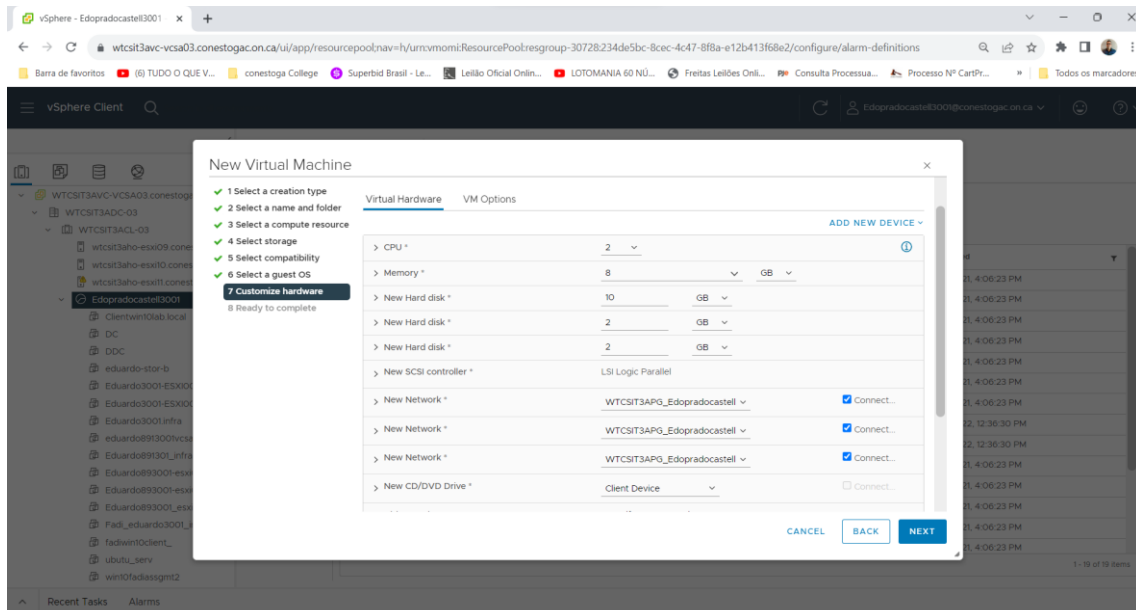
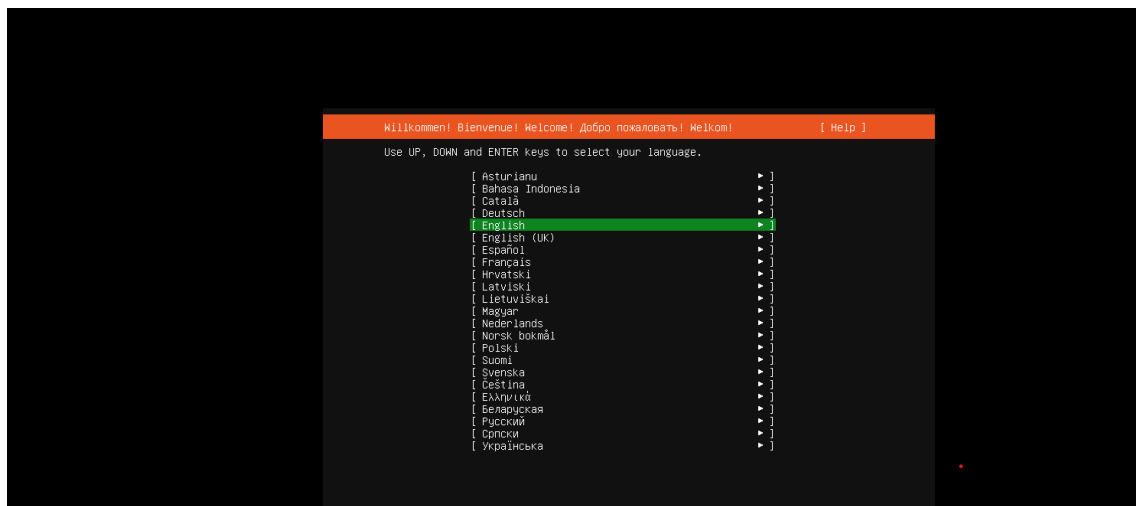


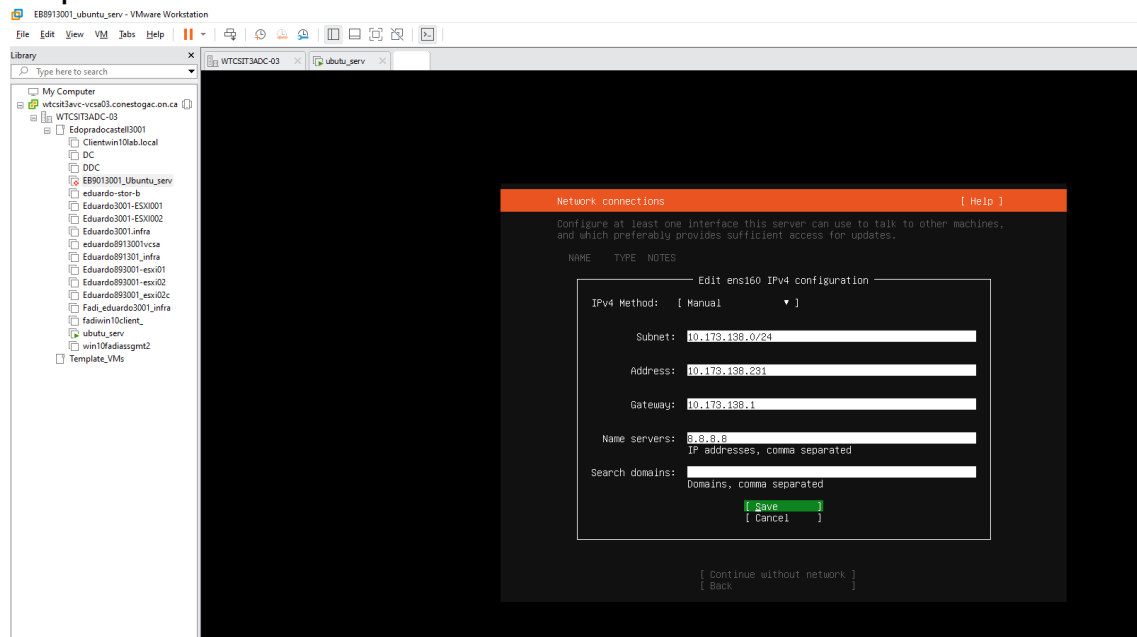
In this first stage, the Ubuntu Server VM was created. Customized according to needs, as we can see in this image, 2 CPUs were selected, 8 GB of memory, and 1 Hard disk with 10 GB in size; I also added 2 more network interfaces, totalling 3 NICs. As requested, I added 2x more Hard Disk units with 2Gb of capacity each.



