Linux administration

PART 1

```
root@host1:/home/user1# compgen -u
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
systemd-timesync
messagebus
syslog
_apt
tss
uuidd
tcpdump
landscape
pollinate
usbmux
systemd-coredump
user1
lxd
root
nobody
root@host1:/home/user1# _
```

Screenshot 1 – Созданные пользователи в системе

```
 -n, --mindays MIN_DAYS          set minimum number of days before password
                                 change to MIN_DAYS
 -q, --quiet                     quiet mode
 -r, --repository REPOSITORY     change password in REPOSITORY repository
 -R, --root CHROOT_DIR           directory to chroot into
 -S, --status                    report password status on the named account
 -u, --unlock                    unlock the password of the named account
 -w, --warndays WARN_DAYS        set expiration warning days to WARN_DAYS
 -x, --maxdays MAX_DAYS          set maximum number of days before password
                                 change to MAX_DAYS

root@host1:/home/user1# passwd -a
Usage: passwd [options] [LOGIN]

Options:
 -a, --all                       report password status on all accounts
 -d, --delete                    delete the password for the named account
 -e, --expire                    force expire the password for the named account
 -h, --help                      display this help message and exit
 -k, --keep-tokens               change password only if expired
 -i, --inactive INACTIVE         set password inactive after expiration
                                 to INACTIVE
 -l, --lock                      lock the password of the named account
 -n, --mindays MIN_DAYS          set minimum number of days before password
                                 change to MIN_DAYS
 -q, --quiet                     quiet mode
 -r, --repository REPOSITORY     change password in REPOSITORY repository
 -R, --root CHROOT_DIR           directory to chroot into
 -S, --status                    report password status on the named account
 -u, --unlock                    unlock the password of the named account
 -w, --warndays WARN_DAYS        set expiration warning days to WARN_DAYS
 -x, --maxdays MAX_DAYS          set maximum number of days before password
                                 change to MAX_DAYS

root@host1:/home/user1# passwd -S
root P 07/26/2021 0 99999 7 -1
root@host1:/home/user1#
```

Screenshot 2 – Passwd использование и помощь

```
 -Z, --selinux-user SEUSER      new SELinux user mapping for the user account

root@host1:/home/user1# usermod -b
Usage: usermod [options] LOGIN

Options:
  -b, --badnames                allow bad names
  -c, --comment COMMENT         new value of the GECOS field
  -d, --home HOME_DIR           new home directory for the user account
  -e, --expiredate EXPIRE_DATE  set account expiration date to EXPIRE_DATE
  -f, --inactive INACTIVE       set password inactive after expiration
                                to INACTIVE
  -g, --gid GROUP               force use GROUP as new primary group
  -G, --groups GROUPS           new list of supplementary GROUPS
  -a, --append                  append the user to the supplemental GROUPS
                                mentioned by the -G option without removing
                                the user from other groups
  -h, --help                    display this help message and exit
  -l, --login NEW_LOGIN         new value of the login name
  -L, --lock                    lock the user account
  -m, --move-home               move contents of the home directory to the
                                new location (use only with -d)
  -o, --non-unique              allow using duplicate (non-unique) UID
  -p, --password PASSWORD       use encrypted password for the new password
  -R, --root CHROOT_DIR         directory to chroot into
  -P, --prefix PREFIX_DIR       prefix directory where are located the /etc/* files
  -s, --shell SHELL             new login shell for the user account
  -u, --uid UID                 new UID for the user account
  -U, --unlock                  unlock the user account
  -v, --add-subuids FIRST-LAST  add range of subordinate uids
  -V, --del-subuids FIRST-LAST  remove range of subordinate uids
  -w, --add-subgids FIRST-LAST  add range of subordinate gids
  -W, --del-subgids FIRST-LAST  remove range of subordinate gids
  -Z, --selinux-user SEUSER     new SELinux user mapping for the user account

root@host1:/home/user1# usermod -p '1234' user1
root@host1:/home/user1#
```

