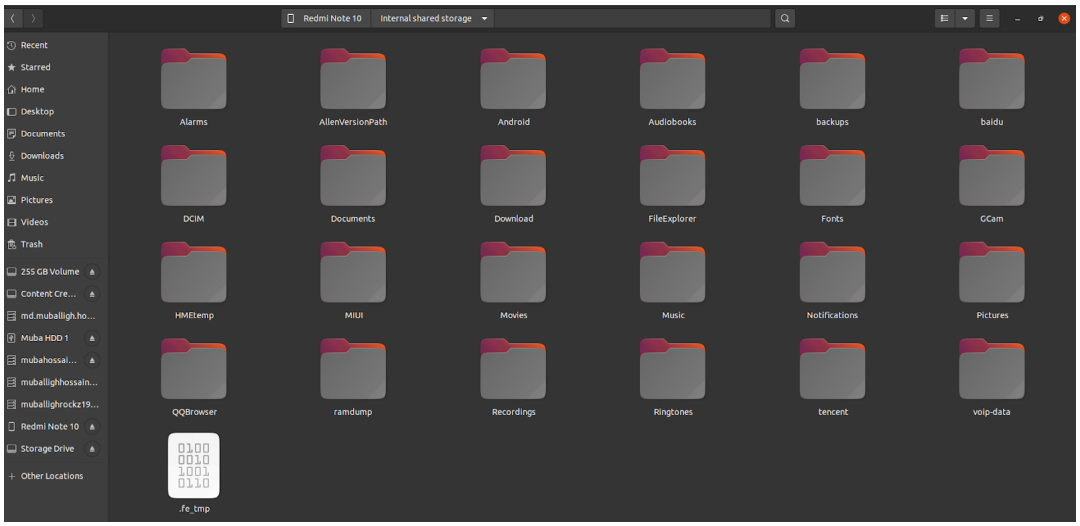
Task 1 - Connect guest os with a phone and access the phone's files

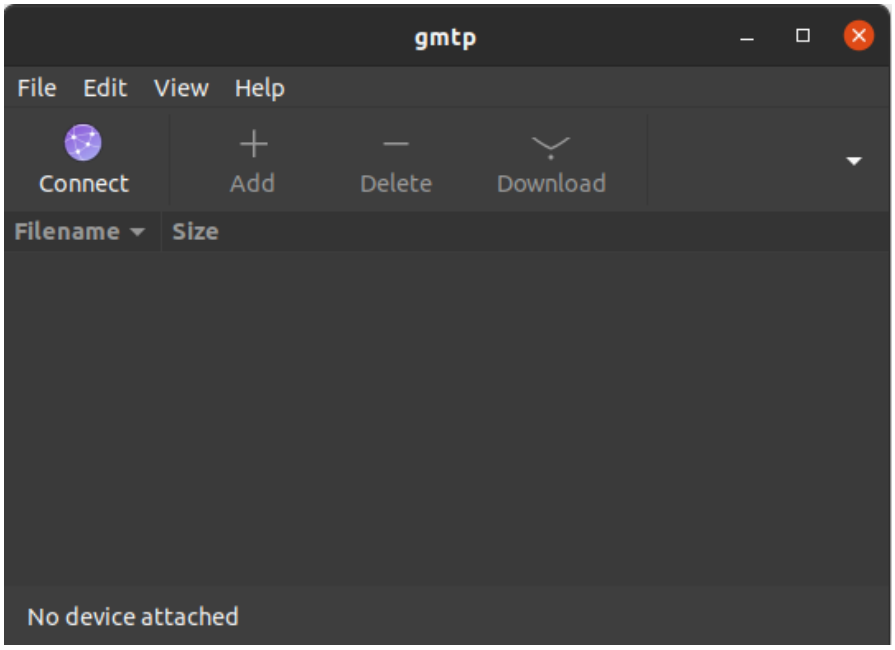
Android Devices gives access to their internal storage using Media Transfer Protocol In our instance, Ubuntu or other popular distros already have MTP built in, so it can access the phone directly.

- For Ubuntu 20.04- Connect your phone using USB and select File Transfer Mode



- For other cases, an MTP client has to be installed.

```
muballigh@hossain-19101289:~$ sudo apt-get install gmtp
[sudo] password for muballigh:
Reading package lists... Done
Building dependency tree
```



- Or, install jmtpfs - > `sudo apt-get install jmtpfs`

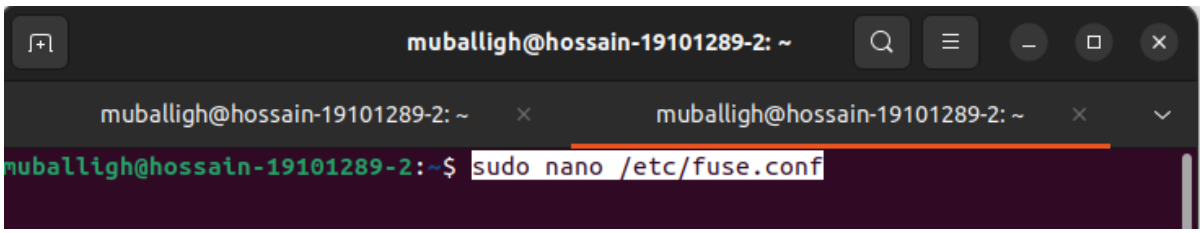
```
muballigh@hossain-19101289:~$ sudo apt-get install jmtpfs
Reading package lists... Done
Building dependency tree
```

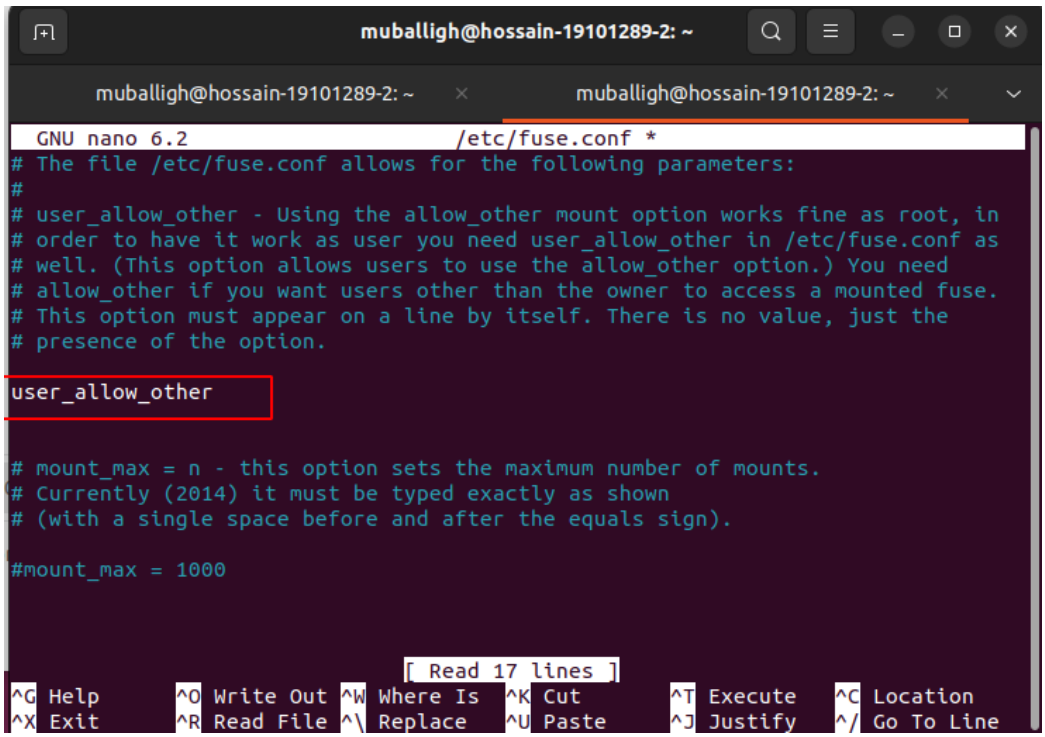
After connecting your phone via USB, enable the MTP file transfer on your phone and it will show up as a USB device on your computer. You can then access the whole file system

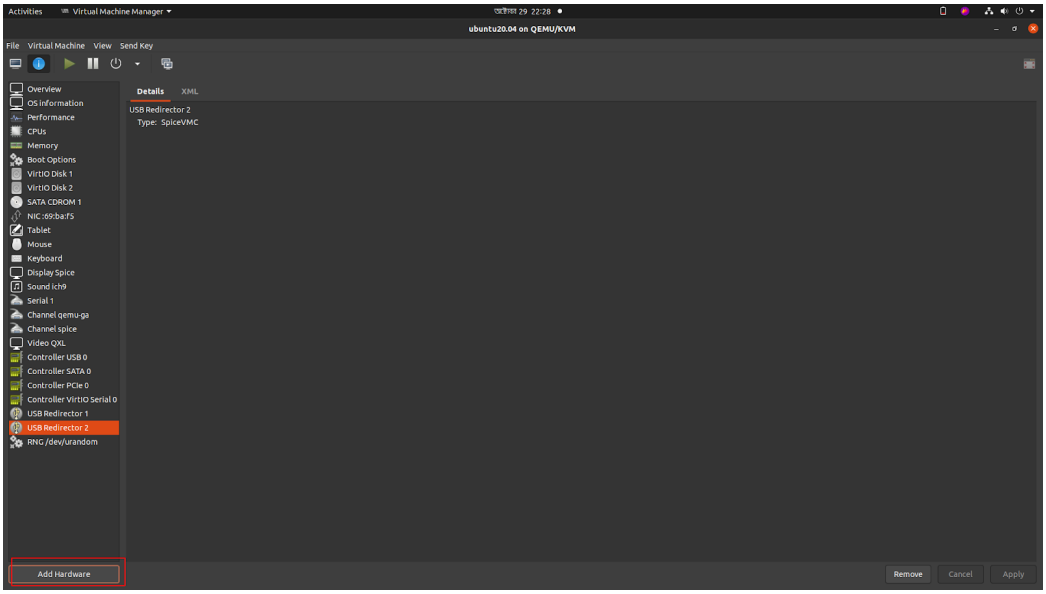
- If the above steps don't work, follow -> https://whoozle.github.io/android-file-transfer-linux/

