

Лабораторная работа №6 по операционной системе

Имя: Чу минь Тиеп

Группа: K33401

Преподаватель: Ватьян Александра Сергеевна

Часть 1.1 .Создание LVM

Создайте точки монтирования для каждого эпизода и добавьте соответствующие записи в `/etc/fstab`. Убедитесь, что том смонтирован после перезапуска системы

```
root@localhost:~/os/lab6
[root@localhost lab6]# mkdir -p /mnt/ms/movies
[root@localhost lab6]# mkdir -p /mnt/ms/music
[root@localhost lab6]# mkdir -p /mnt/ms/images
[root@localhost lab6]#
[root@localhost lab6]# mount /dev/mdiaserver/movies /mnt/ms/movies
[root@localhost lab6]# mount /dev/mdiaserver/music /mnt/ms/music
[root@localhost lab6]# mount /dev/mdiaserver/images /mnt/ms/images
[root@localhost lab6]#
[root@localhost lab6]#
```

```
GNU nano 2.9.8 /etc/fstab Modified

#
# /etc/fstab
# Created by anaconda on Fri Aug 7 08:25:48 2020
#
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
#
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
#
/dev/mapper/cl-root / xfs defaults 0 0
UUID=1869a4cd-d0cd-41ca-a7d1-86496309cb78 /boot xfs defaults ext4 defaults $
/dev/mapper/cl-home /home xfs defaults 0 0
/dev/mapper/cl-swap swap swap defaults 0 0
/dev/mdiaserver/movies /mnt/ms/movies ext4 defaults 0 2
/dev/mdiaserver/music /mnt/ms/music ext4 defaults 0 2
/dev/mdiaserver/images /mnt/ms/images ext4 defaults 0 2
```

^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify ^C Cur Pos
^X Exit ^R Read File ^N Replace ^U Uncut Text ^T To Spell ^_ Go To Line

Монтирование

```
root@localhost:/mnt/ms/images

[root@localhost images]# reboot
Connection to 127.0.0.1 closed by remote host.
Connection to 127.0.0.1 closed.
+ ts git:(dev) centos1
root@127.0.0.1's password:
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Tue Dec 1 03:09:51 2020 from 10.211.55.1
[root@localhost ~]# cd /mnt/ms/images
[root@localhost images]# ls
file1.txt  lost+found
[root@localhost images]#
```

Убедитесь, что после перезагрузки все в порядке

Усечение раздела происходит в обратном порядке: сначала уменьшается размер файловой системы, затем размер раздела. Измените размер тома **movies** обратно на 200M

```
root@localhost:~

root@localhost:~ #1
root@localhost:~ #2

[root@localhost ~]# e2fsck -f /dev/mediaserver/movies
e2fsck 1.45.4 (23-Sep-2019)
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/mediaserver/movies: 11/77824 files (0.0% non-contiguous), 15987/307200 blocks
[root@localhost ~]# resize2fs /dev/mediaserver/movies 200M
resize2fs 1.45.4 (23-Sep-2019)
Resizing the filesystem on /dev/mediaserver/movies to 204800 (1k) blocks.
The filesystem on /dev/mediaserver/movies is now 204800 (1k) blocks long.

[root@localhost ~]# lvreduce -L200M /dev/mediaserver/movies
WARNING: Reducing active logical volume to 200.00 MiB.
THIS MAY DESTROY YOUR DATA (filesystem etc.)
Do you really want to reduce mediaserver/movies? [y/n]: y
Size of logical volume mediaserver/movies changed from 300.00 MiB (75 extents) to 2
00.00 MiB (50 extents).
Logical volume mediaserver/movies successfully resized.
[root@localhost ~]#
[root@localhost ~]# mount /dev/mediaserver/movies /mnt/ms/movies
[root@localhost ~]#
[root@localhost ~]# df -h
Filesystem                Size      Used Avail Use% Mounted on
devtmpfs                   1.9G    0 1.9G  0% /dev
tmpfs                      1.9G    0 1.9G  0% /dev/shm
tmpfs                      1.9G  9.4M  1.9G  1% /run
tmpfs                      1.9G    0 1.9G  0% /sys/fs/cgroup
/dev/mapper/cl-root        40G   5.4G   35G 14% /
/dev/mapper/cl-home        20G   273M   20G  2% /home
/dev/mapper/mediaserver-images 190M   1.6M  175M  1% /mnt/ms/images
/dev/mapper/mediaserver-music 190M   1.6M  175M  1% /mnt/ms/music
/dev/sda1                  976M  210M   700M 24% /boot
Home                       113G  101G   13G  90% /media/psf/Home
iCloud                     113G  101G   13G  90% /media/psf/iCloud
tmpfs                      359M   1.2M  358M  1% /run/user/42
tmpfs                      359M   4.0K  359M  1% /run/user/0
/dev/mapper/mediaserver-movies 287M   2.1M  266M  1% /mnt/ms/movies
[root@localhost ~]#
```