Screenshot 3 – usermod установка пароля и помощь


```
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
uuidd:x:107:112::/run/uuidd:/usr/sbin/nologin
tcpdump:x:108:113::/nonexistent:/usr/sbin/nologin
landscape:x:109:115::/var/lib/landscape:/usr/sbin/nologin
pollinate:x:110:1::/var/cache/pollinate:/bin/false
usbmux:x:111:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
user1:x:1000:1000:Dmitry:/home/user1:/bin/bash
lxd:x:998:100::/var/snap/lxd/common/lxd:/bin/false
root:x:0:0:root:/root:/bin/sh
nobody:x:65534:65534:nobody:/:/usr/sbin/nologin
root@host1:/home/user1#
root@host1:/home/user1#
root@host1:/home/user1#
root@host1:/home/user1# compgen -h
bash: compgen: -h: invalid option
compgen: usage: compgen [-abcdefgjksuv] [-o option] [-A action] [-G globpat] [-W wordlist]  [-F func
tion] [-C command] [-X filterpat] [-P prefix] [-S suffix] [word]
root@host1:/home/user1# who -h
who: invalid option -- 'h'
Try 'who --help' for more information.
root@host1:/home/user1# less -h
Value is required after -h (--max-back-scroll)
root@host1:/home/user1# getend passwd | grep user1

Command 'getend' not found, did you mean:

  command 'getent' from deb libc-bin (2.31-0ubuntu9.2)

Try: apt install <deb name>

root@host1:/home/user1# getent passwd | grep user1
user1:x:1000:1000:Dmitry:/home/user1:/bin/bash
root@host1:/home/user1# getent passwd | grep root
root:x:0:0:root:/root:/bin/bash
root:x:0:0:root:/root:/bin/sh
root@host1:/home/user1# _
```
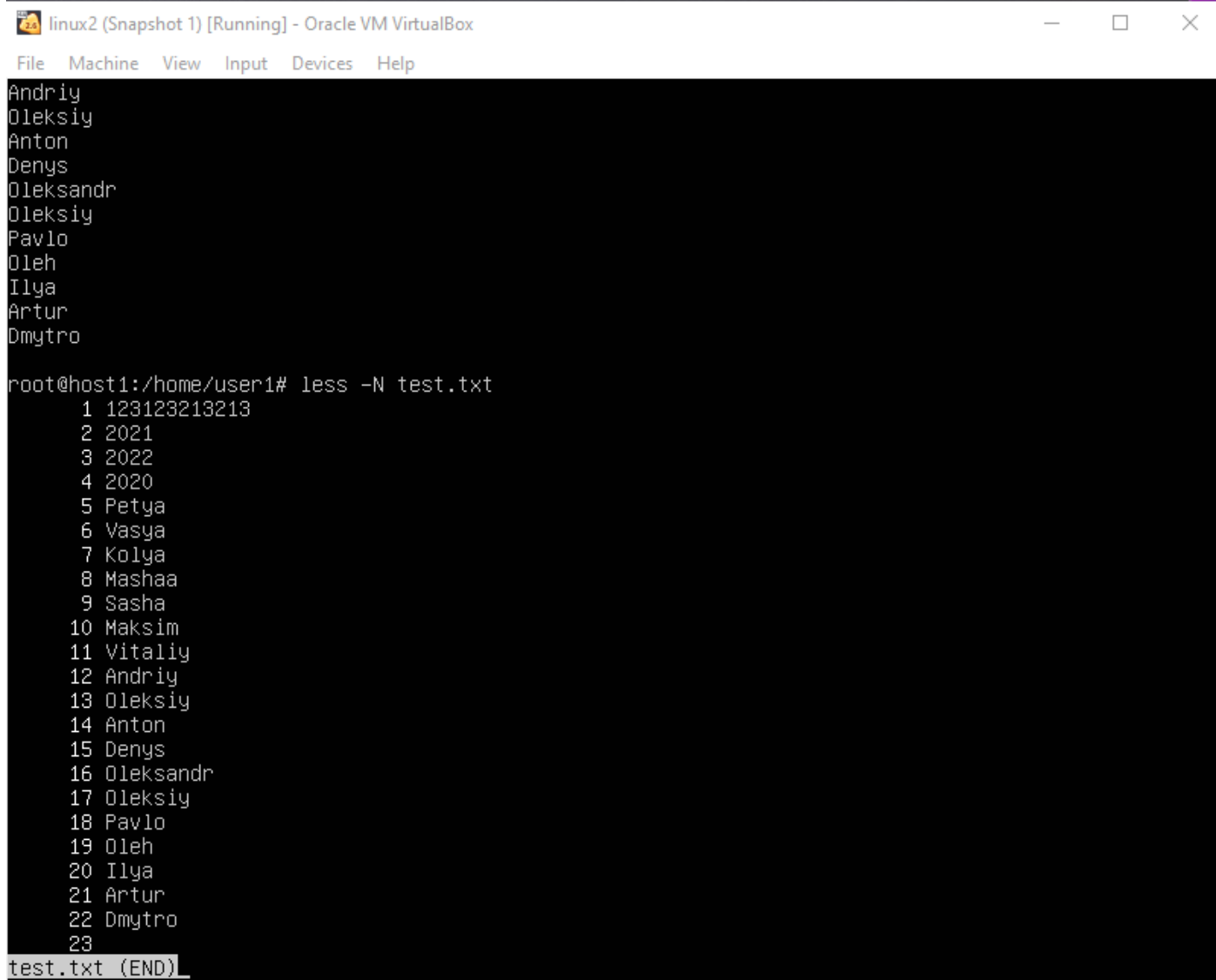
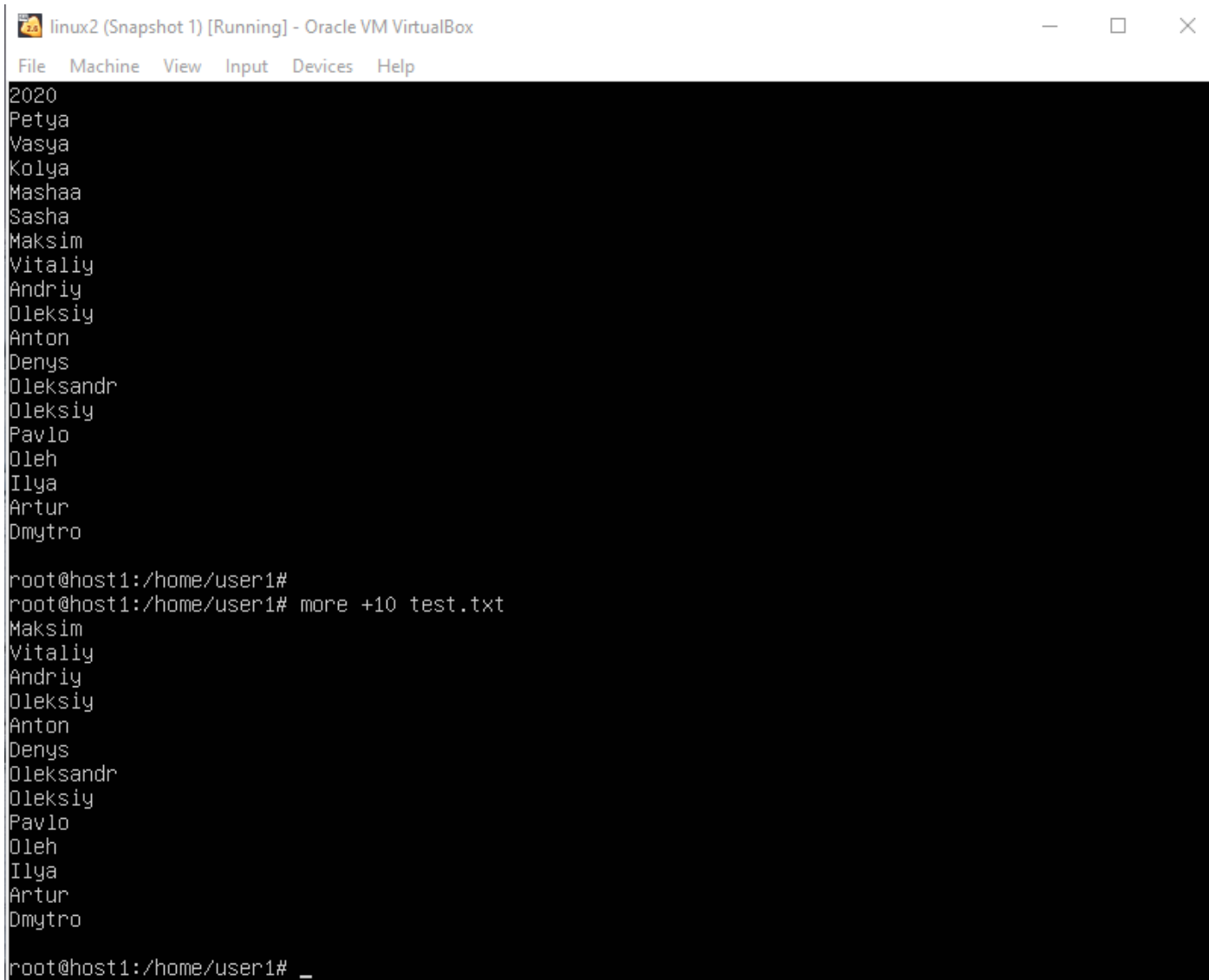*Screenshot 4 – grep информации пользователей в системе*

