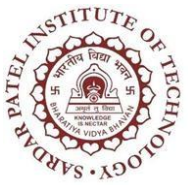

1T33: Cloud Architecture

Lab- 1A: Creating and Running Virtual Machines on Hosted Hypervisors

Objective:

To create and run virtual machines on hosted hypervisors such as KVM, VMware Workstation, and Oracle VirtualBox.

Lab Outcomes:

1. Install, configure and use hosted hypervisors.
2. Deploy and manage virtual machines.
3. Configure virtual machine settings.
4. Evaluate the performance of virtual machines on hosted hypervisors.

System Requirements:

- Host machine with sufficient resources
- Installed hypervisors: KVM, VMware Workstation, Oracle VirtualBox
- ISO images of operating systems for VM creation

Step-by-step Procedure:

Step 1: Installing and Configuring Hypervisors

```
sudo apt-get install qemu-kvm libvirt-daemon-system libvirt-clients bridge-utils
```

$ sudo apt-get install virt-manager

- Install VMware Workstation:

Download and install VMware Workstation from the official website.

- Install Oracle VirtualBox:

Download and install VirtualBox from the official website.

Step 2: Creating Virtual Machines

1. KVM:

- Open Virt-Manager and create a new virtual machine.
- Select the ISO image and configure VM settings.
- Start the VM and complete the OS installation.

2. VMware Workstation:

- Open VMware Workstation and create a new virtual machine.
- Select the ISO image and configure VM settings.
- Start the VM and complete the OS installation.

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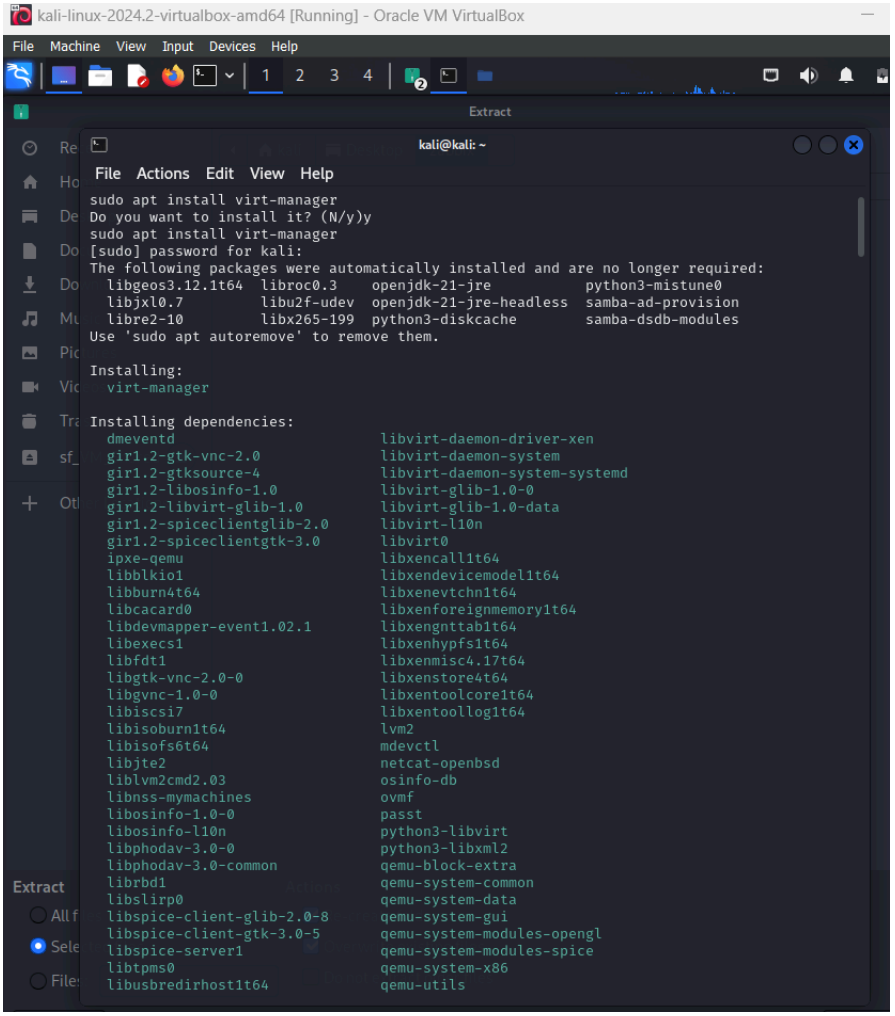
3. Oracle VirtualBox:

- Open VirtualBox and create a new virtual machine.
- Select the ISO image and configure VM settings.
- Start the VM and complete the OS installation.