Часть 1.2. Замена дисков

root@localhost:~

root@localhost:~

```
[root@localhost ~]# pvremove /dev/sdb1
Labels on physical volume "/dev/sdb1" successfully wiped.
[root@localhost ~]# pvdisplay
--- Physical volume ---
PV Name               /dev/sdc1
VG Name               mediaserver
PV Size               1023.00 MiB / not usable 3.00 MiB
Allocatable           yes
PE Size               4.00 MiB
Total PE              255
Free PE               255
Allocated PE          0
PV UUID               O6MNdJ-DIuG-HWmV-yj5p-8Loz-BRwF-YlU6ik

--- Physical volume ---
PV Name               /dev/sdd1
VG Name               mediaserver
PV Size               1023.00 MiB / not usable 3.00 MiB
Allocatable           yes
PE Size               4.00 MiB
Total PE              255
Free PE               255
Allocated PE          0
PV UUID               osKqQA-BpeQ-xeGs-eQEU-C6IO-70H3-WJd1zf

--- Physical volume ---
PV Name               /dev/sde1
VG Name               mediaserver
PV Size               1023.00 MiB / not usable 3.00 MiB
Allocatable           yes
PE Size               4.00 MiB
Total PE              255
Free PE               105
Allocated PE          150
PV UUID               DCy7Fb-020B-Y25X-mla1-4gbe-DFJ6-vy05Dc

--- Physical volume ---
PV Name               /dev/sda2
VG Name               cl
PV Size               <63.00 GiB / not usable 3.00 MiB
Allocatable           yes (but full)
PE Size               4.00 MiB
Total PE              16127
Free PE               0
Allocated PE          16127
PV UUID               bbQeQy-zATZ-cD79-vQYp-k2ey-5jFI-ulrA1S

[root@localhost ~]#
```

```
[root@localhost ~]# clear
[root@localhost ~]#
```

Проверка корректной замены диска

Часть 1.3. “Разборка” LVM

root@localhost:~

..development/ts

```
[root@localhost ~]# df -h
Filesystem      Size  Used Avail Use% Mounted on
devtmpfs        1.9G   0  1.9G   0% /dev
tmpfs           1.9G   0  1.9G   0% /dev/shm
tmpfs           1.9G  9.3M  1.9G   1% /run
tmpfs           1.9G   0  1.9G   0% /sys/fs/cgroup
/dev/mapper/cl-root 40G   5.4G   35G  14% /
/dev/mapper/cl-home 20G  273M   20G   2% /home
/dev/sda1       976M  210M  700M  24% /boot
Home            113G  101G   13G  90% /media/psf/Home
iCloud          113G  101G   13G  90% /media/psf/iCloud
tmpfs           378M  1.2M  377M   1% /run/user/42
tmpfs           378M  4.0K  378M   1% /run/user/0

[root@localhost ~]#
```

```
→ ts git:(dev)
```