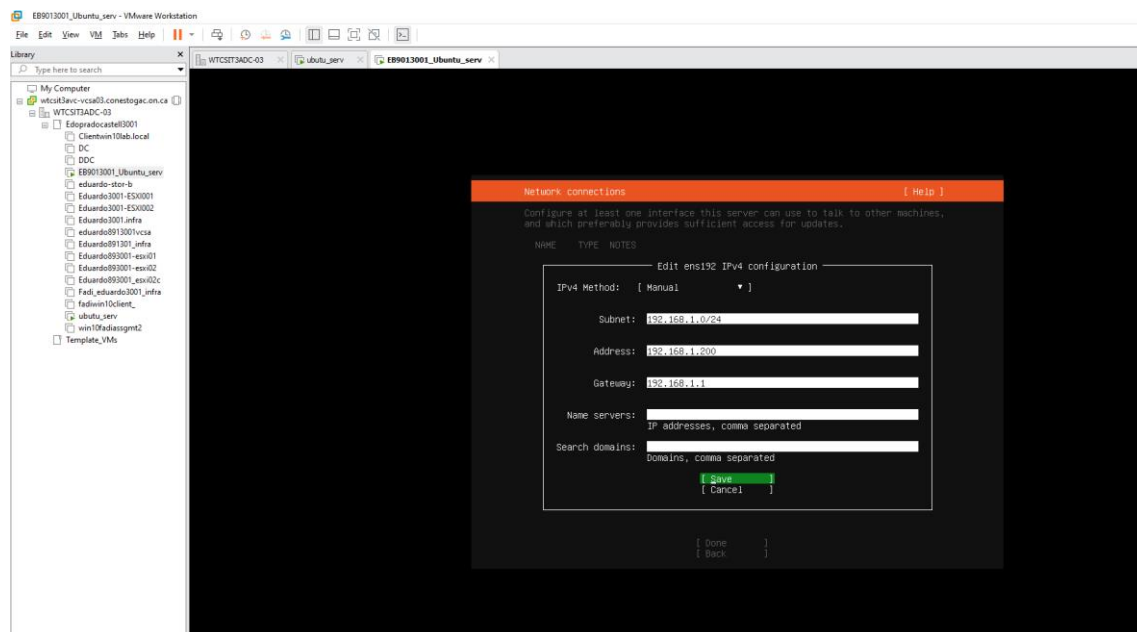
This next step depends on the required configuration of the host operating system. So, as we can see on the first screen, these are the first installation steps, simply selecting the English language in this case.



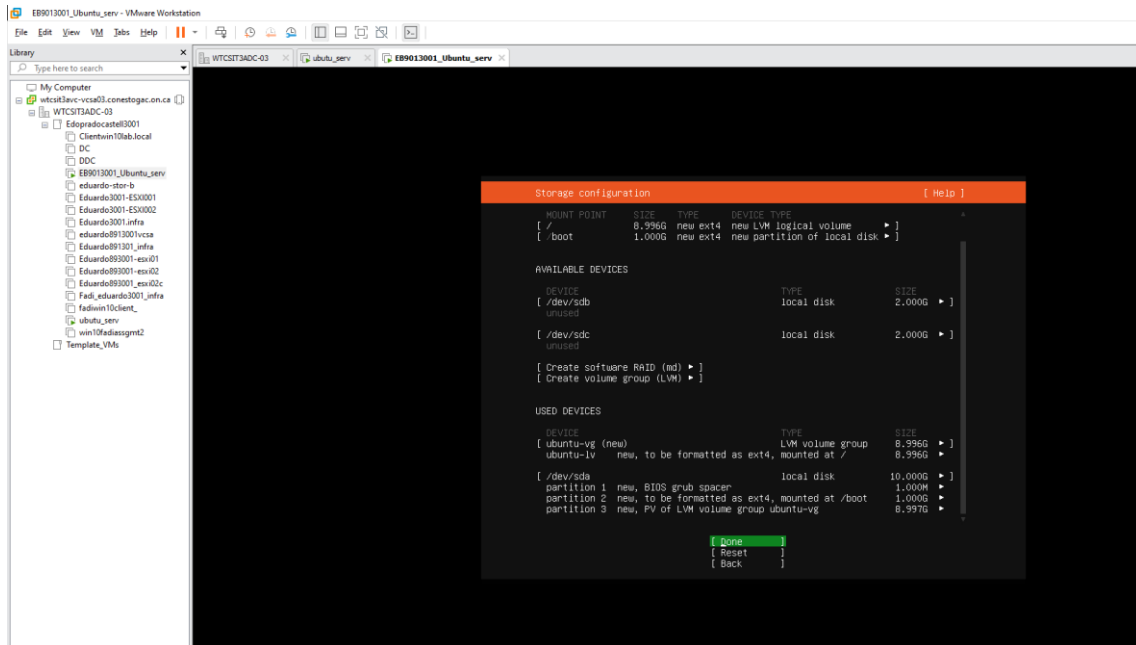
The IP addressing was configured according to my subnet in this next step.



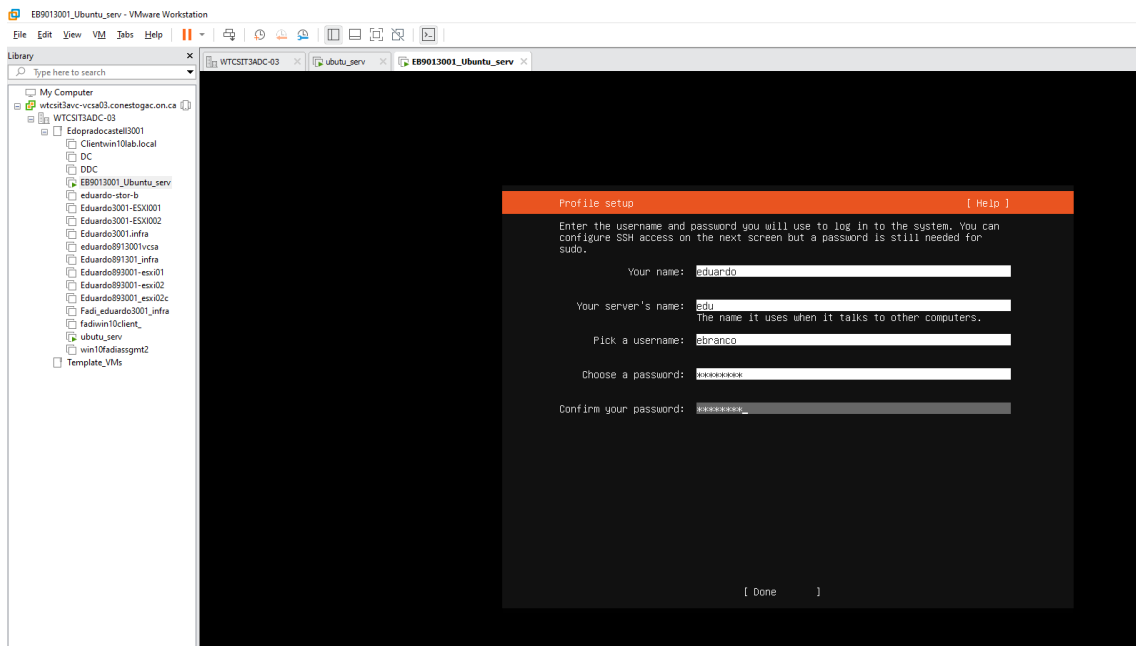
In this step, configure the IP of the second network card.