Andriy
Oleksiy
Anton
Denys
Oleksandr
Oleksiy
Pavlo
Oleh
Ilya
Artur
Dmytro

```
root@host1:/home/user1# less -N test.txt
      1 123123213213
      2 2021
      3 2022
      4 2020
      5 Petya
      6 Vasya
      7 Kolya
      8 Mashaa
      9 Sasha
     10 Maksim
     11 Vitaliy
     12 Andriy
     13 Oleksiy
     14 Anton
     15 Denys
     16 Oleksandr
     17 Oleksiy
     18 Pavlo
     19 Oleh
     20 Ilya
     21 Artur
     22 Dmytro
     23
test.txt (END)
```

Screenshot 5 – less с нумерацией строк

```
2020
Petya
Vasya
Kolya
Mashaa
Sasha
Maksim
Vitaliy
Andriy
Oleksiy
Anton
Denys
Oleksandr
Oleksiy
Pavlo
Oleh
Ilya
Artur
Dmytro

root@host1:/home/user1#
root@host1:/home/user1# more +10 test.txt
Maksim
Vitaliy
Andriy
Oleksiy
Anton
Denys
Oleksandr
Oleksiy
Pavlo
Oleh
Ilya
Artur
Dmytro

root@host1:/home/user1# _
```

Screenshot 6 – more с началом с 10 строчки

```
├── .sudo_as_admin_successful
└── test.txt

1 directory, 7 files
root@host1:/home/user1# tree -P 'e'
.

0 directories, 0 files
root@host1:/home/user1# tree -avD
.
├── [Jul  5 08:06]  .bash_history
├── [Feb 25  2020]  .bash_logout
├── [Feb 25  2020]  .bashrc
├── [Jul  5 08:02]  .cache
│   └── [Jul  5 08:02]  motd.legal-displayed
├── [Feb 25  2020]  .profile
├── [Jul  5 08:05]  .sudo_as_admin_successful
└── [Jul 26 08:19]  test.txt

1 directory, 7 files
root@host1:/home/user1# tree -P '*.txt.' --prine
tree: Invalid argument `--prine'.
usage: tree [-acdfghilnpqrstuvxACDFJQNSUX] [-H baseHREF] [-T title ]
        [-L level [-R]] [-P pattern] [-I pattern] [-o filename] [--version]
        [--help] [--inodes] [--device] [--noreport] [--nolinks] [--dirsfirst]
        [--charset charset] [--filelimit[=]#] [--si] [--timefmt[=]<f>]
        [--sort[=]<name>] [--matchdirs] [--ignore-case] [--fromfile] [--]
        [<directory list>]
root@host1:/home/user1# tree -P '*.txt.' --prune
.

0 directories, 0 files
root@host1:/home/user1# tree -P '*.txt' --prune
.
└── test.txt

0 directories, 1 file
root@host1:/home/user1# tree -P '*.txt' --prune
```

Screenshot 7- Tree команда

```
0 directories, 1 file
root@host1:/home/user1# tree -P *te*

└── test.txt

0 directories, 1 file
root@host1:/home/user1# tree -P
tree: missing argument to -P option.
root@host1:/home/user1# tree

└── test.txt

0 directories, 1 file
root@host1:/home/user1# tree

└── test.txt

0 directories, 1 file
root@host1:/home/user1# tree -a

├── .bash_history
├── .bash_logout
├── .bashrc
├── .cache
│   └── motd.legal-displayed
├── .profile
├── .sudo_as_admin_successful
└── test.txt

1 directory, 7 files
root@host1:/home/user1# tree -a -P *e*

├── .cache
└── test.txt

1 directory, 1 file
root@host1:/home/user1#
```

Screenshot 8- Tree с поиском по букве «e»

```
0 directories, 1 file
root@host1:/home/user1# tree -f -L 2
.
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# tree -f -L 1
.
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# tree -f -L 0
tree: Invalid level, must be greater than 0.
root@host1:/home/user1# tree -f -L 2
.
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# tree -f -P test*
.
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# tree -f -P e*
.

0 directories, 0 files
root@host1:/home/user1# tree -P e*
.

0 directories, 0 files
root@host1:/home/user1# tree -P test*
.
└── test.txt

0 directories, 1 file
root@host1:/home/user1#
```

Screenshot 9 – Tree с уровнем ветки 2

```
  System information as of Tue Jul 27 07:37:41 UTC 2021

  System load:   1.13            Processes:            116
  Usage of /:    48.0% of 8.79GB  Users logged in:       0
  Memory usage: 20%              IPv4 address for enp0s3: 10.0.2.15
  Swap usage:    0%

 * Super-optimized for small spaces - read how we shrank the memory
   footprint of MicroK8s to make it the smallest full K8s around.

   https://ubuntu.com/blog/microk8s-memory-optimisation

68 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable



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.

root@host1:~# cd /home
root@host1:/home# ls -a
.  ..  test  user1
root@host1:/home# file *
test:  directory
user1: directory
root@host1:/home# cd user1
root@host1:/home/user1# file *
labwork2:       broken symbolic link to /home/test/labwork2
rootfile2.txt: ASCII text
test.txt:       ASCII text
root@host1:/home/user1#
```

Screenshot 10 – file вывод типов файлов

```
1 directory, 7 files
root@host1:/home/user1# tree -a -P *e*

├── .cache
└── test.txt

1 directory, 1 file
root@host1:/home/user1# tree -P --prune
.

0 directories, 0 files
root@host1:/home/user1# tree -a -P --prune
.
└── .cache

1 directory, 0 files
root@host1:/home/user1# tree -a  --prune
.
├── .bash_history
├── .bash_logout
├── .bashrc
├── .cache
│   └── motd.legal-displayed
├── .profile
├── .sudo_as_admin_successful
└── test.txt

1 directory, 7 files
root@host1:/home/user1# tree -f
.
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# cd /home
root@host1:/home# cd ..
root@host1:/#
```

