

Como montar RAID con comandos LVM2 (raid 6) o mdadm(raid 5) mínimo 3 discos, en clase lo vimos con 4 discos, para raid 6 necesitamos 6, (2 para paridad)

```
[root@server ~]# pvcreate /dev/sdb /dev/sdc /dev/sdd /dev/sde /dev/sdf /dev/sdg /dev/sdh
```

```
Physical volume "/dev/sdb" successfully created.
Physical volume "/dev/sdc" successfully created.
Physical volume "/dev/sdd" successfully created.
Physical volume "/dev/sde" successfully created.
Physical volume "/dev/sdf" successfully created.
Physical volume "/dev/sdg" successfully created.
Physical volume "/dev/sdh" successfully created.
```

```
[root@server ~]# pvscan
```

```
PV /dev/sda3    VG centos          lvm2 [94.07 GiB / 4.00 MiB free]
PV /dev/sdc          lvm2 [<9.10 TiB]
PV /dev/sdb          lvm2 [<9.10 TiB]
PV /dev/sdf          lvm2 [<9.10 TiB]
PV /dev/sde          lvm2 [<9.10 TiB]
PV /dev/sdd          lvm2 [<9.10 TiB]
PV /dev/sdh          lvm2 [<9.10 TiB]
PV /dev/sdg          lvm2 [<9.10 TiB]
```

```
[root@server ~]# vgcreate storage /dev/sdb /dev/sdc /dev/sdd /dev/sde /dev/sdf /dev/sdg /dev/sdh
```

```
Volume group "storage" successfully created
```

```
[root@server ~]# vgs
```

VG	#PV	#LV	#SN	Attr	VSize	VFree
centos	1	2	0	wz--n-	94.07g	4.00m
storage	7	0	0	wz--n-	<63.67t	<63.67t

```
[root@server ~]# lvcreate --type raid6 -i 5 -l 100%FREE -n storageVolumeLMV
storage
```

Using default stripesize 64.00 KiB.

```

Rounding size (16690681 extents) down to stripe boundary size (16690680
extents)

```

Logical volume "storageVolumeLMV" created.

```
[root@server ~]# mkfs.xfs -d su=64k,sw=5 /dev/storage/storageVolumeLMV
mkfs.xfs: Specified data stripe width 512 is not the same as the volume stripe
width 640
```

```
meta-data=/dev/storage/storageVolumeLMV isize=512    agcount=46,
agsize=268435440 blks
```

```
= sectsz=4096 attr=2, projid32bit=1
```

```

=
crc=1      finobt=0, sparse=0

```

```
data = bsize=4096 blocks=12208035840, imaxpct=5
```

```
= sunit=16      swidth=64 blks
```

```
naming      =version 2          bsize=4096  ascii-ci=0  ftype=1
```

```
log          =internal log          bsize=4096   blocks=521728, version=2
```

```
= sectsz=4096  sunit=1 blks, lazy-count=1
```

```
realtime =none          extsz=4096    blocks=0, rtextents=0
```

Añadir al /etc/fstab":

```
/dev/storage/storageVolumeLMV /mnt/storage xfs defaults 0 0
```

```
[root@server ~]# mkdir /mnt/storage
```

```
[root@server ~]# mount /mnt/storage
```

```
[root@server ~]# df -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/mapper/centos-root	94G	1.1G	93G	2%	/
devtmpfs	7.5G	0	7.5G	0%	/dev
tmpfs	7.6G	0	7.6G	0%	/dev/shm
tmpfs	7.6G	11M	7.6G	1%	/run
tmpfs	7.6G	0	7.6G	0%	/sys/fs/cgroup
/dev/sda2	947M	146M	802M	16%	/boot
tmpfs	1.6G	0	1.6G	0%	/run/user/0
tmpfs	1.6G	0	1.6G	0%	/run/user/1000
/dev/mapper/storage-storageVolumeLMV	46T	35M	46T	1%	/mnt/storage

## OTRA FORMA DE MONTAR EL RAID

