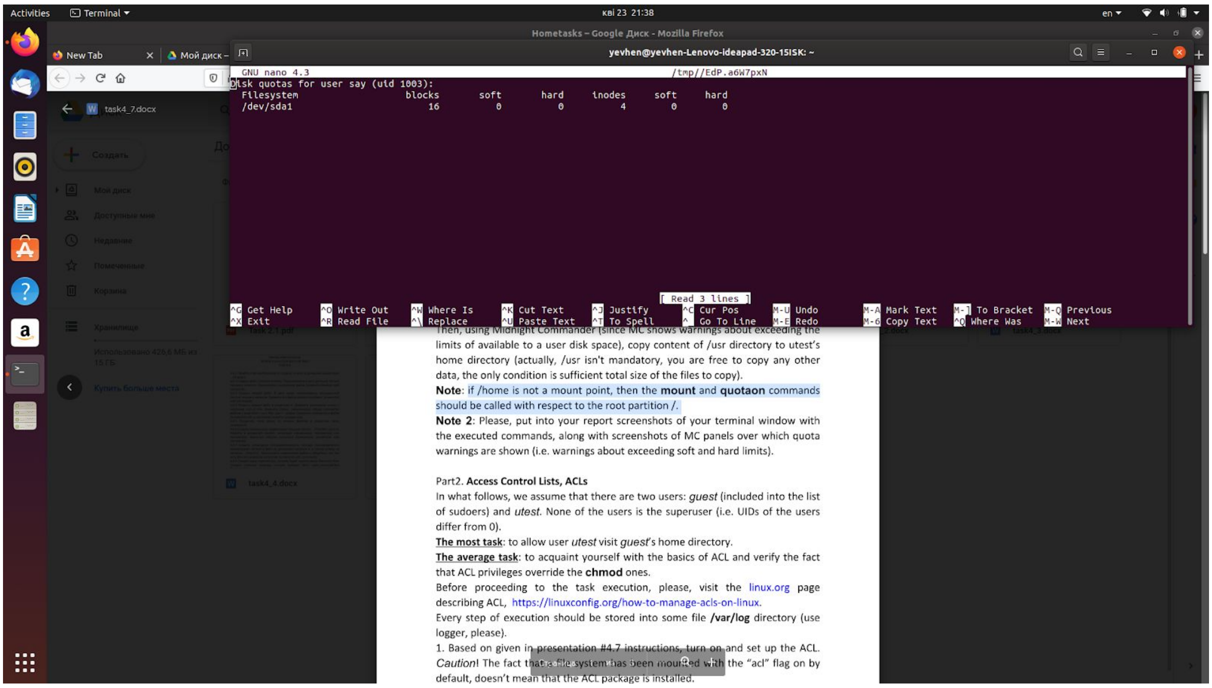
1. Based on given in presentation #4.7 instructions, turn on and set up the ACL. *Caution*! The fact that file system has been mounted with the "acl" flag on by default, doesn't mean that the ACL package is installed.

Set limit quota



```
  GNU nano 4.3                                              /tmp//EdP.a6W7pxN
Disk quotas for user say (uid 1003):
  Filesystem                   blocks       soft       hard     inodes     soft     hard
  /dev/sda1                        16          0          0          4        0        0
```

Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

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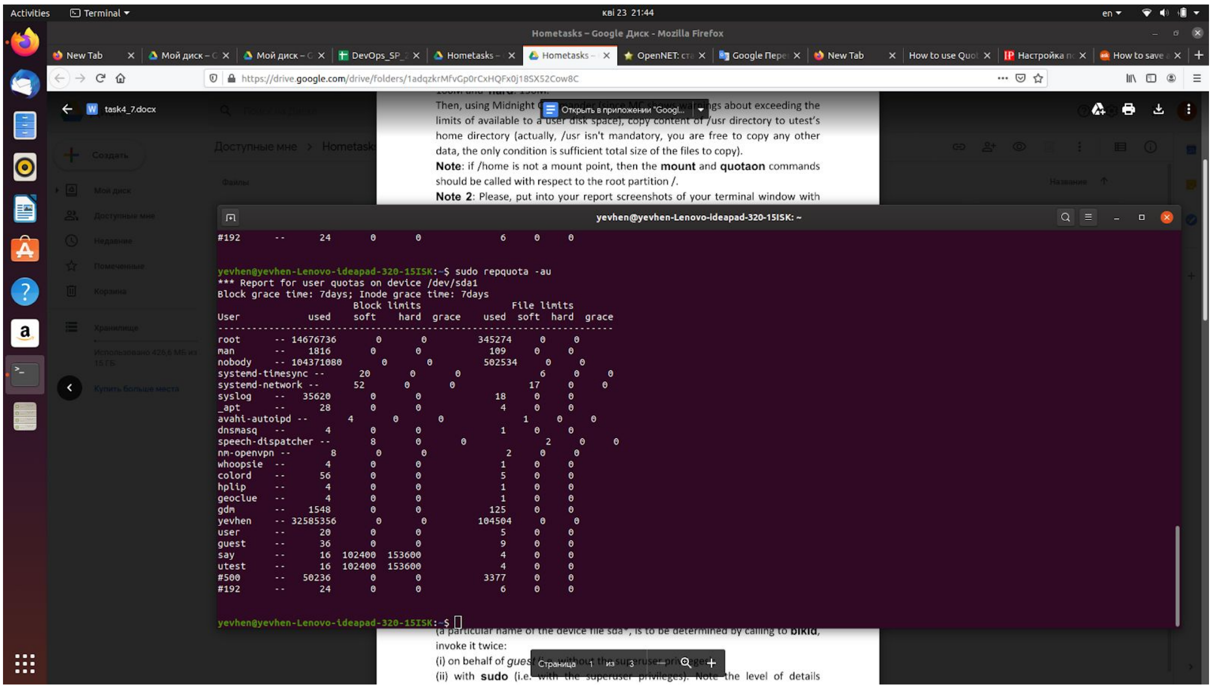
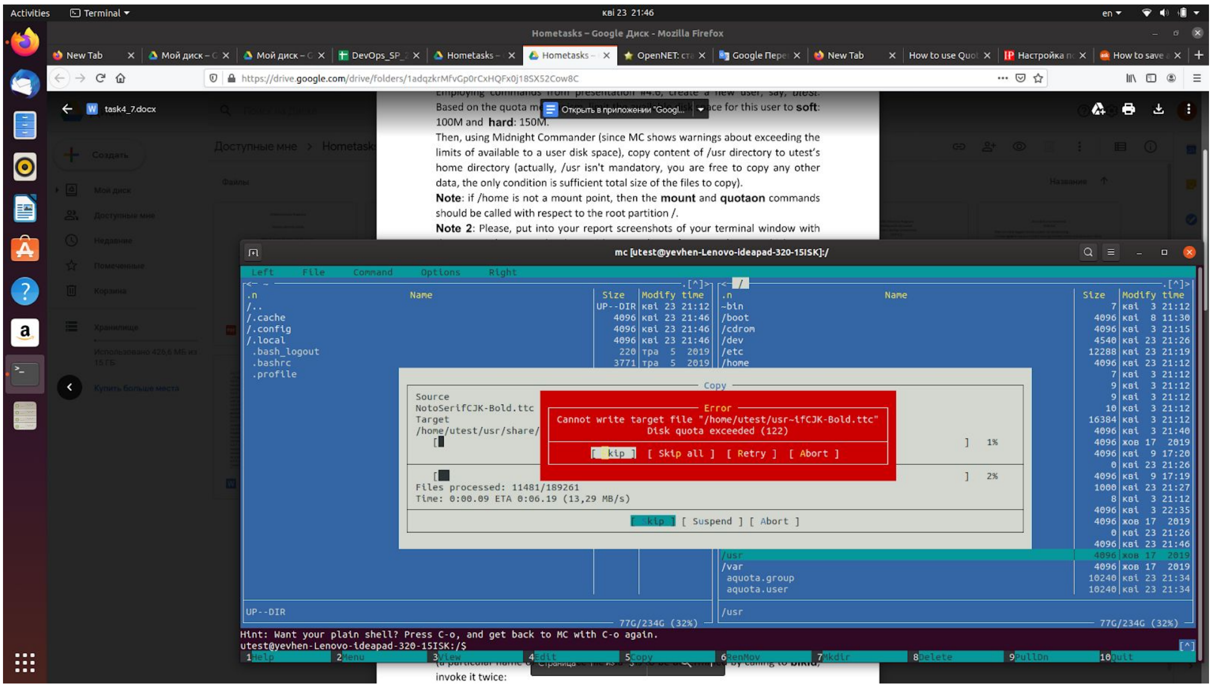


```
#192      --      24       0       0              6     0     0


yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo repquota -au
*** Report for user quotas on device /dev/sda1
Block grace time: 7days; Inode grace time: 7days
                        Block limits                File limits
User            used    soft    hard  grace    used  soft  hard  grace
----------------------------------------------------------------------
root      -- 14676736       0       0         345274     0     0
man       --    1816       0       0            109     0     0
nobody    -- 104371080       0       0         502534     0     0
systemd-timesync --      20       0       0              6     0     0
systemd-network --      52       0       0             17     0     0
syslog    --   35620       0       0             18     0     0
_apt      --      28       0       0              4     0     0
avahi-autoipd --       4       0       0              1     0     0
dnsmasq   --       4       0       0              1     0     0
speech-dispatcher --       8       0       0              2     0     0
nm-openvpn --       8       0       0              2     0     0
whoopsie  --       4       0       0              1     0     0
colord    --      56       0       0              5     0     0
hplip     --       4       0       0              1     0     0
geoclue   --       4       0       0              1     0     0
gdm       --    1548       0       0            125     0     0
yevhen    -- 32585356       0       0         104504     0     0
user      --      20       0       0              5     0     0
guest     --      36       0       0              9     0     0
say       --      16  102400  153600              4     0     0
utest     --      16  102400  153600              4     0     0
#500      --   50236       0       0           3377     0     0
#192      --      24       0       0              6     0     0


yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```

quota warning


Activities
Terminal ▾
кві 23 21:46
Hometasks – Google Диск - Mozilla Firefox
New Tab
Мой диск
DevOps_SP_
Hometasks
OpenNET: ста
Google Пере
New Tab
How to use Quo
Настройка
How to save
https://drive.google.com/drive/folders/1adqzkrMfvGp0rCxHQFx0j18SX52Cow8C
task4_7.docx
Открыть в приложении "Googl...

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Note: if /home is not a mount point, then the **mount** and **quotaon** commands should be called with respect to the root partition /.

Note 2: Please, put into your report screenshots of your terminal window with

mc [utest@yevhen-Lenovo-ideapad-320-15ISK]:/

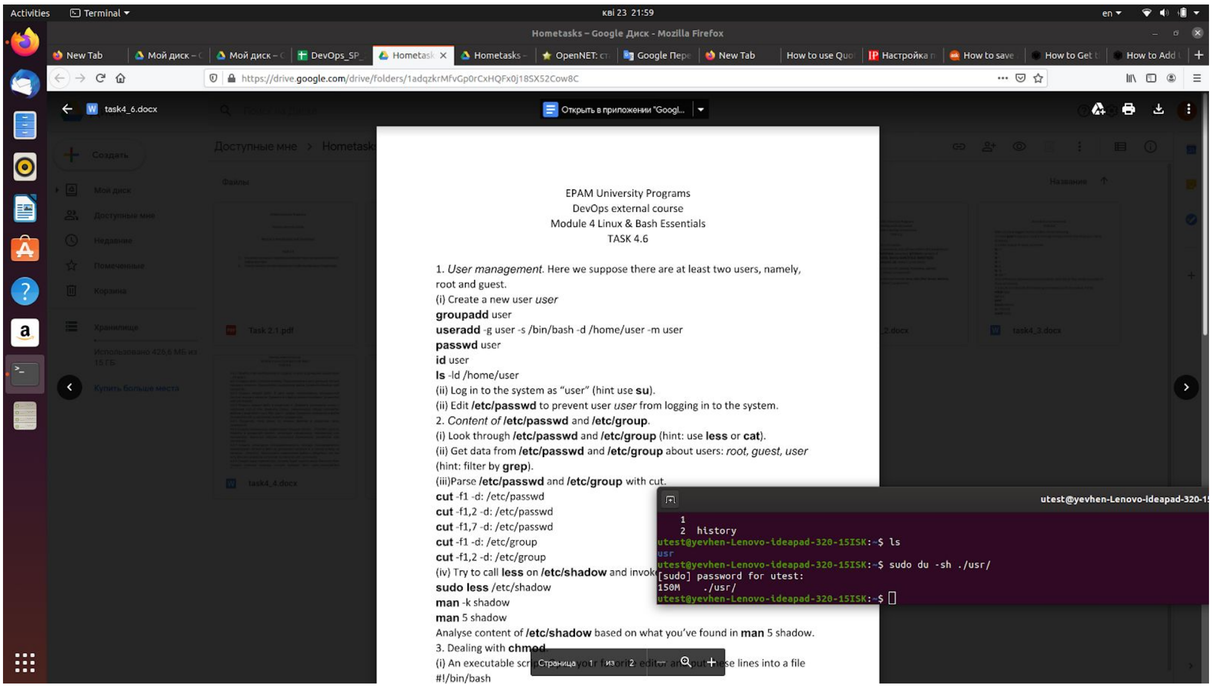
```
 Left     File     Command     Options     Right
┌<─ ~ ──────────────────────────────.[^]>┐┌<─ / ───────────────────────────────────.[^]>┐
 .n               Name        Size   Modify time  .n           Name          Size   Modify time
 /..                        UP--DIR  кві 23 21:12  ~bin                          7  кві  3 21:12
 /.cache                       4096  кві 23 21:46  /boot                      4096  кві  8 11:30
 /.config                      4096  кві 23 21:46  /cdrom                     4096  кві  3 21:15
 /.local                       4096  кві 23 21:46  /dev                       4540  кві 23 21:26
  .bash_logout                  220  тра  5  2019  /etc                      12288  кві 23 21:19
  .bashrc                      3771  тра  5  2019  /home                      4096  кві 23 21:12
  .profile                                                                       7  кві  3 21:12
                                                                                 9  кві  3 21:12
                                                                                 9  кві  3 21:12
                                                                                10  кві  3 21:12
                                                                             16384  кві  3 21:12
                                                                              4096  кві  3 21:40
                                                                              4096  жов 17  2019
                                                                              4096  кві  9 17:20
                                                                                 0  кві 23 21:26
                                                                              4096  кві  9 17:19
                                                                              1000  кві 23 21:27
                                                                                 8  кві  3 21:12
                                                                              4096  кві  3 22:35
                                                                              4096  жов 17  2019
                                                                                 0  кві 23 21:26
                                                                              4096  кві 23 21:46
                                                   /usr                       4096  жов 17  2019
                                                   /var                       4096  жов 17  2019
                                                    aquota.group             10240  кві 23 21:34
                                                    aquota.user              10240  кві 23 21:34
 UP--DIR                                            /usr
                              77G/234G (32%)                                  77G/234G (32%)

                 ┌──────────────────────── Copy ────────────────────────┐
                 │ Source                                               │
                 │ NotoSerifCJK-Bold.ttc                                │
                 │ Target                                               │
                 │ /home/utest/usr/share/                               │
                 │   [█                                        ]   1%   │
                 │   [█                                        ]   2%   │
                 │ Files processed: 11481/189261                        │
                 │ Time: 0:00.09 ETA 0:06.19 (13,29 MB/s)               │
                 │          [ Skip ] [ Suspend ] [ Abort ]              │
                 └──────────────────────────────────────────────────────┘

          ┌──────────────────────── Error ────────────────────────┐
          │ Cannot write target file "/home/utest/usr~ifCJK-Bold.ttc" │
          │            Disk quota exceeded (122)                  │
          │   [ Skip ]  [ Skip all ]  [ Retry ]  [ Abort ]        │
          └───────────────────────────────────────────────────────┘

Hint: Want your plain shell? Press C-o, and get back to MC with C-o again.
utest@yevhen-Lenovo-ideapad-320-15ISK:/$                                              [^]
 1Help  2Menu  3View  4Edit  5Copy  6RenMov  7Mkdir  8Delete  9PullDn  10Quit
```

invoke it twice:



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

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

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

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

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

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

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

cut -f1 -d: /etc/passwd

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

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

cut -f1 -d: /etc/group

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

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

sudo less /etc/shadow

man -k shadow

man 5 shadow

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

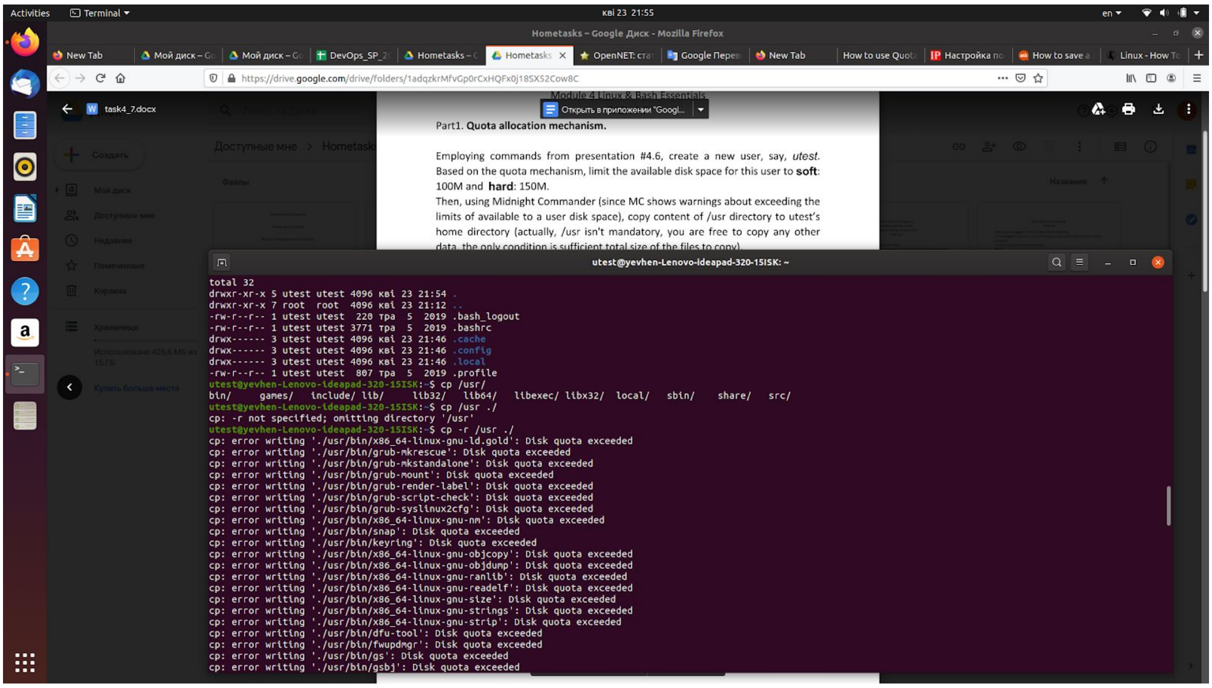
3. Dealing with **chmod**.

(i) An executable scr[…]your favorite editor and put these lines into a file

#!/bin/bash

utest@yevhen-Lenovo-ideapad-320-15ISK

