CREATING RAID 0 IN CENTOS 7

RAID 0 is not fault tolerant but it has some advantage

→ it is high performance
→ no space will be wasted
→ reading and writing speed will be Fast

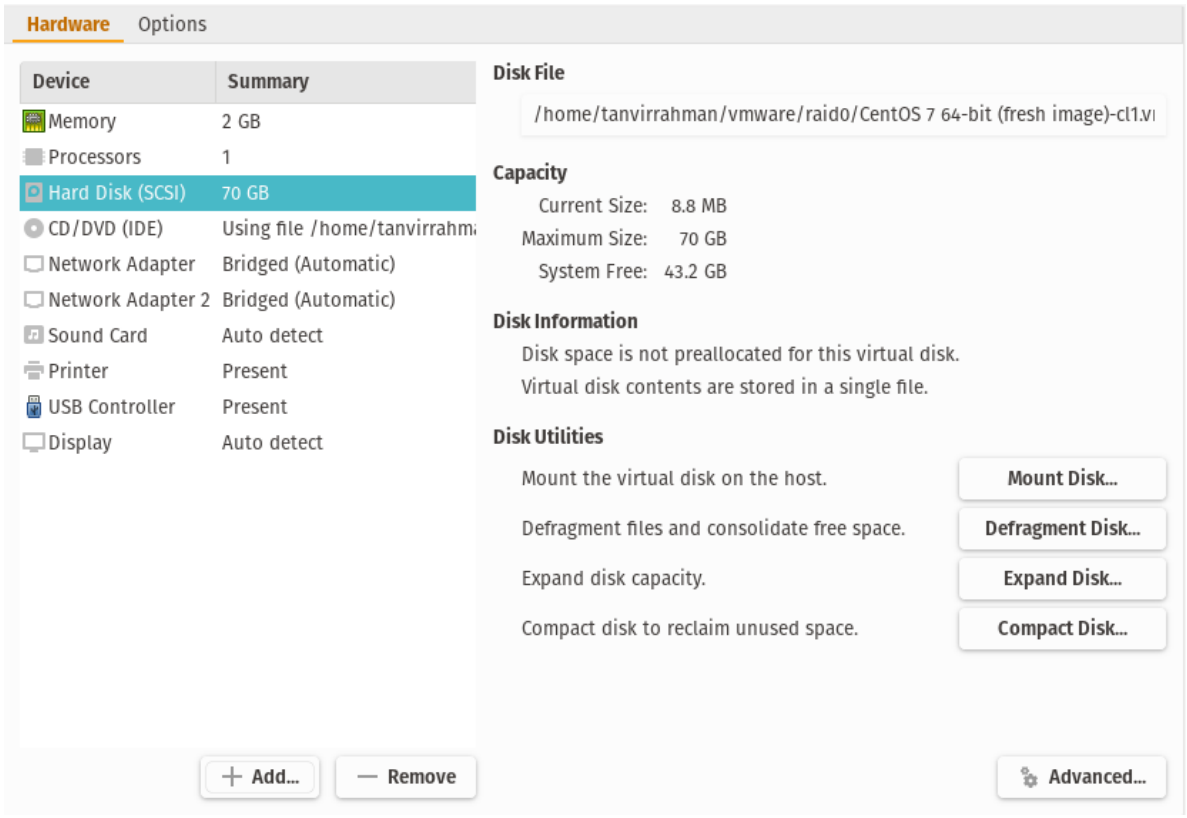
Setting up RAID 0 in Virtual Machine :

