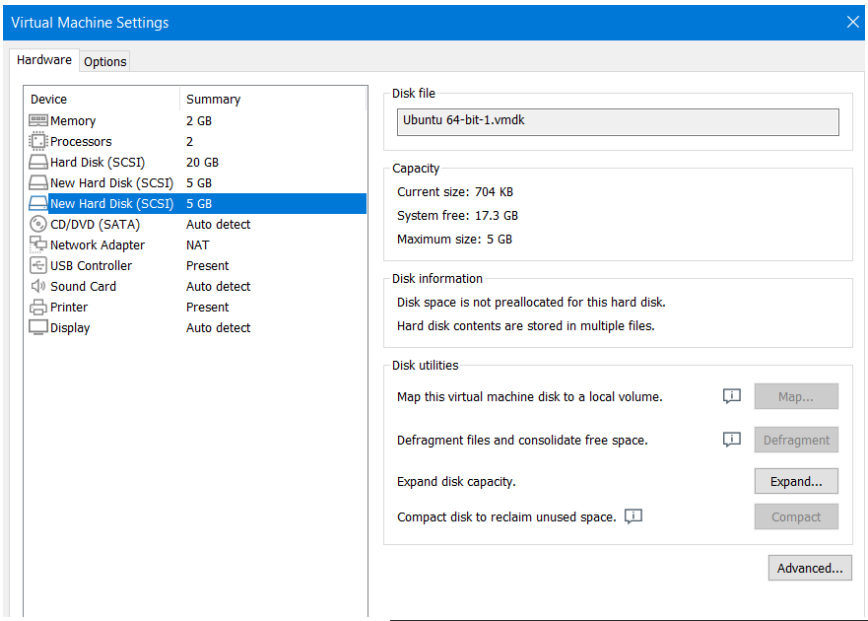
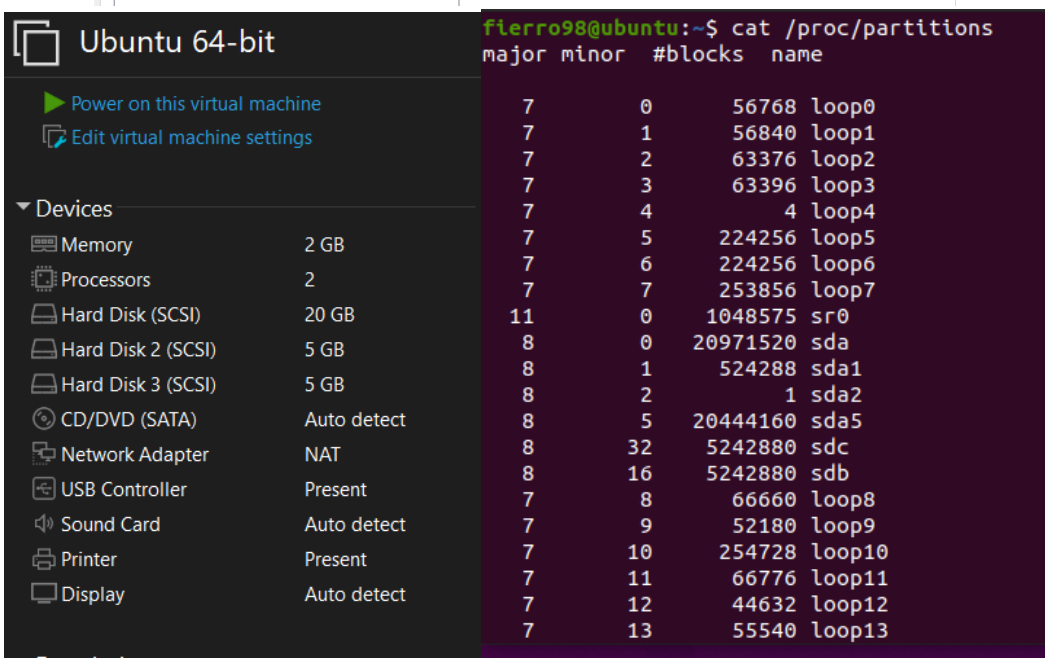
1-Using Virtual machine