```
    1
    2  history
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ ls
usr
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo du -sh ./usr/
[sudo] password for utest:
150M    ./usr/
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```


Hometasks – Google Диск - Mozilla Firefox
task4_7.docx
Module 4 Linux & Bash Essentials
Открыть в приложении "Googl...
utest@yevhen-Lenovo-ideapad-320-15ISK: ~

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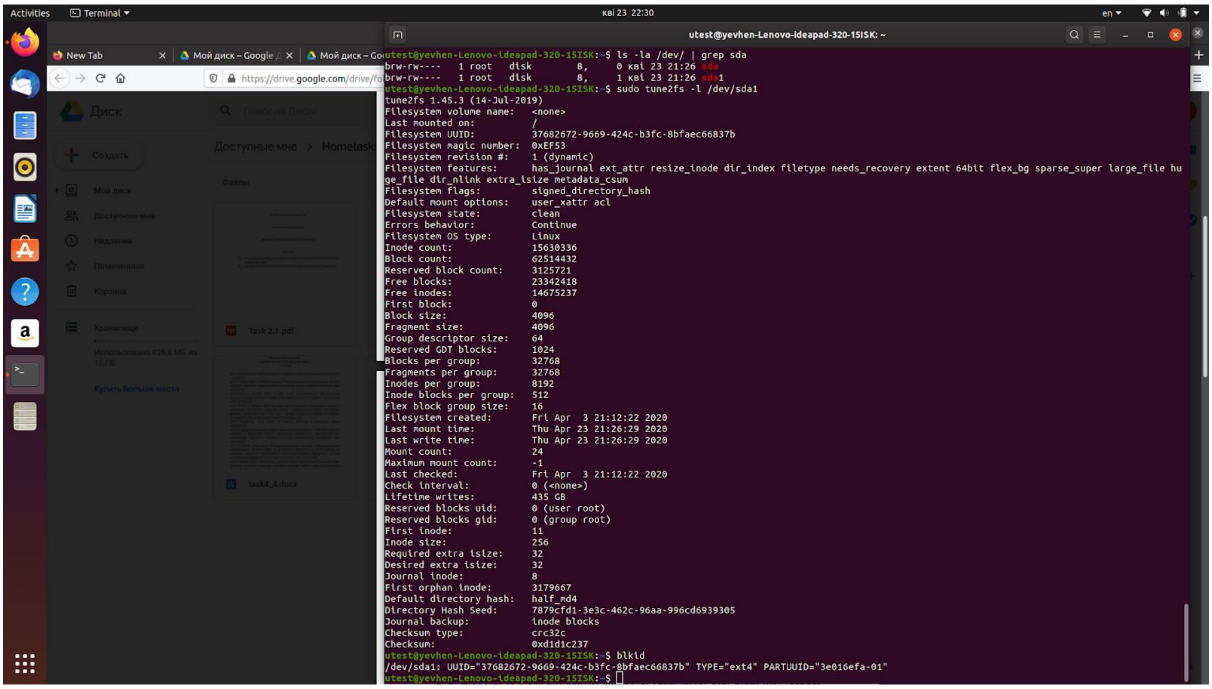
Employing commands from presentation #4.6, create a new user, say, *utest*. Based on the quota mechanism, limit the available disk space for this user to **soft**: 100M and **hard**: 150M.
Then, using Midnight Commander (since MC shows warnings about exceeding the limits of available to a user disk space), copy content of /usr directory to utest's home directory (actually, /usr isn't mandatory, you are free to copy any other data, the only condition is sufficient total size of the files to copy).

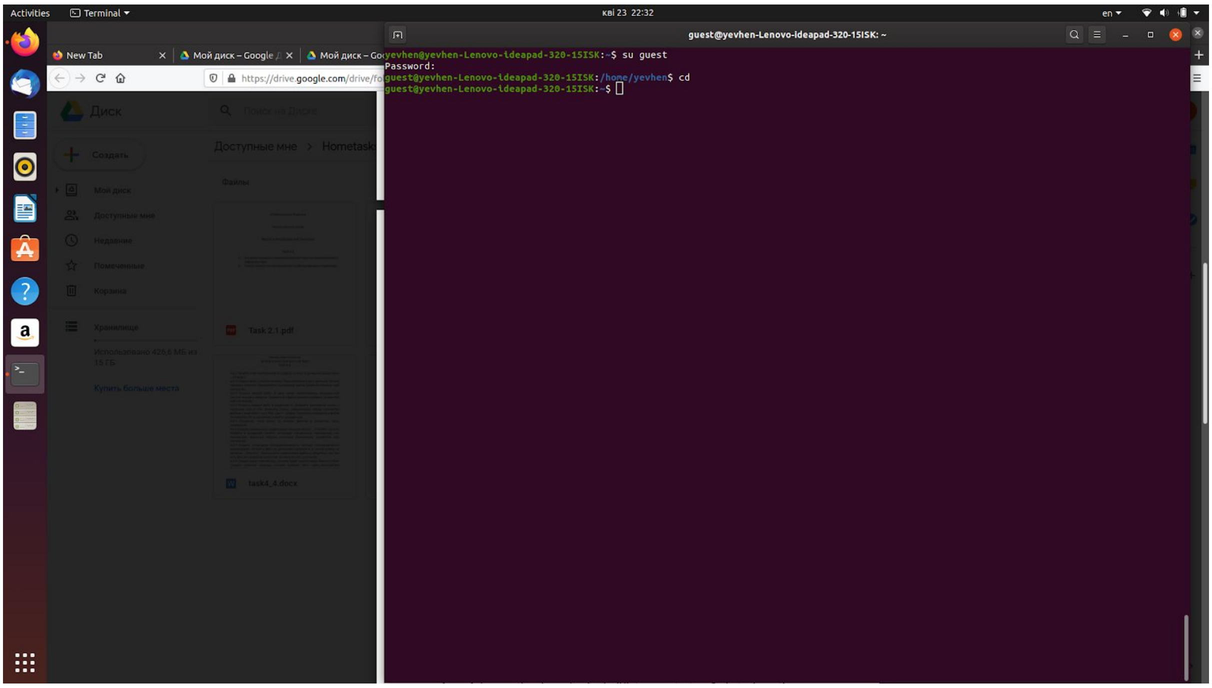
```
total 32
drwxr-xr-x 5 utest utest 4096 кві 23 21:54 .
drwxr-xr-x 7 root  root  4096 кві 23 21:12 ..
-rw-r--r-- 1 utest utest  220 тра  5  2019 .bash_logout
-rw-r--r-- 1 utest utest 3771 тра  5  2019 .bashrc
drwx------ 3 utest utest 4096 кві 23 21:46 .cache
drwx------ 3 utest utest 4096 кві 23 21:46 .config
drwx------ 3 utest utest 4096 кві 23 21:46 .local
-rw-r--r-- 1 utest utest  807 тра  5  2019 .profile
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ cp /usr/
bin/     games/   include/ lib/     lib32/   lib64/   libexec/ libx32/  local/   sbin/    share/   src/
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ cp /usr ./
cp: -r not specified; omitting directory '/usr'
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ cp -r /usr ./
cp: error writing './usr/bin/x86_64-linux-gnu-ld.gold': Disk quota exceeded
cp: error writing './usr/bin/grub-mkrescue': Disk quota exceeded
cp: error writing './usr/bin/grub-mkstandalone': Disk quota exceeded
cp: error writing './usr/bin/grub-mount': Disk quota exceeded
cp: error writing './usr/bin/grub-render-label': Disk quota exceeded
cp: error writing './usr/bin/grub-script-check': Disk quota exceeded
cp: error writing './usr/bin/grub-syslinux2cfg': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-nm': Disk quota exceeded
cp: error writing './usr/bin/snap': Disk quota exceeded
cp: error writing './usr/bin/keyring': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-objcopy': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-objdump': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-ranlib': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-readelf': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-size': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-strings': Disk quota exceeded
cp: error writing './usr/bin/x86_64-linux-gnu-strip': Disk quota exceeded
cp: error writing './usr/bin/dfu-tool': Disk quota exceeded
cp: error writing './usr/bin/fwupdmgr': Disk quota exceeded
cp: error writing './usr/bin/gs': Disk quota exceeded
cp: error writing './usr/bin/gsbj': Disk quota exceeded
```

