

Домашняя работа № 6

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Изучение свойств блочных устройств

```
vagrant@ubuntu:~$ script typescript.txt
Script started, output log file is 'typescript.txt'.
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn" 22:58 02-июл-25

```
vagrant@ubuntu:~$ script typescript.txt
Script started, output log file is 'typescript.txt'.
vagrant@ubuntu:~$ ls -l /dev/sda{,1}
ls: command not found
vagrant@ubuntu:~$ ls -l /dev/sda{,1}
brw-rw---- 1 root disk 8, 0 Jul  2 17:32 /dev/sda
brw-rw---- 1 root disk 8, 1 Jul  2 17:31 /dev/sda1
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn" 22:58 02-июл-25

```
vagrant@ubuntu:~$ script typescript.txt
Script started, output log file is 'typescript.txt'.
vagrant@ubuntu:~$ $ ls -l /dev/sda{,[123]}
$: command not found
vagrant@ubuntu:~$ ls -l /dev/sda{,[123]}
brw-rw---- 1 root disk 8, 0 Jul  2 17:32 /dev/sda
brw-rw---- 1 root disk 8, 1 Jul  2 17:31 /dev/sda1
vagrant@ubuntu:~$ lsblk --list
NAME MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
loop0  7:0    0 63.8M  1 loop /snap/core20/2599
loop1  7:1    0 89.4M  1 loop /snap/lxd/31333
loop2  7:2    0 63.8M  1 loop /snap/core20/2582
loop3  7:3    0 50.9M  1 loop /snap/snapd/24671
loop4  7:4    0 73.9M  1 loop /snap/core22/2010
loop5  7:5    0 31.6M  1 loop /snap/nvim/3953
sda     8:0    0  40G   0 disk
sda1    8:1    0  40G   0 part /
sdb     8:16   0 10M   0 disk
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 22:59 02-июл-25

```
vagrant@ubuntu:~$ script typescript.txt
Script started, output log file is 'typescript.txt'.
vagrant@ubuntu:~$ $ ls -l /dev/sda{,[123]}
$: command not found
vagrant@ubuntu:~$ ls -l /dev/sda{,[123]}
brw-rw---- 1 root disk 8, 0 Jul  2 17:32 /dev/sda
brw-rw---- 1 root disk 8, 1 Jul  2 17:31 /dev/sda1
vagrant@ubuntu:~$ lsblk --list
NAME MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
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loop2  7:2    0 63.8M  1 loop /snap/core20/2582
loop3  7:3    0 50.9M  1 loop /snap/snapd/24671
loop4  7:4    0 73.9M  1 loop /snap/core22/2010
loop5  7:5    0 31.6M  1 loop /snap/nvim/3953
sda     8:0    0  40G   0 disk
sda1    8:1    0  40G   0 part /
sdb     8:16   0 10M   0 disk
vagrant@ubuntu:~$ cat /proc/diskstats
 7      0 loop0 233 0 4454 37 0 0 0 0 0 160 37 0 0 0 0 0
 7      1 loop1 69 0 2232 19 0 0 0 0 0 40 19 0 0 0 0 0
 7      2 loop2 43 0 692 21 0 0 0 0 0 36 21 0 0 0 0 0
 7      3 loop3 1974 0 157732 107 0 0 0 0 0 3464 107 0 0 0 0 0
 7      4 loop4 68 0 2688 0 0 0 0 0 0 88 0 0 0 0 0 0
 7      5 loop5 160 0 5864 2 0 0 0 0 0 180 2 0 0 0 0 0
 7      6 loop6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 7      7 loop7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 8      0 sda 6200 1981 496488 1462 4517 4167 309650 2575 0 5472 4038 0 0 0 0 0
 8      1 sda1 6070 1981 492936 1445 4517 4167 309650 2575 0 5420 4021 0 0 0 0 0
 8      16 sdb 361 0 6348 64 0 0 0 0 0 132 64 0 0 0 0 0
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 22:59 02-июл-25