1-Add two disks





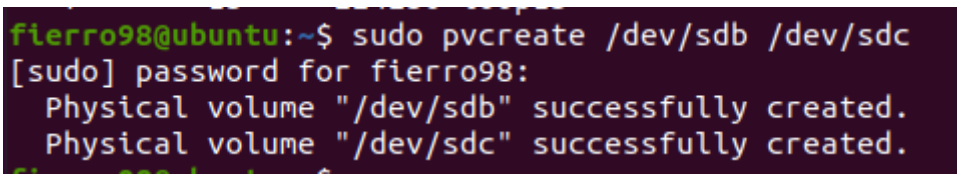
$ cat /proc/partitions

2-COnfigure Volume group of the 2 disks

1-CSreate physical volume

$ sudo apt install lvm2

$ sudo pvcreate /dev/sdb /dev/sdc



$ sudo pvdisplay /dev/sdb /dev/sdc

```
  "/dev/sdb" is a new physical volume of "5.00 GiB"
  --- NEW Physical volume ---
  PV Name               /dev/sdb
  VG Name
  PV Size               5.00 GiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               nBj0nx-SxUH-t570-zCVt-CU6X-NL0V-C9obge

  "/dev/sdc" is a new physical volume of "5.00 GiB"
  --- NEW Physical volume ---
  PV Name               /dev/sdc
  VG Name
  PV Size               5.00 GiB
  Allocatable           NO
  PE Size               0
  Total PE              0
  Free PE               0
  Allocated PE          0
  PV UUID               3GC1yW-59CU-frfR-a2Vf-3WCC-Yj24-Wt8UdW
```

3-Create volume group

$ sudo vgcreate itivg /dev/sdb /dev/sdc

```
fierro98@ubuntu:~$ sudo vgcreate itivg /dev/sdb /dev/sdc
  Volume group "itivg" successfully created
```

4-Display vg info

$ sudo vgdisplay itivg

```
fierro98@ubuntu:~$ sudo vgdisplay itivg
  --- Volume group ---
  VG Name               itivg
  System ID
  Format                lvm2
  Metadata Areas        2
  Metadata Sequence No  1
  VG Access             read/write
  VG Status             resizable
  MAX LV                0
  Cur LV                0
  Open LV               0
  Max PV                0
  Cur PV                2
  Act PV                2
  VG Size               9.99 GiB
  PE Size               4.00 MiB
  Total PE              2558
  Alloc PE / Size       0 / 0
  Free  PE / Size       2558 / 9.99 GiB
  VG UUID               Y9xDRZ-gJSz-fKzB-x4Se-BOmt-S2eb-4jc2iM
```

```
fierro98@ubuntu:~$ sudo pvdisplay /dev/sdb /dev/sdc
  --- Physical volume ---
  PV Name               /dev/sdb
  VG Name               itivg
  PV Size               5.00 GiB / not usable 4.00 MiB
  Allocatable           yes
  PE Size               4.00 MiB
  Total PE              1279
  Free PE               1279
  Allocated PE          0
  PV UUID               nBj0nx-SxUH-t570-zCVt-CU6X-NL0V-C9obge

  --- Physical volume ---
  PV Name               /dev/sdc
  VG Name               itivg
  PV Size               5.00 GiB / not usable 4.00 MiB
  Allocatable           yes
  PE Size               4.00 MiB
  Total PE              1279
  Free PE               1279
  Allocated PE          0
  PV UUID               3GC1yW-59CU-frfR-a2Vf-3WCC-Yj24-Wt8UdW
```

3-Create two logical volume

1-lv1 : 20% of total VG

2-lv2 : 80% rest of VG

5-Create logical volume

$ sudo lvcreate -l 20%FREE-n lv1 itivg

$ sudo lvcreate -l 100%FREE -n lv2 itivg

6-Display info about logical volume

$ sudo lvdisplay /dev/itivg/lv1

$ sudo lvdisplay /dev/itivg/lv2

```
fierro98@ubuntu:~$ sudo lvcreate -l 20%FREE -n lv1 itivg
  Logical volume "lv1" created.
fierro98@ubuntu:~$ sudo lvcreate -l 100%FREE -n lv2 itivg
  Logical volume "lv2" created.
fierro98@ubuntu:~$ sudo lvdisplay /dev/itivg/lv1
  --- Logical volume ---
  LV Path                /dev/itivg/lv1
  LV Name                lv1
  VG Name                itivg
  LV UUID                41eUGQ-Jcvy-VpIP-3yzm-Wg0B-EGt2-JkwNzh
  LV Write Access        read/write
  LV Creation host, time ubuntu, 2022-03-05 04:29:06 -0800
  LV Status              available
  # open                 0
  LV Size                <2.00 GiB
  Current LE             511
  Segments               1
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:0

fierro98@ubuntu:~$ sudo lvdisplay /dev/itivg/lv2
  --- Logical volume ---
  LV Path                /dev/itivg/lv2
  LV Name                lv2
  VG Name                itivg
  LV UUID                MZCv2X-TaGK-I8Bo-Pcnz-FUUM-Z0WB-DZiNRk
  LV Write Access        read/write
  LV Creation host, time ubuntu, 2022-03-05 04:30:01 -0800
  LV Status              available
  # open                 0
  LV Size                <8.00 GiB
  Current LE             2047
  Segments               2
  Allocation             inherit
  Read ahead sectors     auto
  - currently set to     256
  Block device           253:1
```

7- Create a file system on the partition(Formatting) & Mount the partition under mount point