2. Access Control Lists, ACLs

2.1. Check if the “acl” flag is on.

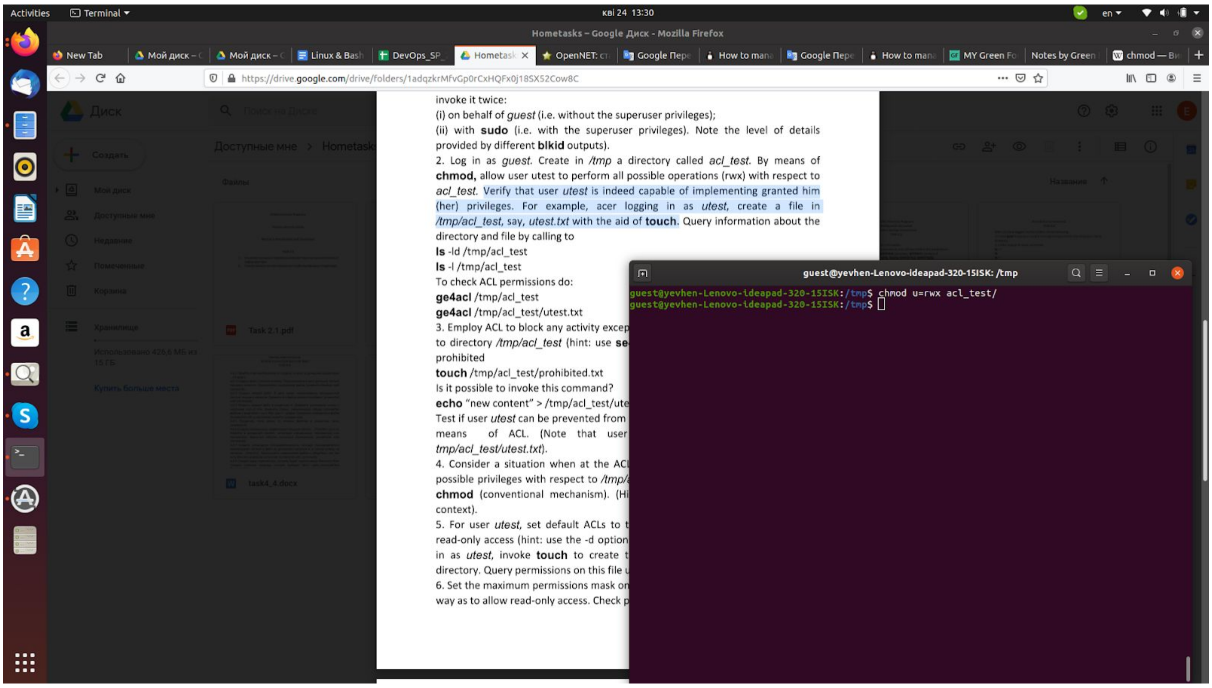


```
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ ls -la /dev/ | grep sda
brw-rw----   1 root   disk        8,     0 кві 23 21:26 sda
brw-rw----   1 root   disk        8,     1 кві 23 21:26 sda1
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ sudo tune2fs -l /dev/sda1
tune2fs 1.45.3 (14-Jul-2019)
Filesystem volume name:   <none>
Last mounted on:          /
Filesystem UUID:          37682672-9669-424c-b3fc-8bfaec66837b
Filesystem magic number:  0xEF53
Filesystem revision #:    1 (dynamic)
Filesystem features:      has_journal ext_attr resize_inode dir_index filetype needs_recovery extent 64bit flex_bg sparse_super large_file hu
ge_file dir_nlink extra_isize metadata_csum
Filesystem flags:         signed_directory_hash
Default mount options:    user_xattr acl
Filesystem state:         clean
Errors behavior:          Continue
Filesystem OS type:       Linux
Inode count:              15630336
Block count:              62514432
Reserved block count:     3125721
Free blocks:              23342418
Free inodes:              14675237
First block:              0
Block size:               4096
Fragment size:            4096
Group descriptor size:    64
Reserved GDT blocks:      1024
Blocks per group:         32768
Fragments per group:      32768
Inodes per group:         8192
Inode blocks per group:   512
Flex block group size:    16
Filesystem created:       Fri Apr  3 21:12:22 2020
Last mount time:          Thu Apr 23 21:26:29 2020
Last write time:          Thu Apr 23 21:26:29 2020
Mount count:              24
Maximum mount count:      -1
Last checked:             Fri Apr  3 21:12:22 2020
Check interval:           0 (<none>)
Lifetime writes:          435 GB
Reserved blocks uid:      0 (user root)
Reserved blocks gid:      0 (group root)
First inode:              11
Inode size:               256
Required extra isize:     32
Desired extra isize:      32
Journal inode:            8
First orphan inode:       3179667
Default directory hash:   half_md4
Directory Hash Seed:      7879cfd1-3e3c-462c-96aa-996cd6939305
Journal backup:           inode blocks
Checksum type:            crc32c
Checksum:                 0xd1d1c237
utest@yevhen-Lenovo-ideapad-320-15ISK:~$ blkid
/dev/sda1: UUID="37682672-9669-424c-b3fc-8bfaec66837b" TYPE="ext4" PARTUUID="3e016efa-01"
utest@yevhen-Lenovo-ideapad-320-15ISK:~$
```



```
yevhen@yevhen-Lenovo-ideapad-320-15ISK:~$ su guest
Password:
guest@yevhen-Lenovo-ideapad-320-15ISK:/home/yevhen$ cd
guest@yevhen-Lenovo-ideapad-320-15ISK:~$ 
```

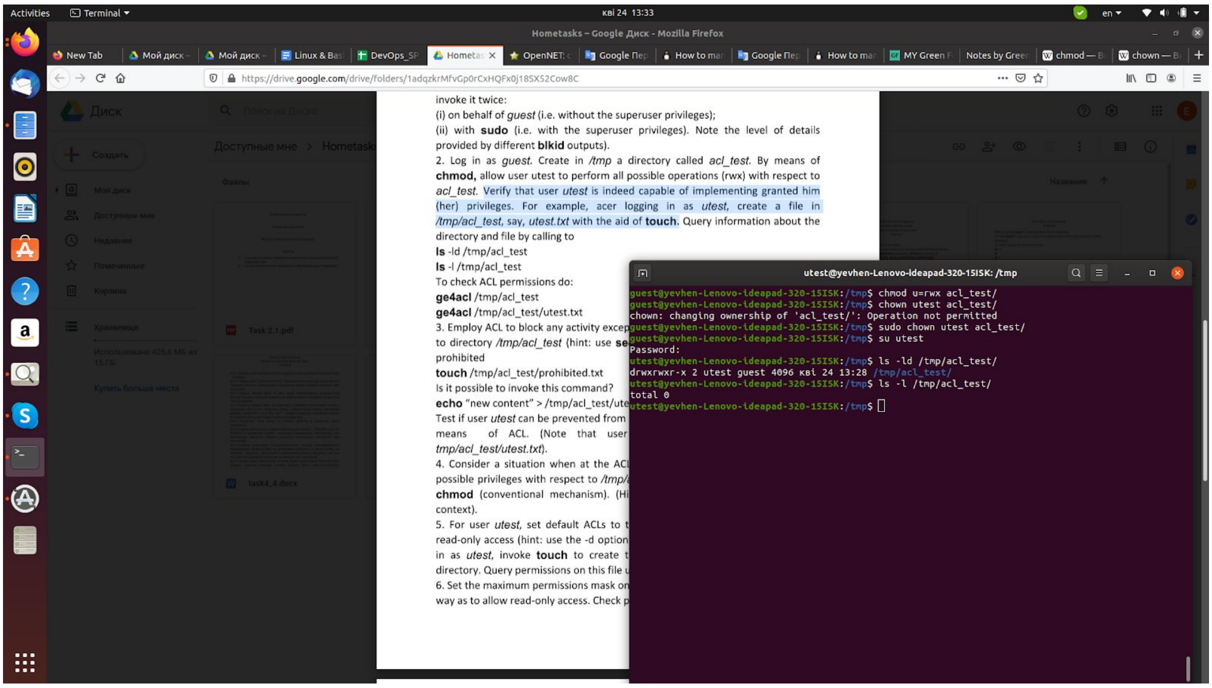
2.2 allow user utest to perform all possible operations