Создание файла-образа

```
vagrant@ubuntu:~$ dd if=/dev/zero of=./fs.img bs=1M count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB, 10 MiB) copied, 0.00283663 s, 3.7 GB/s
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 23:01 02-июл-25

```
Qp. 2 more 2001
vagrant@ubuntu:~$ dd if=/dev/zero of=./fs.img bs=1M count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB, 10 MiB) copied, 0.00283663 s, 3.7 GB/s
vagrant@ubuntu:~$ losetup --find --show ./fs.img
losetup: ./fs.img: failed to set up loop device: Permission denied
vagrant@ubuntu:~$ sudo losetup --find --show ./fs.img
/dev/loop6
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 23:01 02-июл-25

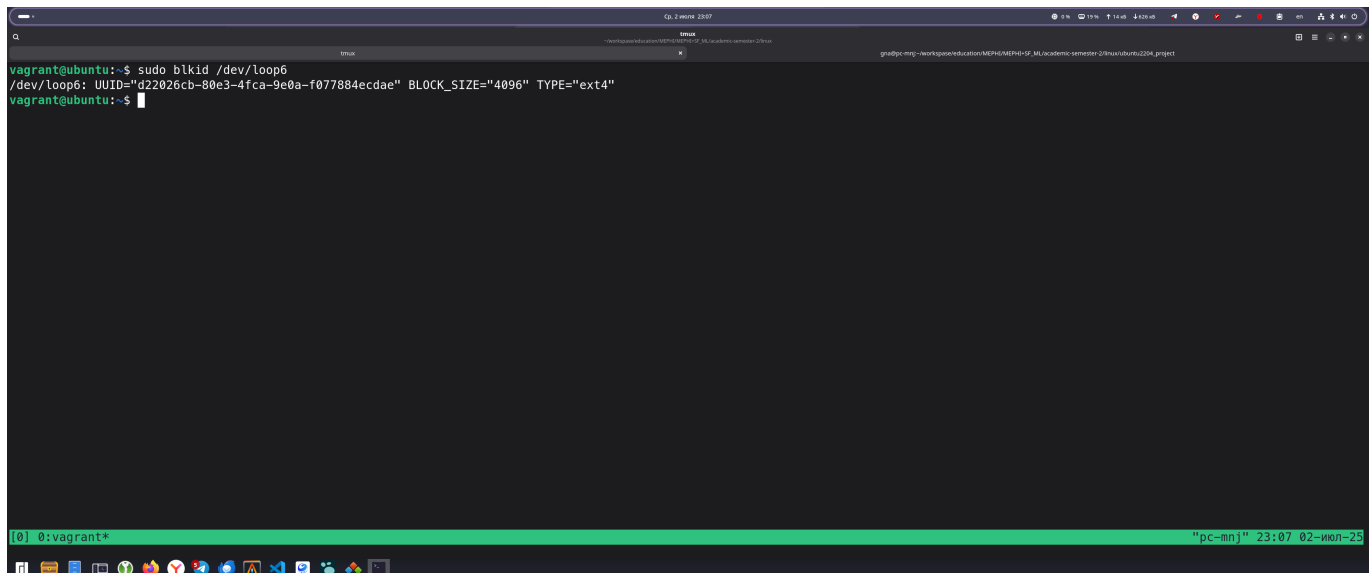
```
Qp. 2 more 2002
vagrant@ubuntu:~$ dd if=/dev/zero of=./fs.img bs=1M count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB, 10 MiB) copied, 0.00283663 s, 3.7 GB/s
vagrant@ubuntu:~$ losetup --find --show ./fs.img
losetup: ./fs.img: failed to set up loop device: Permission denied
vagrant@ubuntu:~$ sudo losetup --find --show ./fs.img
/dev/loop6
vagrant@ubuntu:~$ sudo losetup --list
NAME          SIZELIMIT OFFSET  AUTOCLEAR RO BACK-FILE          DIO LOG-SEC
/dev/loop1    0          0      1 1 /var/lib/snapd/snaps/lxd_31333.snap 0      512
/dev/loop6    0          0      0 0 /home/vagrant/fs.img              0      512
/dev/loop4    0          0      1 1 /var/lib/snapd/snaps/core22_2010.snap 0      512
/dev/loop2    0          0      1 1 /var/lib/snapd/snaps/core20_2582.snap 0      512
/dev/loop0    0          0      1 1 /var/lib/snapd/snaps/core20_2599.snap 0      512
/dev/loop5    0          0      1 1 /var/lib/snapd/snaps/nvim_3953.snap  0      512
/dev/loop3    0          0      1 1 /var/lib/snapd/snaps/snapd_24671.snap 0      512
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 23:02 02-июл-25

Создание файловой системы ext4