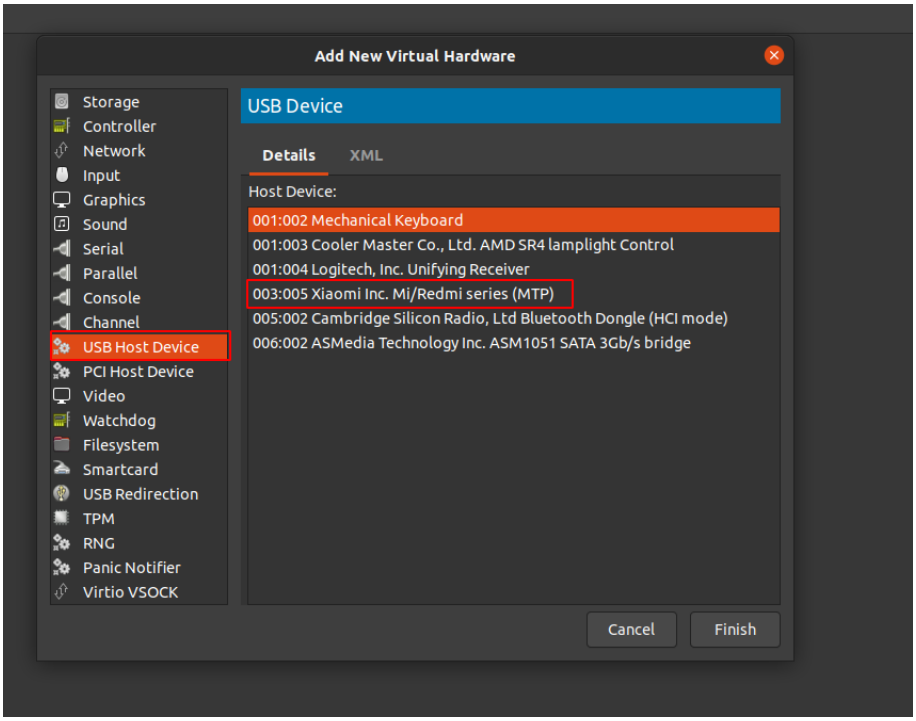
Connecting Phone to Guest OS

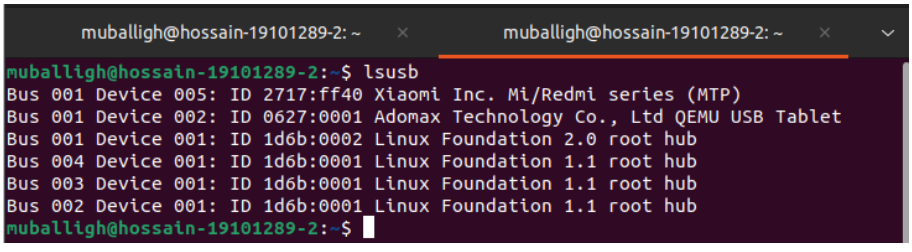
```
muballigh@hossain-19101289-2:~$ sudo apt-get install libmtp-common mtp-tools lib
mtp-dev libmtp-runtime libmtp9
Reading package lists... Done
Building dependency tree... Done
```

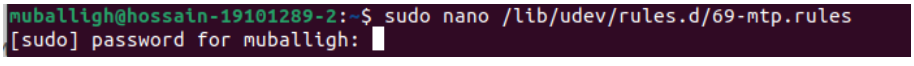





Activities
Virtual Machine Manager
ubuntu20.04 on QEMU/KVM
File Virtual Machine View Send Key
Overview
OS Information
Performance
CPUs
Memory
Boot Options
VirtIO Disk 1
VirtIO Disk 2
SATA CDROM 1
Tablet
Mouse
Keyboard
Display Spice
Sound ich9
Serial 1
Channel qemu-ga
Channel spice
Video QXL
Controller USB 0
Controller SATA 0
Controller PCIe 0
Controller VirtIO Serial 0
USB Redirector 1
USB Redirector 2
RNG /dev/urandom
Details
XML
USB Redirector 2
Type: SpiceVMC
Add Hardware
Remove
Cancel
Apply


Add New Virtual Hardware
Storage
Controller
Network
Input
Graphics
Sound
Serial
Parallel
Console
Channel
USB Host Device
PCI Host Device
Video
Watchdog
Filesystem
Smartcard
USB Redirection
TPM
RNG
Panic Notifier
Virtio VSOCK
USB Device
Details
XML
Host Device:
001:002 Mechanical Keyboard
001:003 Cooler Master Co., Ltd. AMD SR4 lamplight Control
001:004 Logitech, Inc. Unifying Receiver
003:005 Xiaomi Inc. Mi/Redmi series (MTP)
005:002 Cambridge Silicon Radio, Ltd Bluetooth Dongle (HCI mode)
006:002 ASMedia Technology Inc. ASM1051 SATA 3Gb/s bridge
Cancel
Finish


muballigh@hossain-19101289-2: ~
muballigh@hossain-19101289-2: ~
muballigh@hossain-19101289-2:~$ lsusb
Bus 001 Device 005: ID 2717:ff40 Xiaomi Inc. Mi/Redmi series (MTP)
Bus 001 Device 002: ID 0627:0001 Adomax Technology Co., Ltd QEMU USB Tablet
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
muballigh@hossain-19101289-2:~$

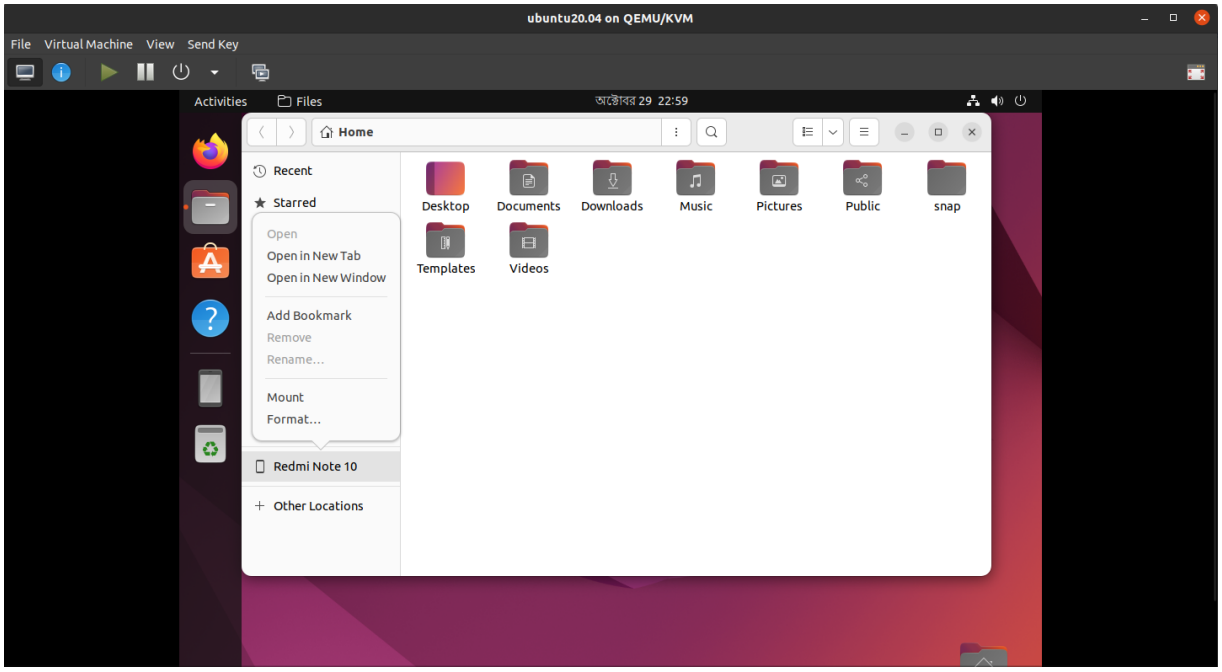

muballigh@hossain-19101289-2:~$ sudo nano /lib/udev/rules.d/69-mtp.rules
[sudo] password for muballigh:

```
muballigh@hossain-19101289-2:~$ cat /lib/udev/rules.d/69-mtp.rules
Redmi Note 10
ATTR{idVendor}=="0fce", ATTR{idProduct}=="01b1", SYMLINK+="libmtp-%k", ENV{ID_MT
P_DEVICE}="1", ENV{ID_MEDIA_PLAYER}="1"
muballigh@hossain-19101289-2:~$
```

```
muballigh@hossain-19101289-2:~$ sudo nano /etc/udev/rules.d/51-android.rules
```

```
muballigh@hossain-19101289-2: ~
  GNU nano 6.2                  /etc/udev/rules.d/51-android.rules *
ATTR{idVendor}=="0fce", ATTR{idProduct}=="01b1", MODE="0666"
```