Activities
Terminal
кві 24 13:30
Hometasks – Google Диск - Mozilla Firefox
guest@yevhen-Lenovo-Ideapad-320-15ISK: /tmp

invoke it twice:
(i) on behalf of *guest* (i.e. without the superuser privileges);
(ii) with **sudo** (i.e. with the superuser privileges). Note the level of details provided by different **blkid** outputs).
2. Log in as *guest*. Create in */tmp* a directory called *acl_test*. By means of **chmod,** allow user utest to perform all possible operations (rwx) with respect to *acl_test*. Verify that user *utest* is indeed capable of implementing granted him (her) privileges. For example, acer logging in as *utest*, create a file in */tmp/acl_test*, say, *utest.txt* with the aid of **touch**. Query information about the directory and file by calling to
ls -ld /tmp/acl_test
ls -l /tmp/acl_test
To check ACL permissions do:
ge4acl /tmp/acl_test
ge4acl /tmp/acl_test/utest.txt
3. Employ ACL to block any activity excep
to directory */tmp/acl_test* (hint: use **se**
prohibited
touch /tmp/acl_test/prohibited.txt
Is it possible to invoke this command?
echo “new content” > /tmp/acl_test/ute
Test if user *utest* can be prevented from
means of ACL. (Note that user
tmp/acl_test/utest.txt).
4. Consider a situation when at the ACL
possible privileges with respect to */tmp/*
chmod (conventional mechanism). (Hi
context).
5. For user *utest*, set default ACLs to t
read-only access (hint: use the -d option
in as *utest*, invoke **touch** to create t
directory. Query permissions on this file u
6. Set the maximum permissions mask on
way as to allow read-only access. Check p

```
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ chmod u=rwx acl_test/
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```



Activities
Terminal
кві 24 13:33
Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-Ideapad-320-15ISK: /tmp

invoke it twice:
(i) on behalf of *guest* (i.e. without the superuser privileges);
(ii) with **sudo** (i.e. with the superuser privileges). Note the level of details provided by different **blkid** outputs).

2. Log in as *guest*. Create in */tmp* a directory called *acl_test*. By means of **chmod,** allow user utest to perform all possible operations (rwx) with respect to *acl_test*. Verify that user *utest* is indeed capable of implementing granted him (her) privileges. For example, acer logging in as *utest*, create a file in */tmp/acl_test*, say, *utest.txt* with the aid of **touch**. Query information about the directory and file by calling to

ls -ld /tmp/acl_test
ls -l /tmp/acl_test

To check ACL permissions do:

ge4acl /tmp/acl_test
ge4acl /tmp/acl_test/utest.txt

3. Employ ACL to block any activity excep
to directory */tmp/acl_test* (hint: use **se**
prohibited

touch /tmp/acl_test/prohibited.txt

Is it possible to invoke this command?

echo "new content" > /tmp/acl_test/ute

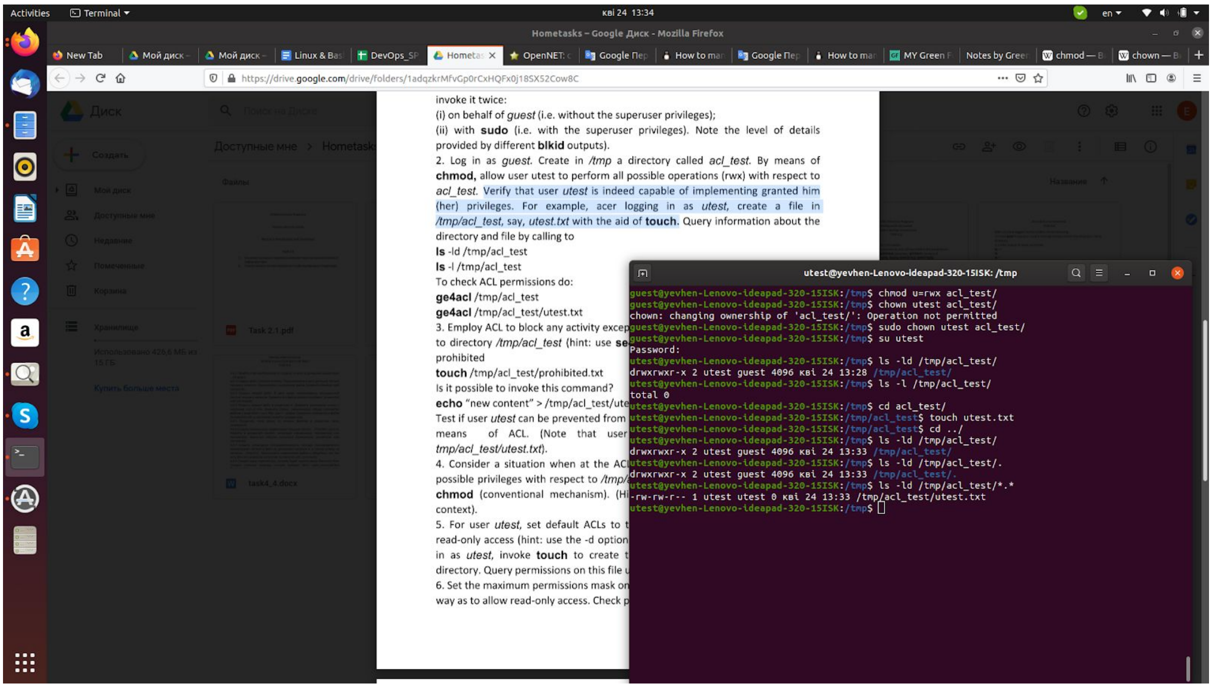
Test if user *utest* can be prevented from
means of ACL. (Note that user
tmp/acl_test/utest.txt).

4. Consider a situation when at the ACl
possible privileges with respect to */tmp/*
chmod (conventional mechanism). (Hi
context).

5. For user *utest*, set default ACLs to t
read-only access (hint: use the -d option
in as *utest*, invoke **touch** to create t
directory. Query permissions on this file u

6. Set the maximum permissions mask on
way as to allow read-only access. Check p

```
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ chmod u=rwx acl_test/
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ chown utest acl_test/
chown: changing ownership of 'acl_test/': Operation not permitted
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ sudo chown utest acl_test/
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ su utest
Password:
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/
drwxrwxr-x 2 utest guest 4096 кві 24 13:28 /tmp/acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -l /tmp/acl_test/
total 0
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```



Activities
Terminal
кві 24 13:34
Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-Ideapad-320-15ISK: /tmp

invoke it twice:
(i) on behalf of *guest* (i.e. without the superuser privileges);
(ii) with **sudo** (i.e. with the superuser privileges). Note the level of details provided by different **blkid** outputs).

2. Log in as *guest*. Create in */tmp* a directory called *acl_test*. By means of **chmod,** allow user utest to perform all possible operations (rwx) with respect to *acl_test*. Verify that user *utest* is indeed capable of implementing granted him (her) privileges. For example, acer logging in as *utest*, create a file in */tmp/acl_test*, say, *utest.txt* with the aid of **touch**. Query information about the directory and file by calling to

ls -ld /tmp/acl_test
ls -l /tmp/acl_test

To check ACL permissions do:

ge4acl /tmp/acl_test
ge4acl /tmp/acl_test/utest.txt

3. Employ ACL to block any activity excep
to directory */tmp/acl_test* (hint: use **se**
prohibited

touch /tmp/acl_test/prohibited.txt

Is it possible to invoke this command?

echo "new content" > /tmp/acl_test/ute

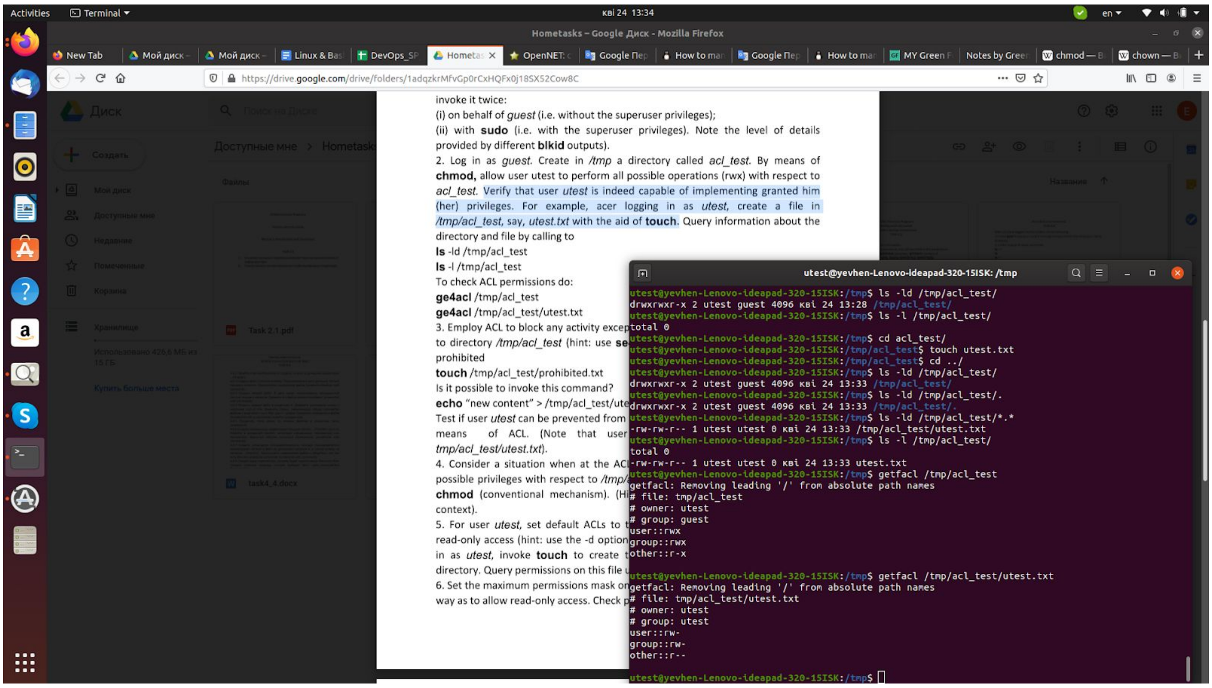
Test if user *utest* can be prevented from
means of ACL. (Note that user
tmp/acl_test/utest.txt).