Screenshot 11 – cd переход в директорию

```
└── ./test.txt

0 directories, 1 file
root@host1:/home/user1# cd /home
root@host1:/home# cd ..
root@host1:/# ls
bin   cdrom   etc    lib    lib64   lost+found  mnt   proc  run   snap   swap.img   tmp  var
boot  dev     home   lib32  libx32  media       opt   root  sbin  srv    sys        usr
root@host1:/# ls -l
total 1792072
lrwxrwxrwx   1 root root          7 Feb  1 17:20 bin -> usr/bin
drwxr-xr-x   4 root root       4096 Jul  5 07:51 boot
drwxr-xr-x   2 root root       4096 Jul  5 07:49 cdrom
drwxr-xr-x  19 root root       4080 Jul 26 07:13 dev
drwxr-xr-x  96 root root       4096 Jul 26 07:21 etc
drwxr-xr-x   3 root root       4096 Jul  5 08:01 home
lrwxrwxrwx   1 root root          7 Feb  1 17:20 lib -> usr/lib
lrwxrwxrwx   1 root root          9 Feb  1 17:20 lib32 -> usr/lib32
lrwxrwxrwx   1 root root          9 Feb  1 17:20 lib64 -> usr/lib64
lrwxrwxrwx   1 root root         10 Feb  1 17:20 libx32 -> usr/libx32
drwx------   2 root root      16384 Jul  5 07:48 lost+found
drwxr-xr-x   2 root root       4096 Feb  1 17:20 media
drwxr-xr-x   2 root root       4096 Feb  1 17:20 mnt
drwxr-xr-x   2 root root       4096 Feb  1 17:20 opt
dr-xr-xr-x 175 root root          0 Jul 26 06:53 proc
drwx------   5 root root       4096 Jul 26 08:13 root
drwxr-xr-x  26 root root        800 Jul 26 08:26 run
lrwxrwxrwx   1 root root          8 Feb  1 17:20 sbin -> usr/sbin
drwxr-xr-x   7 root root       4096 Jul  5 08:02 snap
drwxr-xr-x   2 root root       4096 Feb  1 17:20 srv
-rw-------   1 root root 1835008000 Jul  5 07:50 swap.img
dr-xr-xr-x  13 root root          0 Jul 26 06:53 sys
drwxrwxrwt  13 root root       4096 Jul 26 08:26 tmp
drwxr-xr-x  14 root root       4096 Feb  1 17:25 usr
drwxr-xr-x  13 root root       4096 Feb  1 17:28 var
root@host1:/# _
```

Screenshot 12 – ls список всех директорий и файлов

```
lrwxrwxrwx   1 root root            10 Feb  1 17:20 libx32 -> usr/libx32
drwx------   2 root root         16384 Jul  5 07:48 lost+found
drwxr-xr-x   2 root root          4096 Feb  1 17:20 media
drwxr-xr-x   2 root root          4096 Feb  1 17:20 mnt
drwxr-xr-x   2 root root          4096 Feb  1 17:20 opt
dr-xr-xr-x 175 root root             0 Jul 26 06:53 proc
drwx------   5 root root          4096 Jul 26 08:13 root
drwxr-xr-x  26 root root           800 Jul 26 08:26 run
lrwxrwxrwx   1 root root             8 Feb  1 17:20 sbin -> usr/sbin
drwxr-xr-x   7 root root          4096 Jul  5 08:02 snap
drwxr-xr-x   2 root root          4096 Feb  1 17:20 srv
-rw-------   1 root root    1835008000 Jul  5 07:50 swap.img
dr-xr-xr-x  13 root root             0 Jul 26 06:53 sys
drwxrwxrwt  13 root root          4096 Jul 26 08:26 tmp
drwxr-xr-x  14 root root          4096 Feb  1 17:25 usr
drwxr-xr-x  13 root root          4096 Feb  1 17:28 var
root@host1:/# cd /home
root@host1:/home# mkdir test
root@host1:/home# ls
test  user1
root@host1:/home# mkdir -p test/dir--{000..010}
root@host1:/home# touch test/dir--{000..010}/file-{A..J}
root@host1:/home# cd test
root@host1:/home/test# ls -l
total 44
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--000
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--010
root@host1:/home/test#
```

Screenshot 13 – mkdir создание папки и touch создание файла

```
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--010
root@host1:/home/test# c
c: command not found
root@host1:/home/test# cat rootfile.txt
cat: rootfile.txt: No such file or directory
root@host1:/home/test# touch rootfile.txt
root@host1:/home/test# ls ~ > rootfile.txt
root@host1:/home/test# ls -a
.    dir--000  dir--002  dir--004  dir--006  dir--008  dir--010
..   dir--001  dir--003  dir--005  dir--007  dir--009  rootfile.txt
root@host1:/home/test# cat rootfile.txt
snap
root@host1:/home/test# ls root -l >> rootfile.txt
ls: cannot access 'root': No such file or directory
root@host1:/home/test# ls -l >> rootfile.txt
root@host1:/home/test# cat rootfile.txt
snap
total 48
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--000
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--010
-rw-r--r-- 1 root root    5 Jul 26 09:01 rootfile.txt
root@host1:/home/test# cp _
```

Screenshot 14 – >> Перенаправление команды в файл с дописыванием

```
   command 'rm' from deb coreutils (8.30-3ubuntu2)
   command 'rmm' from deb mailutils-mh (1:3.7-2.1)
   command 'rmm' from deb mmh (0.4-2)
   command 'rmm' from deb nmh (1.7.1-6)

Try: apt install <deb name>

root@host1:/home/test# rm *
rm: cannot remove 'dir--000': Is a directory
rm: cannot remove 'dir--001': Is a directory
rm: cannot remove 'dir--002': Is a directory
rm: cannot remove 'dir--003': Is a directory
rm: cannot remove 'dir--004': Is a directory
rm: cannot remove 'dir--005': Is a directory
rm: cannot remove 'dir--006': Is a directory
rm: cannot remove 'dir--007': Is a directory
rm: cannot remove 'dir--008': Is a directory
rm: cannot remove 'dir--009': Is a directory
rm: cannot remove 'dir--010': Is a directory
root@host1:/home/test# ls -l
total 44
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--000
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--010
root@host1:/home/test# rm dir--000
rm: cannot remove 'dir--000': Is a directory
root@host1:/home/test# rm -r dir--000
root@host1:/home/test# rm -rf dir--010
root@host1:/home/test#
```

Screenshot 15 – cp копирование файла

```
   command 'rm' from deb coreutils (8.30-3ubuntu2)
   command 'rmm' from deb mailutils-mh (1:3.7-2.1)
   command 'rmm' from deb mmh (0.4-2)
   command 'rmm' from deb nmh (1.7.1-6)

Try: apt install <deb name>

root@host1:/home/test# rm *
rm: cannot remove 'dir--000': Is a directory
rm: cannot remove 'dir--001': Is a directory
rm: cannot remove 'dir--002': Is a directory
rm: cannot remove 'dir--003': Is a directory
rm: cannot remove 'dir--004': Is a directory
rm: cannot remove 'dir--005': Is a directory
rm: cannot remove 'dir--006': Is a directory
rm: cannot remove 'dir--007': Is a directory
rm: cannot remove 'dir--008': Is a directory
rm: cannot remove 'dir--009': Is a directory
rm: cannot remove 'dir--010': Is a directory
root@host1:/home/test# ls -l
total 44
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--000
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--010
root@host1:/home/test# rm dir--000
rm: cannot remove 'dir--000': Is a directory
root@host1:/home/test# rm -r dir--000
root@host1:/home/test# rm -rf dir--010
root@host1:/home/test#
```

