

1. Создание раздела размером 500 МБ на первом добавленном диске

```
fdisk /dev/sdb <<EOF
```

```
n
```

```
p
```

```
1
```

```
+500M
```

```
w
```

```
EOF
```

2. Сохранение UUID созданного раздела в файл

```
blkid /dev/sdb1 | awk '{print $2}' > ~/disk_uuid.txt
```

В файле disk_uuid.txt появится что-то типа:

```
GNU nano 8.3
PARTUUID="5ac5e302-01"
```

3. Создание файловой системы ext4 с размером блока 4096 байт

```
mkfs.ext4 -b 4096 /dev/sdb1
```

4. Вывод состояния суперблока

```
dumpe2fs /dev/sdb1 | head -n 20
```

```
[root@archlinux ~]# dumpe2fs /dev/sdb1 | head -n 20
dumpe2fs 1.47.2 (1-Jan-2025)
Filesystem volume name:   <none>
Last mounted on:          <not available>
Filesystem UUID:          892fa568-4e97-4071-affc-46913d2eff4d
Filesystem magic number:  0xEF53
Filesystem revision #:    1 (dynamic)
Filesystem features:      has_journal ext_attr resize_inode dir_index orphan_file filetype extent 64bit flex_bg metadata_csum sparse_super large_file huge_
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:              128000
Block count:              128000
Reserved block count:    6400
Overhead clusters:       12296
Free blocks:              115666
Free inodes:              127988
First block:              0
Block size:               4096
Fragment size:            4096
```

5. Настройка автоматической проверки файловой системы

```
tune2fs -c 2 -i 2m /dev/sdb1
```

```
[root@archlinux ~]# tune2fs -c 2 -i 2m /dev/sdb1
tune2fs 1.47.2 (1-Jan-2025)
Setting maximal mount count to 2
Setting interval between checks to 5184000 seconds
```

6. Монтирование файловой системы

```
mkdir -p /mnt/newdisk
```

```
mount /dev/sdb1 /mnt/newdisk
```

```
[root@archlinux ~]# mkdir -p /mnt/newdisk
[root@archlinux ~]# mount /dev/sdb1 /mnt/newdisk
[root@archlinux ~]# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	8G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	7G	0	part	/
sdb	8:16	0	2G	0	disk	
└─sdb1	8:17	0	500M	0	part	/mnt/newdisk
sdc	8:32	0	2G	0	disk	
sdd	8:48	0	2G	0	disk	
sde	8:64	0	2G	0	disk	
zram0	254:0	0	3.9G	0	disk	[SWAP]

7. Создание символической ссылки

```
ln -s /mnt/newdisk ~/newdisk_link
```

```
[root@archlinux ~]# ln -s /mnt/newdisk ~/newdisk_link
[root@archlinux ~]# ls
disk_uuid.txt  newdisk_link
```

8. Создание каталога в смонтированной ФС

```
mkdir /mnt/newdisk/mydir
```

9. Настройка автомонтирования

```
UUID=$(blkid -s UUID -o value /dev/sdb1)
```

```
echo "UUID=$UUID /mnt/newdisk ext4 defaults,noexec,noatime 0 2" >> /etc/fstab
```

```
reboot
```

10. Увеличение размера раздела и ФС до 1 ГБ

```
fdisk /dev/sdb <<EOF
```

```
d
```

```
n
```

```
p
```

1

+1G

w

EOF

resize2fs /dev/sdb1

```
[root@archlinux saidl]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
sda          8:0    0   8G  0 disk
├─sda1       8:1    0   1G  0 part /boot
└─sda2       8:2    0   7G  0 part /
sdb          8:16   0   2G  0 disk
└─sdb1       8:17   0   1G  0 part /mnt/newdisk
sdc          8:32   0   2G  0 disk
sdd          8:48   0   2G  0 disk
sde          8:64   0   2G  0 disk
zram0       254:0    0  3.9G  0 disk [SWAP]
[root@archlinux saidl]# resize2fs /dev/sdb1
resize2fs 1.47.2 (1-Jan-2025)
Filesystem at /dev/sdb1 is mounted on /mnt/newdisk; on-line resizing required
old_desc_blocks = 1, new_desc_blocks = 1
The filesystem on /dev/sdb1 is now 262144 (4k) blocks long.
```

11. Проверка файловой системы на ошибки

umount /dev/sdb1

e2fsck -n /dev/sdb1

mount /dev/sdb1 /mnt/newdisk