```
# yum install mdadm [on RedHat systems]
```

```
# apt-get install mdadm [on Debain systems]
```

```
# fdisk -l | grep sd
```

```
root@rd5:~
[root@rd5 ~]#
[root@rd5 ~]# fdisk -l | grep sd
Disk /dev/sda: 19.3 GB, 19327352832 bytes
/dev/sda1 *          1          64          512000      83 Linux
/dev/sda2            64        2350       18361344      8e Linux LVM
Disk /dev/sdb: 19.3 GB, 19327352832 bytes
Disk /dev/sdc: 19.3 GB, 19327352832 bytes
Disk /dev/sdd: 19.3 GB, 19327352832 bytes
[root@rd5 ~]#
[root@rd5 ~]# ls -l /dev | grep sd
brw-rw----. 1 root disk      8,  0 Oct 12  2014 sda
brw-rw----. 1 root disk      8,  1 Oct 12 05:41 sda1
brw-rw----. 1 root disk      8,  2 Oct 12  2014 sda2
brw-rw----. 1 root disk      8, 16 Oct 12  2014 sdb
brw-rw----. 1 root disk      8, 32 Oct 12  2014 sdc
brw-rw----. 1 root disk      8, 48 Oct 12 05:41 sdd
[root@rd5 ~]#
```

<http://www.tecmint.com>

```
# mdadm -E /dev/sd[b-d]
```

```
# mdadm --examine /dev/sdb /dev/sdc /dev/sdd
```

```
root@rd5:~
[root@rd5 ~]#
[root@rd5 ~]# mdadm -E /dev/sd[b-d]
mdadm: No md superblock detected on /dev/sdb.
mdadm: No md superblock detected on /dev/sdc.
mdadm: No md superblock detected on /dev/sdd.
[root@rd5 ~]#
[root@rd5 ~]#
[root@rd5 ~]# mdadm --examine /dev/sdb /dev/sdc /dev/sdd
mdadm: No md superblock detected on /dev/sdb.
mdadm: No md superblock detected on /dev/sdc.
mdadm: No md superblock detected on /dev/sdd.
[root@rd5 ~]#
[root@rd5 ~]#
```

<http://www.tecmint.com>

```
# fdisk /dev/sdb
# fdisk /dev/sdc
# fdisk /dev/sdd
```

```
root@rd5:~
[root@rd5 ~]# fdisk /dev/sdb

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').

Command (m for help): n
Command action
  e   extended
  p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-2349, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-2349, default 2349):
Using default value 2349

Command (m for help): t
Selected partition 1
Hex code (type L to list codes): fd
Changed system type of partition 1 to fd (Linux raid autodetect)

Command (m for help): p

Disk /dev/sdb: 19.3 GB, 19327352832 bytes
255 heads, 63 sectors/track, 2349 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0xed21efaf

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1             1         2349     18868311    fd  Linux raid autodetect

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
```

```
fdisk /dev/sdc
```

```
root@rd5:~
[root@rd5 ~]# fdisk /dev/sdc

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').

Command (m for help): n
Command action
  e   extended
  p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-2349, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-2349, default 2349):
Using default value 2349

Command (m for help): t
Selected partition 1
Hex code (type L to list codes): fd
Changed system type of partition 1 to fd (Linux raid autodetect)

Command (m for help): p

Disk /dev/sdc: 19.3 GB, 19327352832 bytes
255 heads, 63 sectors/track, 2349 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x26ad0e05

   Device Boot      Start         End      Blocks   Id  System
/dev/sdc1             1         2349     18868311    fd  Linux raid autodetect

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.
Syncing disks.
[root@rd5 ~]#
```