Проверка после перезагрузки

Часть 1.4. LVM поверх RAID

root@localhost:~

root@localhost:~

8193, 24577, 40961, 57345, 73729

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

[root@localhost ~]# mkfs.ext4 /dev/mediaserver/images
mke2fs 1.45.4 (23-Sep-2019)
Discarding device blocks: done
Creating filesystem with 204800 1k blocks and 51200 inodes
Filesystem UUID: b43f4afb-e49b-4937-b42d-0d9dbaef0160
Superblock backups stored on blocks:
8193, 24577, 40961, 57345, 73729

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done

[root@localhost ~]# mount /dev/mediaserver/movies /mediaserver/movies
mount: /mediaserver/movies: mount point does not exist.
[root@localhost ~]# mkdir /mediaserver
[root@localhost ~]# mount /dev/mediaserver/movies /mediaserver/movies
mount: /mediaserver/movies: mount point does not exist.
[root@localhost ~]# mkdir /mediaserver/movies
[root@localhost ~]# mkdir /mediaserver/music
[root@localhost ~]# mkdir /mediaserver/images
[root@localhost ~]# mount /dev/mediaserver/movies /mediaserver/movies
[root@localhost ~]# mount /dev/mediaserver/music /mediaserver/music
[root@localhost ~]# mount /dev/mediaserver/images /mediaserver/images
[root@localhost ~]# df -h

Filesystem Size Used Avail Use% Mounted on
devtmpfs 1.9G 0 1.9G 0% /dev
tmpfs 1.9G 0 1.9G 0% /dev/shm
tmpfs 1.9G 9.3M 1.9G 1% /run
tmpfs 1.9G 0 1.9G 0% /sys/fs/cgroup
/dev/mapper/cl-root 40G 5.4G 35G 14% /
/dev/mapper/cl-home 20G 273M 20G 2% /home
/dev/sda1 976M 210M 700M 24% /boot
Home 113G 101G 13G 90% /media/psf/Home
iCloud 113G 101G 13G 90% /media/psf/iCloud
tmpfs 378M 1.2M 377M 1% /run/user/42
tmpfs 378M 4.0K 378M 1% /run/user/0
/dev/mapper/mediaserver-movies 190M 1.6M 175M 1% /mediaserver/movies
/dev/mapper/mediaserver-music 190M 1.6M 175M 1% /mediaserver/music
/dev/mapper/mediaserver-images 190M 1.6M 175M 1% /mediaserver/images
[root@localhost ~]#

[root@localhost ~]# touch /mediaserver/images/file{1..10}
[root@localhost ~]# mdadm --manage --fail /dev/md0 /dev/sdb1
mdadm: set /dev/sdb1 faulty in /dev/md0
[root@localhost ~]# cat /proc/mdstat
Personalities : [raid1]
md1 : active raid1 sde1[2] sdd1[0]
 1046528 blocks super 1.2 [2/2] [UU]

md0 : active raid1 sdc1[2] sdb1[0](F)
 1046528 blocks super 1.2 [2/1] [_U]

unused devices: <none>
[root@localhost ~]# mdadm --manage --remove /dev/md0 /dev/sdb1
mdadm: hot removed /dev/sdb1 from /dev/md0
[root@localhost ~]# mdadm --manage --add /dev/md0 /dev/sdb1
mdadm: added /dev/sdb1
[root@localhost ~]#

Тестинг

Часть 1.5. Создание снимотов

```
# Create snapshot
lvcreate -L200M -s -n snap /dev/devserver/project
mkdir /devserver/snap
mount /dev/devserver/snap /devserver/snap

# -----
# MAKE BACKUP
# -----
cd /devserver/snap/
tar -cvzf snap_backup.tar.gz *
mv snap_backup.tar.gz /root/os/lab6/

# Remove snapshot
umount /devserver/snap
lvremove /dev/devserver/snap

# -----
# RESTORE SNAPSHOT
# -----
lvcreate --name snap_back --size 200M devserver
mkfs.ext4 /dev/devserver/snap_back
mkdir /devserver/snap_back
mount /dev/devserver/snap_back /devserver/snap_back
tar -xvzf snap_backup.tar.gz -C /devserver/snap_back
```