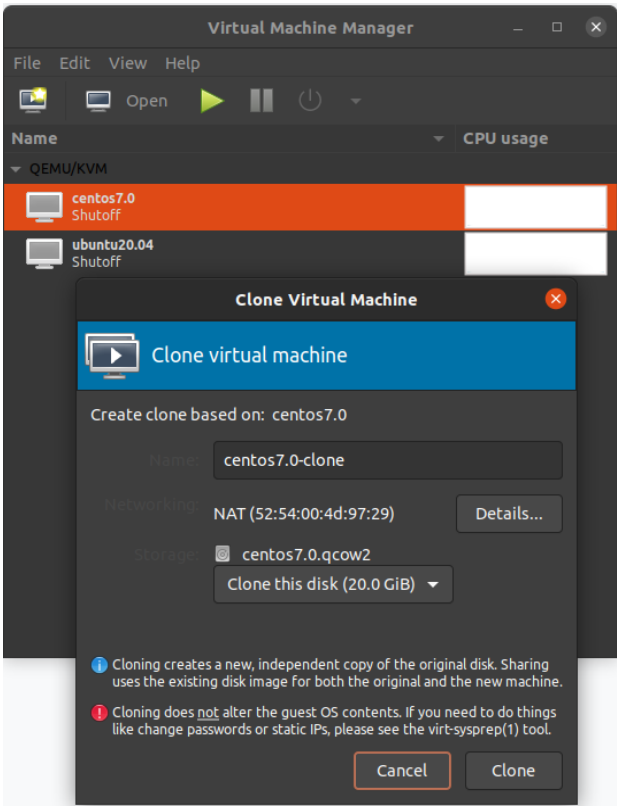
```
muballigh@hossain-19101289-2:~$ sudo service udev restart
```



Task 2 : Clone a VM using GUI and using kvm based command

Using GUI:

- Star VMM
- Select the VM you want to clone
- Select Clone and give a name for the new VM



- Press Clone and the desired VM will be created

Using CLI:

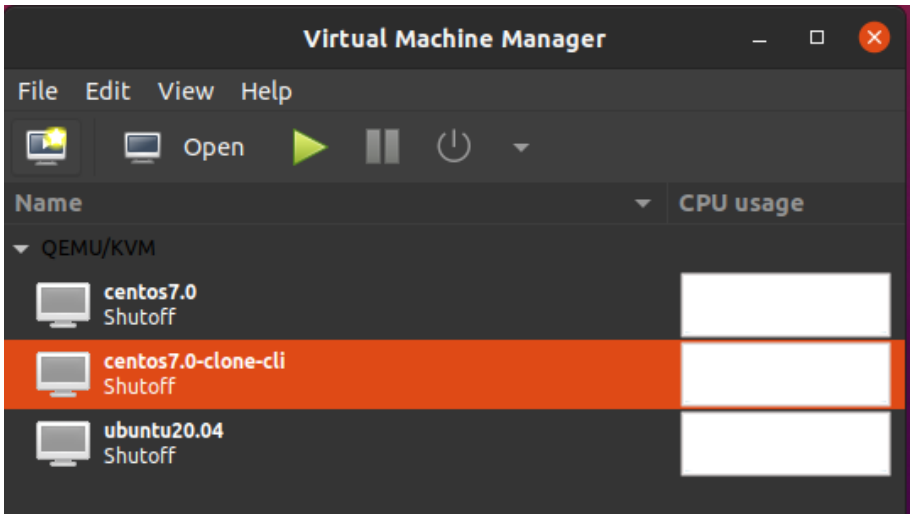
- See the existing VMs using virsh list —all

```
muballigh@hossain-19101289:~$ virsh list --all
 Id    Name           State
------------------------------
 -     centos7.0      shut off
 -     ubuntu20.04    shut off
```

- Select the VM you want to clone and give a new name to it using
  sudo virt-clone --original centos7.0 --name centos7.0-clone-cli --auto-clone

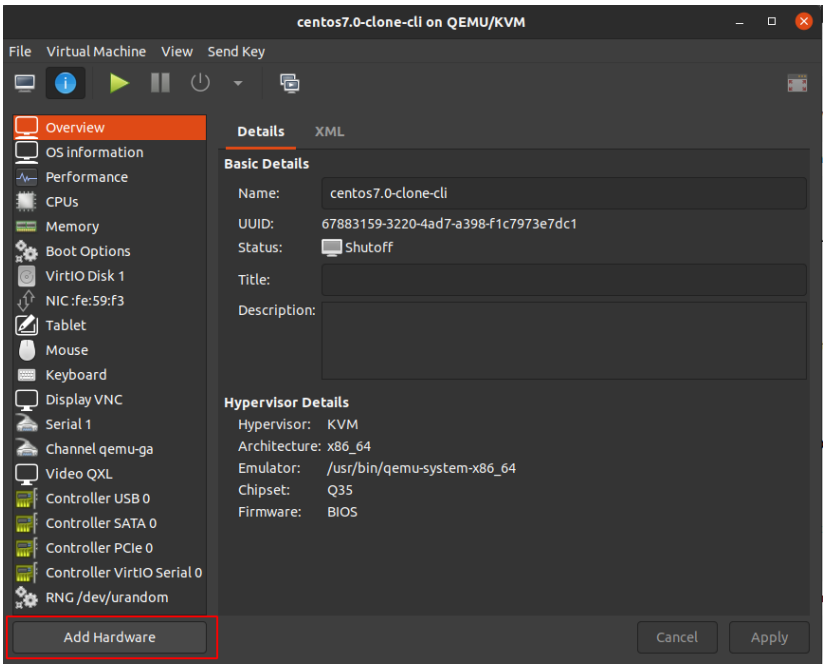
```
muballigh@hossain-19101289:~$ sudo virt-clone --original centos7.0 --name centos7.0-clone-cli --auto-clone
Allocating 'centos7.0-clone-cli.qcow2'                                                    |  20 GB  00:00:00

Clone 'centos7.0-clone-cli' created successfully.
muballigh@hossain-19101289:~$
```

- A new VM will be created successfully (cloned)

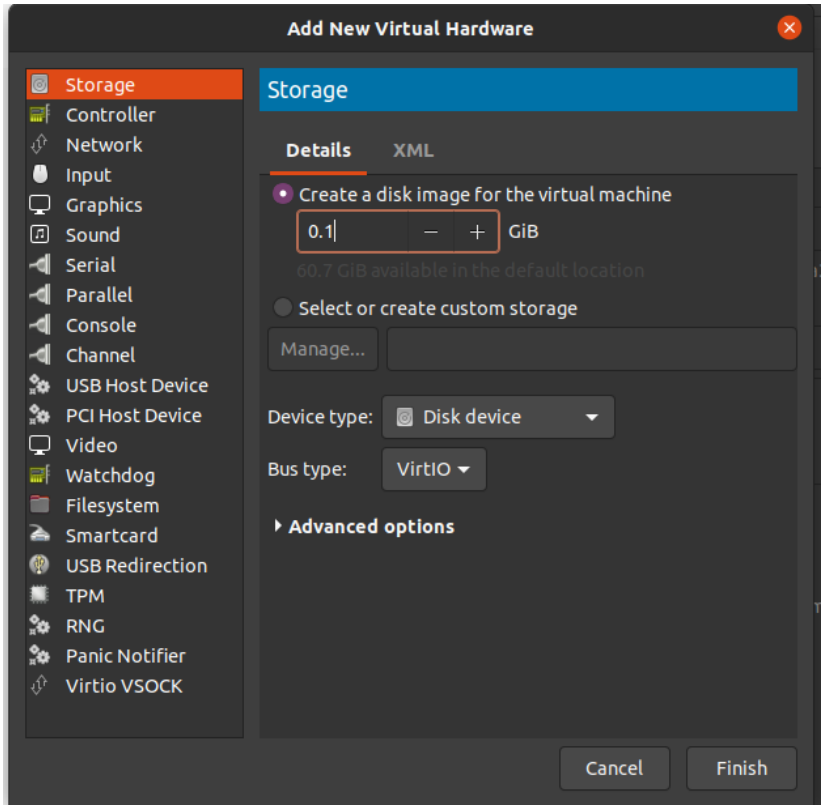


Task 3: Add two hard disks in a new cloned virtual machine using GUI

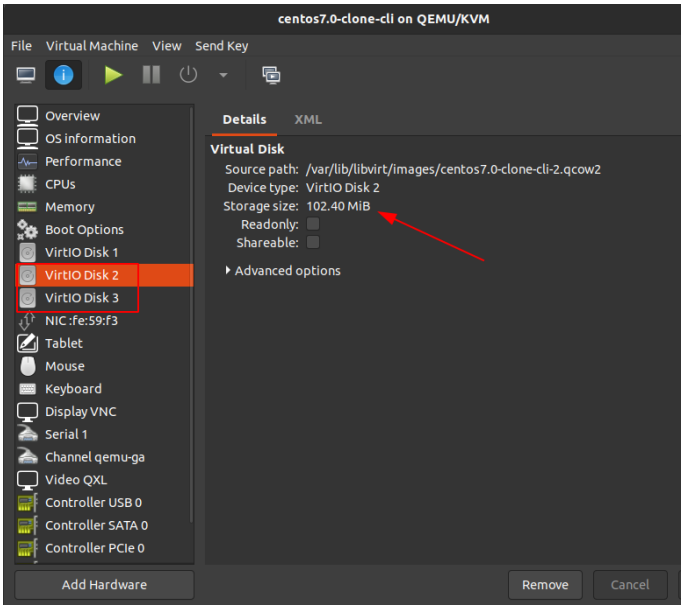
- Open the VM and Press “Add Hardware”