```
# fdisk /dev/sdd
```

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# fdisk /dev/sdd  
  
WARNING: DOS-compatible mode is deprecated. It's strongly recommended to  
switch off the mode (command 'c') and change display units to  
sectors (command 'u').  
  
Command (m for help): n  
Command action  
e extended  
p primary partition (1-4)  
p  
Partition number (1-4): 1  
First cylinder (1-2349, default 1):  
Using default value 1  
Last cylinder, +cylinders or +size{K,M,G} (1-2349, default 2349):  
Using default value 2349  
  
Command (m for help): t  
Selected partition 1  
Hex code (type L to list codes): fd  
Changed system type of partition 1 to fd (Linux raid autodetect)  
  
Command (m for help): p  
  
Disk /dev/sdd: 19.3 GB, 19327352832 bytes  
255 heads, 63 sectors/track, 2349 cylinders  
Units = cylinders of 16065 * 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x3fbe8772  
  
   Device Boot      Start         End      Blocks   Id  System  
/dev/sdd1             1         2349     18868311    fd  Linux raid autodetect  
  
Command (m for help): w  
The partition table has been altered!  
  
Calling ioctl() to re-read partition table.  
Syncing disks.  
[root@rd5 ~]#
```

<http://www.tecmint.com>

```
# mdadm --examine /dev/sdb /dev/sdc /dev/sdd
```

or

```
# mdadm -E /dev/sd[b-c]
```

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# mdadm --examine /dev/sdb /dev/sdc /dev/sdd  
/dev/sdb:  
    MBR Magic : aa55  
Partition[0] :    37736622 sectors at          63 (type fd)  
/dev/sdc:  
    MBR Magic : aa55  
Partition[0] :    37736622 sectors at          63 (type fd)  
/dev/sdd:  
    MBR Magic : aa55  
Partition[0] :    37736622 sectors at          63 (type fd)  
[root@rd5 ~]# http://www.tecmint.com
```

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# mdadm --examine /dev/sdb1 /dev/sdc1 /dev/sdd1  
mdadm: No md superblock detected on /dev/sdb1.  
mdadm: No md superblock detected on /dev/sdc1.  
mdadm: No md superblock detected on /dev/sdd1.  
[root@rd5 ~]# http://www.tecmint.com
```

```
# mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/sdb1 /dev/sdc1  
/dev/sdd1
```

or

```
# mdadm -C /dev/md0 -l=5 -n=3 /dev/sd[b-d]1
```

```
# cat /proc/mdstat
```

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/sdb1 /dev/  
sdc1 /dev/sdd1  
mdadm: Defaulting to version 1.2 metadata  
mdadm: array /dev/md0 started.  
[root@rd5 ~]#  
[root@rd5 ~]# cat /proc/mdstat  
Personalities : [raid6] [raid5] [raid4]  
md0 : active raid5 sdd1[3] sdc1[1] sdb1[0]  
      37703680 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/2] [UU_]  
      [>.....] recovery = 0.3% (73088/18851840) finish=47.0min  
      speed=6644K/sec  
  
unused devices: <none>  
[root@rd5 ~]# http://www.tecmint.com
```

```
# watch -n1 cat /proc/mdstat
```

```
root@rd5:~  
Every 1.0s: cat /proc/mdstat Sun Oct 12 07:48:09 2014  
Personalities : [raid6] [raid5] [raid4]  
md0 : active raid5 sdd1[3] sdc1[1] sdb1[0]  
      37703680 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/2] [UU ]  
      [=>.....] recovery = 7.4% (1411840/18851840) finish=35.1min speed=8276K/sec  
unused devices: <none>  
http://www.tecmint.com
```