Instructions with Screenshots and Captions:

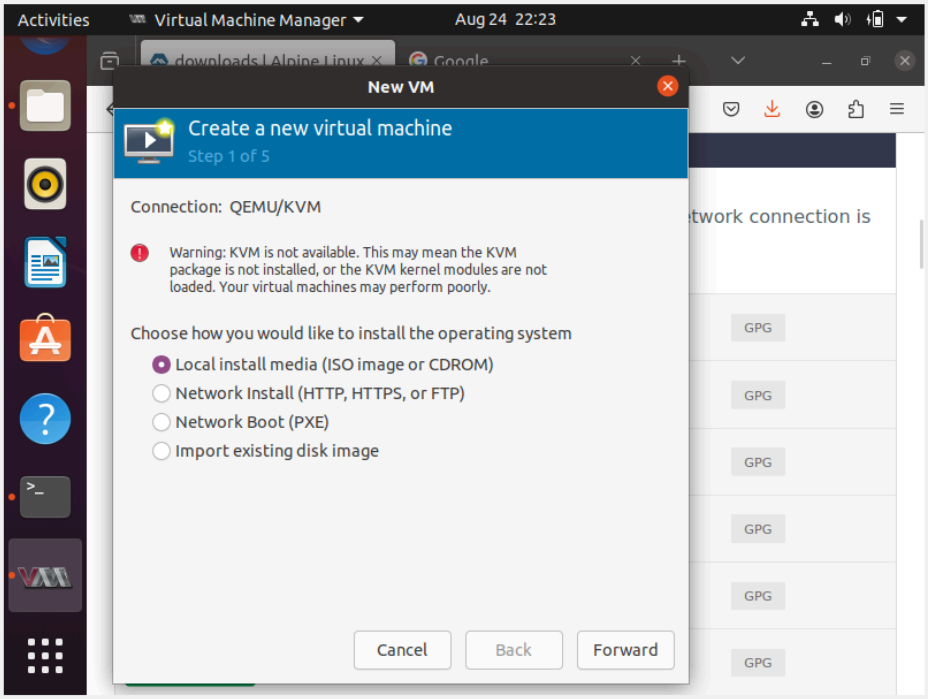
Install Virt-Manager before installation of ISO files.



KVM Installation Screenshot:

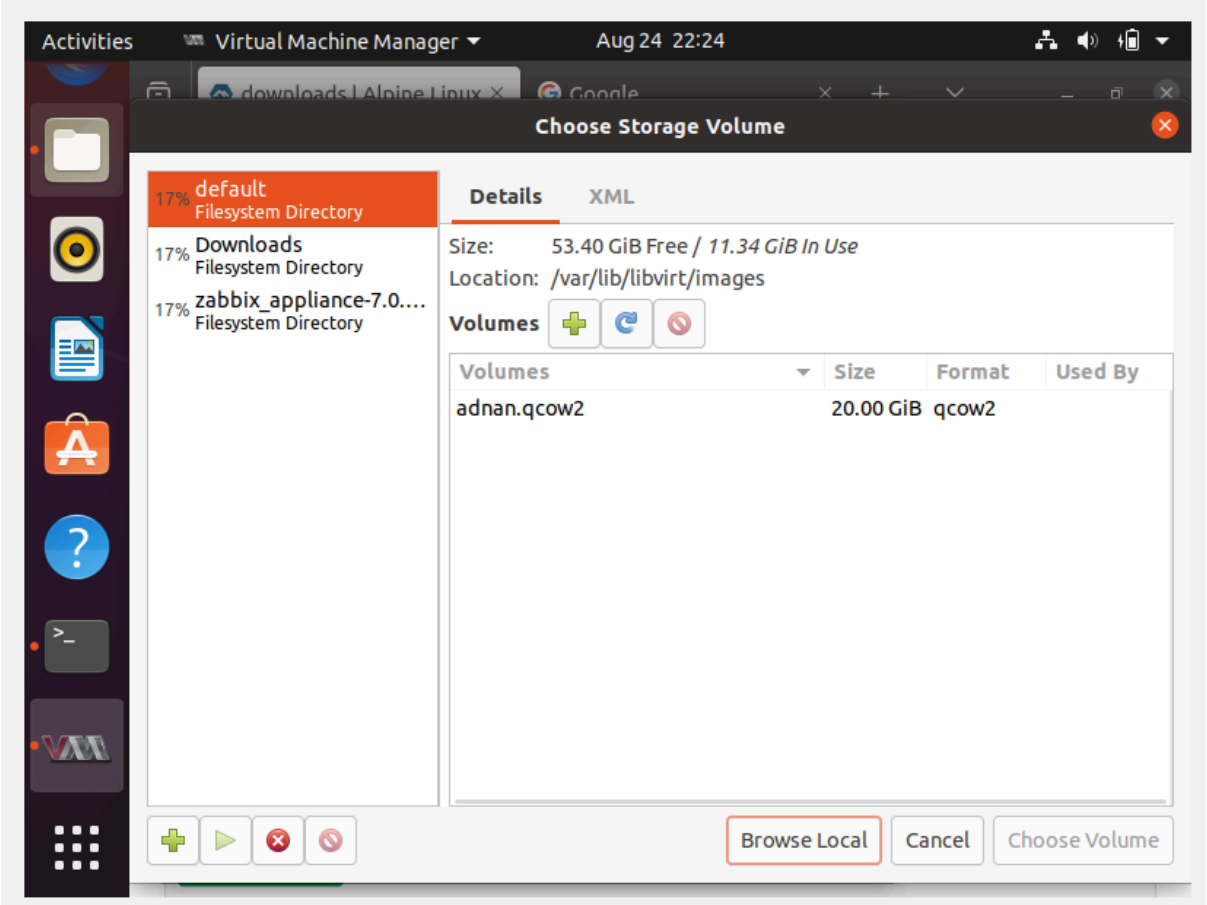
Step 1

Start Virt-Manager



Step 1

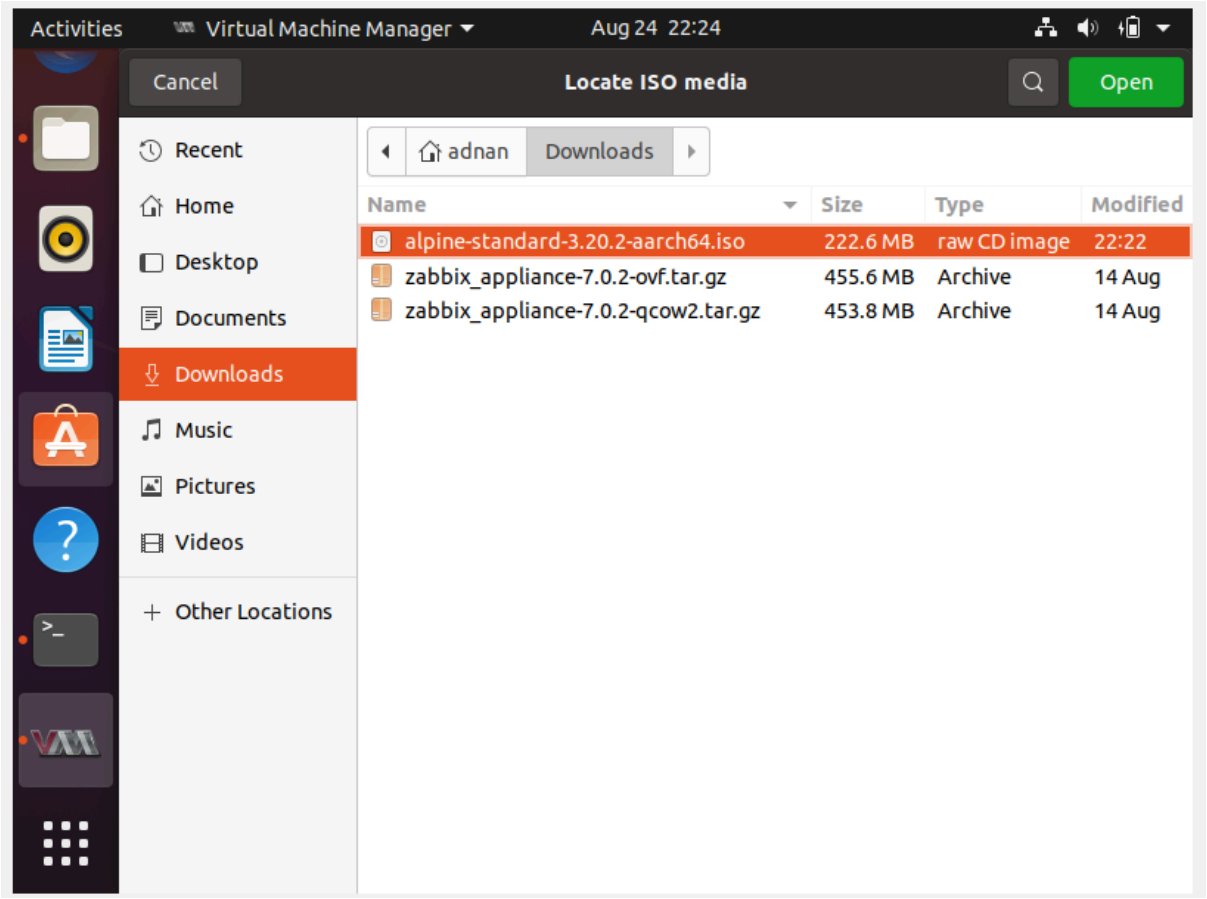
Browse to ISO file want to install


Activities
Virtual Machine Manager
Aug 24 22:24
Choose Storage Volume
17% default
Filesystem Directory
17% Downloads
Filesystem Directory
17% zabbix_appliance-7.0....
Filesystem Directory
Details
XML
Size: 53.40 GiB Free / 11.34 GiB In Use
Location: /var/lib/libvirt/images
Volumes
Volumes
Size
Format
Used By
adnan.qcow2
20.00 GiB
qcow2
Browse Local
Cancel
Choose Volume