- Go to storage option and add a disk image according to your need



- The two new disks can be seen



Task 4 : Add hard disks using kvm based command

- See the list of all available storage pools

```
muballigh@hossain-19101289:~$ sudo virsh pool-list --all
[sudo] password for muballigh:
 Name           State      Autostart
-----------------------------------------
 boot-scratch   active     yes
 default        active     yes
 Downloads      active     yes
 Downloads-1    inactive   yes
 Downloads-2    active     yes
```

- Show the default storage pool definition including the directory path /var/lib/libvirt/images

```
muballigh@hossain-19101289:~$ sudo virsh pool-dumpxml default
<pool type='dir'>
  <name>default</name>
  <uuid>3169ce2e-a0d5-444b-aa3c-647f7728b1c7</uuid>
  <capacity unit='bytes'>102611623936</capacity>
  <allocation unit='bytes'>37385555968</allocation>
  <available unit='bytes'>65226067968</available>
  <source>
  </source>
  <target>
    <path>/var/lib/libvirt/images</path>
    <permissions>
      <mode>0711</mode>
      <owner>0</owner>
      <group>0</group>
    </permissions>
  </target>
</pool>
```

- This is the directory path

```
<path>/var/lib/libvirt/images</path>
```

- Creating the disk image by the following command

  sudo qemu-img create -f qcow2 -o size=0.1G /var/lib/libvirt/images/ubuntu20.04-1G.qcow2

```
muballigh@hossain-19101289:~$ sudo qemu-img create -f qcow2 -o size=0.1G /var/lib/libvirt/images/ubuntu20.04-1G.qcow2
Formatting '/var/lib/libvirt/images/ubuntu20.04-1G.qcow2', fmt=qcow2 size=107374182 cluster_size=65536 lazy_refcounts=off refcount_bits=16
muballigh@hossain-19101289:~$
```

```
muballigh@hossain-19101289:~$ sudo qemu-img create -f qcow2 -o size=0.1G /var/lib/libvirt/images/centos7.0-clone-cli-0.1G.qcow2
Formatting '/var/lib/libvirt/images/centos7.0-clone-cli-0.1G.qcow2', fmt=qcow2 size=107374182 cluster_size=65536 lazy_refcounts=off refcount_bits=16
```

- Checking if the newly created disk is okay or not

```
muballigh@hossain-19101289:~$ sudo qemu-img info /var/lib/libvirt/images/ubuntu20.04-1G.qcow2
image: /var/lib/libvirt/images/ubuntu20.04-1G.qcow2
file format: qcow2
virtual size: 102 MiB (107374592 bytes)
disk size: 196 KiB
cluster_size: 65536
Format specific information:
    compat: 1.1
    lazy refcounts: false
    refcount bits: 16
    corrupt: false
```

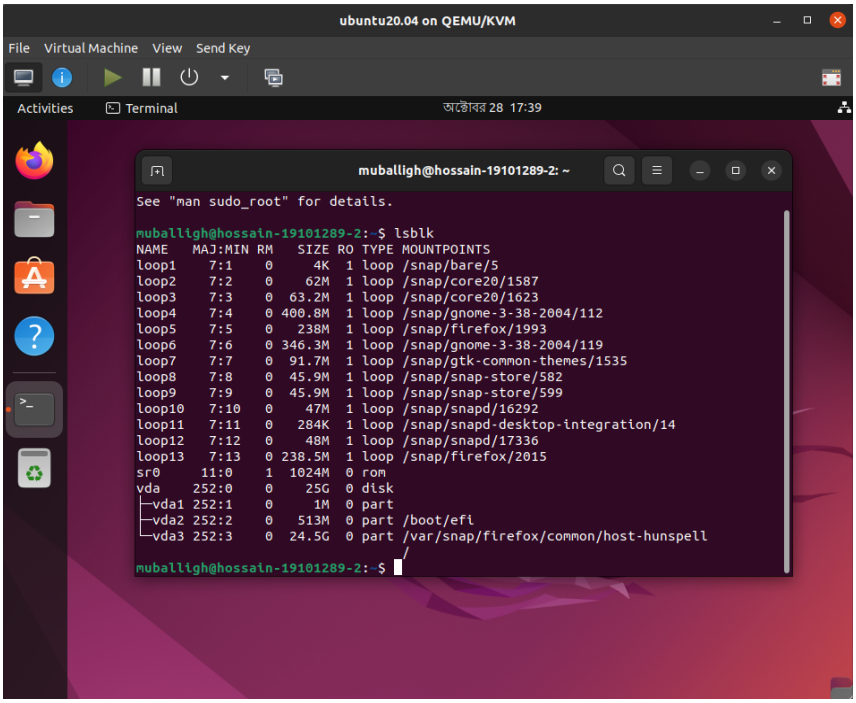
```
muballigh@hossain-19101289:~$ sudo qemu-img info /var/lib/libvirt/images/centos7.0-clone-cli-0.1G.qcow2
image: /var/lib/libvirt/images/centos7.0-clone-cli-0.1G.qcow2
file format: qcow2
virtual size: 102 MiB (107374592 bytes)
disk size: 196 KiB
cluster_size: 65536
Format specific information:
    compat: 1.1
    lazy refcounts: false
    refcount bits: 16
    corrupt: false
```

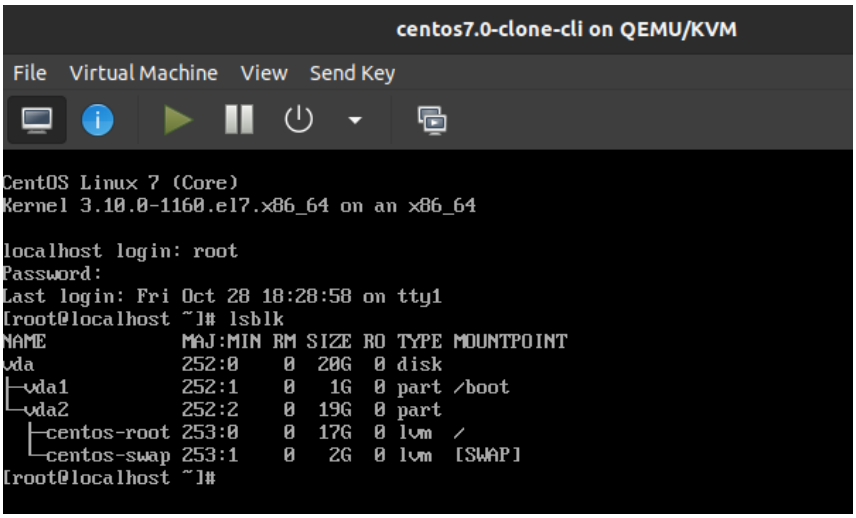
- List of all VMs. If our desired VM is shut down, run it by -

  sudo virsh star {VM name}

```
muballigh@hossain-19101289:~$ sudo virsh list --all
 Id   Name                 State
-----------------------------------
 5    ubuntu20.04          running
 -    centos7.0            shut off
 -    centos7.0-clone-cli  shut off
```