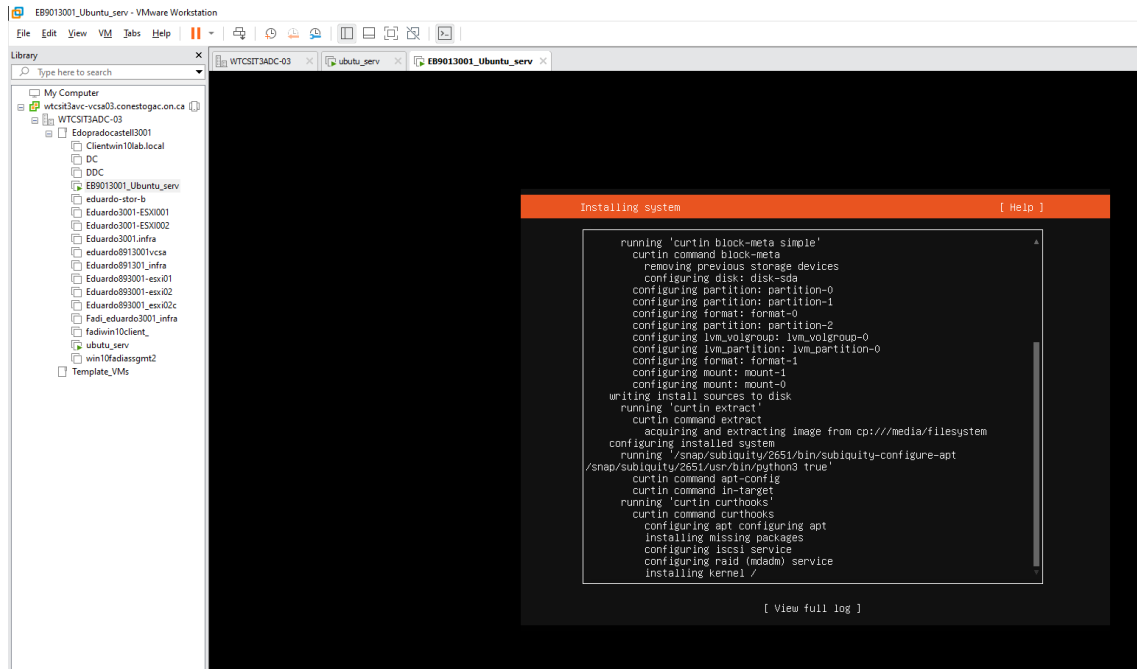
I only selected the 10GB hard drive for installation in this step. But as we can see, the system shows two more hard disks available.



In this image, as requested in this step, the system asks for the Name, and the name of the server, along with the password, then next.



Next steps install the system.



Using Putty, and then connecting to the server via ssh, I used the PING command, which I received a response to. This means that the host can go out to the internet.

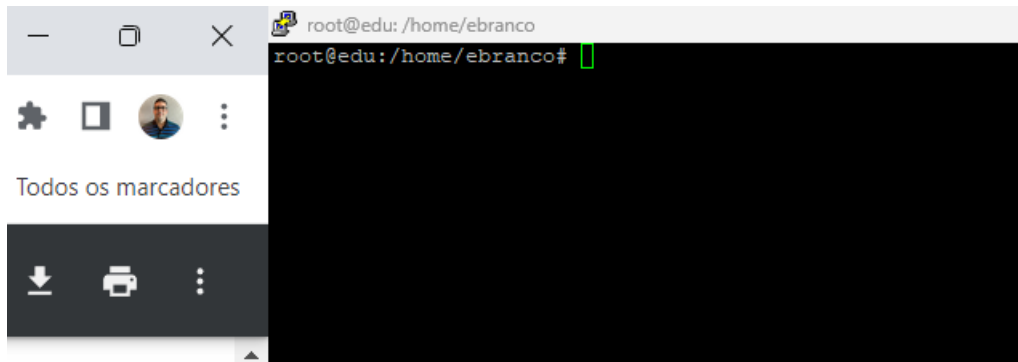
```
root@edu:/home/ebranco
root@edu:/home/ebranco# ping www.google.com.br
PING www.google.com.br (142.251.41.35) 56(84) bytes of data:
64 bytes from yyz12s08-in-f3.1e100.net (142.251.41.35): icmp_seq=1 ttl=110 time=17.8 ms
64 bytes from yyz12s08-in-f3.1e100.net (142.251.41.35): icmp_seq=2 ttl=110 time=17.5 ms
^C
--- www.google.com.br ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 17.523/17.638/17.754/0.115 ms
root@edu:/home/ebranco#
```

Using the sudo systemctl status ssh command to show the status of the ssh server.

```
root@edu:/home/ebranco
root@edu:/home/ebranco# sudo systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2023-11-24 04:46:20 UTC; 6min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Process: 1077 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Main PID: 1109 (sshd)
     Tasks: 1 (limit: 9426)
    Memory: 6.2M
   CGroup: /system.slice/ssh.service
           └─1109 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Nov 24 04:46:20 edu.lab2.local systemd[1]: Starting OpenBSD Secure Shell server...
Nov 24 04:46:20 edu.lab2.local sshd[1109]: Server listening on 0.0.0.0 port 22.
Nov 24 04:46:20 edu.lab2.local sshd[1109]: Server listening on :: port 22.
Nov 24 04:46:20 edu.lab2.local systemd[1]: Started OpenBSD Secure Shell server.
Nov 24 04:46:55 edu.lab2.local sshd[1297]: Accepted password for ebranco from 10.119.69.245 port 51919 ssh2
Nov 24 04:46:55 edu.lab2.local sshd[1297]: pam_unix(sshd:session): session opened for user ebranco by (uid=0)
root@edu:/home/ebranco#
```

I have privilegie. Sudo.