Screenshot 16 – rm удаление файлов и директорий

```
root@host1:/home/user1# cp .bash_history /home/test/bashhistory.txt
root@host1:/home/user1# cp .bash_history /home/test/labwork
root@host1:/home/user1# cp .bash_history /home/test/labwork2;
root@host1:/home/user1# ln -s /home/test/labwork2
root@host1:/home/user1# ln -s /home/test/labwork2 home/test/labwork2-softlink.txt
ln: failed to create symbolic link 'home/test/labwork2-softlink.txt': No such file or directory
root@host1:/home/user1# ln -s /home/test/labwork2-softlink.txt /home/test/labwork2
ln: failed to create symbolic link '/home/test/labwork2': File exists
root@host1:/home/user1# cd ..
root@host1:/home# cd test
root@host1:/home/test# ls -l
total 48
-rw------- 1 root root   38 Jul 26 09:44 bashhistory.txt
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
-rw------- 1 root root   38 Jul 26 09:45 labwork
-rw------- 1 root root   38 Jul 26 09:45 labwork2
root@host1:/home/test# touch labwork2-softlink.txt
root@host1:/home/test# ln -s /home/test/labwork2 home/test/labwork2-softlink.txt
ln: failed to create symbolic link 'home/test/labwork2-softlink.txt': No such file or directory
root@host1:/home/test# ln -s /home/test/labwork2 /home/test/labwork2-softlink.txt
ln: failed to create symbolic link '/home/test/labwork2-softlink.txt': File exists
root@host1:/home/test# ln -s /home/test/labwork2 /home/test/labwork2-softlink2.txt
root@host1:/home/test# ls -li /home/test/labwork2
277025 -rw------- 1 root root 38 Jul 26 09:45 /home/test/labwork2
root@host1:/home/test# ls -li /home/test/labwork2 /home/test/labwork2-softlink2.txt
277025 -rw------- 1 root root 38 Jul 26 09:45 /home/test/labwork2
277028 lrwxrwxrwx 1 root root 19 Jul 26 09:53 /home/test/labwork2-softlink2.txt -> /home/test/labwor
k2
root@host1:/home/test#
```

Screenshot 17 – ln -s Создание мягкой ссылки

```
ln: failed to create symbolic link '/home/test/labwork2': File exists
root@host1:/home/user1# cd ..
root@host1:/home# cd test
root@host1:/home/test# ls -l
total 48
-rw------- 1 root root   38 Jul 26 09:44 bashhistory.txt
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
-rw------- 1 root root   38 Jul 26 09:45 labwork
-rw------- 1 root root   38 Jul 26 09:45 labwork2
root@host1:/home/test# touch labwork2-softlink.txt
root@host1:/home/test# ln -s /home/test/labwork2 home/test/labwork2-softlink.txt
ln: failed to create symbolic link 'home/test/labwork2-softlink.txt': No such file or directory
root@host1:/home/test# ln -s /home/test/labwork2 /home/test/labwork2-softlink.txt
ln: failed to create symbolic link '/home/test/labwork2-softlink.txt': File exists
root@host1:/home/test# ln -s /home/test/labwork2 /home/test/labwork2-softlink2.txt
root@host1:/home/test# ls -li /home/test/labwork2
277025 -rw------- 1 root root 38 Jul 26 09:45 /home/test/labwork2
root@host1:/home/test# ls -li /home/test/labwork2 /home/test/labwork2-softlink2.txt
277025 -rw------- 1 root root 38 Jul 26 09:45 /home/test/labwork2
277028 lrwxrwxrwx 1 root root 19 Jul 26 09:53 /home/test/labwork2-softlink2.txt -> /home/test/labwor
k2
root@host1:/home/test# ln /home/test/labwork2 /home/test/labwork-hardlink.txt
root@host1:/home/test# ls -li /home/test/labwork2 /home/test/labwork/hardlink.txt
ls: cannot access '/home/test/labwork/hardlink.txt': Not a directory
277025 -rw------- 2 root root 38 Jul 26 09:45 /home/test/labwork2
root@host1:/home/test# ls -li /home/test/labwork2 /home/test/labwork-hardlink.txt
277025 -rw------- 2 root root 38 Jul 26 09:45 /home/test/labwork-hardlink.txt
277025 -rw------- 2 root root 38 Jul 26 09:45 /home/test/labwork2
root@host1:/home/test#
```

Screenshot 18 – ln создание жесткой ссылки

```
total 52
-rw------- 1 root root   38 Jul 26 09:44 bashhistory.txt
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
-rw------- 2 root root    4 Jul 26 10:12 hard_lnk_labwork2.txt
-rw------- 1 root root   38 Jul 26 09:45 labwork
-rw------- 1 root root   38 Jul 26 10:12 labwork2
lrwxrwxrwx 1 root root   19 Jul 26 09:53 labwork2-softlink2.txt -> /home/test/labwork2
root@host1:/home/test# mv labwork2-softlink2.txt symb_lnk_labwork2 file.txt
mv: target 'file.txt' is not a directory
root@host1:/home/test# mv labwork2-softlink2.txt symb_lnk_labwork2 file
mv: target 'file' is not a directory
root@host1:/home/test# mv labwork2-softlink2.txt symb_lnk_labwork2file.txt
root@host1:/home/test# rm labwork2
root@host1:/home/test# ls -l
total 48
-rw------- 1 root root   38 Jul 26 09:44 bashhistory.txt
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--001
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--002
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--003
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--004
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--005
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--006
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--007
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--008
drwxr-xr-x 2 root root 4096 Jul 26 08:52 dir--009
-rw------- 1 root root    4 Jul 26 10:12 hard_lnk_labwork2.txt
-rw------- 1 root root   38 Jul 26 09:45 labwork
lrwxrwxrwx 1 root root   19 Jul 26 09:53 symb_lnk_labwork2file.txt -> /home/test/labwork2
root@host1:/home/test#
```