- Check the disk configuration of VM before adding



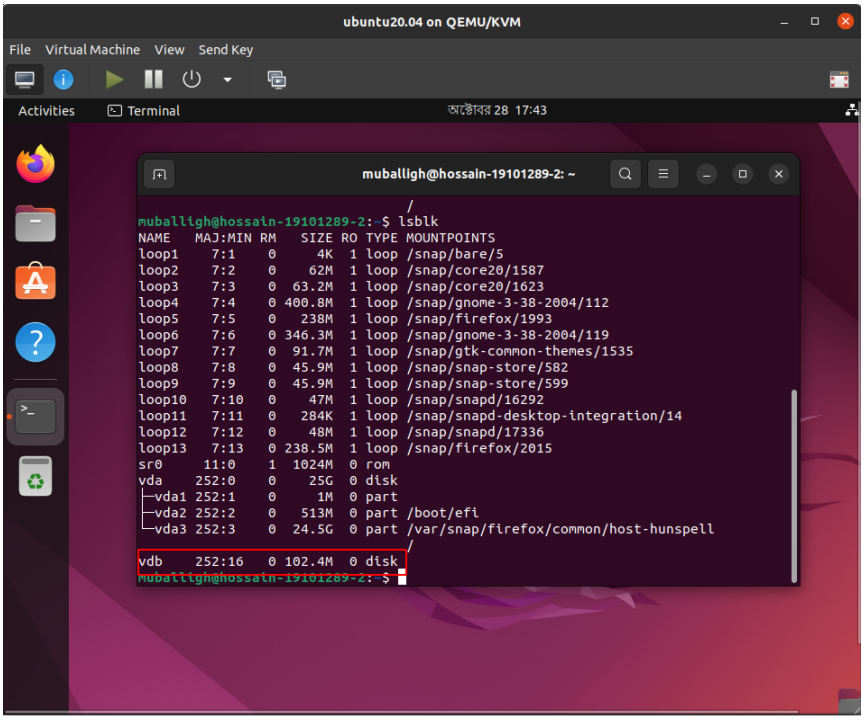


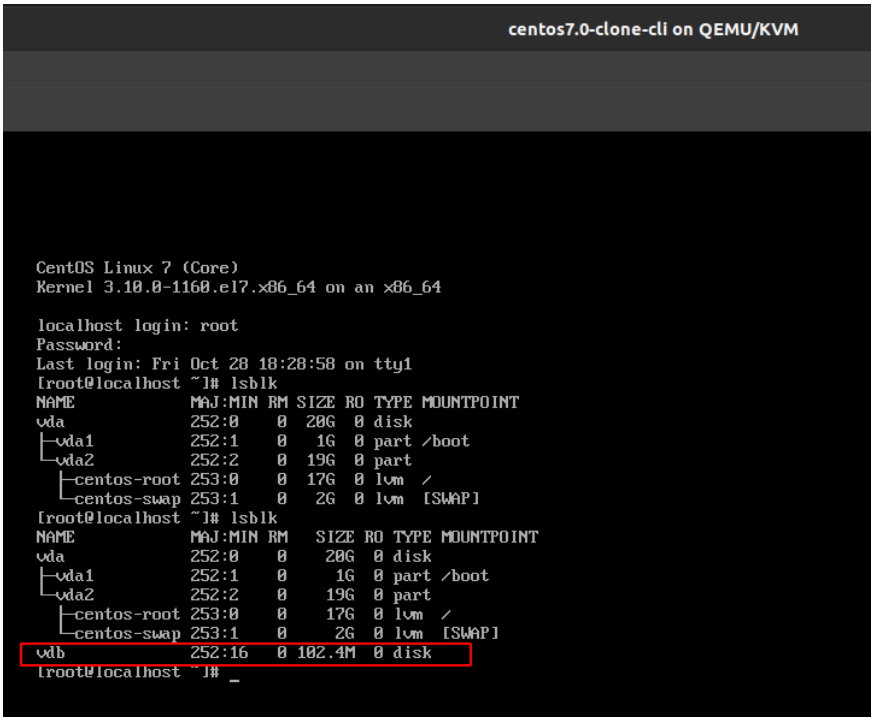
- Attaching the new disk to our desired VM

```
muballigh@hossain-19101289:~$ sudo virsh attach-disk --persistent --subdriver qcow2 ubuntu20.04 /var/lib/libvirt/images/ubuntu20.04-1G.qcow2 vdb
Disk attached successfully
```

```
muballigh@hossain-19101289:~$ sudo virsh attach-disk --persistent --subdriver qcow2 centos7.0-clone-cli /var/lib/libvirt/images/centos7.0-clone-cli-0.1G.qcow2 vdb
Disk attached successfully
```

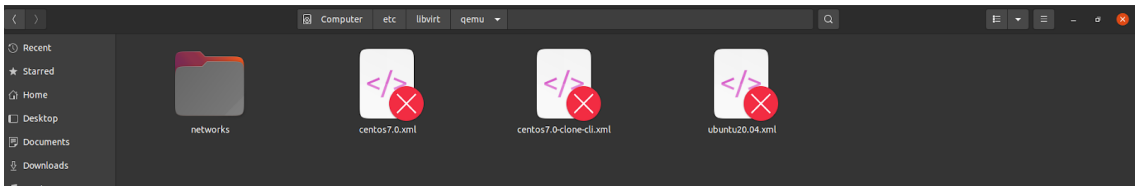
- Checking if the newly created disk was attached successfully to our desired VM


ubuntu20.04 on QEMU/KVM
File Virtual Machine View Send Key
Activities Terminal অক্টোবর 28 17:43
muballigh@hossain-19101289-2: ~
muballigh@hossain-19101289-2:~$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS
loop1 7:1 0 4K 1 loop /snap/bare/5
loop2 7:2 0 62M 1 loop /snap/core20/1587
loop3 7:3 0 63.2M 1 loop /snap/core20/1623
loop4 7:4 0 400.8M 1 loop /snap/gnome-3-38-2004/112
loop5 7:5 0 238M 1 loop /snap/firefox/1993
loop6 7:6 0 346.3M 1 loop /snap/gnome-3-38-2004/119
loop7 7:7 0 91.7M 1 loop /snap/gtk-common-themes/1535
loop8 7:8 0 45.9M 1 loop /snap/snap-store/582
loop9 7:9 0 45.9M 1 loop /snap/snap-store/599
loop10 7:10 0 47M 1 loop /snap/snapd/16292
loop11 7:11 0 284K 1 loop /snap/snapd-desktop-integration/14
loop12 7:12 0 48M 1 loop /snap/snapd/17336
loop13 7:13 0 238.5M 1 loop /snap/firefox/2015
sr0 11:0 1 1024M 0 rom
vda 252:0 0 25G 0 disk
├─vda1 252:1 0 1M 0 part
├─vda2 252:2 0 513M 0 part /boot/efi
└─vda3 252:3 0 24.5G 0 part /var/snap/firefox/common/host-hunspell
vdb 252:16 0 102.4M 0 disk


centos7.0-clone-cli on QEMU/KVM
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.el7.x86_64 on an x86_64
localhost login: root
Password:
Last login: Fri Oct 28 18:28:58 on tty1
[root@localhost ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda 252:0 0 20G 0 disk
├─vda1 252:1 0 1G 0 part /boot
└─vda2 252:2 0 19G 0 part
├─centos-root 253:0 0 17G 0 lvm /
└─centos-swap 253:1 0 2G 0 lvm [SWAP]
[root@localhost ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda 252:0 0 20G 0 disk
├─vda1 252:1 0 1G 0 part /boot
└─vda2 252:2 0 19G 0 part
├─centos-root 253:0 0 17G 0 lvm /
└─centos-swap 253:1 0 2G 0 lvm [SWAP]
vdb 252:16 0 102.4M 0 disk
[root@localhost ~]#

Task 5 - Migration

- The XML Files of the created VMs' can be found in -> etc/libvirt/qemu



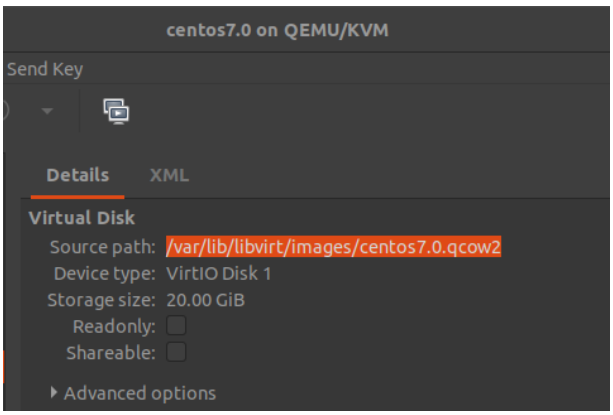
- If you want to export another xml file do the following

```
muballigh@hossain-19101289:~$ virsh list --all
 Id   Name                   State
----------------------------------
 -    centos7.0              shut off
 -    centos7.0-clone-cli    shut off
 -    ubuntu20.04            shut off

muballigh@hossain-19101289:~$ virsh dumpxml centos7.0-clone-cli > /home/muballigh/Desktop/centos-guest.xml
```

- Checking the XML File

```
muballigh@hossain-19101289:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  samba  smb.conf  snap  Templates  Videos
muballigh@hossain-19101289:~$ cd Desktop
muballigh@hossain-19101289:~/Desktop$ ls
centos-guest.xml  smb.conf
muballigh@hossain-19101289:~/Desktop$ cat centos-guest.xml
<domain type='kvm'>
  <name>centos7.0-clone-cli</name>
  <uuid>41a1309a-e021-4f73-a1c9-ce3af985a4e1</uuid>
  <metadata>
    <libosinfo:libosinfo xmlns:libosinfo="http://libosinfo.org/xmlns/libvirt/domain/1.0">
      <libosinfo:os id="http://centos.org/centos/7.0"/>
    </libosinfo:libosinfo>
  </metadata>
  <memory unit='KiB'>8388608</memory>
  <currentMemory unit='KiB'>8388608</currentMemory>
  <vcpu placement='static'>8</vcpu>
  <os>
    <type arch='x86_64' machine='pc-q35-4.2'>hvm</type>
    <boot dev='hd'/>
  </os>
  <features>
    <acpi/>
    <apic/>
  </features>
  <cpu mode='host-model' check='partial'/>
  <clock offset='utc'>
    <timer name='rtc' tickpolicy='catchup'/>
    <timer name='pit' tickpolicy='delay'/>
    <timer name='hpet' present='no'/>
  </clock>
  <on_poweroff>destroy</on_poweroff>
  <on_reboot>restart</on_reboot>
  <on_crash>destroy</on_crash>
  <pm>
    <suspend-to-mem enabled='no'/>
    <suspend-to-disk enabled='no'/>
  </pm>
  <devices>
    <emulator>/usr/bin/qemu-system-x86_64</emulator>
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2'/>
      <source file='/var/lib/libvirt/images/centos7.0-clone-cli.qcow2'/>
      <target dev='vda' bus='virtio'/>
      <address type='pci' domain='0x0000' bus='0x04' slot='0x00' function='0x0'/>
    </disk>
    <disk type='file' device='disk'>
```