```
Qp. 3 more 2000
vagrant@ubuntu:~$ sudo mkfs -t ext4 /dev/loop6
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 2560 4k blocks and 2560 inodes
Allocating group tables: done
Writing inode tables: done
Creating journal (1024 blocks): done
Writing superblocks and filesystem accounting information: done
vagrant@ubuntu:~$
```

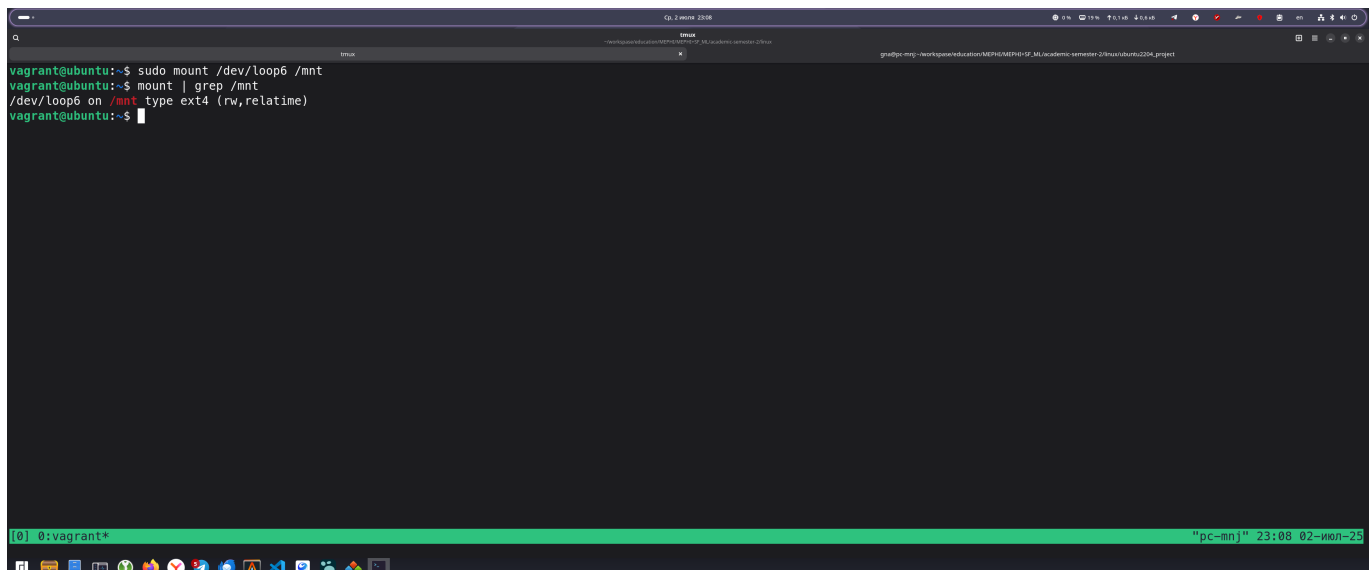
[0] 0:vagrant* "pc-mn]" 23:05 02-июл-25