In this step, I used command lsblk to take information block devices, their mount. As can see sdb and sdc. 2gb each;

```
root@edu: /home/ebranco
root@edu: /home/ebranco# lsblk
NAME                                MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0                               7:0      0  70.3M 1 loop /snap/lxd/21029
loop1                               7:1      0  32.3M 1 loop /snap/snapd/12704
loop2                               7:2      0  55.4M 1 loop /snap/core18/2128
sda                                 8:0      0   10G  0 disk
├─sda1                              8:1      0    1M  0 part
├─sda2                              8:2      0    1G  0 part /boot
└─sda3                              8:3      0    9G  0 part
   └─ubuntu--vg-ubuntu--lv 253:0    0    9G  0 lvm  /
sdb                                 8:16     0    2G  0 disk
sdc                                 8:32     0    2G  0 disk
sr0                                 11:0     1 1024M  0 rom
root@edu: /home/ebranco#
```

Task2

In this, I went through some preparations for the disks, using the command Fdisk -l, and then the system returned a lot of information to me, including the additional disks...;

```
root@edu:/home/ebranco
root@edu:/home/ebranco# fdisk -l
Disk /dev/loop0: 70.32 MiB, 73728000 bytes, 144000 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 /dev/loop1: 32.3 MiB, 33865728 bytes, 66144 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 /dev/loop2: 55.45 MiB, 58130432 bytes, 113536 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 /dev/sda: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: Virtual disk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: gpt
Disk identifier: 72DDD107-898C-47A7-8DDB-4D22CA23D873

Device          Start      End  Sectors  Size Type
/dev/sda1       2048      4095     2048    1M BIOS boot
/dev/sda2       4096  2101247  2097152    1G Linux filesystem
/dev/sda3     2101248 20969471 18868224    9G Linux filesystem

Disk /dev/sdc: 2 GiB, 2147483648 bytes, 4194304 sectors
Disk model: Virtual disk
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 /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 sectors
Disk model: Virtual disk
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 /dev/mapper/ubuntu--vg-ubuntu--lv: 8.102 GiB, 9659482112 bytes, 18866176 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
root@edu:/home/ebranco# █
```

using the command fdisk /dev/sdb (I can access it to create the partition.)


```

root@edu:/home/ebranco# fdisk /dev/sdb

Welcome to fdisk (util-linux 2.34).
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.
Created a new DOS disklabel with disk identifier 0x61f4b9e9.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-4194303, default 2048): ^[[A^[[B^[[D^[[D^[[C^[[B^[[D
Value out of range.
First sector (2048-4194303, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-4194303, default 4194303):

Created a new partition 1 of type 'Linux' and of size 2 GiB.

Command (m for help): n
All space for primary partitions is in use.

Command (m for help): p
Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 sectors
Disk model: Virtual disk
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x61f4b9e9

Device      Boot Start      End Sectors Size Id Type
/dev/sdb1           2048 4194303 4192256  2G 83 Linux

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

```

Same step in second disk.

```
root@edu:/home/ebranco# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.34).
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.
Created a new DOS disklabel with disk identifier 0xb130c400.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (2048-4194303, default 2048): p
Value out of range.
First sector (2048-4194303, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-4194303, default 4194303):

Created a new partition 1 of type 'Linux' and of size 2 GiB.

Command (m for help):

Command (m for help): ^Z
[1]+  Stopped                  fdisk /dev/sdc
```

```

Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): d
Selected partition 1
Partition 1 has been deleted.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

root@edu:/home/ebranco# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.34).
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.
Created a new DOS disklabel with disk identifier 0x58e2d67b.

Command (m for help): d
No partition is defined yet!

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

root@edu:/home/ebranco# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): d
No partition is defined yet!

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

```

Just make sure, about creations partitions, and after that I wipe.

```

root@edu:/home/ebranco# pvcreate /dev/sdb
WARNING: dos signature detected on /dev/sdb at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdb.
Physical volume "/dev/sdb" successfully created.
root@edu:/home/ebranco# pvcreate /dev/sdc
WARNING: dos signature detected on /dev/sdc at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdc.
Physical volume "/dev/sdc" successfully created.
root@edu:/home/ebranco# █

```

In this step, we need to initialize the disks; I used the Pvcreeate command on each device. VGcreate is used to create volumes, and lvcreate is used to create logical volumes. Finally, I used lvmddisplay to show information about the disk.

```

root@edu: /home/ebranco
root@edu:/home/ebranco# fdisk /dev/sdc

Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): d
No partition is defined yet!

Command (m for help): w

The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.

root@edu:/home/ebranco# pvcreate /dev/sdb
WARNING: dos signature detected on /dev/sdb at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdb.
Physical volume "/dev/sdb" successfully created.
root@edu:/home/ebranco# pvcreate /dev/sdc
WARNING: dos signature detected on /dev/sdc at offset 510. Wipe it? [y/n]: y
Wiping dos signature on /dev/sdc.
Physical volume "/dev/sdc" successfully created.
root@edu:/home/ebranco# vgcreate vg_disk_1 /dev/sdb
Volume group "vg_disk_1" successfully created
root@edu:/home/ebranco# vgcreate vg_disk_2 /dev/sdc
Volume group "vg_disk_2" successfully created
root@edu:/home/ebranco# lvcreate -n disk_1 vg_disk_1 -l 100%FREE
Logical volume "disk_1" created.
root@edu:/home/ebranco# ii.lvcreate -n disk_2 vg_disk_2 -l 100%FREE
ii.lvcreate: command not found
root@edu:/home/ebranco# lvcreate -n disk_2 vg_disk_2 -l 100%FREE
Logical volume "disk_2" created.
root@edu:/home/ebranco# i.lvdisplay /dev/vg_disk_1/disk_1
i.lvdisplay: command not found
root@edu:/home/ebranco# lvdisplay /dev/vg_disk_1/disk_1
--- Logical volume ---
LV Path                /dev/vg_disk_1/disk_1
LV Name                 disk_1
VG Name                 vg_disk_1
LV UUID                 0B5v4c-4eVG-eYIx-PFsP-4ruiy-tcNU-yEdVdQ
LV Write Access         read/write
LV Creation host, time edu.lab2.local, 2023-11-24 05:09:56 +0000
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            253:1

