CREATING RAID 5 IN CENTOS 7

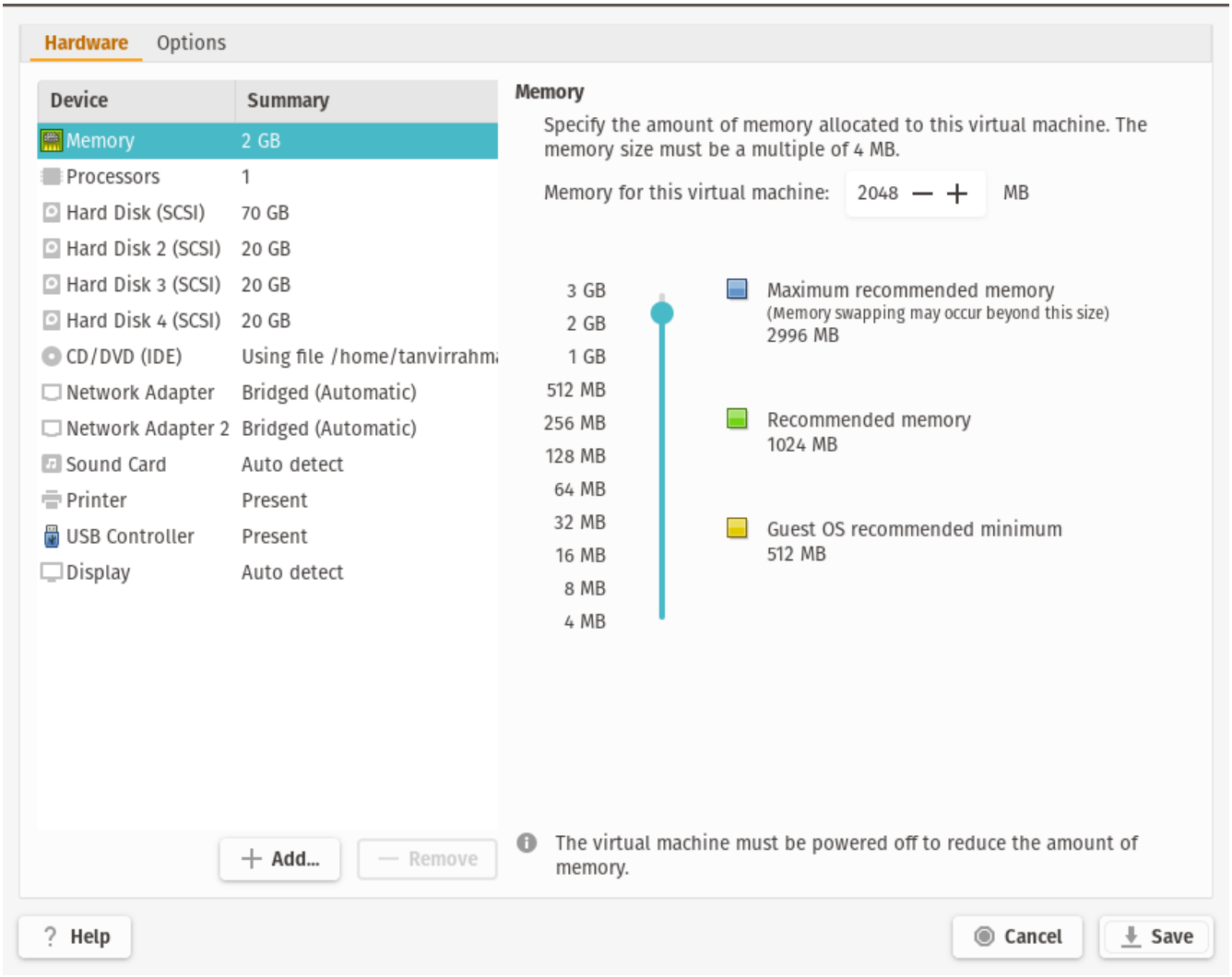
Setting up RAID 0 in Virtual Machine :

Requirements:

- → Virtual Machine
- → Two disk
- → internet connection
- → a static ip address (in case you want to ssh the server)

STEP 1:

Adding three 20GB disk in the centos7 Virtual machine.



STEP2:

Boot the machine.