Screenshot 19 – мягкая ссылка не будет работать без основного файла

```
The following NEW packages will be installed:
  mlocate
0 upgraded, 1 newly installed, 0 to remove and 67 not upgraded.
Need to get 50.1 kB of archives.
After this operation, 258 kB of additional disk space will be used.
Get:1 http://ua.archive.ubuntu.com/ubuntu focal/main amd64 mlocate amd64 0.26-3ubuntu3 [50.1 kB]
Fetched 50.1 kB in 0s (330 kB/s)
Selecting previously unselected package mlocate.
(Reading database ... 74221 files and directories currently installed.)
Preparing to unpack .../mlocate_0.26-3ubuntu3_amd64.deb ...
Unpacking mlocate (0.26-3ubuntu3) ...
Setting up mlocate (0.26-3ubuntu3) ...
update-alternatives: using /usr/bin/mlocate to provide /usr/bin/locate (locate) in auto mode
Adding group `mlocate' (GID 117) ...
Done.
Initializing mlocate database; this may take some time... done
Processing triggers for man-db (2.9.1-1) ...
root@host1:/home/test# cd ..
root@host1:/home# cd ..
root@host1:/# cd ..
root@host1:/# locate -w squid
/usr/lib/python3/dist-packages/sos/report/plugins/squid.py
/usr/lib/python3/dist-packages/sos/report/plugins/__pycache__/squid.cpython-38.pyc
/usr/share/vim/vim81/syntax/squid.vim
root@host1:/# locate -w squid traceroute
/etc/alternatives/traceroute6
/etc/alternatives/traceroute6.8.gz
/usr/bin/traceroute6
/usr/bin/traceroute6.iputils
/usr/lib/modules/5.4.0-77-generic/kernel/drivers/tty/n_tracerouter.ko
/usr/lib/python3/dist-packages/sos/report/plugins/squid.py
/usr/lib/python3/dist-packages/sos/report/plugins/__pycache__/squid.cpython-38.pyc
/usr/share/man/man8/traceroute6.8.gz
/usr/share/man/man8/traceroute6.iputils.8.gz
/usr/share/vim/vim81/syntax/squid.vim
/var/lib/dpkg/alternatives/traceroute6
root@host1:/#
```

Screenshot 20 – locate -w поиск по совпадениям

```
drwxr-xr-x   96 root root       4096 Jul 26 10:36 etc
drwxr-xr-x    4 root root       4096 Jul 26 08:50 home
lrwxrwxrwx    1 root root          7 Feb  1 17:20 lib -> usr/lib
lrwxrwxrwx    1 root root          9 Feb  1 17:20 lib32 -> usr/lib32
lrwxrwxrwx    1 root root          9 Feb  1 17:20 lib64 -> usr/lib64
lrwxrwxrwx    1 root root         10 Feb  1 17:20 libx32 -> usr/libx32
drwx------    2 root root      16384 Jul  5 07:48 lost+found
drwxr-xr-x    2 root root       4096 Feb  1 17:20 media
drwxr-xr-x    2 root root       4096 Feb  1 17:20 mnt
drwxr-xr-x    2 root root       4096 Feb  1 17:20 opt
dr-xr-xr-x  175 root root          0 Jul 26 06:53 proc
drwx------    5 root root       4096 Jul 26 08:13 root
drwxr-xr-x   26 root root        820 Jul 26 10:36 run
lrwxrwxrwx    1 root root          8 Feb  1 17:20 sbin -> usr/sbin
drwxr-xr-x    7 root root       4096 Jul  5 08:02 snap
drwxr-xr-x    2 root root       4096 Feb  1 17:20 srv
-rw-------    1 root root 1835008000 Jul  5 07:50 swap.img
dr-xr-xr-x   13 root root          0 Jul 26 06:53 sys
drwxrwxrwt   12 root root       4096 Jul 26 10:36 tmp
drwxr-xr-x   14 root root       4096 Feb  1 17:25 usr
drwxr-xr-x   13 root root       4096 Feb  1 17:28 var
root@host1:/# lsblk
NAME                       MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
loop0                        7:0    0  69.9M  1 loop /snap/lxd/19188
loop1                        7:1    0  55.4M  1 loop /snap/core18/1944
loop2                        7:2    0  65.3M  1 loop /snap/powershell/160
loop3                        7:3    0  31.1M  1 loop /snap/snapd/10707
loop4                        7:4    0  32.3M  1 loop /snap/snapd/12398
loop5                        7:5    0  55.5M  1 loop /snap/core18/2074
loop6                        7:6    0  70.3M  1 loop /snap/lxd/21029
sda                          8:0    0    10G  0 disk
├─sda1                       8:1    0     1M  0 part
├─sda2                       8:2    0     1G  0 part /boot
└─sda3                       8:3    0     9G  0 part
  └─ubuntu--vg-ubuntu--lv  253:0    0     9G  0 lvm  /
sr0                         11:0    1  58.2M  0 rom
root@host1:/#
```

Screenshot 21 – lsblk смонтированные разделы

```
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/sda: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 1653AD5C-FA1E-4B55-8791-1DE296300040

Device       Start      End  Sectors Size Type
/dev/sda1     2048     4095     2048  1M BIOS boot
/dev/sda2     4096  2101247  2097152  1G Linux filesystem
/dev/sda3  2101248 20969471 18868224  9G Linux filesystem


Disk /dev/mapper/ubuntu--vg-ubuntu--lv: 8.102 GiB, 9659482112 bytes, 18866176 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
root@host1:/# sfdisk -l /dev/sda
Disk /dev/sda: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 1653AD5C-FA1E-4B55-8791-1DE296300040

Device       Start      End  Sectors Size Type
/dev/sda1     2048     4095     2048  1M BIOS boot
/dev/sda2     4096  2101247  2097152  1G Linux filesystem
/dev/sda3  2101248 20969471 18868224  9G Linux filesystem
root@host1:/#
```

Screenshot 22 – fdisk -l разделы на дисках

```
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 1653AD5C-FA1E-4B55-8791-1DE296300040

Device        Start      End  Sectors Size Type
/dev/sda1      2048     4095     2048   1M BIOS boot
/dev/sda2      4096  2101247  2097152   1G Linux filesystem
/dev/sda3   2101248 20969471 18868224   9G Linux filesystem
root@host1:/# parted
GNU Parted 3.3
Using /dev/sda
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) ^Z
[5]+  Stopped                 parted
root@host1:/# parted /dev/devicename
Error: Could not stat device /dev/devicename - No such file or directory.
Retry/Cancel? cancel
root@host1:/# parted /dev/sda
GNU Parted 3.3
Using /dev/sda
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted)
(parted)
(parted) unit GB
(parted) print
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 10.7GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name  Flags
 1      0.00GB  0.00GB  0.00GB                      bios_grub
 2      0.00GB  1.08GB  1.07GB  ext4
 3      1.08GB  10.7GB  9.66GB

(parted)
```