```
[root@archlinux saidl]# umount /dev/sdb1
[root@archlinux saidl]# e2fsck -n /dev/sdb1
e2fsck 1.47.2 (1-Jan-2025)
/dev/sdb1 has been mounted 2 times without being checked, check forced.
Pass 1: Checking inodes, blocks, and sizes
Pass 2: Checking directory structure
Pass 3: Checking directory connectivity
Pass 4: Checking reference counts
Pass 5: Checking group summary information
/dev/sdb1: 13/256000 files (0.0% non-contiguous), 20471/262144 blocks
[root@archlinux saidl]# mount /dev/sdb1 /mnt/newdisk
```

12. Создание раздела 12 МБ и перенос журнала

fdisk /dev/sdb <<EOF

n

p

2

+12M

w

EOF

mkfs.ext4 /dev/sdb2

tune2fs -J device=/dev/sdb2 /dev/sdb1

```
[root@archlinux said]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
└─sda         8:0    0   8G  0 disk
  └─sda1       8:1    0   1G  0 part /boot
  └─sda2       8:2    0   7G  0 part /
sdb           8:16   0   2G  0 disk
  └─sdb1       8:17   0   1G  0 part /mnt/newdisk
  └─sdb2       8:18   0   12M 0 part
sdc           8:32   0   2G  0 disk
sdd           8:48   0   2G  0 disk
sde           8:64   0   2G  0 disk
zram0       254:0    0  3.9G  0 disk [SWAP]
[root@archlinux said]# mkfs.ext4 /dev/sdb2
mke2fs 1.47.2 (1-Jan-2025)
Creating filesystem with 12288 1k blocks and 3072 inodes
Filesystem UUID: 61c5d222-8efb-4947-87b8-5504c3f568d5
Superblock backups stored on blocks:
    8193

Allocating group tables: done
Writing inode tables: done
Creating journal (1024 blocks): done
Writing superblocks and filesystem accounting information: done

[root@archlinux said]# tune2fs -J device=/dev/sdb2 /dev/sdb1
tune2fs 1.47.2 (1-Jan-2025)
The filesystem already has a journal.
```

13. Создание разделов на 2 и 3 дисках

for disk in /dev/sdc /dev/sdd; do

echo -e "n\np\n1\n\n\nnw" | fdisk \$disk

done

```
[root@archlinux said]# lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
├─sda        8:0      0   8G   0 disk
│ └─sda1     8:1      0   1G   0 part /boot
│ └─sda2     8:2      0   7G   0 part /
├─sdb        8:16     0   2G   0 disk
│ └─sdb1     8:17     0   1G   0 part /mnt/newdisk
│ └─sdb2     8:18     0  12M   0 part
├─sdc        8:32     0   2G   0 disk
│ └─sdc1     8:33     0   2G   0 part
├─sdd        8:48     0   2G   0 disk
│ └─sdd1     8:49     0   2G   0 part
├─sde        8:64     0   2G   0 disk
└─zram0     254:0     0  3.9G   0 disk [SWAP]
```

14. Инициализация и создание LVM