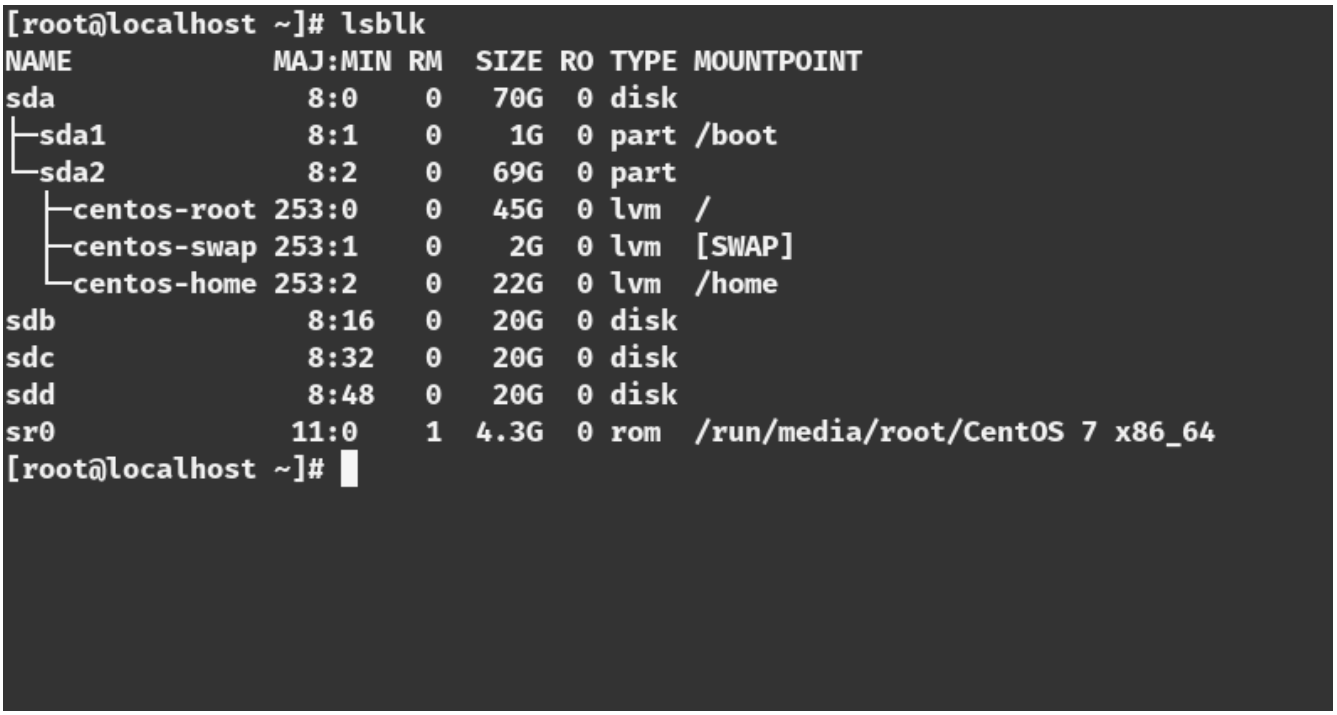
STEP3:

open Terminal .(or you just ssh the server from the server) [in this case I ssh to the server]

STEP4:

apply the ‘lsblk’ command to see the block devices

=>lsblk



There are three additional block devices name ‘sdb’ and ‘sdc’ and ‘sdd’ we use this three drive to make a raid 5.

STEP5:

install the **mdadm** package

=>yum update

=> yum install mdadm -y

STEP6:

check the version in the of the packages

=> mdadm –version

```
[root@server2 ~]# mdadm --version
mdadm - v4.1-rc1 - 2018-03-22
[root@server2 ~]#
```

STEP7:

Examine the hard drive with mdadm

=> **mdadm –examine /dev/sd[b-d]**

```
[root@localhost ~]# mdadm --examine /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@localhost ~]#
```

STEP8:

Create partition for RAID

=>fdisk /dev/sdb

Follow below instructions for creating partitions.

1. Press ‘**n**‘ for creating new partition.
2. Then choose ‘**P**‘ for Primary partition.
3. Next select the partition number as **1**.
4. Give the default value by just pressing two times **Enter** key.
5. Next press ‘**P**‘ to print the defined partition.

Follow below instructions for creating Linux raid auto on partitions.

1. Press ‘**L**‘ to list all available types.
2. Type ‘**t**‘to choose the partitions.
3. Choose ‘**fd**‘ for Linux raid auto and press Enter to apply.
4. Then again use ‘**P**‘ to print the changes what we have made.
5. Use ‘**w**‘ to write the changes.

[creating partition]

```
[root@server2 ~]#
[root@server2 ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table
Building a new DOS disklabel with disk identifier 0xc4707f2b.

Command (m for help): n
Partition type:
   p   primary (0 primary, 0 extended, 4 free)
   e   extended
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-41943039, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-41943039, default 41943039):
Using default value 41943039
Partition 1 of type Linux and of size 20 GiB is set

Command (m for help): p

Disk /dev/sdb: 21.5 GB, 21474836480 bytes, 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0xc4707f2b

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048    41943039    20970496   83  Linux

Command (m for help):
```

[creating raid on that paririon]

```
[root@server2 ~]# fdisk /dev/sdb
Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.


Command (m for help): t
Selected partition 1
Hex code (type L to list all codes): fd
Changed type of partition 'Linux' to 'Linux raid autodetect'

Command (m for help): P

Disk /dev/sdb: 21.5 GB, 21474836480 bytes, 41943040 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0xc4707f2b

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048    41943039    20970496   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@server2 ~]#
```

[see the block devices]

STEP9:

Do the step 8 for the ‘sdc’ and ‘sdd’

=>fdisk /dev/sdc
=>fdisk /dev/sdd

STEP10:

Examine with the ‘lsblk’