```

```
root@edu:/home/ebranco# lvs /dev/vg_dick_1/disk1
Volume group "vg_dick_1" not found
Cannot process volume group vg_dick_1
root@edu:/home/ebranco# lvs /dev/vg_disk_1/disk_1
--- Logical volume ---
LV Path                /dev/vg_disk_1/disk_1
LV Name                 disk_1
VG Name                 vg_disk_1
LV UUID                0B5v4c-4eVG-eYIx-PFsP-4ruy-tcNU-yEdVdQ
LV Write Access        read/write
LV Creation host, time edu.lab2.local, 2023-11-24 05:09:56 +0000
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           253:1

root@edu:/home/ebranco# lvs /dev/vg_disk_1/disk_2
Failed to find logical volume "vg_disk_1/disk_2"
root@edu:/home/ebranco# lvs /dev/vg_disk_1/disk_2
Failed to find logical volume "vg_disk_1/disk_2"
root@edu:/home/ebranco# lvcreate -n disk_2 vg_disk_2 -l 100%FREE
Calculated size of logical volume is 0 extents. Needs to be larger.
root@edu:/home/ebranco# vgcreate vg_disk_2 /dev/sdc
/dev/vg_disk_2: already exists in filesystem
Run `vgcreate --help' for more information.
root@edu:/home/ebranco# lvs /dev/vg_disk_2/disk_2
--- Logical volume ---
LV Path                /dev/vg_disk_2/disk_2
LV Name                 disk_2
VG Name                 vg_disk_2
LV UUID                ytCx2- XuMU-eWct-xeL0-mlDE-XDOc-cdBBqw
LV Write Access        read/write
LV Creation host, time edu.lab2.local, 2023-11-24 05:10:14 +0000
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           253:2

root@edu:/home/ebranco#
```

Step 3

This step is very detailed, it is necessary to install targetcli-fb, so I used the command apt install targetcli-fb.

```
root@edu:/home/ebranco
root@edu:/home/ebranco# apt install targetcli-fb
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  python3-configshell-fb python3-pyparsing python3-pyudev python3-rtslib-fb python3-urwid
Suggested packages:
  python-pyparsing-doc python-urwid-doc
The following NEW packages will be installed:
  python3-configshell-fb python3-pyparsing python3-pyudev python3-rtslib-fb python3-urwid targetcli-fb
0 upgraded, 6 newly installed, 0 to remove and 169 not upgraded.
Need to get 356 kB of archives.
After this operation, 2,294 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ca.archive.ubuntu.com/ubuntu focal/main amd64 python3-pyparsing all 2.4.6-1 [61.3 kB]
Get:2 http://ca.archive.ubuntu.com/ubuntu focal/universe amd64 python3-urwid amd64 2.0.1-3 [159 kB]
Get:3 http://ca.archive.ubuntu.com/ubuntu focal/universe amd64 python3-configshell-fb all 1:1.1.27-0ubuntu1 [28.0 kB]
Get:4 http://ca.archive.ubuntu.com/ubuntu focal/main amd64 python3-pyudev all 0.21.0-3ubuntu1 [37.1 kB]
Get:5 http://ca.archive.ubuntu.com/ubuntu focal-updates/universe amd64 python3-rtslib-fb all 2.1.71-0ubuntu1.1 [36.4 kB]
Get:6 http://ca.archive.ubuntu.com/ubuntu focal/universe amd64 targetcli-fb all 1:2.1.51-0ubuntu1 [35.1 kB]
Fetched 356 kB in 0s (1,591 kB/s)
Selecting previously unselected package python3-pyparsing.
(Reading database ... 71833 files and directories currently installed.)
Preparing to unpack .../0-python3-pyparsing_2.4.6-1_all.deb ...
Unpacking python3-pyparsing (2.4.6-1) ...
Selecting previously unselected package python3-urwid.
Preparing to unpack .../1-python3-urwid_2.0.1-3_amd64.deb ...
Unpacking python3-urwid (2.0.1-3) ...
Selecting previously unselected package python3-configshell-fb.
Preparing to unpack .../2-python3-configshell-fb_1:1.1.27-0ubuntu1_all.deb ...
Unpacking python3-configshell-fb (1:1.1.27-0ubuntu1) ...
Selecting previously unselected package python3-pyudev.
Preparing to unpack .../3-python3-pyudev_0.21.0-3ubuntu1_all.deb ...
Unpacking python3-pyudev (0.21.0-3ubuntu1) ...
Selecting previously unselected package python3-rtslib-fb.
Preparing to unpack .../4-python3-rtslib-fb_2.1.71-0ubuntu1.1_all.deb ...
Unpacking python3-rtslib-fb (2.1.71-0ubuntu1.1) ...
Selecting previously unselected package targetcli-fb.
Preparing to unpack .../5-targetcli-fb_1:2.1.51-0ubuntu1_all.deb ...
Unpacking targetcli-fb (1:2.1.51-0ubuntu1) ...
Setting up python3-urwid (2.0.1-3) ...
/usr/lib/python3/dist-packages/urwid/tests/test_canvas.py:141: SyntaxWarning: 'str' object is not callable; perhaps you missed a comma?
  assert result == expected, "got: %r expected: %r" (result, expected)
/usr/lib/python3/dist-packages/urwid/tests/test_canvas.py:145: SyntaxWarning: 'str' object is not callable; perhaps you missed a comma?
  assert result == expected, "got: %r expected: %r" (result, expected)
/usr/lib/python3/dist-packages/urwid/tests/test_canvas.py:149: SyntaxWarning: 'str' object is not callable; perhaps you missed a comma?
  assert result == expected, "got: %r expected: %r" (result, expected)
/usr/lib/python3/dist-packages/urwid/tests/test_canvas.py:232: SyntaxWarning: 'str' object is not callable; perhaps you missed a comma?
  assert result == expected, "got: %r expected: %r" (result, expected)
Setting up python3-pyparsing (2.4.6-1) ...
Setting up python3-configshell-fb (1:1.1.27-0ubuntu1) ...
Setting up python3-pyudev (0.21.0-3ubuntu1) ...
Setting up python3-rtslib-fb (2.1.71-0ubuntu1.1) ...
invoke-rc.d: policy-rc.d denied execution of start.
Setting up targetcli-fb (1:2.1.51-0ubuntu1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/targetclid.service - /lib/systemd/system/targetclid.service.
Created symlink /etc/systemd/system/sockets.target.wants/targetclid.socket - /lib/systemd/system/targetclid.socket.
/usr/sbin/policy-rc.d returned 101, not running 'start targetclid.socket'
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for systemd (245.4-4ubuntu3.20) ...
root@edu:/home/ebranco#
```

