

- 
- :

- 

$$- \quad :$$

- $$\begin{array}{c} \bullet \\ \bullet \end{array}$$

- $$\vdots$$

```
lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	32G	0	disk	
sda1	8:1		243M	0	part	/boot
sda2	8:2	0	1K	0	part	
sda5	8:5	0	31,3G	0	part	

- sda1 - /boot, 243
- sda2 - ;
- sda5 - LVM, 31.3, LVM root, home, swap_1, , /root, /home (lsblk LVM , ,).

LVS, sda5:

```
sudo pvs
```

PV	VG	Fmt	Attr	PSize	PFree
/dev/sda5	lvs-vg	lvm2	a--	31,76g	0

```
sudo vgs
```

VG	#PV	#LV	#SN	Attr	VSize	VFree
lvs-vg	1	3	0	wz--n-	31,76g	0

```
sudo lvs
```

LV	VG	Attr	LSize	Pool	Origin	Data%	Meta%	Move	Log	Cpy%
Sync Convert										
home	lvs-vg	-wi-ao----	16,68							
g										
root	lvs-vg	-wi-ao----	11,08							
g										
swap_1	lvs-vg	-wi-ao----	4,00g							

```

sudo pvs -v --segments /dev/sda5

Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG          Fmt  Attr PSize  PFree  Start  SSize LV          Start
Type    PE Ranges
/dev/sda5  lvs-vg  lvm2  a--  31,76g    0        0   2836 root          0 linear
/dev/sda5:0-2835
/dev/sda5  lvs-vg  lvm2  a--  31,76g    0   2836   1023 swap_1        0 linear
/dev/sda5:2836-3858
/dev/sda5  lvs-vg  lvm2  a--  31,76g    0   3859   4271 home          0 linear
/dev/sda5:3859-8129

```



swap_1 root home, , .



, live-USB (. [USB flash drive](#) [ALP-live \(Live-CD/Live-USB\)](#) [Astra Linux](#)), /boot . , , .



1. :

```
sudo swapon
```

NAME	TYPE	SIZE	USED	PRI0
/dev/dm-1	partition	4G	0B	-2

```
sudo swapoff /dev/dm-1
```

:

```
sudo swapoff -a
```

2. (/etc/fstab):

```
#/dev/mapper/lvs--vg-swap_1 none swap sw 0 0
```

3. swap_1:

```
sudo lvremove /dev/`hostname`-vg/swap_1
```

```
Do you really want to remove active logical volume lvs-vg/swap_1? [y/n]: y
Logical volume "swap_1" successfully removed
```

4. , , , /etc/initramfs-tools/conf.d/resume :

```
#RESUME=/dev/mapper/lvs--vg-swap_1
```

:

```
sudo update-initramfs -t -u -k `uname -r`
sudo update-grub
```

- .

, pvs "" :

```
sudo pvs -v --segments /dev/sda5
```

```
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG          Fmt Attr PSize  PFree Start  SSize LV      Start Type   PE
Ranges
/dev/sda5   lvs-vg   lvm2 a--  31,76g 4,00g    0   2836 root      0 linear /dev
/sda5:0-2835
/dev/sda5   lvs-vg   lvm2 a--  31,76g 4,00g  2836   1023      0
free
/dev/sda5   lvs-vg   lvm2 a--  31,76g 4,00g  3859   4271 home     0 linear /dev
/sda5:3859-8129
```

, , 1023, home 4271,, home, .

LVM

LVM , , .

, (. "").



live-USB . , /home, :

1. ;
2. (Ctrl+Alt+F1);
3. , :

```
cd /
```

4. /home:

```
sudo umount /home
```

5. (Ctrl+Alt+F7) (,).
6. .
7. :

```
sudo mount /home
```

, , . root, root, live-USB .

, LVM, :

```
sudo pvmove --alloc anywhere /dev/sda5:XXXX+YYY /dev/sda5:ZZZZ+YYY
```

+YYY - (. sudo pvs -v --segmens), ZZZZ+YYY - , (. "").

LVM, pvmove :