Screenshot 23 – parted разделы на диске

```
Model: Linux device-mapper (linear) (dm)
Disk /dev/mapper/ubuntu--vg-ubuntu--lv: 9659MB
Sector size (logical/physical): 512B/512B
Partition Table: loop
Disk Flags:

Number  Start  End     Size    File system  Flags
 1      0.00B  9659MB  9659MB  ext4


Warning: Unable to open /dev/sr0 read-write (Read-only file system).  /dev/sr0
has been opened read-only.
Error: /dev/sr0: unrecognised disk label
Model: VBOX CD-ROM (scsi)
Disk /dev/sr0: 61.0MB
Sector size (logical/physical): 2048B/2048B
Partition Table: unknown
Disk Flags:

root@host1:/# df -h
Filesystem                         Size  Used Avail Use% Mounted on
udev                               447M     0  447M   0% /dev
tmpfs                               99M  1.1M   98M   2% /run
/dev/mapper/ubuntu--vg-ubuntu--lv  8.8G  4.3G  4.2G  51% /
tmpfs                              491M     0  491M   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
tmpfs                              491M     0  491M   0% /sys/fs/cgroup
/dev/sda2                          976M  106M  804M  12% /boot
/dev/loop1                          56M   56M     0 100% /snap/core18/1944
/dev/loop0                          70M   70M     0 100% /snap/lxd/19188
/dev/loop3                          32M   32M     0 100% /snap/snapd/10707
/dev/loop2                          66M   66M     0 100% /snap/powershell/160
/dev/loop4                          33M   33M     0 100% /snap/snapd/12398
/dev/loop5                          56M   56M     0 100% /snap/core18/2074
/dev/loop6                          71M   71M     0 100% /snap/lxd/21029
tmpfs                               99M     0   99M   0% /run/user/1000
root@host1:/#
```

Screenshot 24 – df -h где и какие разделы смонтированы

```
./etc/default/grub.d/init-select.cfg
./etc/default/networkd-dispatcher
./etc/default/open-iscsi
./etc/login.defs
./etc/fonts
./etc/fonts/conf.d
./etc/fonts/conf.d/30-cjk-aliases.conf
./etc/fonts/conf.d/64-language-selector-prefer.conf
./etc/fonts/conf.d/69-language-selector-zh-sg.conf
./etc/fonts/conf.d/99-language-selector-zh.conf
./etc/fonts/conf.d/69-language-selector-zh-hk.conf
./etc/fonts/conf.d/69-language-selector-zh-mo.conf
./etc/fonts/conf.d/69-language-selector-zh-cn.conf
./etc/fonts/conf.d/69-language-selector-zh-tw.conf
./etc/fonts/conf.d/69-language-selector-ja.conf
./etc/fonts/conf.d/56-language-selector-ar.conf
./etc/fonts/conf.avail
./etc/fonts/conf.avail/30-cjk-aliases.conf
./etc/fonts/conf.avail/64-language-selector-prefer.conf
./etc/fonts/conf.avail/69-language-selector-zh-sg.conf
./etc/fonts/conf.avail/99-language-selector-zh.conf
./etc/fonts/conf.avail/69-language-selector-zh-hk.conf
./etc/fonts/conf.avail/69-language-selector-zh-mo.conf
./etc/fonts/conf.avail/69-language-selector-zh-cn.conf
./etc/fonts/conf.avail/69-language-selector-zh-tw.conf
./etc/fonts/conf.avail/69-language-selector-ja.conf
./etc/fonts/conf.avail/56-language-selector-ar.conf
root@host1:/# find ./etc -iname "host*"
./etc/cloud/templates/hosts.alpine.tmpl
./etc/cloud/templates/hosts.freebsd.tmpl
./etc/cloud/templates/hosts.redhat.tmpl
./etc/cloud/templates/hosts.debian.tmpl
./etc/cloud/templates/hosts.suse.tmpl
./etc/hostname
./etc/host.conf
./etc/hosts
root@host1:/# _
```

Screenshot 25 - find "host" поиск совпадений

```
./etc/fonts/conf.d
./etc/fonts/conf.d/30-cjk-aliases.conf
./etc/fonts/conf.d/64-language-selector-prefer.conf
./etc/fonts/conf.d/69-language-selector-zh-sg.conf
./etc/fonts/conf.d/99-language-selector-zh.conf
./etc/fonts/conf.d/69-language-selector-zh-hk.conf
./etc/fonts/conf.d/69-language-selector-zh-mo.conf
./etc/fonts/conf.d/69-language-selector-zh-cn.conf
./etc/fonts/conf.d/69-language-selector-zh-tw.conf
./etc/fonts/conf.d/69-language-selector-ja.conf
./etc/fonts/conf.d/56-language-selector-ar.conf
./etc/fonts/conf.avail
./etc/fonts/conf.avail/30-cjk-aliases.conf
./etc/fonts/conf.avail/64-language-selector-prefer.conf
./etc/fonts/conf.avail/69-language-selector-zh-sg.conf
./etc/fonts/conf.avail/99-language-selector-zh.conf
./etc/fonts/conf.avail/69-language-selector-zh-hk.conf
./etc/fonts/conf.avail/69-language-selector-zh-mo.conf
./etc/fonts/conf.avail/69-language-selector-zh-cn.conf
./etc/fonts/conf.avail/69-language-selector-zh-tw.conf
./etc/fonts/conf.avail/69-language-selector-ja.conf
./etc/fonts/conf.avail/56-language-selector-ar.conf
root@host1:/# find ./etc -iname "host*"
./etc/cloud/templates/hosts.alpine.tmpl
./etc/cloud/templates/hosts.freebsd.tmpl
./etc/cloud/templates/hosts.redhat.tmpl
./etc/cloud/templates/hosts.debian.tmpl
./etc/cloud/templates/hosts.suse.tmpl
./etc/hostname
./etc/host.conf
./etc/hosts
root@host1:/# find ./etc -iname "*ss"
./etc/alternatives/lzless
./etc/gss
./etc/apparmor.d/abstractions/smbpass
./etc/default/nss
root@host1:/#
```

Screenshot 26 – Поиск по окончанию ss

```
NetworkManager
PackageKit
UPower
X11
adduser.conf
alternatives
apparmor
apparmor.d
apport
apt
at.deny
bash.bashrc
bash_completion
bash_completion.d
bindresvport.blacklist
binfmt.d
byobu
ca-certificates
ca-certificates.conf
ca-certificates.conf.dpkg-old
calendar
cloud
console-setup
cron.d
cron.daily
cron.hourly
cron.monthly
cron.weekly
crontab
cryptsetup-initramfs
crypttab
dbus-1
dconf
debconf.conf
debian_version
default
:
```