Создание бэкапа для снимота

Часть 1.6. Зеркалирование с 2 дисками

```
pvccreate /dev/sdb /dev/sdc
vgcreate mirrored /dev/sdb /dev/sdc
lvcreate -L 500M -m1 -n mirror mirrored
mkfs.ext4 /dev/mirrored/mirror
mkdir /mirror
mount /dev/mirrored/mirror /mirror
man ls > /mirror/ls.txt
man cp > /mirror/cp.txt
man dd > /mirror/dd.txt
lvs -a -o +devices
```

Create mirrored logical volume

1.Вдруг у нас “выпал” один диск из зеркала (например, /dev/sdb) и его необходимо заменить. Чтобы представить такую ситуацию, удалите диск из настроек виртуальной машины или выполните следующую команду

```
echo offline > /sys/block/sdb/device/state
```

Сначала проверьте, работает ли зеркало и данные не теряются. Во-вторых, выполните операции по замене диска и ремонту зеркала.

```
root@localhost:~  
[root@localhost ~]# pvs  
PV          VG      Fmt  Attr  PSize    PFree  
/dev/sda2   cl       lvm2 a--   <63.00g    0  
/dev/sdb    mirrored lvm2 a--  1020.00m  516.00m  
/dev/sdc    mirrored lvm2 a--  1020.00m  516.00m  
[root@localhost ~]#  
[root@localhost ~]# echo offline > /sys/block/sdb/device/state  
[root@localhost ~]#  
[root@localhost ~]# ls /mirror/  
cp.txt  dd.txt  lost+found  ls.txt  
[root@localhost ~]#  
[root@localhost ~]# vgs  
/dev/sdb: open failed: No such device or address  
/dev/sdb: open failed: No such device or address  
/dev/sdb: open failed: No such device or address  
WARNING: Couldn't find device with uuid 06y8jh-jg4E-V0jQ-9Ges-cPLg-ahWg-hxczQW.  
WARNING: VG mirrored is missing PV 06y8jh-jg4E-V0jQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).  
VG      #PV #LV #SN Attr   VSize    VFree  
cl       1  3  0 wz--n-   <63.00g    0  
mirrored 2  1  0 wz-pn-   1.99g <1.01g  
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]# lvs  
/dev/sdb: open failed: No such device or address  
/dev/sdb: open failed: No such device or address  
WARNING: Couldn't find device with uuid 06y8jh-jg4E-V0jQ-9Ges-cPLg-ahWg-hxczQW.  
WARNING: VG mirrored is missing PV 06y8jh-jg4E-V0jQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).  
LV      VG      Attr      LSize    Pool Origin Data%  Meta%  Move Log Cpy%Sync Conv  
ert  
home   cl       -wi-ao---- 19.36g  
root   cl       -wi-ao---- 39.66g  
swap   cl       -wi-ao---- <3.97g  
  
mirror mirrored rwi-aor-p- 500.00m                100.00  
[root@localhost ~]#
```

Отключил диск, проверьте, все ли еще работает

```
# Превращаем mirrored в linear  
vgchange -a y --partial mirrored  
  
# Удаляем испорченный диск из VG  
vgreduce --removemissing mirrored  
  
# Создаем новый PV и добавляем его в VG  
pvcreate /dev/sdd  
vgextend mirrored /dev/sdd  
  
# Превращаем linear обратно в mirrored  
lvconvert --type mirror -m1 /dev/mirrored/mirror /dev/sdc /dev/sdd
```

