

1. На OS CentOS8 Stream в VirtualBox подключены 4 дополнительных диска.

```
[nastya@centos8lab ~]$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda          8:0    0   21G  0 disk
├─sda1       8:1    0   600M  0 part /boot/efi
├─sda2       8:2    0    1G  0 part /boot
├─sda3       8:3    0  19,4G  0 part
├─┬─cs-root 253:0    0  17,4G  0 lvm  /
├─┬─cs-swap 253:1    0    2G  0 lvm  [SWAP]
└─sdb        8:16    0    3G  0 disk
sdc          8:32    0    3G  0 disk
sdd          8:48    0    3G  0 disk
sde          8:64    0    3G  0 disk
sr0         11:0    1 1024M  0 rom
```

2. Выполнена команда `sudo mdadm --create /dev/md127 --level=5 --raid-devices=4 /dev/sd{b,c,d,e}` для создания RAID-массива 5 уровня. Далее виден процесс его создания и окончательный результат.

```
[nastya@centos8lab ~]$ sudo mdadm --create /dev/md127 --level=5 --raid-devices=4 /dev/sd{b,c,d,e}
[sudo] password for nastya:
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md127 started.
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4] sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/3] [UUU_]
      [=====>.....]  recovery = 34.3% (1079548/3142656) finish=0.1min speed=179924K/sec

unused devices: <none>
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4] sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/4] [UUUU]

unused devices: <none>
```

3. Результат команды `sudo mdadm -D /dev/md127`

```
[nastya@centos8lab ~]$ sudo mdadm -D /dev/md127
[sudo] password for nastya:
/dev/md127:
  Version : 1.2
  Creation Time : Tue Jan 30 17:57:26 2024
    Raid Level : raid5
    Array Size : 9427968 (8.99 GiB 9.65 GB)
  Used Dev Size : 3142656 (3.00 GiB 3.22 GB)
  Raid Devices : 4
  Total Devices : 4
  Persistence : Superblock is persistent

  Update Time : Tue Jan 30 17:57:44 2024
    State : clean
  Active Devices : 4
  Working Devices : 4
  Failed Devices : 0
  Spare Devices : 0


  Layout : left-symmetric
  Chunk Size : 512K

Consistency Policy : resync

           Name : centos8lab:127 (local to host centos8lab)
           UUID : 67d17fd7:2fa87e7c:1ebdb796:ed6786d9
           Events : 18

   Number   Major   Minor   RaidDevice State
     0         8       16         0     active sync  /dev/sdb
     1         8       32         1     active sync  /dev/sdc
     2         8       48         2     active sync  /dev/sdd
     4         8       64         3     active sync  /dev/sde
```

4. Далее создаем конфигурационный файл и копируем в него результат команды `mdadm --detail --scan /dev/md127`

```
[nastya@centos8lab ~]$ sudo mdadm --detail --scan /dev/md127
[sudo] password for nastya:
ARRAY /dev/md127 metadata=1.2 name=centos8lab:127 UUID=67d17fd7:2fa87e7c:1ebdb796:ed6786d9
[nastya@centos8lab ~]$ sudo vim /etc/mdadm/mdadm.conf
[nastya@centos8lab ~]$ sudo vim /etc/mdadm/mdadm.conf
[nastya@centos8lab ~]$ cat /etc/mdadm/mdadm.conf
ARRAY /dev/md127 metadata=1.2 name=centos8lab:127 UUID=67d17fd7:2fa87e7c:1ebdb796:ed6786d9
```

5. Эмулируем выход из строя диска, удаляем его из RAID, добавляем снова

```
[nastya@centos8lab ~]$ sudo mdadm /dev/md127 --fail /dev/sde
mdadm: Value "centos8lab:127" cannot be set as name. Reason: Not POSIX compatible. Value ignored.
mdadm: set /dev/sde faulty in /dev/md127
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4](F) sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/3] [UUU_]

unused devices: <none>
[nastya@centos8lab ~]$ sudo mdadm /dev/md127 --remove /dev/sde
mdadm: Value "centos8lab:127" cannot be set as name. Reason: Not POSIX compatible. Value ignored.
mdadm: hot removed /dev/sde from /dev/md127
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/3] [UUU_]

unused devices: <none>
[nastya@centos8lab ~]$ sudo mdadm /dev/md127 --add /dev/sde
mdadm: Value "centos8lab:127" cannot be set as name. Reason: Not POSIX compatible. Value ignored.
mdadm: added /dev/sde
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4] sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/3] [UUU_]
[=====>.....] recovery = 35.6% (1120380/3142656) finish=0.1min speed=186730K/sec

unused devices: <none>
[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4] sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/3] [UUU_]
[=====>.....] recovery = 83.8% (2636284/3142656) finish=0.0min speed=202791K/sec

[nastya@centos8lab ~]$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md127 : active raid5 sde[4] sdd[2] sdc[1] sdb[0]
      9427968 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/4] [UUUU]

unused devices: <none>
```

6. Создаем раздел GPT на RAID

```
[nastya@centos8lab ~]$ sudo parted /dev/md127
[sudo] password for nastya:
GNU Parted 3.2
Using /dev/md127
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted) mklabel gpt
(parted) q
Information: You may need to update /etc/fstab.

[nastya@centos8lab ~]$ sudo fdisk -l /dev/md127
Disk /dev/md127: 9 GiB, 9654239232 bytes, 18855936 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 524288 bytes / 1572864 bytes
Disklabel type: gpt
Disk identifier: 3259538B-174F-485A-98B8-03D42F075A93
```

7. Создаем 5 партиций

```
[nastya@centos8lab ~]$ sudo parted /dev/md127 mkpart primary ext4 0% 20%
Information: You may need to update /etc/fstab.

[nastya@centos8lab ~]$ sudo parted /dev/md127 mkpart primary ext4 20% 40%
Information: You may need to update /etc/fstab.

[nastya@centos8lab ~]$ sudo parted /dev/md127 mkpart primary ext4 40% 60%
Information: You may need to update /etc/fstab.

[nastya@centos8lab ~]$ sudo parted /dev/md127 mkpart primary ext4 60% 80%
Information: You may need to update /etc/fstab.

[nastya@centos8lab ~]$ sudo parted /dev/md127 mkpart primary ext4 80% 100%
Information: You may need to update /etc/fstab.
```

8. Создаем файловую систему скриптом

```
for i in $(seq 1 5); do sudo mkfs.ext4 /dev/md127p$i; done
```

9. Монтируем диски

```
[nastya@centos8lab ~]$ sudo mkdir /md127p{1,2,3,4,5}
[nastya@centos8lab ~]$ for i in /md127p$i; do sudo mount /dev/md127
md127    md127p1  md127p2  md127p3  md127p4  md127p5
[nastya@centos8lab ~]$ for i in /md127p$i; do sudo mount /dev/md127
md127    md127p1  md127p2  md127p3  md127p4  md127p5
[nastya@centos8lab ~]$ for i in $(seq 1 5); do sudo mount /dev/md127p$i /md127p$i; done
[nastya@centos8lab ~]$ ls /etc | grep md127p
[nastya@centos8lab ~]$ ls / | grep md127p
md127p1
md127p2
md127p3
md127p4
md127p5
```