Screenshot 27 ls -al /etc | less s с переходом по одной строке или по экрану

```
drwxr-xr-x  2 root  root       60 Jul 26 06:53 ubuntu-vg
crw-rw----  1 root  kvm    10,  60 Jul 26 06:53 udmabuf
crw-------  1 root  root   10, 239 Jul 26 06:53 uhid
crw-------  1 root  root   10, 223 Jul 26 06:53 uinput
crw-rw-rw-  1 root  root    1,   9 Jul 26 06:53 urandom
crw-------  1 root  root   10, 240 Jul 26 06:53 userio
crw-------  1 root  root   10,  58 Jul 26 06:53 vboxguest
crw-------  1 root  root   10,  57 Jul 26 06:53 vboxuser
crw-rw----  1 root  tty     7,   0 Jul 26 06:53 vcs
crw-rw----  1 root  tty     7,   1 Jul 26 06:53 vcs1
crw-rw----  1 root  tty     7,   2 Jul 26 06:53 vcs2
crw-rw----  1 root  tty     7,   3 Jul 26 06:53 vcs3
crw-rw----  1 root  tty     7,   4 Jul 26 06:53 vcs4
crw-rw----  1 root  tty     7,   5 Jul 26 06:53 vcs5
crw-rw----  1 root  tty     7,   6 Jul 26 06:53 vcs6
crw-rw----  1 root  tty     7, 128 Jul 26 06:53 vcsa
crw-rw----  1 root  tty     7, 129 Jul 26 06:53 vcsa1
crw-rw----  1 root  tty     7, 130 Jul 26 06:53 vcsa2
crw-rw----  1 root  tty     7, 131 Jul 26 06:53 vcsa3
crw-rw----  1 root  tty     7, 132 Jul 26 06:53 vcsa4
crw-rw----  1 root  tty     7, 133 Jul 26 06:53 vcsa5
crw-rw----  1 root  tty     7, 134 Jul 26 06:53 vcsa6
crw-rw----  1 root  tty     7,  64 Jul 26 06:53 vcsu
crw-rw----  1 root  tty     7,  65 Jul 26 06:53 vcsu1
crw-rw----  1 root  tty     7,  66 Jul 26 06:53 vcsu2
crw-rw----  1 root  tty     7,  67 Jul 26 06:53 vcsu3
crw-rw----  1 root  tty     7,  68 Jul 26 06:53 vcsu4
crw-rw----  1 root  tty     7,  69 Jul 26 06:53 vcsu5
crw-rw----  1 root  tty     7,  70 Jul 26 06:53 vcsu6
drwxr-xr-x  2 root  root       60 Jul 26 06:53 vfio
crw-------  1 root  root   10,  63 Jul 26 06:53 vga_arbiter
crw-------  1 root  root   10, 137 Jul 26 06:53 vhci
crw-------  1 root  root   10, 238 Jul 26 06:53 vhost-net
crw-------  1 root  root   10, 241 Jul 26 06:53 vhost-vsock
crw-rw-rw-  1 root  root    1,   5 Jul 26 06:53 zero
crw-------  1 root  root   10, 249 Jul 26 06:53 zfs
root@host1:/# _
```

Screenshot 28 – ls устройств

```
-rwxr-xr-x 1 root     root      557256 Aug  8  2020 x86_64-linux-gnu-gcov-tool-9
-rwxr-xr-x 1 root     root      102280 Jan 21  2021 x86_64-linux-gnu-gprof
-rwxr-xr-x 1 root     root     1740384 Jan 21  2021 x86_64-linux-gnu-ld.bfd
-rwxr-xr-x 1 root     root     2312584 Jan 21  2021 x86_64-linux-gnu-ld.gold
-rwxr-xr-x 1 root     root       52664 Jan 21  2021 x86_64-linux-gnu-nm
-rwxr-xr-x 1 root     root      186856 Jan 21  2021 x86_64-linux-gnu-objcopy
-rwxr-xr-x 1 root     root      402256 Jan 21  2021 x86_64-linux-gnu-objdump
-rwxr-xr-x 1 root     root       68056 Jan 21  2021 x86_64-linux-gnu-ranlib
-rwxr-xr-x 1 root     root      658360 Jan 21  2021 x86_64-linux-gnu-readelf
-rwxr-xr-x 1 root     root       35280 Jan 21  2021 x86_64-linux-gnu-size
-rwxr-xr-x 1 root     root       35488 Jan 21  2021 x86_64-linux-gnu-strings
-rwxr-xr-x 1 root     root      186856 Jan 21  2021 x86_64-linux-gnu-strip
-rwxr-xr-x 1 root     root       76152 Feb 18  2020 xargs
-rwxr-xr-x 1 root     root       56288 Aug 25  2019 xauth
-rwxr-xr-x 1 root     root         234 Jan 24  2019 xdg-user-dir
-rwxr-xr-x 1 root     root       26696 Jan 24  2019 xdg-user-dirs-update
-rwxr-xr-x 1 root     root        5164 Oct 19  2020 xsubpp
-rwxr-xr-x 1 root     root       18712 Apr 15  2020 xxd
-rwxr-xr-x 1 root     root       80384 Apr 20  2020 xz
-rwxr-xr-x 1 root     root        6632 Apr 20  2020 xzdiff
-rwxr-xr-x 1 root     root        5628 Apr 20  2020 xzgrep
-rwxr-xr-x 1 root     root        1802 Apr 20  2020 xzless
-rwxr-xr-x 1 root     root        2161 Apr 20  2020 xzmore
-rwxr-xr-x 1 root     root       39256 Sep  5  2019 yes
-rwxr-xr-x 1 root     root        1984 Dec 13  2019 zcat
-rwxr-xr-x 1 root     root        1678 Dec 13  2019 zcmp
-rwxr-xr-x 1 root     root        5880 Dec 13  2019 zdiff
-rwxr-xr-x 1 root     root       26840 Dec 16  2020 zdump
-rwxr-xr-x 1 root     root          29 Dec 13  2019 zegrep
-rwxr-xr-x 1 root     root          29 Dec 13  2019 zfgrep
-rwxr-xr-x 1 root     root        2081 Dec 13  2019 zforce
-rwxr-xr-x 1 root     root        7585 Dec 13  2019 zgrep
-rwxr-xr-x 1 root     root       50718 Oct 19  2020 zipdetails
-rwxr-xr-x 1 root     root        2206 Dec 13  2019 zless
-rwxr-xr-x 1 root     root        1842 Dec 13  2019 zmore
-rwxr-xr-x 1 root     root        4553 Dec 13  2019 znew
root@host1:/# _
```

Screenshot 29 – простые файлы с -