Порядок восстановления

root@localhost:~

root@localhost:~

ts git:(dev)

```
[root@localhost ~]# pvcreate /dev/sdd
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
WARNING: dos signature detected on /dev/sdd at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdd.
Physical volume "/dev/sdd" successfully created.
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# pvs
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
PV          VG      Fmt Attr PSize   PFree
/dev/sda2   cl      lvm2 a--  <63.00g    0
/dev/sdc    mirrored lvm2 a--  1020.00m 516.00m
/dev/sdd    lvm2   ---   1.00g    1.00g
[unknown]   mirrored lvm2 a-m  1020.00m 516.00m
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# vgextend mirrored /dev/sdd
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
Volume group "mirrored" successfully extended
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# pvs
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to [unknown]).
PV          VG      Fmt Attr PSize   PFree
/dev/sda2   cl      lvm2 a--  <63.00g    0
/dev/sdc    mirrored lvm2 a--  1020.00m 516.00m
/dev/sdd    mirrored lvm2 a--  1020.00m 1020.00m
[unknown]   mirrored lvm2 a-m  1020.00m 516.00m
[root@localhost ~]#
```

Добавить новые диски в группу томов

root@localhost:~

root@localhost:~

root@localhost:~

```
[root@localhost ~]# pvcreate /dev/sdd
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
WARNING: dos signature detected on /dev/sdd at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdd.
Physical volume "/dev/sdd" successfully created.
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# pvs
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
PV          VG      Fmt Attr PSize   PFree
/dev/sda2   cl      lvm2 a--  <63.00g    0
/dev/sdc    mirrored lvm2 a--  1020.00m 516.00m
/dev/sdd    lvm2   ---   1.00g    1.00g
[unknown]   mirrored lvm2 a-m  1020.00m 516.00m
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# vgextend mirrored /dev/sdd
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to /dev/sdb).
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
Volume group "mirrored" successfully extended
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# pvs
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
WARNING: Couldn't find device with uuid 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW.
WARNING: VG mirrored is missing PV 06y8jh-jg4E-VOjQ-9Ges-cPLg-ahWg-hxczQW (last written to [unknown]).
PV          VG      Fmt Attr PSize   PFree
/dev/sda2   cl      lvm2 a--  <63.00g    0
/dev/sdc    mirrored lvm2 a--  1020.00m 516.00m
/dev/sdd    mirrored lvm2 a--  1020.00m 1020.00m
[unknown]   mirrored lvm2 a-m  1020.00m 516.00m
[root@localhost ~]#
```

PV VG Fmt Attr PSize PFree
/dev/sda2 cl lvm2 a-- <63.00g 0
/dev/sdc mirrored lvm2 a-- 1020.00m 516.00m
/dev/sdd mirrored lvm2 a-- 1020.00m 1020.00m

[root@localhost ~]# lvconvert --type mirror -m1 /dev/mirrored/mirror /dev/sdc /dev/sdd
/dev/sdb: open failed: No such device or address
Are you sure you want to convert mirrored/mirror back to the older mirror type? [y/n] : y
Logical volume mirrored/mirror successfully converted.
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# lvs
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
LV VG Attr LSize Pool Origin Data% Meta% Move Log Cpy
%Sync Convert
home cl -wi-ao---- 19.36g
root cl -wi-ao---- 39.66g
swap cl -wi-ao---- <3.97g

mirror mirrored mwi-aom--- 500.00m [mirror_mlog] 100.00
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# lvs -a -o +devices
/dev/sdb: open failed: No such device or address
/dev/sdb: open failed: No such device or address
LV VG Attr LSize Pool Origin Data% Meta% Move Log Cpy%Sync Convert Devices
home cl -wi-ao---- 19.36g
root cl -wi-ao---- 39.66g
swap cl -wi-ao---- <3.97g
mirror mirrored mwi-aom--- 500.00m [mirror_mlog] 100.00
mirror_mimage_0 mirror_mimage_0(0),mirror_mimage_1(0)
[mirror_mimage_0] mirrored vwi-aom--- 500.00m