4. Consider a situation when at the ACl
possible privileges with respect to */tmp/*
chmod (conventional mechanism). (Hi
context).

5. For user *utest*, set default ACLs to t
read-only access (hint: use the -d option
in as *utest*, invoke **touch** to create t
directory. Query permissions on this file u

6. Set the maximum permissions mask on
way as to allow read-only access. Check p

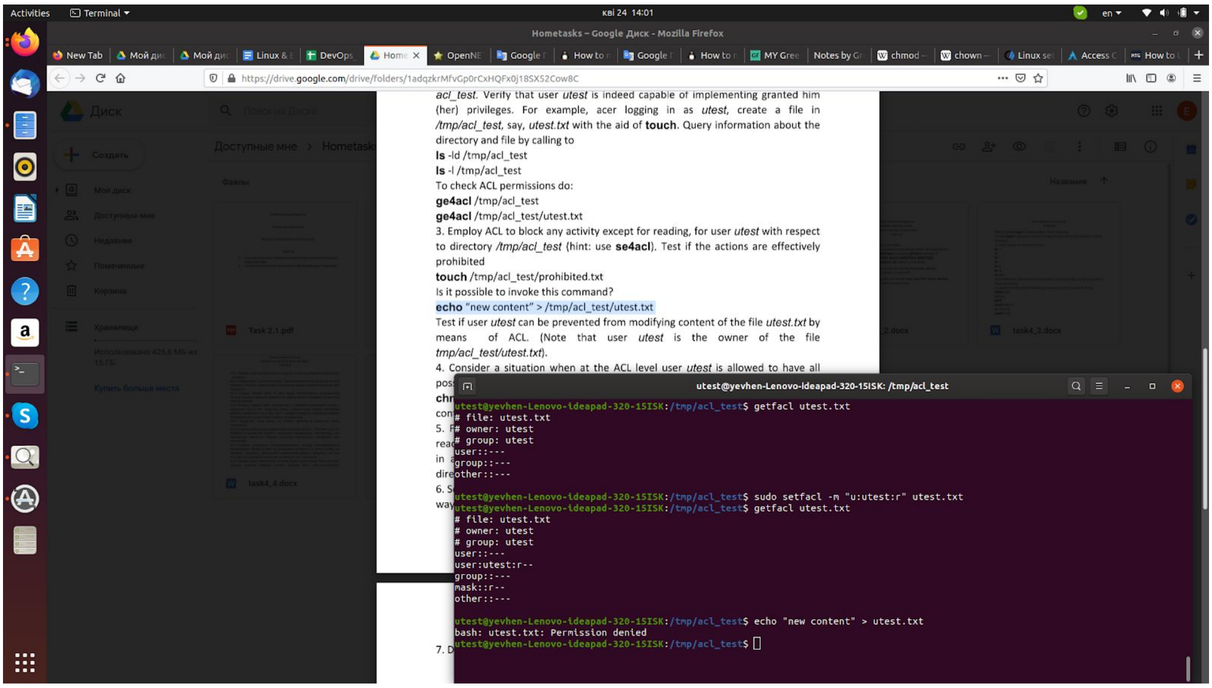
```
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ chmod u=rwx acl_test/
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ chown utest acl_test/
chown: changing ownership of 'acl_test/': Operation not permitted
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ sudo chown utest acl_test/
guest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ su utest
Password:
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/
drwxrwxr-x 2 utest guest 4096 кві 24 13:28 /tmp/acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -l /tmp/acl_test/
total 0
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ cd acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ touch utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ cd ../
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/
drwxrwxr-x 2 utest guest 4096 кві 24 13:33 /tmp/acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/.
drwxrwxr-x 2 utest guest 4096 кві 24 13:33 /tmp/acl_test/.
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/*.*
-rw-rw-r-- 1 utest utest 0 кві 24 13:33 /tmp/acl_test/utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```


кві 24 13:34
Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-Ideapad-320-15ISK: /tmp

invoke it twice:
(i) on behalf of *guest* (i.e. without the superuser privileges);
(ii) with **sudo** (i.e. with the superuser privileges). Note the level of details provided by different **blkid** outputs).
2. Log in as *guest*. Create in */tmp* a directory called *acl_test*. By means of **chmod,** allow user utest to perform all possible operations (rwx) with respect to *acl_test*. Verify that user *utest* is indeed capable of implementing granted him (her) privileges. For example, acer logging in as *utest*, create a file in */tmp/acl_test*, say, *utest.txt* with the aid of **touch**. Query information about the directory and file by calling to
ls -ld /tmp/acl_test
ls -l /tmp/acl_test
To check ACL permissions do:
ge4acl /tmp/acl_test
ge4acl /tmp/acl_test/utest.txt
3. Employ ACL to block any activity excep
to directory */tmp/acl_test* (hint: use **se**
prohibited
touch /tmp/acl_test/prohibited.txt
Is it possible to invoke this command?
echo "new content" > /tmp/acl_test/ute
Test if user *utest* can be prevented from
means of ACL. (Note that user
tmp/acl_test/utest.txt).
4. Consider a situation when at the ACL
possible privileges with respect to */tmp/*
chmod (conventional mechanism). (Hi
context).
5. For user *utest*, set default ACLs to t
read-only access (hint: use the -d option
in as *utest*, invoke **touch** to create t
directory. Query permissions on this file u
6. Set the maximum permissions mask on
way as to allow read-only access. Check p

```
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/
drwxrwxr-x 2 utest guest 4096 кві 24 13:28 /tmp/acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -l /tmp/acl_test/
total 0
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ cd acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ touch utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ cd ../
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/
drwxrwxr-x 2 utest guest 4096 кві 24 13:33 /tmp/acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/.
drwxrwxr-x 2 utest guest 4096 кві 24 13:33 /tmp/acl_test/.
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -ld /tmp/acl_test/*.*
-rw-rw-r-- 1 utest utest 0 кві 24 13:33 /tmp/acl_test/utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ ls -l /tmp/acl_test/
total 0
-rw-rw-r-- 1 utest utest 0 кві 24 13:33 utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl /tmp/acl_test
getfacl: Removing leading '/' from absolute path names
# file: tmp/acl_test
# owner: utest
# group: guest
user::rwx
group::rwx
other::r-x

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl /tmp/acl_test/utest.txt
getfacl: Removing leading '/' from absolute path names
# file: tmp/acl_test/utest.txt
# owner: utest
# group: utest
user::rw-
group::rw-
other::r--

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```

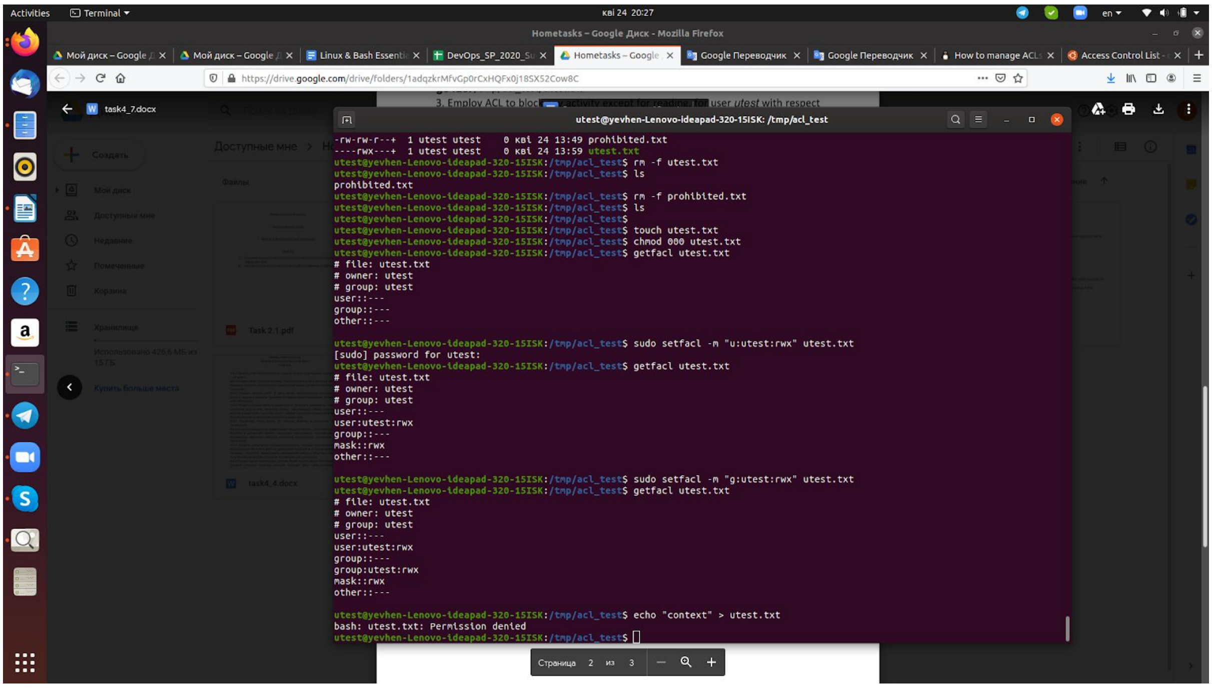
2.3. Employ ACL to block any activity except for reading,