```
vagrant@ubuntu:~$ sudo blkid /dev/loop6
/dev/loop6: UUID="d22026cb-80e3-4fca-9e0a-f077884ecdae" BLOCK_SIZE="4096" TYPE="ext4"
vagrant@ubuntu:~$
```

The screenshot shows a terminal window with a dark background. The user is at the prompt 'vagrant@ubuntu:~\$'. They enter the command 'sudo blkid /dev/loop6'. The output shows the UUID and block size of the loop device. The terminal has a green status bar at the bottom with the text '[0] 0:vagrant*' and a timestamp '23:07 02-июл-25'.

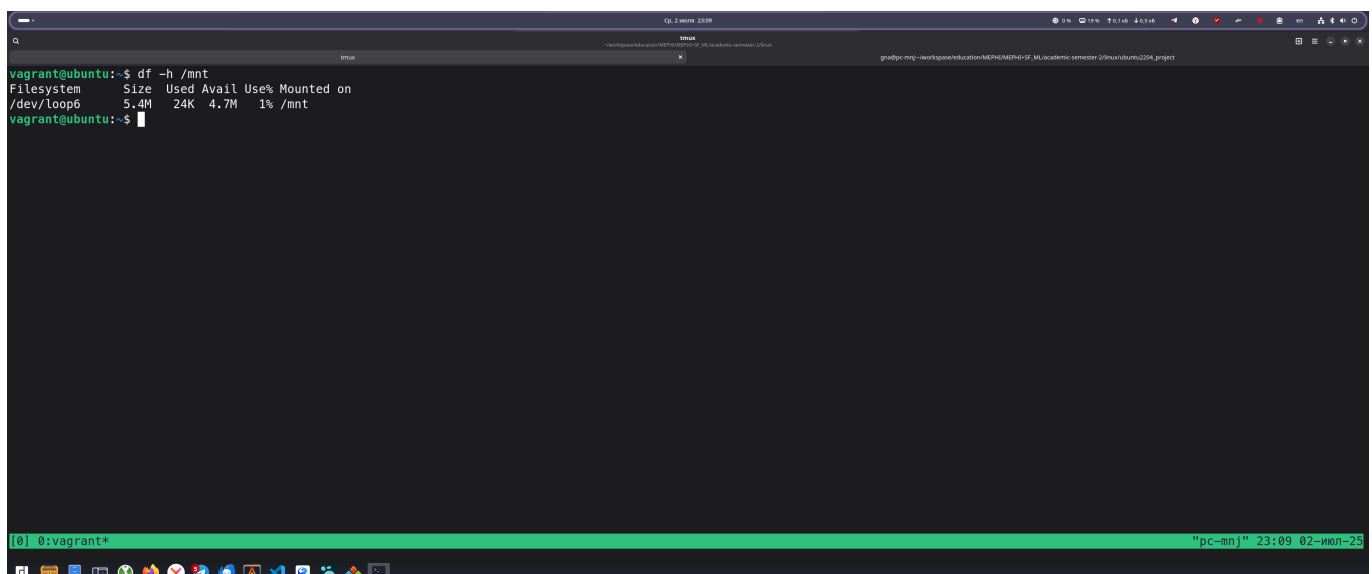
Монтирование файловой системы