$ sudo apt-get install xfsprogs
$ sudo mkfs.xfs /dev/itivg/lv1
$ sudo mkdir /MyApp
$ sudo mount /dev/itivg/lv1 /MyApp
$ sudo mkfs.xfs /dev/itivg/lv2
$ sudo mkdir /MyLogs
$ sudo mount /dev/itivg/lv2 /MyLogs

```
fierro98@ubuntu:~$ sudo mkfs.xfs /dev/itivg/lv1
meta-data=/dev/itivg/lv1         isize=512    agcount=4, agsize=130816 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=1, rmapbt=0
         =                       reflink=1
data     =                       bsize=4096   blocks=523264, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0, ftype=1
log      =internal log           bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
fierro98@ubuntu:~$ sudo mkdir /MyApp
fierro98@ubuntu:~$ sudo mount /dev/itivg/lv1 /MyApp
fierro98@ubuntu:~$ sudo mkfs.xfs /dev/itivg/lv2
meta-data=/dev/itivg/lv2         isize=512    agcount=4, agsize=524032 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=1, rmapbt=0
         =                       reflink=1
data     =                       bsize=4096   blocks=2096128, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0, ftype=1
log      =internal log           bsize=4096   blocks=2560, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
fierro98@ubuntu:~$ sudo mkdir /MyLogs
fierro98@ubuntu:~$ sudo mount /dev/itivg/lv2 /MyLogs
```

2-Configure a web application on apache web on this VM

$ sudo gedit /MyApp/index.html

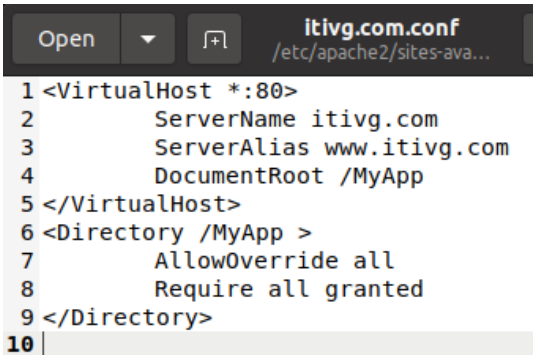
1-Document root will use the lv1

1- Create virtual host

Create a file /etc/apache2/sites-available/itivg.com.conf

$ sudo gedit /etc/apache2/sites-available/itivg.com.conf

```
<VirtualHost *:80>
ServerName itivg.com
ServerAlias www.itivg.com
DocumentRoot /MyApp
</VirtualHost>
<Directory /MyApp >
AllowOverride all
Require all granted
</Directory>
```



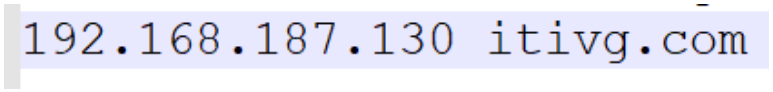
2- Enable site then reload apache2

$ sudo a2ensite itivg.com

$ sudo service apache2 reload

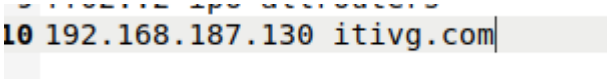
Open notepad on Windows as administrator

Open Hosts files → C:\Windows\System32\drivers\etc\hosts



192.168.187.130 itivg.com

$ sudo gedit /etc/hosts



2-Apache (Access log, and error log) will use the lv2

$ sudo gedit /etc/apache2/sites-available/itivg.com.conf

```
<VirtualHost *:80>
        ServerName itivg.com
        ServerAlias www.itivg.com
        DocumentRoot /MyApp

        ErrorLog /MyLogs/error.log
        CustomLog /MyLogs/access.log combined

<Directory /MyApp >
        AllowOverride all
        Require all granted
</Directory>

</VirtualHost>
```

```
<VirtualHost *:80>
        ServerName itivg.com
        ServerAlias www.itivg.com
        DocumentRoot /MyApp

        ErrorLog /MyLogs/error.log
        CustomLog /MyLogs/access.log combined

<Directory /MyApp >
        AllowOverride all
        Require all granted
</Directory>
</VirtualHost>
```

$ sudo service apache2 reload

```
fierro98@ubuntu:~$ sudo cat /MyLogs/access.log
192.168.187.1 - - [05/Mar/2022:05:14:53 -0800] "GET / HTTP/1.1" 304 180 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/99.0.4844.51 Safari/537.36"
192.168.187.1 - - [05/Mar/2022:05:14:56 -0800] "GET / HTTP/1.1" 304 179 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/99.0.4844.51 Safari/537.36"
192.168.187.130 - - [05/Mar/2022:05:24:21 -0800] "GET / HTTP/1.1" 200 308 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:97.0) Gecko/20100101 Firefox/97.0"
192.168.187.130 - - [05/Mar/2022:05:24:23 -0800] "GET /favicon.ico HTTP/1.1" 404 487 "http://itivg.com/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:97.0) Gecko/20100101 Firefox/97.0"
fierro98@ubuntu:~$
```