Step 1

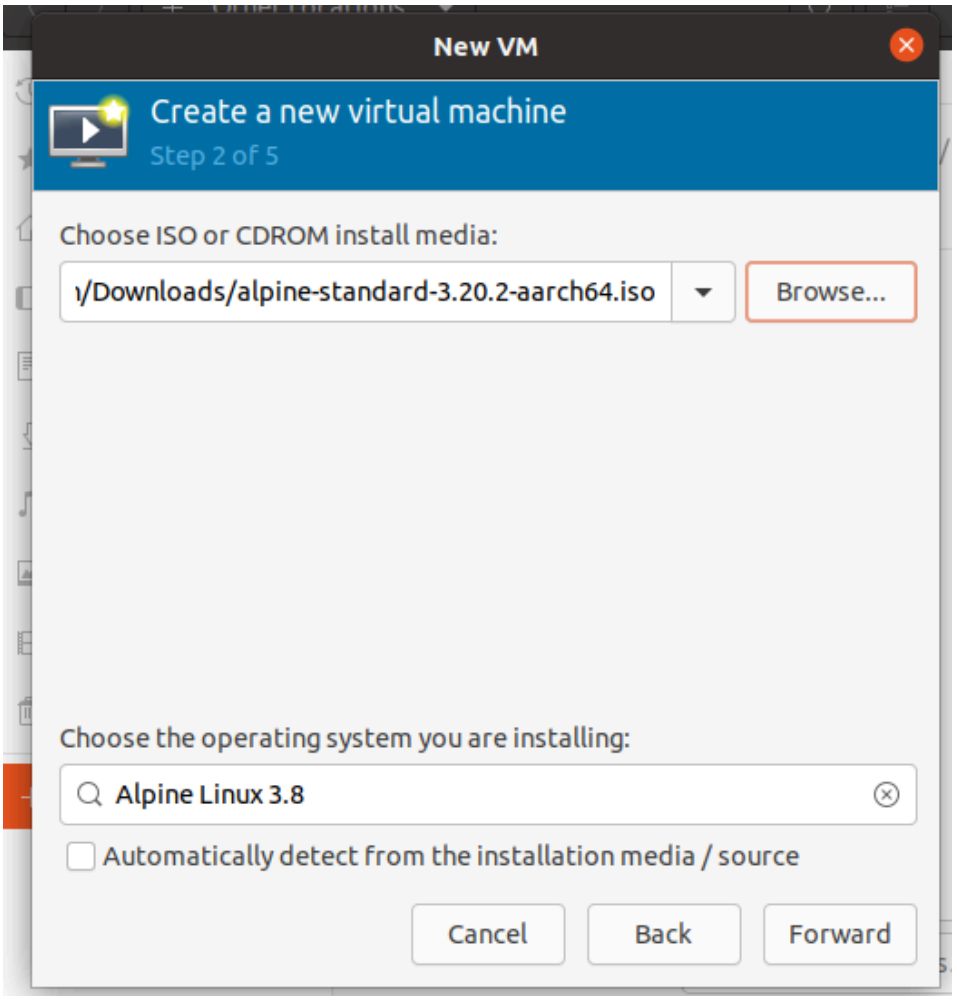
Step 3

Select the ISO file