```
pvcreate /dev/sdc1 /dev/sdd1
```

```
vgcreate vgdata /dev/sdc1 /dev/sdd1
```

```
lvcreate -L 3.8G -i2 -n lvstriped vgdata
```

```
mkfs.ext4 /dev/vgdata/lvstriped
```

```
[root@archlinux said]# pvcreate /dev/sdc1 /dev/sdd1
Physical volume "/dev/sdc1" successfully created.
Physical volume "/dev/sdd1" successfully created.
[root@archlinux said]# vgcreate vgdata /dev/sdc1 /dev/sdd1
Volume group "vgdata" successfully created
[root@archlinux said]# lvcreate -L 3.8G -i2 -n lvstriped vgdata
Using default stripesize 64.00 KiB.
Rounding up size to full physical extent 3.80 GiB
Rounding size 3.80 GiB (973 extents) up to stripe boundary size 3.80 GiB (974 extents).
Logical volume "lvstriped" created.
[root@archlinux said]# mkfs.ext4 /dev/vgdata/lvstriped
mke2fs 1.47.2 (1-Jan-2025)
Creating filesystem with 997376 4k blocks and 249488 inodes
Filesystem UUID: 8fd05964-2229-4e60-b5b9-b685917da095
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

15. Монтирование LVM и автомонтирование

```
mkdir -p /mnt/vol01
```

```
mount /dev/vgdata/lvstriped /mnt/vol01
```

```
echo "/dev/vgdata/lvstriped /mnt/vol01 ext4 defaults 0 2" >> /etc/fstab
```

```
[root@archlinux said]# mkdir -p /mnt/vol01
[root@archlinux said]# mount /dev/vgdata/lvstriped /mnt/vol01
[root@archlinux said]# echo "/dev/vgdata/lvstriped /mnt/vol01 ext4 defaults 0 2" >> /etc/fstab
```

16. Получение информации LVM

```
pvdiskdisplay
```

```
vgdisplay
```

```
lvdisplay
```

```
[root@archlinux said]# pvdiskdisplay
--- Physical volume ---
PV Name                /dev/sdc1
VG Name                vgdata
PV Size                <2.00 GiB / not usable 3.00 MiB
Allocatable            yes
PE Size                4.00 MiB
Total PE               511
Free PE                24
Allocated PE           487
PV UUID                7uybbe-rGcl-2fPY-Y7k4-ZeSY-GWPI-aXafGI

--- Physical volume ---
PV Name                /dev/sdd1
VG Name                vgdata
PV Size                <2.00 GiB / not usable 3.00 MiB
Allocatable            yes
PE Size                4.00 MiB
Total PE               511
Free PE                24
Allocated PE           487
PV UUID                7tEyD1-a2M8-i3sB-CTP9-ksiU-SUJ1-5LCHIz
```

```
[root@archlinux said]# vgdisplay
--- Volume group ---
VG Name                vgdata
System ID
Format                 lvm2
Metadata Areas         2
Metadata Sequence No   2
VG Access               read/write
VG Status               resizable
MAX LV                 0
Cur LV                 1
Open LV                 1
Max PV                 0
Cur PV                 2
Act PV                 2
VG Size                 3.99 GiB
PE Size                 4.00 MiB
Total PE                1022
Alloc PE / Size        974 / 3.80 GiB
Free PE / Size          48 / 192.00 MiB
VG UUID                 En1Duu-zNjH-uzX2-QyH0-eXvJ-JbDN-5NNmp4
```

```
[root@archlinux said]# lvdisplay
--- Logical volume ---
LV Path                /dev/vgdata/lvstriped
LV Name                 lvstriped
VG Name                 vgdata
LV UUID                 H5QKDP-30wl-UY5G-CIPT-ayGc-3ioL-TCh8bi
LV Write Access         read/write
LV Creation host, time archlinux, 2025-03-09 19:45:12 +0300
LV Status                available
# open                  1
LV Size                 3.80 GiB
Current LE              974
Segments                1
Allocation              inherit
Read ahead sectors      auto
- currently set to      512
Block device            253:0
```