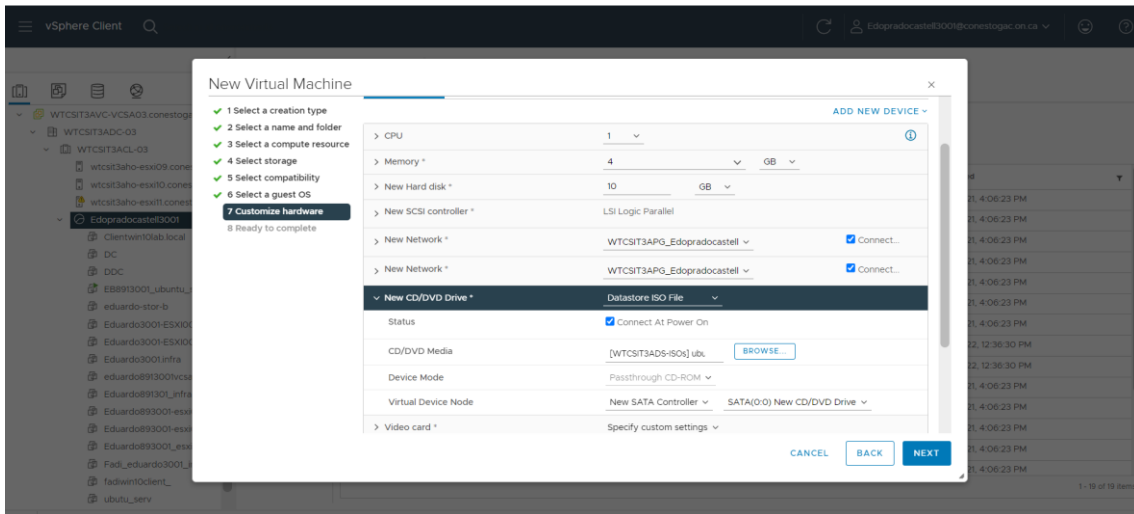
Next, create name disk_01 and disk_02. After that, accessing the iscsi folder, I created iqn.2023-11.lab2.local:4444, was created. and after that sharing two luns from one target.

```
Created block storage object disk_01 using /dev/vg_disk_1/disk_1.
/backstores/block> create name=disk_02 dev=/dev/vg_disk_2/disk_2
Created block storage object disk_02 using /dev/vg_disk_2/disk_2.
/backstores/block> cd..
/backstores> cd..
/> cd iscsi
/iscsi> create iqn.2023-11.lab2.local:4444
Created target iqn.2023-11.lab2.local:4444.
Created TPG 1.
Global pref auto_add_default_portal=true
Created default Portal listening on all IPs (0.0.0.0), port 3260.
/iscsi> cd iqn.2023-11.lab2.local:4444/tpg1/luns
ls such path /iscsi/iqn.2023-11.lab2.local:4444
/iscsi> cd iqn.2023-11.lab2.local:4444/tpg1/luns
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_1
storage object or path not valid
/iscsi/iqn.20...444/tpg1/luns> cd iqn.2023-11.lab2.local:4444/tpg1/luns
ls such path /iscsi/iqn.2023-11.lab2.local:4444/tpg1/luns/iqn.2023-11.lab2.local:4444
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_1
storage object or path not valid
/iscsi/iqn.20...444/tpg1/luns> cd..
/iscsi/iqn.20...cal:4444/tpg1> cd..
/iscsi/iqn.20...b2.local:4444> cd..
/iscsi> create iqn.2023-11.lab2.local:4444
WARN not valid as: iqn, nas, eui
/iscsi> ls
- iscsi
  - iqn.2023-11.lab2.local:4444 [Targets: 1]
    - tpg1 [no-gen-acls, no-auth] [TPGs: 1]
      - acls [ACLs: 0]
      - luns [LUNs: 0]
      - portals [Portals: 1]
      - 0.0.0.0:3260 [OR]
/iscsi> cd iqn.2023-11.lab2.local:4444/
/iscsi/iqn.20...b2.local:4444> ls
- iqn.2023-11.lab2.local:4444 [Targets: 1]
  - tpg1 [no-gen-acls, no-auth] [TPGs: 1]
    - acls [ACLs: 0]
    - luns [LUNs: 0]
    - portals [Portals: 1]
    - 0.0.0.0:3260 [OR]
/iscsi/iqn.20...b2.local:4444> create /backstores/block/disk_1
log arguments must be a number
/iscsi/iqn.20...b2.local:4444> 1
/iscsi/iqn.20...b2.local:4444> @last
/iscsi/iqn.20...cal:4444/tpg1> cd luns
/iscsi/iqn.20...444/tpg1/luns> ls
- luns [LUNs: 0]
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_1
storage object or path not valid
/iscsi/iqn.20...444/tpg1/luns> create
/backstores/block/disk_01 /backstores/block/disk_02 add_mapped_luns= lun=
storage object=
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_01
Created LUN 0.
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_02
Created LUN 1.
/iscsi/iqn.20...444/tpg1/luns> ls
- luns [LUNs: 2]
  - lun0 [block/disk_01 (/dev/vg_disk_1/disk_1) (default_tg_pt_gp)]
  - lun1 [block/disk_02 (/dev/vg_disk_2/disk_2) (default_tg_pt_gp)]
/iscsi/iqn.20...444/tpg1/luns> []
```