[mirror_mimage_1] mirrored lwi-aom--- 500.00m
/dev/sdc(1)
[mirror_mlog] mirrored lwn-aom--- 4.00m
/dev/sdd(0)
[root@localhost ~]#

Конвертим linear volume обратно в mirrored

2. Сравните производительность работы (скорость чтения/записи) RAID 1 и LVM зеркала (для простоты используйте только два диска)

```
root@localhost:~  
[root@localhost ~]#  
[root@localhost ~]# dd if=/dev/zero of=/mirror/test1.img count=1000 oflag=dsync  
1000+0 records in  
1000+0 records out  
512000 bytes (512 kB, 500 KiB) copied, 0.473729 s, 1.1 MB/s  
[root@localhost ~]#  
[root@localhost ~]# dd if=/dev/zero of=/mirror_raid/test1.img count=1000 oflag=dsync  
1000+0 records in  
1000+0 records out  
512000 bytes (512 kB, 500 KiB) copied, 0.607524 s, 843 kB/s  
[root@localhost ~]#  
[root@localhost ~]# dd if=/dev/zero of=/mirror/test1.img bs=400M count=1 oflag=dsync  
1+0 records in  
1+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 3.38535 s, 124 MB/s  
[root@localhost ~]#  
[root@localhost ~]# dd if=/dev/zero of=/mirror_raid/test1.img bs=400M count=1 oflag=d  
sync  
1+0 records in  
1+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 2.24885 s, 187 MB/s  
[root@localhost ~]#  
[root@localhost ~]# dd if=/dev/zero of=/mirror/test1.img bs=1k count=400000 oflag=dsy  
nc  
^C190862+0 records in  
190862+0 records out  
195442688 bytes (195 MB, 186 MiB) copied, 71.7115 s, 2.7 MB/s  
[root@localhost ~]# dd if=/dev/zero of=/mirror/test1.img bs=1k count=10000 oflag=dsyn  
c  
10000+0 records in  
10000+0 records out  
10240000 bytes (10 MB, 9.8 MiB) copied, 3.60352 s, 2.8 MB/s  
[root@localhost ~]# dd if=/dev/zero of=/mirror_raid/test1.img bs=1k count=10000 oflag  
=dsync  
10000+0 records in  
10000+0 records out  
10240000 bytes (10 MB, 9.8 MiB) copied, 5.11862 s, 2.0 MB/s  
[root@localhost ~]#
```

Тест на запись: видно, что если записывать один большой кусок - выигрывает RAID. Если много маленьких – Mirror

```
root@localhost:~  
[root@localhost ~]# du -h /mirror/test1.img  
401M    /mirror/test1.img  
[root@localhost ~]# du -h /mirror_raid/test1.img  
401M    /mirror_raid/test1.img  
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]# time dd if=/mirror/test1.img of=/dev/null bs=8k  
51200+0 records in  
51200+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 0.111101 s, 3.8 GB/s  
  
real    0m0.113s  
user    0m0.038s  
sys     0m0.074s  
[root@localhost ~]# time dd if=/mirror_raid/test1.img of=/dev/null bs=8k  
51200+0 records in  
51200+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 0.112318 s, 3.7 GB/s  
  
real    0m0.115s  
user    0m0.029s  
sys     0m0.085s  
[root@localhost ~]# time dd if=/mirror/test1.img of=/dev/null bs=100M  
4+0 records in  
4+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 0.106959 s, 3.9 GB/s  
  
real    0m0.110s  
user    0m0.000s  
sys     0m0.108s  
[root@localhost ~]# time dd if=/mirror_raid/test1.img of=/dev/null bs=100M  
4+0 records in  
4+0 records out  
419430400 bytes (419 MB, 400 MiB) copied, 0.10658 s, 3.9 GB/s  
  
real    0m0.109s  
user    0m0.000s  
sys     0m0.107s  
[root@localhost ~]#
```

Тест на чтение: видно, что результаты плюс-минус одинаковые, но при большом количестве маленьких кусочков Mirror слегка выигрывает.