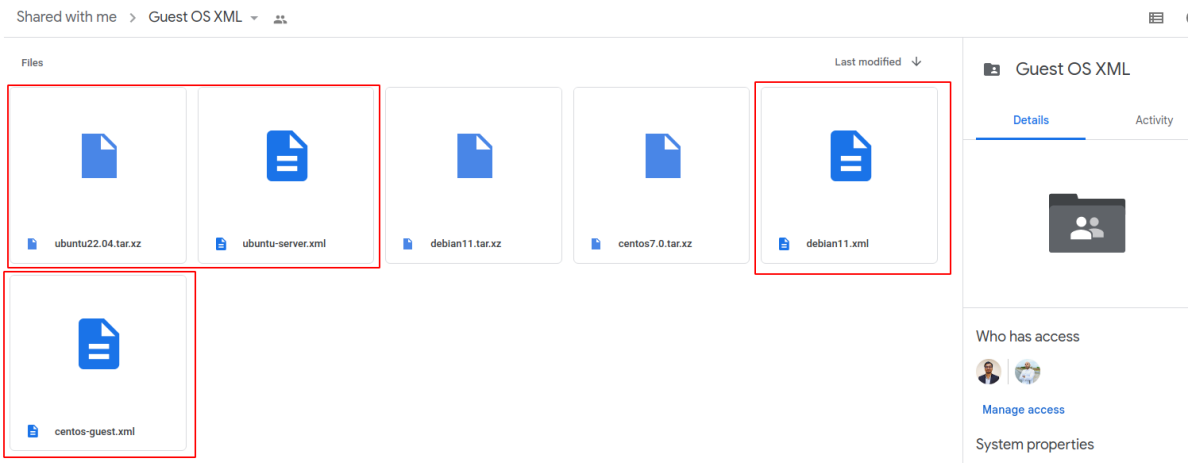
- Copying the disk image in order to share with another user




```
muballigh@hossain-19101289:~$ sudo cp /var/lib/libvirt/images/centos7.0.qcow2 ~/Desktop/
[sudo] password for muballigh:
muballigh@hossain-19101289:~$
```

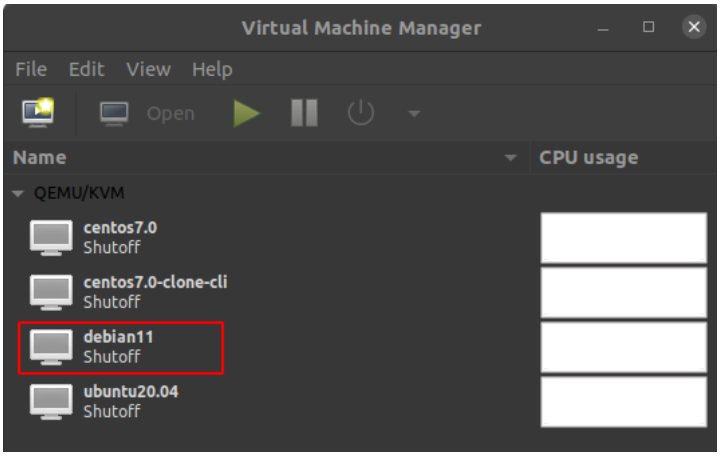
```
muballigh@hossain-19101289:~$ sudo chmod 777 ~/Desktop/centos7.0.qcow2
muballigh@hossain-19101289:~$
```

Migrating a VM to my Local Machine

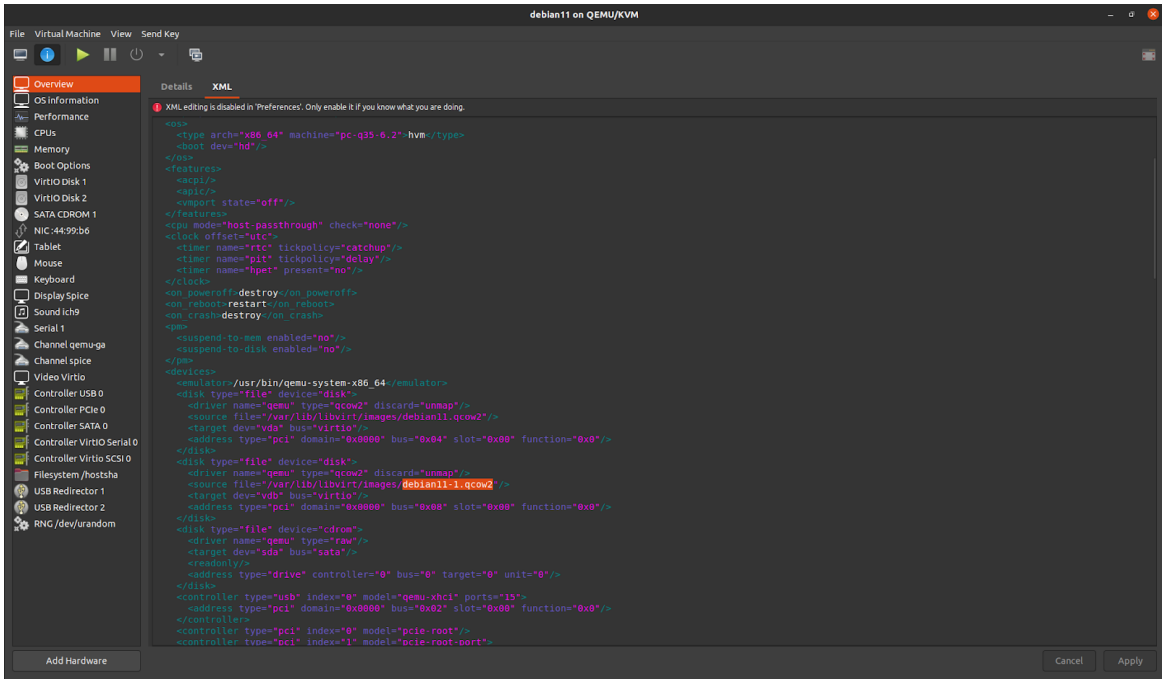


- The XML FIle and the tar.xz files (compressed version of qcow2 disk images) are of VMs belonging to my friend, which I will attempt to migrate to my local machine

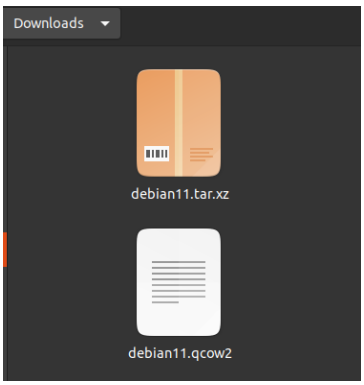
```
muballigh@hossain-19101289:~$ virsh define --file ~/Downloads/debian11.xml
Domain debian11 defined from /home/muballigh/Downloads/debian11.xml
```



- The XML file shows the disk image in qcow2 format. We have to copy this in out disk images directory



- Extract the tar.xz file.



- Copy the qcow2 file to the images directory of our VMM

```
muballigh@hossain-19101289:~$ sudo cp ~/Downloads/ubuntu22.04.qcow2 /var/lib/libvirt/images
muballigh@hossain-19101289:~$
```

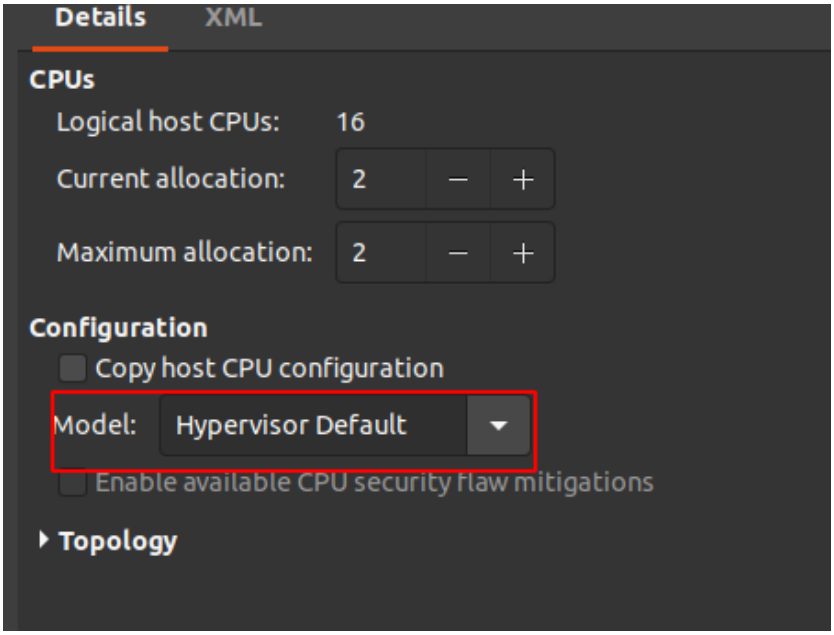
```
muballigh@hossain-19101289:~$ sudo cp ~/Downloads/debian11.qcow2 /var/lib/libvirt/images
muballigh@hossain-19101289:~$
```