```
vagrant@ubuntu:~$ sudo mount /dev/loop6 /mnt
vagrant@ubuntu:~$ mount | grep /mnt
/dev/loop6 on /mnt type ext4 (rw,relatime)
vagrant@ubuntu:~$
```

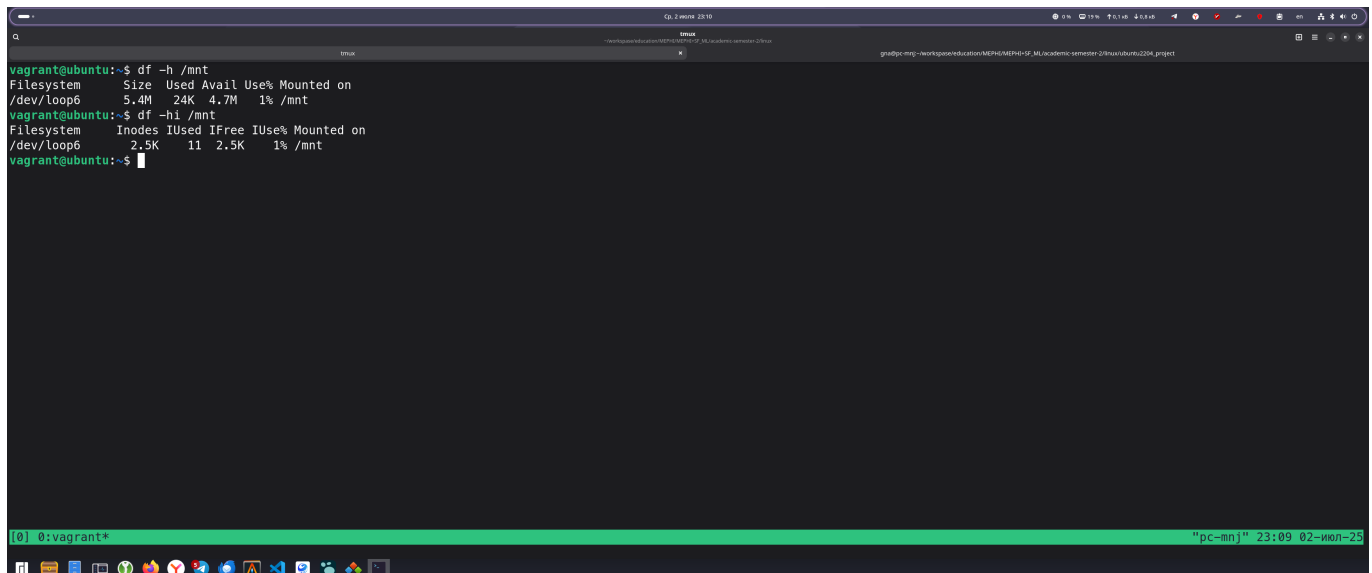
The screenshot shows a terminal window with a dark background. The user is at the prompt 'vagrant@ubuntu:~\$'. They enter the command 'sudo mount /dev/loop6 /mnt'. The output shows the device is mounted on /mnt. They then enter 'mount | grep /mnt' and the output shows the mount details. The terminal has a green status bar at the bottom with the text '[0] 0:vagrant*' and a timestamp '23:08 02-июл-25'.

Мониторинг файловой системы