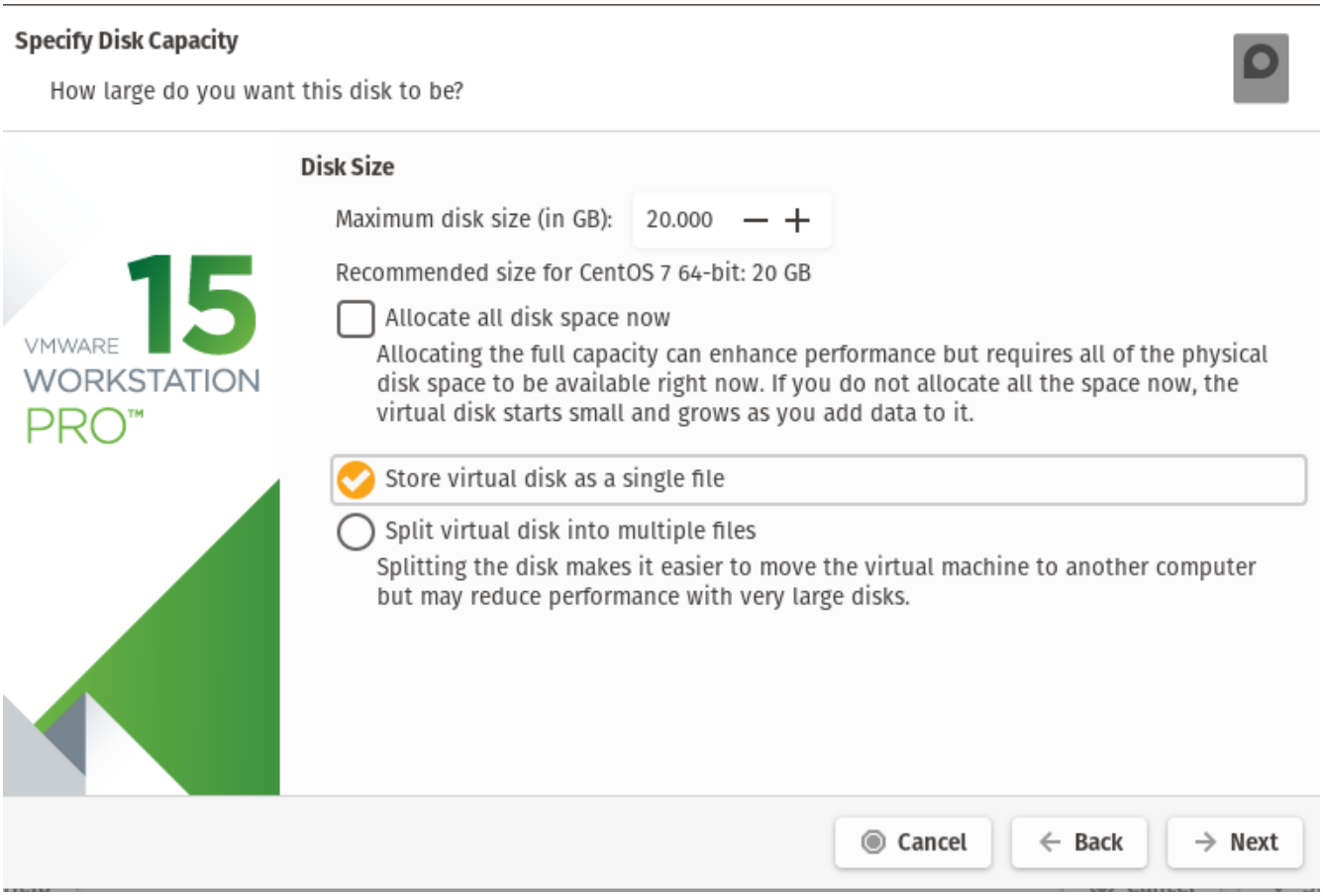
Requirements:

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

STEP 1:

Adding two 20GB disk in the centos7 Virtual machine.


Hardware
Options
Device
Summary
Memory
2 GB
Processors
1
Hard Disk (SCSI)
70 GB
CD/DVD (IDE)
Using file /home/tanvirrahm
Network Adapter
Bridged (Automatic)
Network Adapter 2
Bridged (Automatic)
Sound Card
Auto detect
Printer
Present
USB Controller
Present
Display
Auto detect
Add...
Remove
Disk File
/home/tanvirrahman/vmware/raid0/CentOS 7 64-bit (fresh image)-cl1.vi
Capacity
Current Size: 8.8 MB
Maximum Size: 70 GB
System Free: 43.2 GB
Disk Information
Disk space is not preallocated for this virtual disk.
Virtual disk contents are stored in a single file.
Disk Utilities
Mount the virtual disk on the host.
Mount Disk...
Defragment files and consolidate free space.
Defragment Disk...
Expand disk capacity.
Expand Disk...
Compact disk to reclaim unused space.
Compact Disk...
Advanced...


Specify Disk Capacity
How large do you want this disk to be?
VMWARE 15 WORKSTATION PRO™
Disk Size
Maximum disk size (in GB): 20.000
Recommended size for CentOS 7 64-bit: 20 GB
Allocate all disk space now
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Cancel
Back
Next


Device
Summary
Memory 2 GB
Processors 1
Hard Disk (SCSI) 70 GB
CD/DVD (IDE) Using file /home/tanvirrah
Network Adapter Bridged (Automatic)
Network Adapter 2 Bridged (Automatic)
Sound Card Auto detect
Printer Present
USB Controller Present
Display Auto detect
New Hard Disk (SCSI) 20 GB
New Hard Disk (SCSI) 20 GB

STEP2:

Boot the machine.