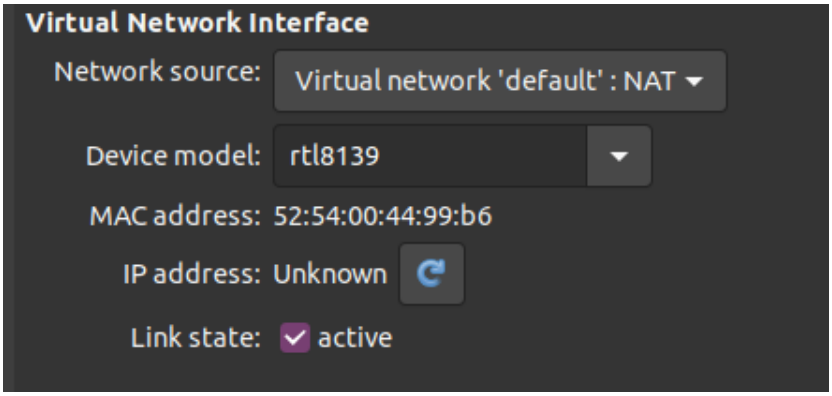
- New VM is defined properly

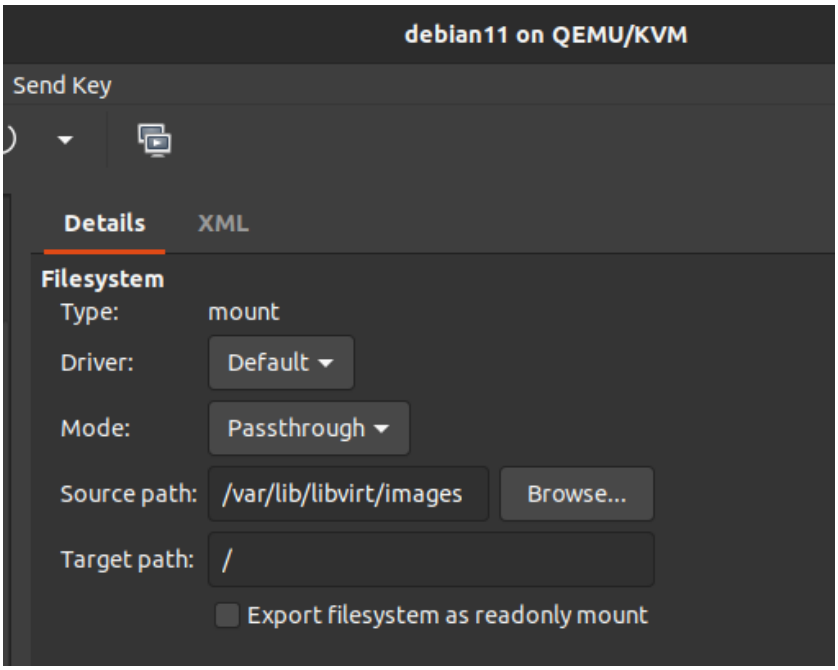
```
muballigh@hossain-19101289:~$ virsh list --all
 Id   Name                 State
-----------------------------------
 -    centos7.0            shut off
 -    centos7.0-clone-cli  shut off
 -    debian11             shut off
 -    ubuntu20.04          shut off
```

```
muballigh@hossain-19101289:~$ virsh list --all
 Id   Name                 State
-----------------------------------
 -    centos7.0            shut off
 -    centos7.0-clone-cli  shut off
 -    ubuntu20.04          shut off
 -    ubuntu22.04          shut off
```

- Making necessary changes in the VMM







- Starting the VM

```
muballigh@hossain-19101289:~$ virsh start ubuntu22.04
error: Failed to start domain ubuntu22.04
error: internal error: process exited while connecting to monitor:
pc-q35-6.2'
Use -machine help to list supported machines
```

```
muballigh@hossain-19101289:~$ virsh start debian11
error: Failed to start domain debian11
error: internal error: process exited while connecting to monitor:
pc-q35-6.2'
Use -machine help to list supported machines
```

- Troubleshooting the error

```
muballigh@hossain-19101289:~$ sudo apt install qemu
[sudo] password for muballigh:
Reading package lists... Done
```

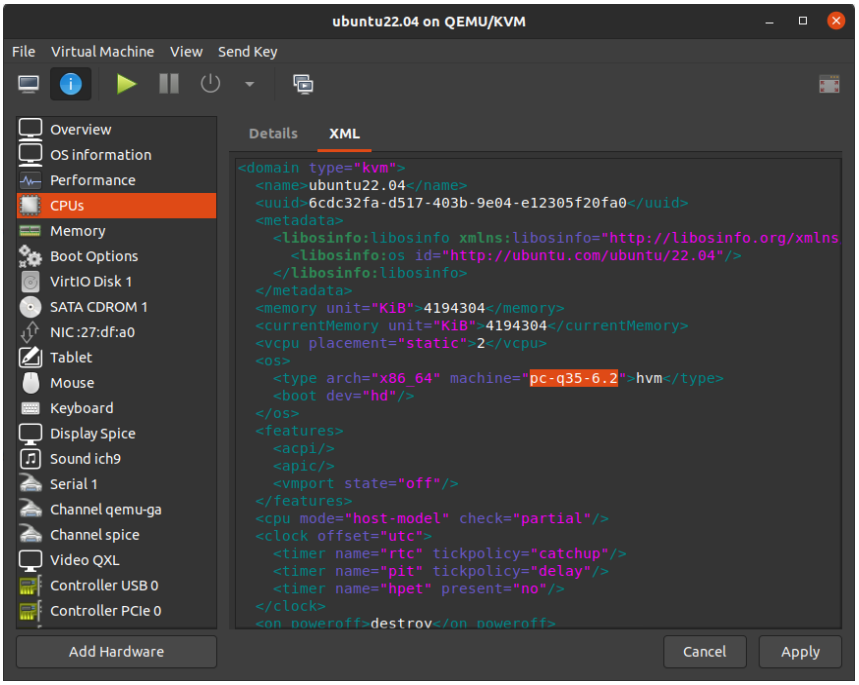
```
muballigh@hossain-19101289:~$ sudo apt install qemu-system-ppc
[sudo] password for muballigh:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libfwupdplugin1 libxmlb1
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  qemu-slof
Suggested packages:
  qemu vde2 openbios-ppc openhackware
The following NEW packages will be installed:
  qemu-slof qemu-system-ppc
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 7,055 kB of archives.
After this operation, 35.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://bd.archive.ubuntu.com/ubuntu focal/main amd64 qemu-slof all 20191209+dfsg-1 [178 kB]
Get:2 http://bd.archive.ubuntu.com/ubuntu focal-updates/main amd64 qemu-system-ppc amd64 1:4.2-3ubuntu6.23 [6,877 kB]
Fetched 7,055 kB in 4s (1,820 kB/s)
Selecting previously unselected package qemu-slof.
(Reading database ... 185643 files and directories currently installed.)
Preparing to unpack .../qemu-slof_20191209+dfsg-1_all.deb ...
Unpacking qemu-slof (20191209+dfsg-1) ...
Selecting previously unselected package qemu-system-ppc.
Preparing to unpack .../qemu-system-ppc_1%3a4.2-3ubuntu6.23_amd64.deb ...
Unpacking qemu-system-ppc (1:4.2-3ubuntu6.23) ...
Setting up qemu-slof (20191209+dfsg-1) ...
Setting up qemu-system-ppc (1:4.2-3ubuntu6.23) ...
Processing triggers for man-db (2.9.1-1) ...
```

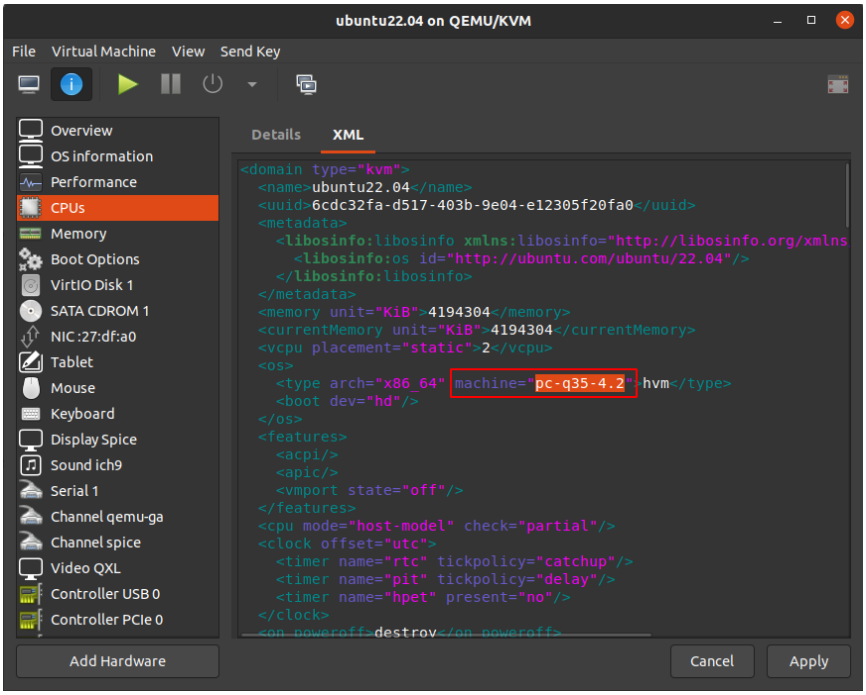
```
muballigh@hossain-19101289:~$ wget https://download.qemu.org/qemu-7.1.0.tar.xz
--2022-10-30 23:13:45--  https://download.qemu.org/qemu-7.1.0.tar.xz
Resolving download.qemu.org (download.qemu.org)... 13.107.227.59, 13.107.219.59, 2
```