=>lsblk

```
[root@localhost ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda               8:0    0   70G  0 disk
├─sda1            8:1    0    1G  0 part /boot
└─sda2            8:2    0   69G  0 part
  ├─centos-root 253:0    0   45G  0 lvm  /
  ├─centos-swap 253:1    0    2G  0 lvm  [SWAP]
  └─centos-home 253:2    0   22G  0 lvm  /home
sdb               8:16   0   20G  0 disk
└─sdb1            8:17   0   20G  0 part
sdc               8:32   0   20G  0 disk
└─sdc1            8:33   0   20G  0 part
sdd               8:48   0   20G  0 disk
└─sdd1            8:49   0   20G  0 part
sr0              11:0    1  4.3G  0 rom  /run/media/root/CentOS 7 x86_64
[root@localhost ~]#
```

STEP11:

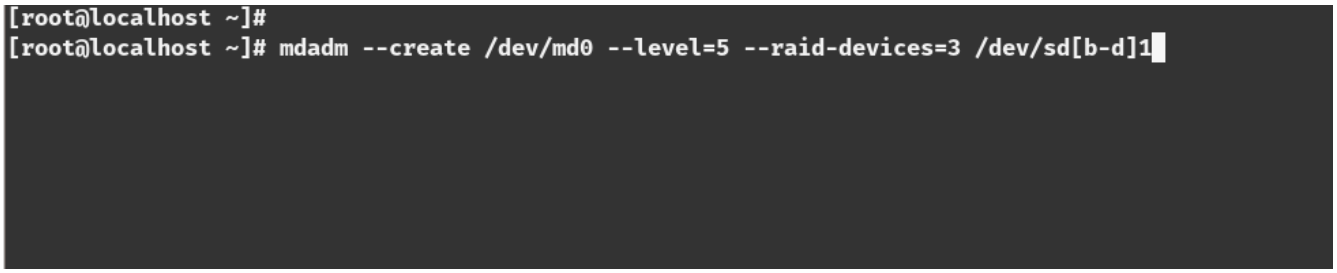
Examine with the ‘mdadm’

```
[root@localhost ~]# mdadm --examine /dev/sd[b-d]1
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@localhost ~]#
```

STEP12:

Create RAID md Devices (with miror)

=>mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/sd[b-d]1



STEP13:

See the Details of the RAID 0 devices

=>mdadm –detail /dev/md0

STEP14:

Varify with this command

=>mdadm -E /dev/sd[b-d]1 | grep raid5

```
[root@localhost ~]# mdadm -E /dev/sd[b-d]1 | grep raid5
     Raid Level : raid5
     Raid Level : raid5
     Raid Level : raid5
[root@localhost ~]#
```

STEP15:

Assigning File partition on the File system

=>mkfs.ext4 /dev/md0

```
[root@server2 ~]# mkfs.ext4 /dev/md0
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=128 blocks, Stripe width=256 blocks
2621440 inodes, 10476544 blocks
523827 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2157969408
320 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

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

STEP15:

mount the volume

=>mkdir /mnt/raid5
=>mount /dev/md0 /mnt/raid5

STEP16:

check the mounted volume

=>df -h

```
[root@localhost ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   45G  3.6G   42G   8% /
devtmpfs                 974M     0  974M   0% /dev
tmpfs                    991M     0  991M   0% /dev/shm
tmpfs                    991M   11M  980M   2% /run
tmpfs                    991M     0  991M   0% /sys/fs/cgroup
/dev/sda1               1014M  166M  849M  17% /boot
/dev/mapper/centos-home   22G   33M   22G   1% /home
tmpfs                    199M  4.0K  199M   1% /run/user/42
tmpfs                    199M   28K  199M   1% /run/user/0
/dev/sr0                 4.3G  4.3G     0 100% /run/media/root/CentOS 7 x86_64
/dev/md0                  40G   49M   38G   1% /mnt/raid5
[root@localhost ~]#
```

STEP17:
check the block devices with lsblk

=>lsblk

```
[root@localhost ~]# lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE  MOUNTPOINT
sda               8:0    0   70G  0 disk
├─sda1            8:1    0    1G  0 part  /boot
└─sda2            8:2    0   69G  0 part
  ├─centos-root 253:0    0   45G  0 lvm   /
  ├─centos-swap 253:1    0    2G  0 lvm   [SWAP]
  └─centos-home 253:2    0   22G  0 lvm   /home
sdb               8:16   0   20G  0 disk
└─sdb1            8:17   0   20G  0 part
  └─md0           9:0    0   40G  0 raid5 /mnt/raid5
sdc               8:32   0   20G  0 disk
└─sdc1            8:33   0   20G  0 part
  └─md0           9:0    0   40G  0 raid5 /mnt/raid5
sdd               8:48   0   20G  0 disk
└─sdd1            8:49   0   20G  0 part
  └─md0           9:0    0   40G  0 raid5 /mnt/raid5
sr0              11:0    1  4.3G  0 rom   /run/media/root/CentOS 7 x86_64
[root@localhost ~]#
```