```
# mdadm -E /dev/sd[b-d]1
```

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# mdadm -E /dev/sd[b-d]1  
/dev/sdb1:  
    Magic : a92b4efc  
    Version : 1.2  
    Feature Map : 0x0  
    Array UUID : 0185fe22:d0e31edf:c313404e:f25172e3  
    Name : rd5.tecmintlocal.com:0 (local to host rd5.tecmintlocal.com)  
    Creation Time : Sun Oct 12 07:44:47 2014  
    Raid Level : raid5  
    Raid Devices : 3  
  
    Avail Dev Size : 37703854 (17.98 GiB 19.30 GB)  
    Array Size : 37703680 (35.96 GiB 38.61 GB)  
    Used Dev Size : 37703680 (17.98 GiB 19.30 GB)  
    Data Offset : 32768 sectors  
    Super Offset : 8 sectors  
    State : clean  
    Device UUID : 4c3fdef8:2b9bcfb0:231ba9bd:a4f96798  
  
    Update Time : Sun Oct 12 08:29:23 2014  
    Checksum : 6b5133a3 - correct  
    Events : 18  
  
    Layout : left-symmetric  
    Chunk Size : 512K  
  
    Device Role : Active device 0  
    Array State : AAA ('A' == active, '.' == missing)  
/dev/sdc1: http://www.tecmint.com
```

```
# mdadm --detail /dev/md0
```

```
root@rd5:~  
[root@rd5 ~]# mdadm --detail /dev/md0  
/dev/md0:  
    Version : 1.2  
    Creation Time : Sun Oct 12 07:44:47 2014  
    Raid Level : raid5  
    Array Size : 37703680 (35.96 GiB 38.61 GB)  
    Used Dev Size : 18851840 (17.98 GiB 19.30 GB)  
    Raid Devices : 3  
    Total Devices : 3  
    Persistence : Superblock is persistent  
  
    Update Time : Sun Oct 12 08:29:23 2014  
    State : clean  
    Active Devices : 3  
    Working Devices : 3  
    Failed Devices : 0  
    Spare Devices : 0  
  
    Layout : left-symmetric  
    Chunk Size : 512K  
  
    Name : rd5.tecmintlocal.com:0 (local to host rd5.tecmintlocal.com)  
    UUID : 0185fe22:d0e31edf:c313404e:f25172e3  
    Events : 18  
  
    Number Major Minor RaidDevice State  
      0      8     17        0    active sync  /dev/sdb1  
      1      8     33        1    active sync  /dev/sdc1  
      3      8     49        2    active sync  /dev/sdd1  
[root@rd5 ~]#
```

<http://www.tecmint.com>

```
# mkfs.ext4 /dev/md0
```

```
root@rd5:~  
[root@rd5 ~]# mkfs.ext4 /dev/md0  
mke2fs 1.41.12 (17-May-2010)  
Filesystem label=  
OS type: Linux  
Block size=4096 (log=2)  
Fragment size=4096 (log=2)  
Stride=128 blocks, Stripe width=256 blocks  
2359296 inodes, 9425920 blocks  
471296 blocks (5.00%) reserved for the super user  
First data block=0  
Maximum filesystem blocks=4294967296  
288 block groups  
32768 blocks per group, 32768 fragments per group  
8192 inodes per group  
Superblock backups stored on blocks:  
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,  
    4096000, 7962624  
  
Writing inode tables: done  
Creating journal (32768 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
This filesystem will be automatically checked every 22 mounts or  
180 days, whichever comes first. Use tune2fs -c or -i to override.  
[root@rd5 ~]#
```