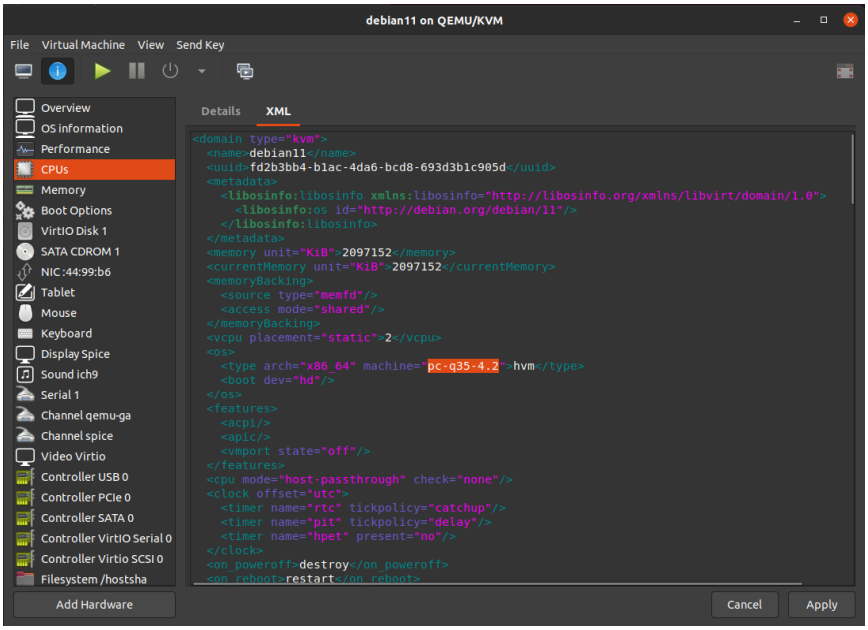
```
muballigh@hossain-19101289:~$ tar xvJf qemu-7.1.0.tar.xz
```

```
muballigh@hossain-19101289:~$ cd qemu-7.1.0
muballigh@hossain-19101289:~/qemu-7.1.0$ ./configure
Using './build' as the directory for build output

ERROR: GNU make (make) not found

muballigh@hossain-19101289:~/qemu-7.1.0$ make
```

- Editing the XML File



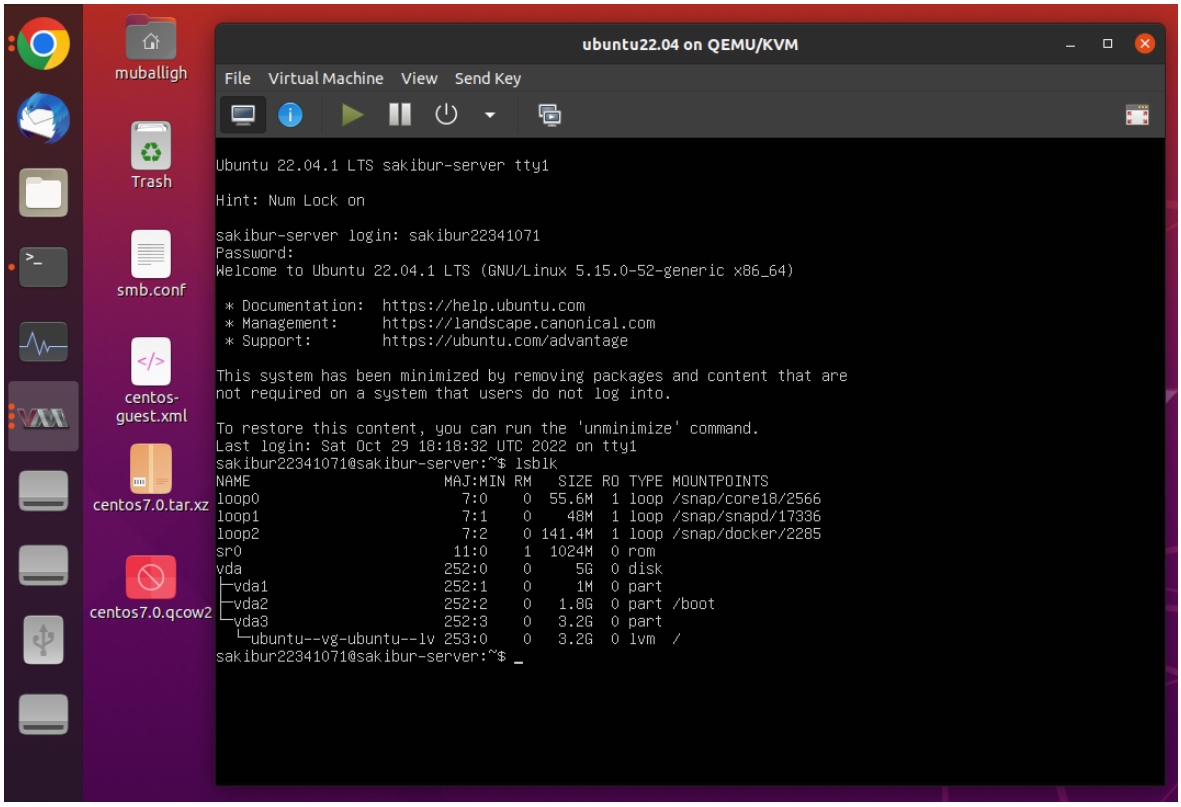


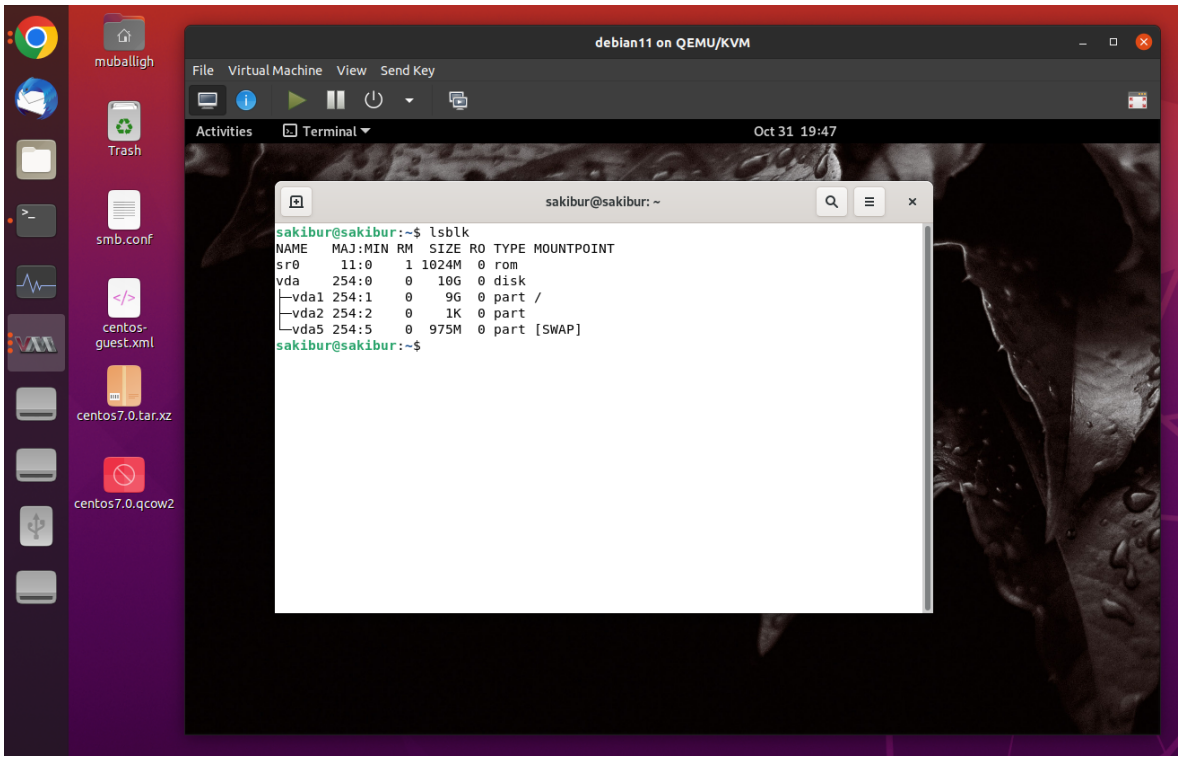


- Starting Once again!

```
muballigh@hossain-19101289:~$ virsh start ubuntu22.04
Domain ubuntu22.04 started

muballigh@hossain-19101289:~$
```

```
muballigh@hossain-19101289:~$ virsh start debian11
error: Failed to start domain debian11
error: internal error: qemu unexpectedly closed the monitor: 2022-10-31T13:41:29.060490Z qemu-system-x86_64:
initialize fsdev 'fsdev-fs0': failed to open '/home/sakibur/shared_folder_deb': No such file or directory

muballigh@hossain-19101289:~$ sudo chmod 777 /var/lib/libvirt/images
muballigh@hossain-19101289:~$ virsh start debian11
Domain debian11 started
```





Migration Successful!!