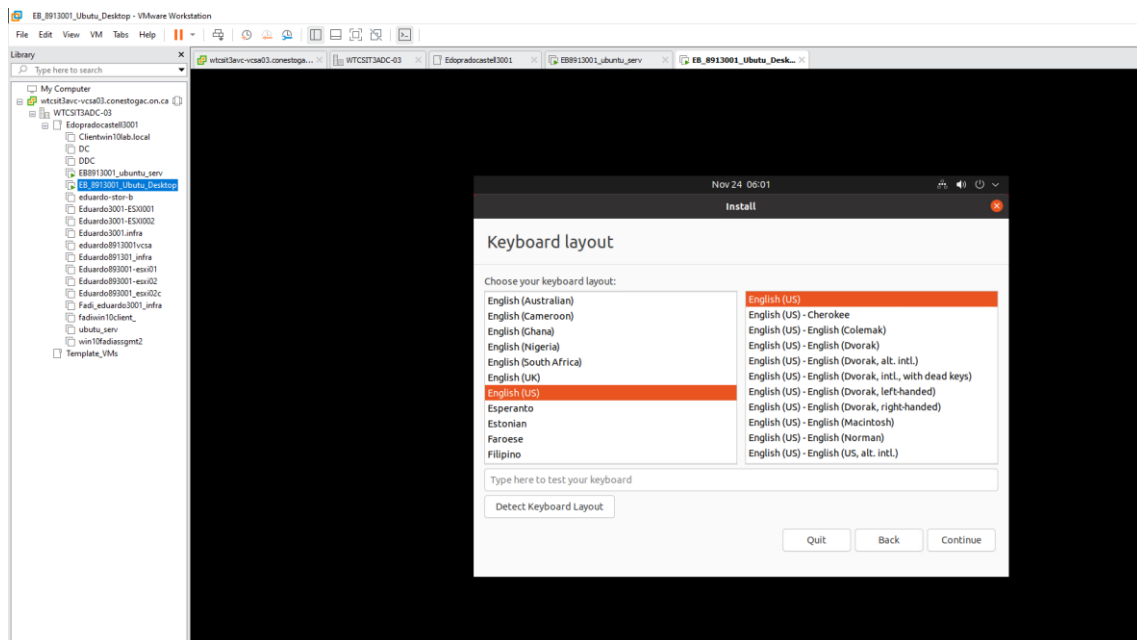
```
root@edu: /home/ebranco
o- iscsi ..... [Targets: 1]
o- iqn.2023-11.lab2.local:4444 ..... [TPGs: 1]
o- tpg1 ..... [no-gen-acls, no-auth]
o- acls ..... [ACls: 0]
o- luns ..... [LUNs: 0]
o- portals ..... [Portals: 1]
o- 0.0.0.0:3260 ..... [OR]
/iscsi> cd iqn.2023-11.lab2.local:4444/
/iscsi/iqn.20...b2.local:4444> ls
o- iqn.2023-11.lab2.local:4444 ..... [TPGs: 1]
o- tpg1 ..... [no-gen-acls, no-auth]
o- acls ..... [ACls: 0]
o- luns ..... [LUNs: 0]
o- portals ..... [Portals: 1]
o- 0.0.0.0:3260 ..... [OR]
/iscsi/iqn.20...b2.local:4444> create /backstores/block/disk_1
The argument must be a number.
/iscsi/iqn.20...b2.local:4444> 1
@last ls
/iscsi/iqn.20...b2.local:4444> @last
/iscsi/iqn.20...cal:4444/tpg1> cd luns
/iscsi/iqn.20...444/tpg1/luns> ls
o- luns ..... [LUNs: 0]
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_1
storage object or path not valid
/iscsi/iqn.20...444/tpg1/luns> create
/backstores/block/disk_01 /backstores/block/disk_02 add_mapped_luns= luns=
storage_object=
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_01
Created LUN 0.
/iscsi/iqn.20...444/tpg1/luns> create /backstores/block/disk_02
Created LUN 1.
/iscsi/iqn.20...444/tpg1/luns> ls
o- luns ..... [LUNs: 2]
o- lun0 ..... [block/disk_01 (/dev/vg_disk_1/disk_1) (default_tg_pt_gp)]
o- lun1 ..... [block/disk_02 (/dev/vg_disk_2/disk_2) (default_tg_pt_gp)]
/iscsi/iqn.20...444/tpg1/luns> cd..
/iscsi/iqn.20...cal:4444/tpg1> cd portals/
/iscsi/iqn.20.../tpg1/portals> delete 0.0.0.0 3260
Deleted network portal 0.0.0.0:3260
/iscsi/iqn.20.../tpg1/portals> create <10.173.138.231>
Using default IP port 3260
Could not create NetworkPortal in configFS
/iscsi/iqn.20.../tpg1/portals> create 10.173.138.231
Using default IP port 3260
Created network portal 10.173.138.231:3260.
/iscsi/iqn.20.../tpg1/portals> cd..
/iscsi/iqn.20...cal:4444/tpg1> cd acls
/iscsi/iqn.20...444/tpg1/acls> create
add_mapped_luns= wwn=
/iscsi/iqn.20...444/tpg1/acls> create iqn.2023-11.lab2.local:node01:init1
Created Node ACL for iqn.2023-11.lab2.local:node01:init1
Created mapped LUN 1.
Created mapped LUN 0.
/iscsi/iqn.20...444/tpg1/acls> create iqn.2023-11.lab2.local:node02:init1
Created Node ACL for iqn.2023-11.lab2.local:node02:init1
Created mapped LUN 1.
Created mapped LUN 0.
/iscsi/iqn.20...444/tpg1/acls> create iqn.2023-11.lab2.local:node03:init1
Created Node ACL for iqn.2023-11.lab2.local:node03:init1
Created mapped LUN 1.
Created mapped LUN 0.
/iscsi/iqn.20...444/tpg1/acls> create iqn.2023-11.lab2.local:node04:init1
Created Node ACL for iqn.2023-11.lab2.local:node04:init1
Created mapped LUN 1.
Created mapped LUN 0.
```


Part2

As required, I deposited a new machine with the following configurations in this part. 1 CPU, 4GB memory. 1 10GB hard drive, adding two more network cards.