кві 24 14:01
Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-Ideapad-320-15ISK: /tmp/acl_test

acl_test. Verify that user *utest* is indeed capable of implementing granted him (her) privileges. For example, acer logging in as *utest*, create a file in */tmp/acl_test*, say, *utest.txt* with the aid of **touch**. Query information about the directory and file by calling to
ls -ld /tmp/acl_test
ls -l /tmp/acl_test
To check ACL permissions do:
ge4acl /tmp/acl_test
ge4acl /tmp/acl_test/utest.txt
3. Employ ACL to block any activity except for reading, for user *utest* with respect to directory */tmp/acl_test* (hint: use **se4acl**). Test if the actions are effectively prohibited
touch /tmp/acl_test/prohibited.txt
Is it possible to invoke this command?
echo "new content" > /tmp/acl_test/utest.txt
Test if user *utest* can be prevented from modifying content of the file *utest.txt* by means of ACL. (Note that user *utest* is the owner of the file *tmp/acl_test/utest.txt*).
4. Consider a situation when at the ACL level user *utest* is allowed to have all
pos
chr
con
5. F
read
in a
dire
6. S
way
7. D

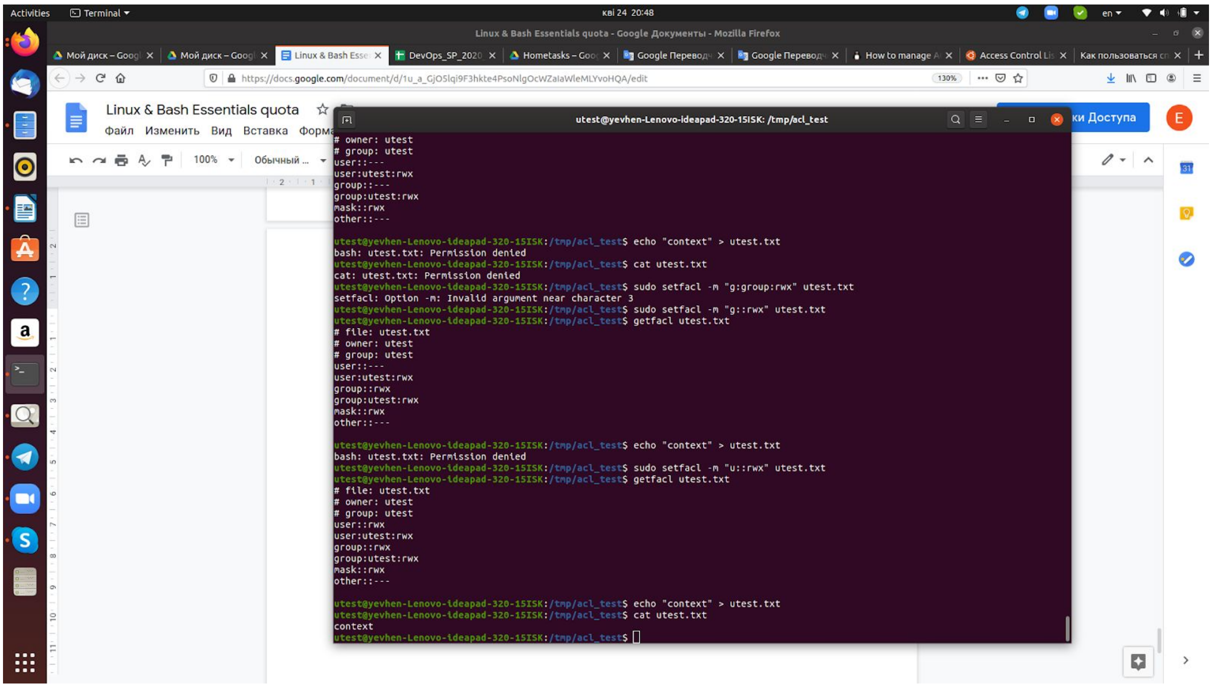
```
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
group::---
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "u:utest:r" utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
user:utest:r--
group::---
mask::r--
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ echo "new content" > utest.txt
bash: utest.txt: Permission denied
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ 
```

2.4. Test setfacl privileges



Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-ideapad-320-15ISK: /tmp/acl_test
Страница 2 из 3

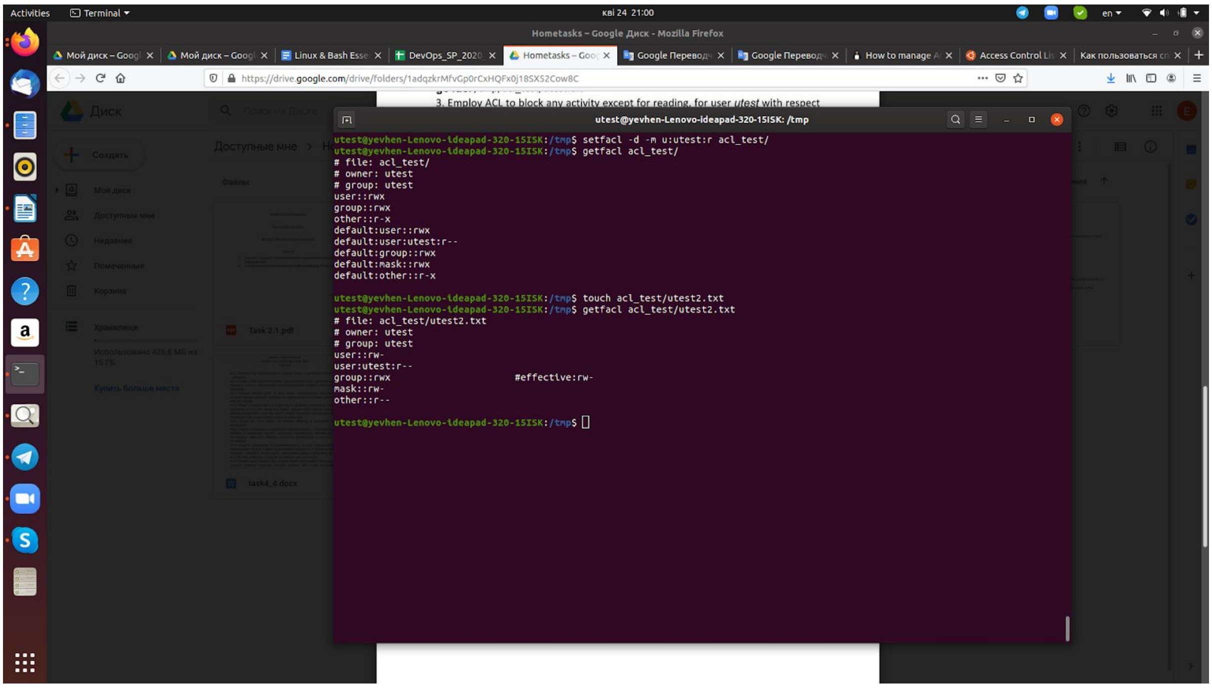
```
-rw-rw-r--+  1 utest utest    0 кві 24 13:49 prohibited.txt
----rwx---+  1 utest utest    0 кві 24 13:59 utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ rm -f utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ ls
prohibited.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ rm -f prohibited.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ ls
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ touch utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ chmod 000 utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
group::---
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "u:utest:rwx" utest.txt
[sudo] password for utest:
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
user:utest:rwx
group::---
mask::rwx
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "g:utest:rwx" utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
user:utest:rwx
group::---
group:utest:rwx
mask::rwx
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ echo "context" > utest.txt
bash: utest.txt: Permission denied
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ 
```



Linux & Bash Essentials quota - Google Документы - Mozilla Firefox
utest@yevhen-Lenovo-ideapad-320-15ISK: /tmp/acl_test