```
vagrant@ubuntu:~$ df -h /mnt
Filesystem      Size  Used Avail Use% Mounted on
/dev/loop6      5.4M   24K  4.7M   1% /mnt
vagrant@ubuntu:~$
```

The screenshot shows a terminal window with a dark background. The user is at the prompt 'vagrant@ubuntu:~\$'. They enter the command 'df -h /mnt'. The output shows the disk usage of the mounted file system. The terminal has a green status bar at the bottom with the text '[0] 0:vagrant*' and a timestamp '23:09 02-июл-25'.

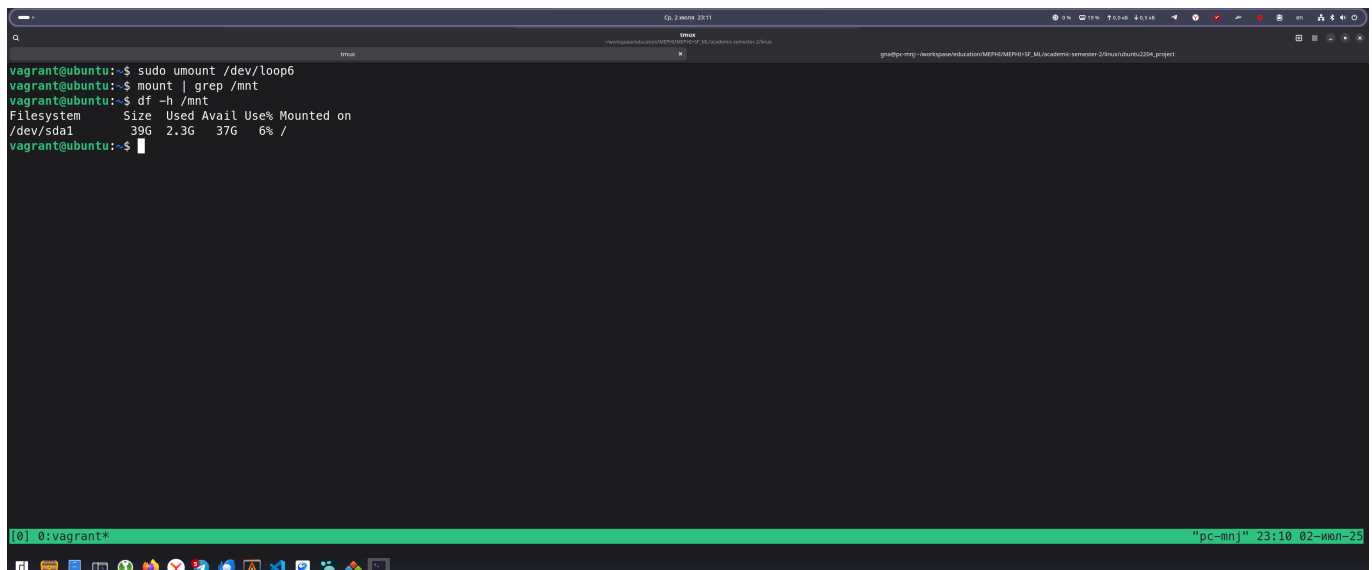


A terminal window titled "Cp_2 more 23:10" showing the output of the `df -h /mnt` and `df -hi /mnt` commands. The first command shows disk usage in human-readable format, and the second shows it in blocks. The output for both commands indicates that the filesystem is `/dev/loop6`, with a size of 5.4M and 2.5K respectively, and it is mounted on `/mnt` with 1% usage.

```
vagrant@ubuntu:~$ df -h /mnt
Filesystem      Size  Used Avail Use% Mounted on
/dev/loop6      5.4M   24K  4.7M   1% /mnt
vagrant@ubuntu:~$ df -hi /mnt
Filesystem      Inodes   IUsed IFree IUse% Mounted on
/dev/loop6      2.5K     11   2.5K    1% /mnt
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 23:09 02-июл-25