STEP3:

open Terminal .(or you jusr ssh the server from the host)

STEP4:

apply the ‘lsblk’ command to see the block devices

=>lsblk

```
[root@server2 ~]# 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
sdc               8:32   0   20G  0 disk
sr0              11:0    1  4.3G  0 rom
```

There are two additional block devices name ‘sdb’ and ‘sdc’ er use this two drie to make a raid 0.

STEP5:

install the mdadm packge

=>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-c]**

```
[root@server2 ~]# mdadm --examine /dev/sd[b-c]
mdadm: No md superblock detected on /dev/sdb.
mdadm: No md superblock detected on /dev/sdc.
[root@server2 ~]#
```

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’

=>fdisk /dev/sdc

STEP10:

Examine with the ‘lsblk’

=>lsblk

```
[root@server2 ~]# 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
sr0              11:0    1  4.3G  0 rom
```

STEP11:

Examine with the ‘mdadm’

```
[root@server2 ~]# mdadm --examine /dev/sd[b-c]1
mdadm: No md superblock detected on /dev/sdb1.
mdadm: No md superblock detected on /dev/sdc1.
[root@server2 ~]#
[root@server2 ~]#
```

STEP12:

Create RAID md Devices (with miror)

=>mdadm --create /dev/md0 --level=mirror --raid-devices=2 /dev/sd[b-c]1

```
[root@server2 ~]# mdadm --create /dev/md0 --level=mirror --raid-devices=2 /dev/sd[b-c]1
mdadm: Note: this array has metadata at the start and
    may not be suitable as a boot device.  If you plan to
    store '/boot' on this device please ensure that
    your boot-loader understands md/v1.x metadata, or use
    --metadata=0.90
Continue creating array? y
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md0 started.
[root@server2 ~]#
```

STEP13:

See the Details of the RAID 0 devices

=>mdadm –detail /dev/md0

STEP14:

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/raid0
=>mount /dev/md0 /mnt/raid0

STEP16:

check the mounted volume

=>df -h

```
[root@server2 ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/centos-root   45G  3.8G   42G   9% /
devtmpfs                 974M     0  974M   0% /dev
tmpfs                    991M     0  991M   0% /dev/shm
tmpfs                    991M   11M  981M   2% /run
tmpfs                    991M     0  991M   0% /sys/fs/cgroup
/dev/sda1               1014M  166M  849M  17% /boot
/dev/mapper/centos-home   22G   39M   22G   1% /home
tmpfs                    199M   12K  199M   1% /run/user/42
tmpfs                    199M     0  199M   0% /run/user/0
/dev/md0                  20G   45M   19G   1% /mnt/raid1
[root@server2 ~]#
```

STEP17:

check the block devices with lsblk

=>lsblk

```
[root@server2 ~]# 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   20G  0 raid1 /mnt/raid1
sdc               8:32   0   20G  0 disk
└─sdc1            8:33   0   20G  0 part
  └─md0           9:0    0   20G  0 raid1 /mnt/raid1
sr0              11:0    1  4.3G  0 rom
[root@server2 ~]#
```

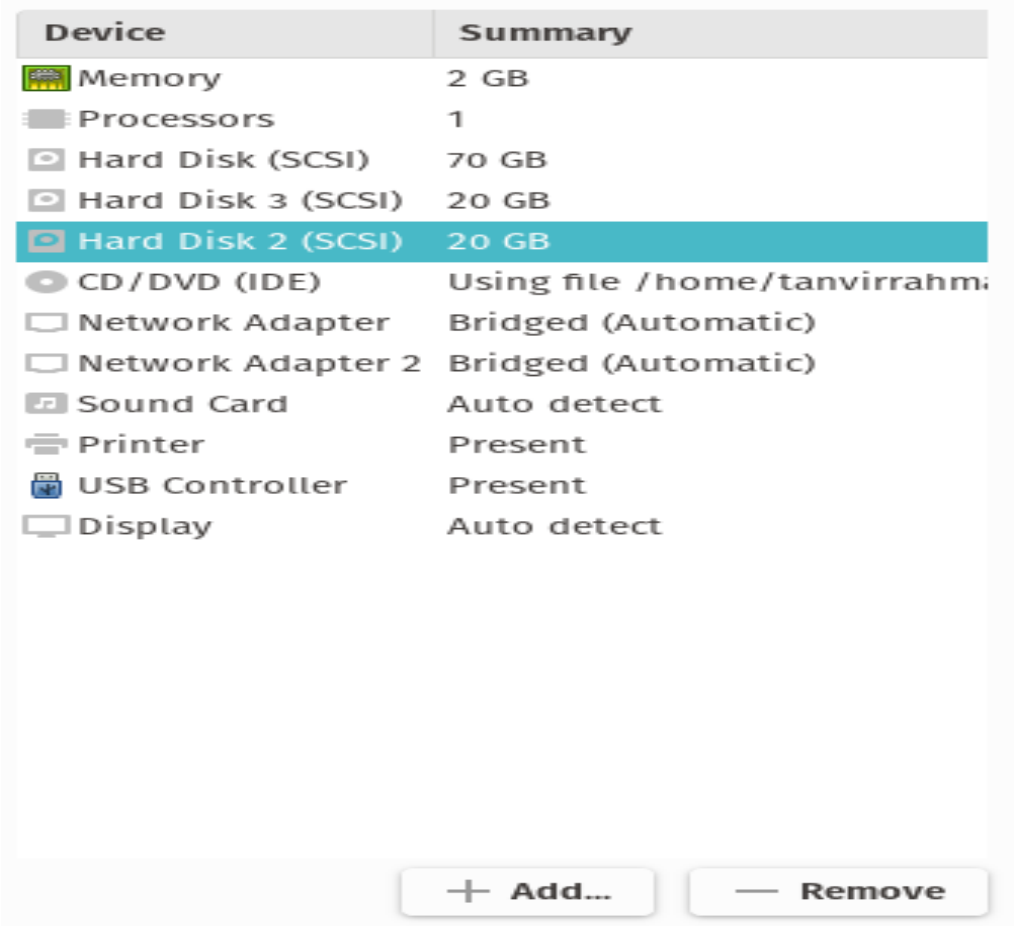
STEP18:

Create a file inside the raid devices. To check that if one device is unplugged if the other have it.

```
[root@server2 raid1]# pwd
/mnt/raid1
[root@server2 raid1]# ls
hello.txt  lost+found
[root@server2 raid1]# cat hello.txt
hello
[root@server2 raid1]#
```

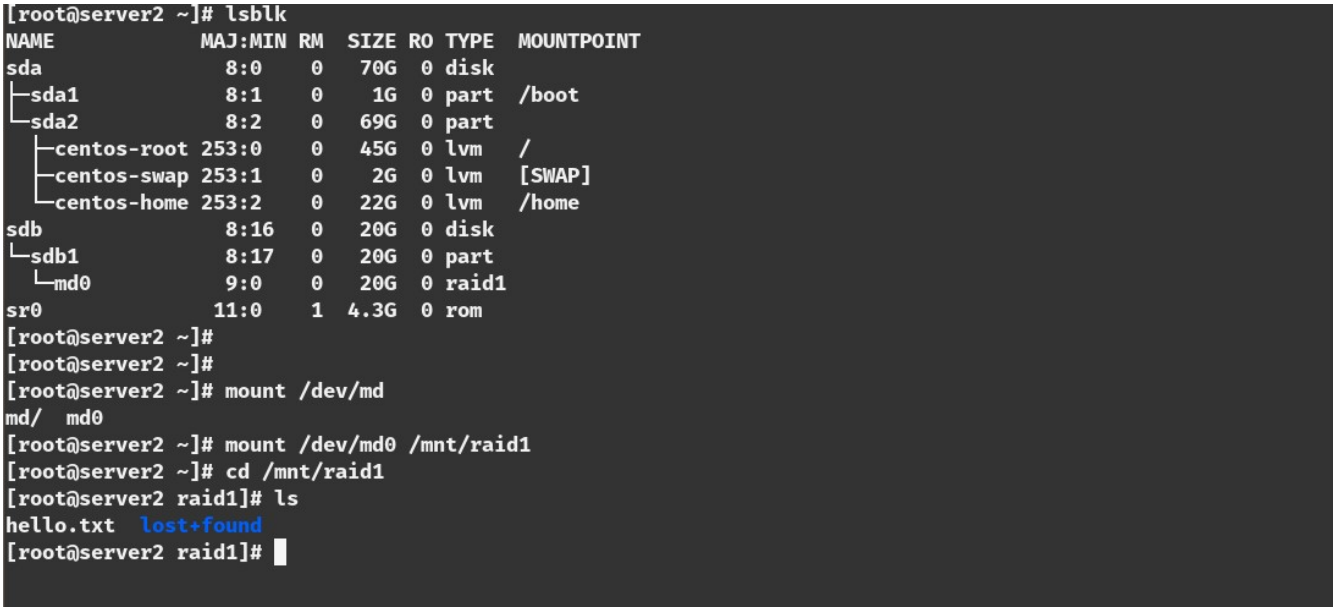
STEP19:

unplug one device



STEP 20:

reboot the system and check the drive that is still connected and see if the backup is still there



Data is still there even one disk is unplugged