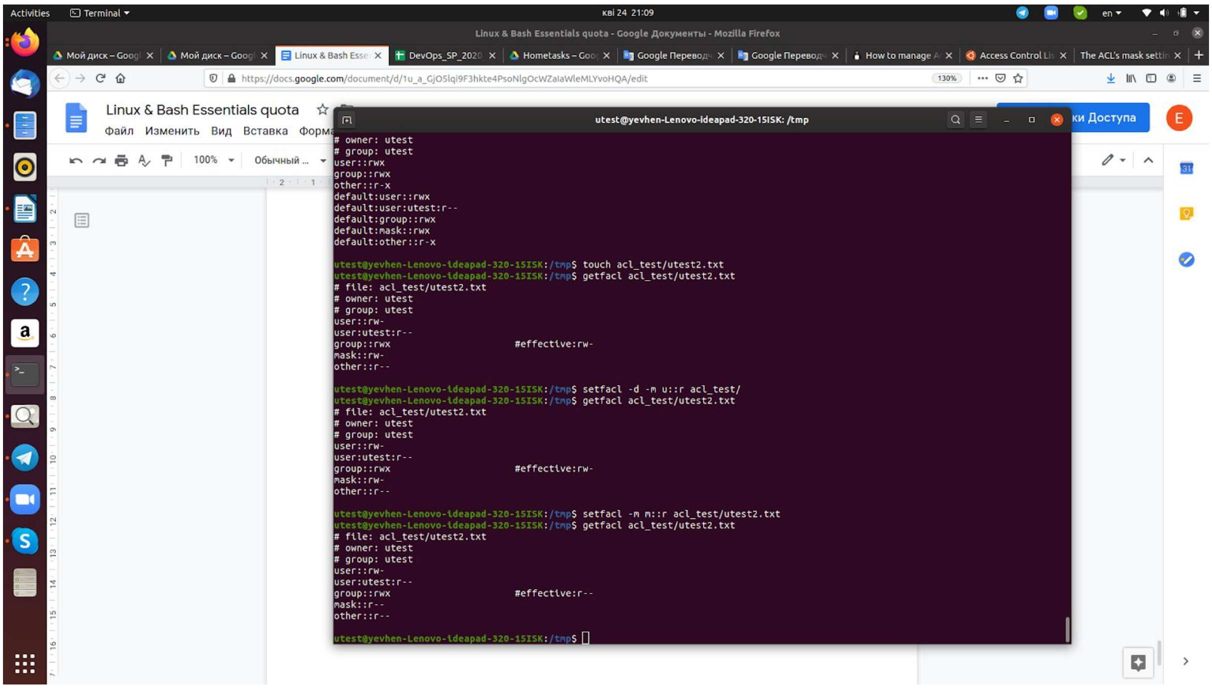
```
# owner: utest
# group: utest
user::---
user:utest:rwx
group::---
group:utest:rwx
mask::rwx
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ echo "context" > utest.txt
bash: utest.txt: Permission denied
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ cat utest.txt
cat: utest.txt: Permission denied
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "g:group:rwx" utest.txt
setfacl: Option -m: Invalid argument near character 3
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "g::rwx" utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::---
user:utest:rwx
group::rwx
group:utest:rwx
mask::rwx
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ echo "context" > utest.txt
bash: utest.txt: Permission denied
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ sudo setfacl -m "u::rwx" utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ getfacl utest.txt
# file: utest.txt
# owner: utest
# group: utest
user::rwx
user:utest:rwx
group::rwx
group:utest:rwx
mask::rwx
other::---

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ echo "context" > utest.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ cat utest.txt
context
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp/acl_test$ 
```

2.5. Query permissions on file using setfacl and checked it with getfacl



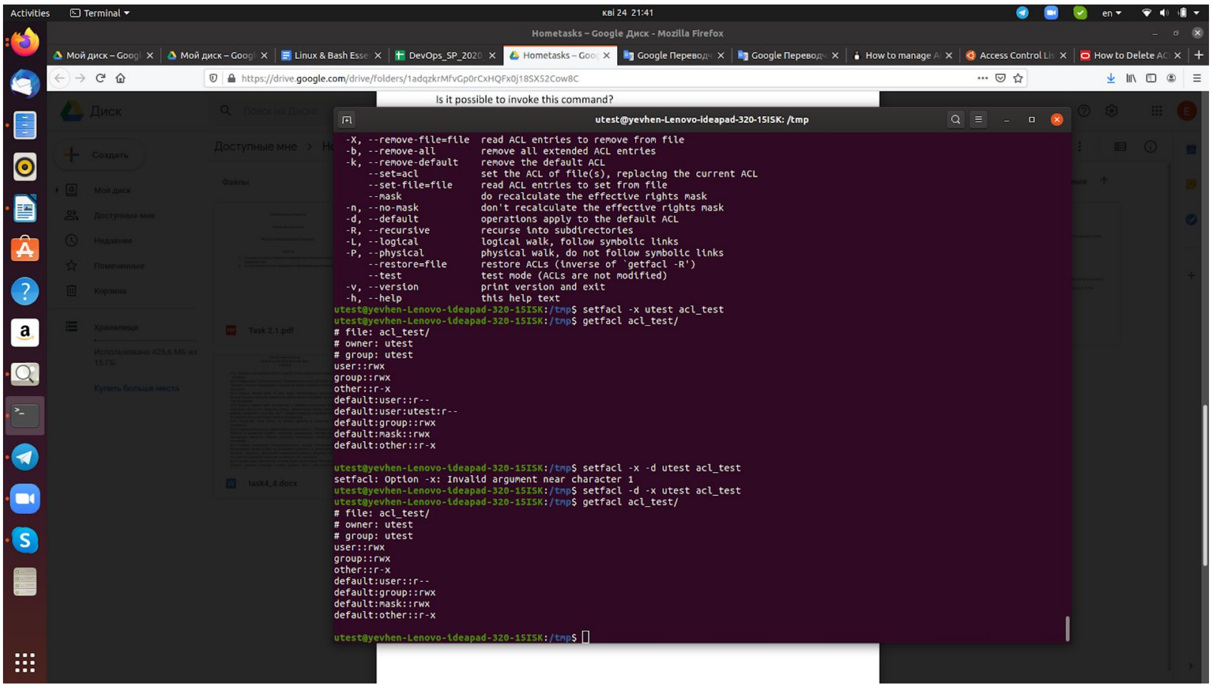
```
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -d -m u:utest:r acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/
# file: acl_test/
# owner: utest
# group: utest
user::rwx
group::rwx
other::r-x
default:user::rwx
default:user:utest:r--
default:group::rwx
default:mask::rwx
default:other::r-x

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ touch acl_test/utest2.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/utest2.txt
# file: acl_test/utest2.txt
# owner: utest
# group: utest
user::rw-
user:utest:r--
group::rwx                      #effective:rw-
mask::rw-
other::r--

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```

2.6. Set the maximum permissions mask and check



```
# owner: utest
# group: utest
user::rwx
group::rwx
other::r-x
default:user::rwx
default:user:utest:r--
default:group::rwx
default:mask::rwx
default:other::r-x

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ touch acl_test/utest2.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/utest2.txt
# file: acl_test/utest2.txt
# owner: utest
# group: utest
user::rw-
user:utest:r--
group::rwx                      #effective:rw-
mask::rw-
other::r--

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -d -m u::r acl_test/
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/utest2.txt
# file: acl_test/utest2.txt
# owner: utest
# group: utest
user::rw-
user:utest:r--
group::rwx                      #effective:rw-
mask::rw-
other::r--

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -m m::r acl_test/utest2.txt
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/utest2.txt
# file: acl_test/utest2.txt
# owner: utest
# group: utest
user::rw-
user:utest:r--
group::rwx                      #effective:r--
mask::r--
other::r--

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```

2.7. Delete all ACL entries relative to the /tmp/acl_test directory.


Activities
Terminal
Hometasks – Google Диск - Mozilla Firefox
utest@yevhen-Lenovo-ideapad-320-15ISK: /tmp

Is it possible to invoke this command?

```
  -X, --remove-file=file  read ACL entries to remove from file
  -b, --remove-all        remove all extended ACL entries
  -k, --remove-default    remove the default ACL
      --set=acl           set the ACL of file(s), replacing the current ACL
      --set-file=file     read ACL entries to set from file
      --mask              do recalculate the effective rights mask
  -n, --no-mask           don't recalculate the effective rights mask
  -d, --default           operations apply to the default ACL
  -R, --recursive         recurse into subdirectories
  -L, --logical           logical walk, follow symbolic links
  -P, --physical          physical walk, do not follow symbolic links
      --restore=file      restore ACLs (inverse of `getfacl -R')
      --test              test mode (ACLs are not modified)
  -v, --version           print version and exit
  -h, --help              this help text
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -x utest acl_test
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/
# file: acl_test/
# owner: utest
# group: utest
user::rwx
group::rwx
other::r-x
default:user::r--
default:user:utest:r--
default:group::rwx
default:mask::rwx
default:other::r-x

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -x -d utest acl_test
setfacl: Option -x: Invalid argument near character 1
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ setfacl -d -x utest acl_test
utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ getfacl acl_test/
# file: acl_test/
# owner: utest
# group: utest
user::rwx
group::rwx
other::r-x
default:user::r--
default:group::rwx
default:mask::rwx
default:other::r-x

utest@yevhen-Lenovo-ideapad-320-15ISK:/tmp$ 
```