<http://www.tecmint.com>

```
# mkdir /mnt/raid5  
# mount /dev/md0 /mnt/raid5/  
# ls -l /mnt/raid5/  
  
# touch /mnt/raid5/raid5_tecmint_{1..5}  
# ls -l /mnt/raid5/  
# echo "tecmin raid setups" > /mnt/raid5/raid5_tecmint_1  
# cat /mnt/raid5/raid5_tecmint_1  
# cat /proc/mdstat
```



```

root@rd5:~
[root@rd5 ~]#
[root@rd5 ~]# mkdir /mnt/raid5
[root@rd5 ~]#
[root@rd5 ~]# mount /dev/md0 /mnt/raid5/
[root@rd5 ~]#
[root@rd5 ~]# ls -l /mnt/raid5/
total 16
drwx----- 2 root root 16384 Oct 12 08:38 lost+found
[root@rd5 ~]#
[root@rd5 ~]# df -h
Filesystem                Size      Used Avail Use% Mounted on
/dev/mapper/vg_tecmint-LogVol01 17G    1.1G    15G   7% /
tmpfs                      499M         0 499M   0% /dev/shm
/dev/sda1                  485M    34M   426M   8% /boot
/dev/md0                   36G    176M   34G   1% /mnt/raid5
[root@rd5 ~]# touch /mnt/raid5/raid5 tecmint {1..5}
[root@rd5 ~]#
[root@rd5 ~]# ls -l /mnt/raid5/
total 16
drwx----- 2 root root 16384 Oct 12 08:38 lost+found
-rw-r--r-- 1 root root    0 Oct 12 08:41 raid5_tecmint_1
-rw-r--r-- 1 root root    0 Oct 12 08:41 raid5_tecmint_2
-rw-r--r-- 1 root root    0 Oct 12 08:41 raid5_tecmint_3
-rw-r--r-- 1 root root    0 Oct 12 08:41 raid5_tecmint_4
-rw-r--r-- 1 root root    0 Oct 12 08:41 raid5_tecmint_5
[root@rd5 ~]#
[root@rd5 ~]# echo "tecmin raid setups" > /mnt/raid5/raid5_tecmint_1
[root@rd5 ~]#
[root@rd5 ~]# cat /mnt/raid5/raid5_tecmint_1
tecmin raid setups
[root@rd5 ~]#
[root@rd5 ~]#
[root@rd5 ~]# cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4]
md0 : active raid5 sdd1[3] sdc1[1] sdb1[0]
      37703680 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/3] [UUU]

unused devices: <none>
[root@rd5 ~]#

```

<http://www.tecmint.com>

```
# vim /etc/fstab
```

```
/dev/md0          /mnt/raid5          ext4      defaults      0 0
```

```

root@rd5:~
#
# /etc/fstab
# Created by anaconda on Sun Oct 12 05:25:34 2014
#
# 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
#
/dev/mapper/vg_tecmint-LogVol01 /                ext4      defaults
1 1
UUID=c5fc78f4-b369-40c7-8b83-dd174b2c10f4 /boot            ext4      default
ts              1 2
/dev/mapper/vg_tecmint-LogVol00 swap             swap      defaults
0 0
tmpfs           /dev/shm        tmpfs      defaults      0 0
devpts          /dev/pts        devpts     gid=5,mode=620 0 0
sysfs           /sys            sysfs      defaults      0 0
proc            /proc           proc       defaults      0 0
/dev/md0        /mnt/raid5      ext4       defaults      0 0

```

<http://www.tecmint.com>

```
root@rd5:~  
[root@rd5 ~]# mount -av  
mount: UUID=c5fc78f4-b369-40c7-8b83-dd174b2c10f4 already mounted on /boot  
mount: tmpfs already mounted on /dev/shm  
mount: devpts already mounted on /dev/pts  
mount: sysfs already mounted on /sys  
mount: proc already mounted on /proc  
mount: /dev/md0 already mounted on /mnt/raid5  
nothing was mounted
```

# mdadm --detail --scan --verbose >> /etc/mdadm.conf

```
root@rd5:~  
[root@rd5 ~]#  
[root@rd5 ~]# mdadm --detail --scan --verbose >> /etc/mdadm.conf  
[root@rd5 ~]#  
[root@rd5 ~]# cat /etc/mdadm.conf  
ARRAY /dev/md0 level=raid5 num-devices=3 metadata=1.2 name=rd5.tecmintlocal.com:  
0 UUID=0185fe22:d0e31edf:c313404e:f25172e3  
  devices=/dev/sdb1,/dev/sdc1,/dev/sdd1  
[root@rd5 ~]#  
[root@rd5 ~]#
```