Размонтирование

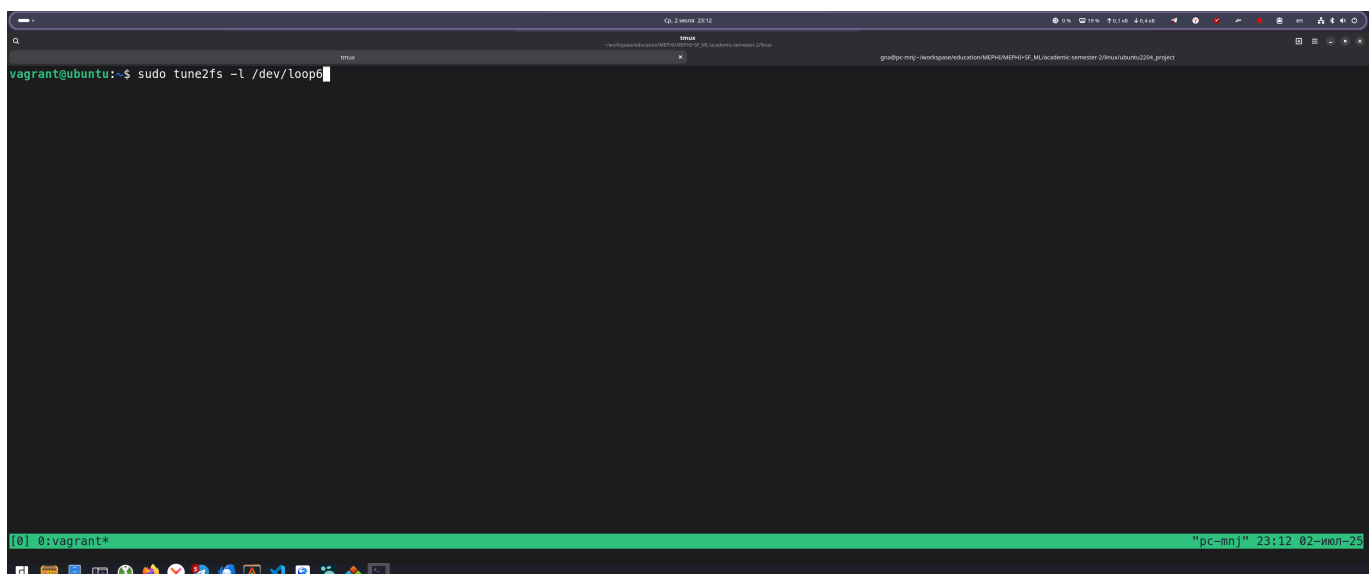


A terminal window titled "Cp_2 more 23:11" showing the execution of `sudo umount /dev/loop6` and `mount | grep /mnt` commands. The `df -h /mnt` command is also run, showing that the filesystem is now `/dev/sda1` with a size of 39G and 2.3G used, mounted on `/` with 6% usage.

```
vagrant@ubuntu:~$ sudo umount /dev/loop6
vagrant@ubuntu:~$ mount | grep /mnt
vagrant@ubuntu:~$ df -h /mnt
Filesystem      Size  Used Avail Use% Mounted on
/dev/sda1       39G   2.3G   37G   6% /
vagrant@ubuntu:~$
```

[0] 0:vagrant* "pc-mn]" 23:10 02-июл-25

Исследование свойств файловой системы



A terminal window titled "Cp_2 more 23:12" showing the execution of the `sudo tune2fs -l /dev/loop6` command. The command is intended to list the superblock information for the filesystem on `/dev/loop6`.

```
vagrant@ubuntu:~$ sudo tune2fs -l /dev/loop6
```

[0] 0:vagrant* "pc-mn]" 23:12 02-июл-25

```
First block: 0
Block size: 4096
Fragment size: 4096
Group descriptor size: 64
Reserved GDT blocks: 1
Blocks per group: 32768
Fragments per group: 32768
Inodes per group: 2560
Inode blocks per group: 160
Flex block group size: 16
Filesystem created: Wed Jul 2 20:05:46 2025
Last mount time: Wed Jul 2 20:08:11 2025
Last write time: Wed Jul 2 20:10:35 2025
Mount count: 1
Maximum mount count: -1
Last checked: Wed Jul 2 20:05:46 2025
Check interval: 0 (<none>)
Lifetime writes: 685 kB
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
Default directory hash: half_md4
Directory Hash Seed: eed3fc53-bc35-48b2-b23a-c04079d7d9d7
Journal backup: inode blocks
Checksum type: crc32c
Checksum: 0x4d8cd538

[0] 0:vagrant* "pc-mn]" 23:12 02-июл-25
```

Освобождение loop-устройства

```
vagrant@ubuntu:~$ sudo losetup --detach /dev/loop6
vagrant@ubuntu:~$ sudo losetup --list
NAME          SIZE LIMIT  OFFSET  AUTO CLEAR  RO  BACK-FILE          DIO  LOG-SEC
/dev/loop1    0          0        1 1 /var/lib/snapd/snaps/lxd_31333.snap 0    512
/dev/loop4    0          0        1 1 /var/lib/snapd/snaps/core22_2010.snap 0    512
/dev/loop2    0          0        1 1 /var/lib/snapd/snaps/core20_2582.snap 0    512
/dev/loop0    0          0        1 1 /var/lib/snapd/snaps/core20_2599.snap 0    512
/dev/loop5    0          0        1 1 /var/lib/snapd/snaps/nvim_3953.snap 0    512
/dev/loop3    0          0        1 1 /var/lib/snapd/snaps/snapd_24671.snap 0    512
vagrant@ubuntu:~$
```