17-18. Расширение LVM и файловой системы

fdisk /dev/sde <<EOF

n

p
1

\nw

EOF

pvccreate /dev/sde1

vgextend vgdata /dev/sde1

lvextend -l +100%FREE /dev/vgdata/lvstriped

resize2fs /dev/vgdata/lvstriped

```
[root@archlinux saidl# pvccreate /dev/sde1
Physical volume "/dev/sde1" successfully created.
[root@archlinux saidl# vgextend vgdata /dev/sde1
Volume group "vgdata" successfully extended
[root@archlinux saidl# lvextend -l +100%FREE /dev/vgdata/lvstriped
Using stripesize of last segment 64.00 KiB
Rounding size (1533 extents) down to stripe boundary size for segment (1532 extents)
Size of logical volume vgdata/lvstriped changed from 3.80 GiB (974 extents) to 3.99 GiB (1022 extents).
Logical volume vgdata/lvstriped successfully resized.
[root@archlinux saidl# lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	8G	0	disk	
└─sda1	8:1	0	1G	0	part	/boot
└─sda2	8:2	0	7G	0	part	/
sdb	8:16	0	2G	0	disk	
└─sdb1	8:17	0	1G	0	part	/mnt/newdisk
└─sdb2	8:18	0	12M	0	part	
sdc	8:32	0	2G	0	disk	
└─sdc1	8:33	0	2G	0	part	
└─vgdata-lvstriped	253:0	0	4G	0	lvm	/mnt/vol01
sdd	8:48	0	2G	0	disk	
└─sdd1	8:49	0	2G	0	part	
└─vgdata-lvstriped	253:0	0	4G	0	lvm	/mnt/vol01
sde	8:64	0	2G	0	disk	
└─sde1	8:65	0	2G	0	part	
zram0	254:0	0	3.9G	0	disk	[SWAP]

19. Проверка LVM после расширения

vgdisplay

lvdisplay


```
[root@archlinux saidl]# vgdisplay
--- Volume group ---
VG Name                vgdata
System ID
Format                 lvm2
Metadata Areas         3
Metadata Sequence No   4
VG Access              read/write
VG Status              resizable
MAX LV                 0
Cur LV                1
Open LV                1
Max PV                 0
Cur PV                3
Act PV                 3
VG Size                <5.99 GiB
PE Size                4.00 MiB
Total PE               1533
Alloc PE / Size        1022 / 3.99 GiB
Free PE / Size         511 / <2.00 GiB
VG UUID                En1Duu-zNjH-uzX2-QyH0-eXvJ-JbDN-5NNmp4
```

```
[root@archlinux saidl]# lvdisplay
--- Logical volume ---
LV Path                /dev/vgdata/lvstriped
LV Name                lvstriped
VG Name                vgdata
LV UUID                H5QKDP-30wl-UY5G-CIPT-ayGc-3ioL-TCh8bi
LV Write Access        read/write
LV Creation host, time archlinux, 2025-03-09 19:45:12 +0300
LV Status              available
# open                 1
LV Size                3.99 GiB
Current LE             1022
Segments               1
Allocation             inherit
Read ahead sectors     auto
- currently set to     512
Block device           253:0
```

20. Установка и запуск NFS

pacman -S nfs-utils

systemctl enable nfs-server

systemctl start nfs-server

```
[root@archlinux said]# systemctl enable nfs-server
Created symlink '/etc/systemd/system/multi-user.target.wants/nfs-server.service' → '/usr/lib/systemd/system/nfs-server.service'.
[root@archlinux said]# systemctl start nfs-server
```

21. Настройка экспорта каталога через NFS

echo "/mnt/vol01 10.0.2.15/24(rw,sync,no_root_squash)" >> /etc/exports

exportfs -ra

systemctl restart nfs-server

```
[root@archlinux said]# echo "/mnt/vol01 192.168.1.0/24(rw,sync,no_root_squash)" >> /etc/exports
[root@archlinux said]# exportfs -ra
[root@archlinux said]# systemctl restart nfs-server
```

22-23. Монтирование NFS на клиенте и проверка

mkdir -p /var/remotenfs

mount -t nfs 10.0.2.15:/mnt/vol01 /var/remotenfs

touch /var/remotenfs/testfile