```
sudo pvmove --alloc anywhere /dev/sda5:3859-8129
```

```
Insufficient free space: 4271 extents needed, but only 1023 available
Unable to allocate mirror extents for lvs-vg/pvmove0.
Failed to convert pvmove LV to mirrored
```

, . 1023, :

```
sudo pvmove --alloc anywhere /dev/sda5:3859+1000 /dev/sda5:2836+1000
```



sudo pvs -v --segments /dev/sda5

```
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG      Fmt  Attr PSize  PFree Start  SSize LV   Start Type  PE Ranges
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g    0 2836 root    0 linear /dev/sda5:0-2835
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g 2836 1001 home    0 linear /dev/sda5:2836-3836
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g 3837 1023      0 free
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g 4860 3270 home 1001 linear /dev/sda5:4860-8129
```

```
sudo pvmove --alloc anywhere /dev/sda5:4860+1000 /dev/sda5:3837+1000
sudo pvmove --alloc anywhere /dev/sda5:5861+1000 /dev/sda5:4838+1000
sudo pvmove --alloc anywhere /dev/sda5:6862+1000 /dev/sda5:5839+1000
sudo pvmove --alloc anywhere /dev/sda5:7863- /dev/sda5:6840-
```

sudo pvs -v --segments /dev/sda5

```
sudo pvs -v --segments /dev/sda5
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG      Fmt  Attr PSize  PFree Start  SSize LV   Start Type  PE
Ranges
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g    0 2836 root    0 linear
/dev/sda5:0-2835
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g 2836 4271 home    0 linear
/dev/sda5:2836-7106
/dev/sda5   lvs-vg  lvm2 a--  31,76g 4,00g 7107 1023      0
free
```



16, . , .

()

(- LVM) live-USB gparted (" - " - " Gparted"). pvresize:

sudo pvresize -v --setphysicalvolumesize 32778240K /dev/sda5

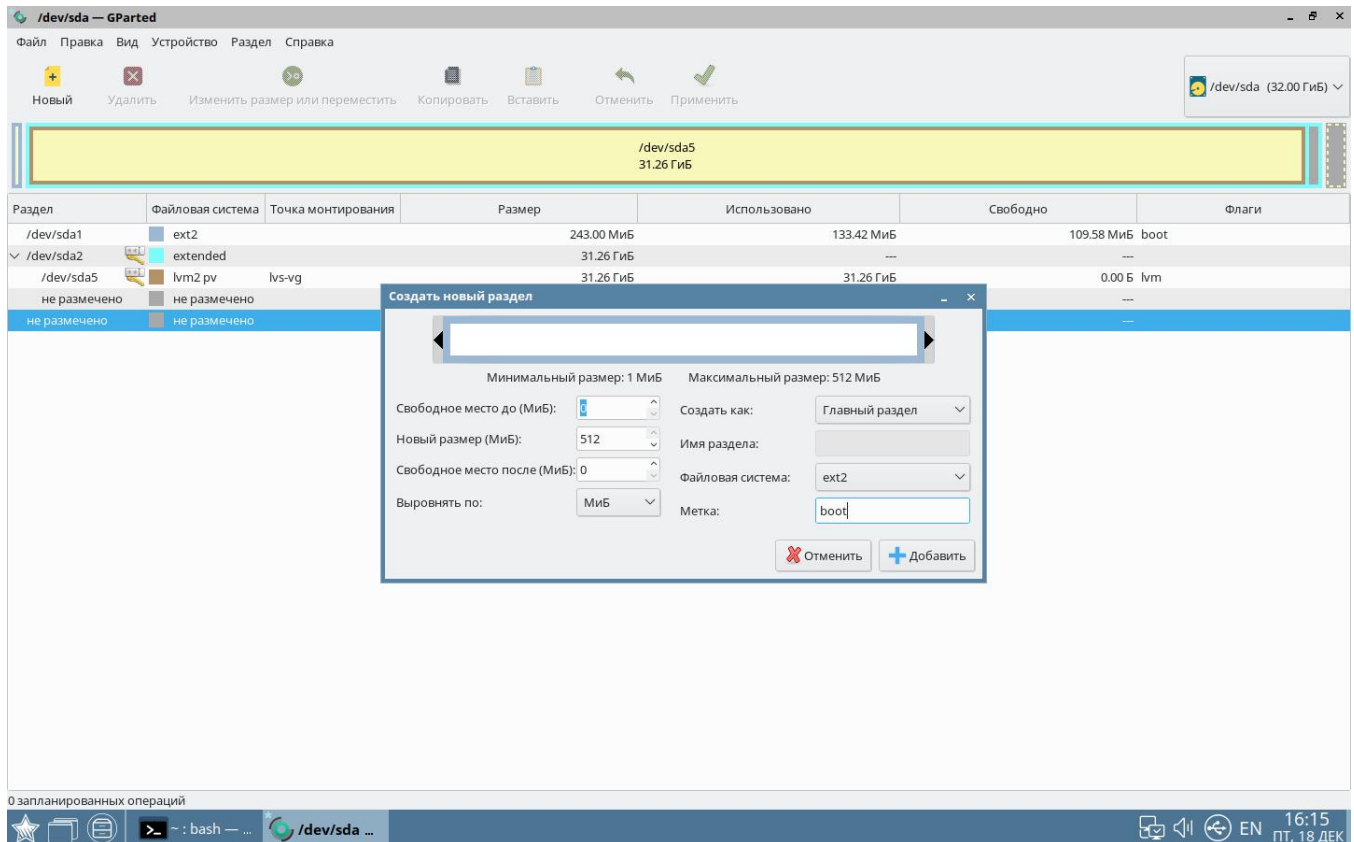
boot

1. live-USB;
2. gparted.

live-USB (live-USB Astra Linux) LVM, LVM, "".

, " ", .

boot:



ext2, boot, (boot).

:

1. parted:

```
sudo parted
```

```
GNU Parted 3.2
Using /dev/sda
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted)
```

2. print (2, extended):

```
(parted) print
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 34,4GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End     Size    Type     File system  Flags
 1      1049kB  256MB   255MB   primary  ext2          boot
 2      257MB  34,4GB  34,1GB   extended
 5      257MB  33,8GB  33,6GB   logical              lvm
```

3. :

```
(print) resizepart 2 33.8G
```

- :
- 2 - ;
 - 33.8G - ();
4. ():

```
(print) mkpart primary ext2 33.8G 34.4G
```

5. :

```
(parted) print
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 34,4GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End     Size    Type     File system  Flags
  1      1049kB  256MB   255MB   primary  ext2
  2      257MB   33,8GB  33,6GB   extended
  5      257MB   33,8GB  33,6GB   logical
  3      33,8GB  34,4GB  537MB   primary  ext2      lvm
                                         boot
```

6. boot:

```
(print) toggle 3 boot
```

7. parted:

```
q
```

8. :

- a. :

```
lsblk
-----
NAME MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda   8:0    0   32G  0 disk
sda1  8:1    0   243M  0 part
sda3  8:3    0   512M  0 part /boot
sda5  8:5    0 31,3G  0 part
```

- b. "boot" ():

```
sudo e2label /dev/sda5 boot
```

boot

live-USB, , :

1. :

```
lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINT
sda	8:0	0	32G	0	disk	
sda1	8:1		243M	0	part	/boot
sda2	8:2	0	1K	0	part	
sda3	8:3		512M	0	part	
sda5	8:5	0	31,3G	0	part	

sda3, 512M

2. , :

```
sudo mount /dev/sda3 /mnt
```

3. boot boot:

```
sudo cp -R /boot/* /mnt
```

4. , boot , :
a. :

```
sudo blkid
```

```
/dev/sda1: UUID="86418b1a-525a-4614-a600-749403a542b2" TYPE="ext2"
PARTUUID="9326d1ae-01"
/dev/sda3: LABEL="boot" UUID="7fb61205-3f42-44ff-8886-
a394991bfac0" TYPE="ext2" PARTUUID="9326d1ae-03"
/dev/sda5: UUID="Xqsuis-3sj7-VEHQ-uUXX-RzJu-lozK-0kbqN9" TYPE="
LVM2_member" PARTUUID="9326d1ae-05"
/dev/mapper/lvs--vg-root: UUID="589855d1-25f5-4151-bfa4-
8d1d1861a954" TYPE="ext4"
/dev/mapper/lvs--vg-home: UUID="88356e6b-7920-4357-a21e-
733435f1aa72" TYPE="ext4"
```

b. /etc/fstab boot, , blkid:

UUID=7fb61205-3f42-44ff-8886-a394991bfac0 /boot	ext2	defaults	0	2
---	------	----------	---	---

, , :

LABEL=boot /boot	ext2	defaults	0	2
------------------	------	----------	---	---

c. boot :

```
sudo umount /boot
sudo mount /boot
```

d. , , , /etc/initramfs-tools/conf.d/resume :

```
#RESUME=/dev/mapper/lvs--vg-swap_1
```

e. :

```
sudo update-initramfs -t -u -k `uname -r`
sudo update-grub
```

boot

boot :

```
sudo grub-install /dev/sda
```

1. , :

```
df -h
```

		%	C		
udev	2,0G	0	2,0G	0%	/dev
tmpfs	395M	8,0M	387M	3%	/run
/dev/mapper/lvs--vg-root	11G	3,9G	6,4G	38%	/
tmpfs	2,0G	4,0K	2,0G	1%	/dev
/shm					
tmpfs	5,0M	4,0K	5,0M	1%	/run
/lock					
tmpfs	2,0G	0	2,0G	0%	/sys/fs
/cgroup					
/dev/sda1	236M	126M	98M	57%	/boot
/dev/mapper/lvs--vg-home	17G	57M	16G	1%	/home
tmpfs	395M	0	395M	0%	/run
/user/999					
tmpfs	395M	8,0K	395M	1%	/run
/user/1000					

, /home, 17, 57 (,,).

2. live-USB /home .

3. :

```
sudo e2fsck -ff /dev/mapper/lvs--vg-home
```

4. 2GB:

```
sudo resize2fs /dev/mapper/lvs--vg-home 2G
```

5. 2GB:

```
sudo lvreduce -L 2G /dev/mapper/lvs--vg-home
```

```
WARNING: Reducing active logical volume to 2,00 GiB.
THIS MAY DESTROY YOUR DATA (filesystem etc.)
Do you really want to reduce lvs-vg/home? [y/n]: y
Size of logical volume lvs-vg/home changed from 16,68 GiB (4271
extents) to 2,00 GiB (512 extents).
Logical volume lvs-vg/home successfully resized.
```

6. .

:

```
sudo pvs -v --segments /dev/sda5
```

```
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG          Fmt  Attr PSize  PFree  Start SSize LV    Start Type  PE
Ranges
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g    0  2836 root    0 linear
/dev/sda5:0-2835
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g 2836  1023      0
free
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g 3859   512 home    0 linear
/dev/sda5:3859-4370
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g 4371  3759      0
free
```

, home , , :

```
sudo pvmove --alloc anywhere /dev/sda5:3859+512 /dev/sda5:2836+512
```

:

```
sudo pvs -v --segments /dev/sda5
```

```
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG          Fmt  Attr PSize  PFree  Start SSize LV    Start Type  PE
Ranges
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g    0  2836 root    0 linear
/dev/sda5:0-2835
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g 2836   512 home    0 linear
/dev/sda5:2836-3347
/dev/sda5   lvs-vg   lvm2 a--   31,76g 18,68g 3348  4782      0
free
```

1. :

1. home (- swap , home):

```
sudo lvextend -l +4654 /dev/mapper/lvs--vg-home
```

2. - swap, :

```
sudo lvcreate -n swap_1 -L 4G lvs-vg
```

:

```
sudo pvs -v --segments /dev/sda5
```

```
Wiping internal VG cache
Wiping cache of LVM-capable devices
PV          VG          Fmt  Attr PSize  PFree  Start SSize LV    Start Type  PE
Ranges
/dev/sda5   lvs-vg   lvm2 a--   31,26g    0    0  2836 root    0 linear /dev
```

```
/sda5:0-2835
```

```
/dev/sda5 lvs-vg lvm2 a-- 31,26g 0 2836 5166 home 0 linear /dev  
/sda5:2836-8001
```

```
live-USB - /home:
```

```
sudo mount /home
```

, .