Installations, configs

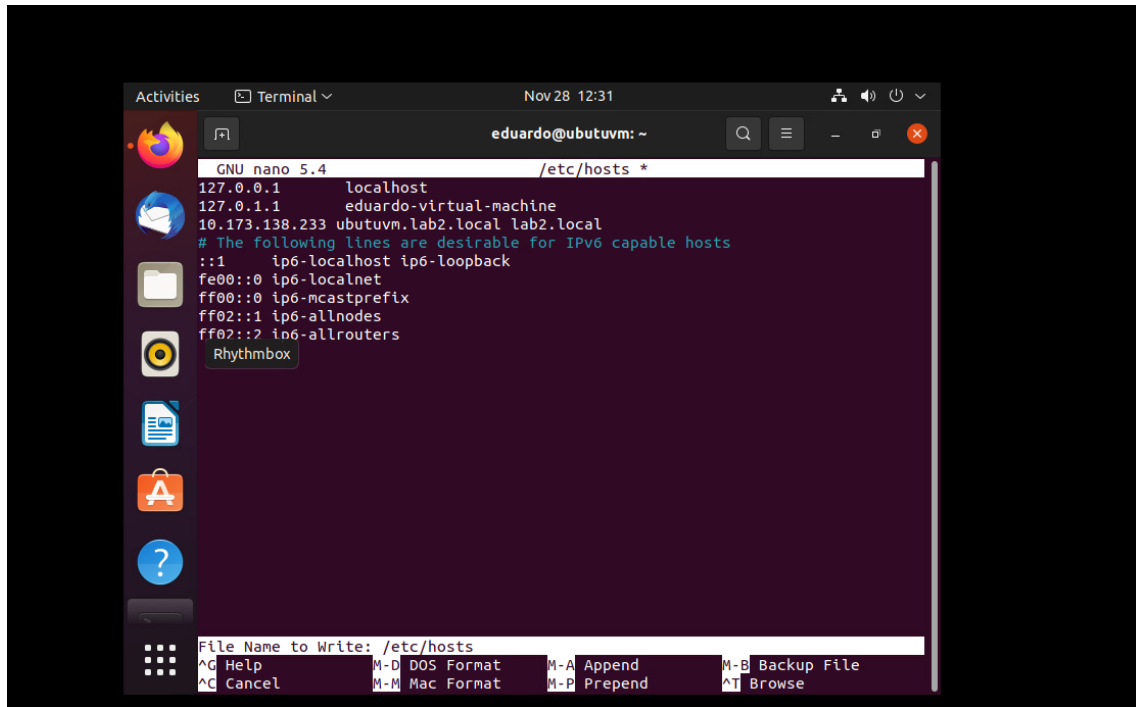


```
eduardo@ubutuvm: ~  
eduardo@ubutuvm:~$ sudo adduser branco  
[sudo] password for eduardo:  
Adding user `branco' ...  
Adding new group `branco' (1001) ...  
Adding new user `branco' (1001) with group `branco' ...  
Creating home directory `/home/branco' ...  
C Files g files from `/etc/skel' ...  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word  
Retype new password:  
passwd: password updated successfully  
Changing the user information for branco  
Enter the new value, or press ENTER for the default  
Full Name []: Henrique Branco  
Room Number []: 5  
Work Phone []: 9*999999  
Home Phone []: 555555  
Other []:  
Is the information correct? [Y/n] y  
eduardo@ubutuvm:~$
```

After installing Ubuntu desktop, configure the IP address, update, register user,

```
GNU nano 5.4 /etc/hosts *  
10.173.138.233 ubutuvm.lab2.local lab2.local  
  
File Name to Write: /etc/hosts  
^G Help M-D DOS Format M-A Append M-B Backup File  
^C Cancel M-M Mac Format M-P Prepend ^T Browse
```

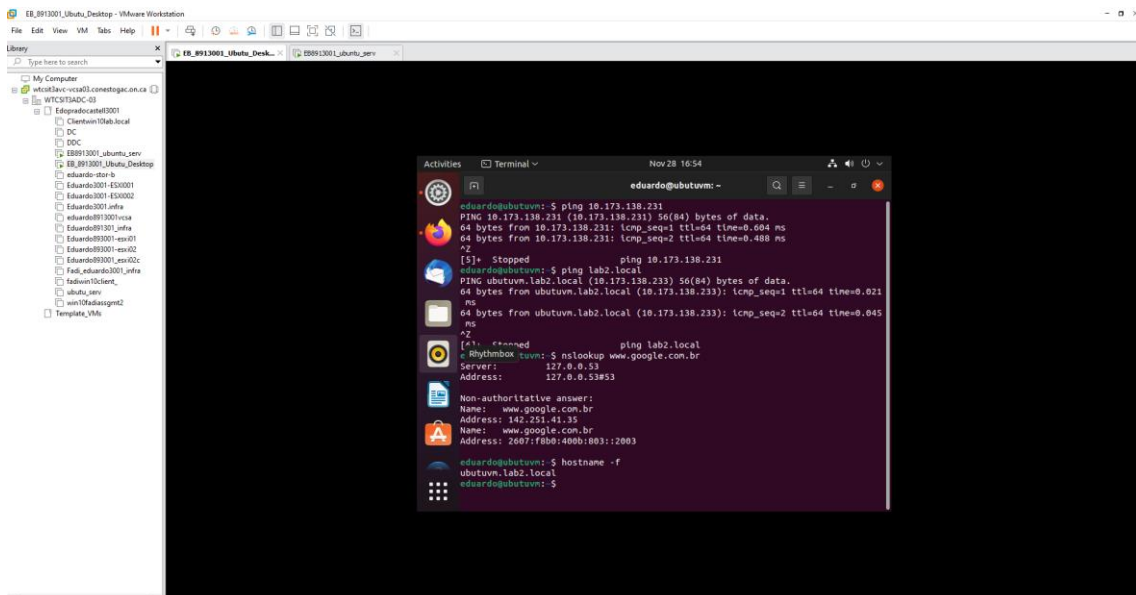
configuring the host.



```
GNU nano 5.4 /etc/hosts *
127.0.0.1 localhost
127.0.1.1 eduardo-virtual-machine
10.173.138.233 ubutuvm.lab2.local lab2.local
# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
Rhythmbox

File Name to Write: /etc/hosts
^G Help M-D DOS Format M-A Append M-B Backup File
^C Cancel M-M Mac Format M-P Prepend ^T Browse
```

In this screen shot, I can ping the ubuntu server, whose IP is 10.173.138.231/24, I can ping the lab2.local domain and I can go out to the internet by running the command nslookup www.google.com.br in which I got an answer.



```
eduardo@ubutuvm:~$ ping 10.173.138.231
PING 10.173.138.231 (10.173.138.231) 56(84) bytes of data:
64 bytes from 10.173.138.231: icmp_seq=1 ttl=64 time=0.094 ms
64 bytes from 10.173.138.231: icmp_seq=2 ttl=64 time=0.488 ms
^Z
[5] Stopped ping 10.173.138.231
eduardo@ubutuvm:~$ ping lab2.local
PING ubutuvm.lab2.local (10.173.138.233) 56(84) bytes of data:
64 bytes from ubutuvm.lab2.local (10.173.138.233): icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from ubutuvm.lab2.local (10.173.138.233): icmp_seq=2 ttl=64 time=0.045 ms
^Z
[21] Stopped ping lab2.local
~$ nslookup www.google.com.br
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: www.google.com.br
Address: 142.251.41.35
Name: www.google.com.br
Address: 2607:f800:4000:003:2003

eduardo@ubutuvm:~$ hostname -f
ubutuvm.lab2.local
eduardo@ubutuvm:~$
```

Conclusion

This labwork was very important for me, as it brought the theoretical concepts I learned in class into practical form, along with research and work related to the history of the emergence of virtualization. The abstraction of the layer enhances the freedom to configure an infrastructure according to our needs, taking advantage of the maximum computational power and dividing the hardware resource through a hypervisor. I would also like to clarify some of the difficulties I encountered during this lab and show how complex but very powerful this tool is, which requires a lot of training and knowledge, and this is only possible through more intense contact. Problems regarding the connection made it impossible to complete, but I did my best in this complex assignment.