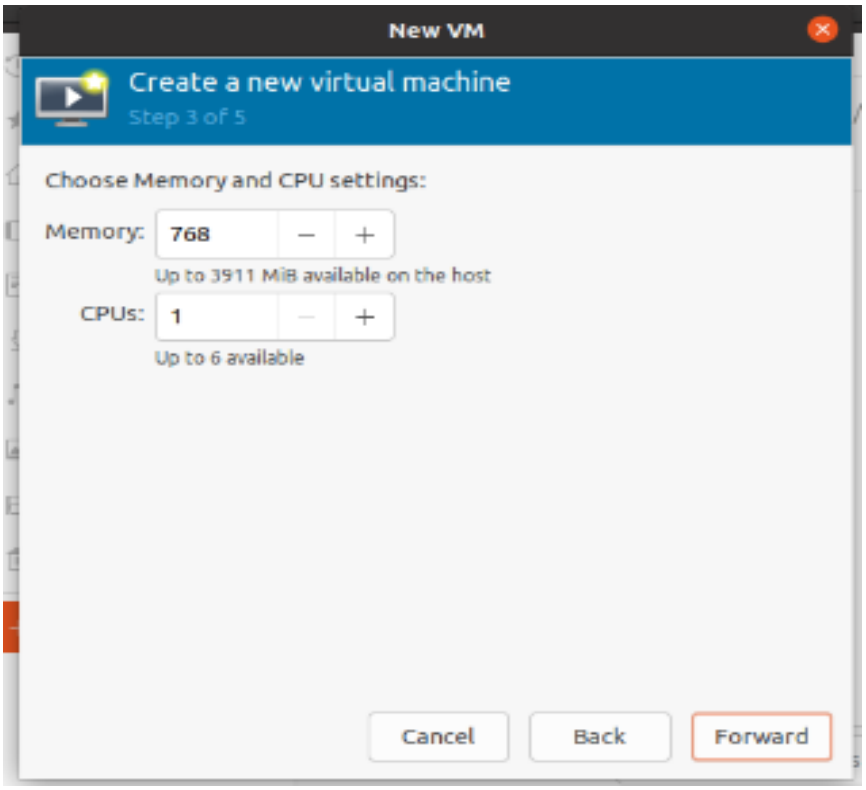


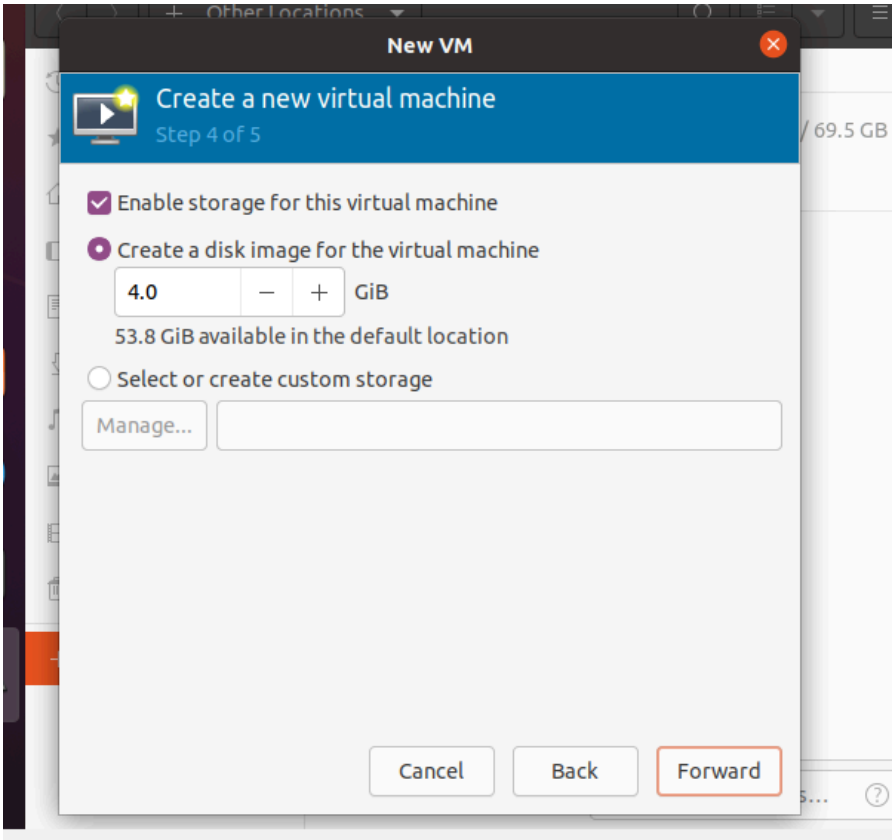
Step 4

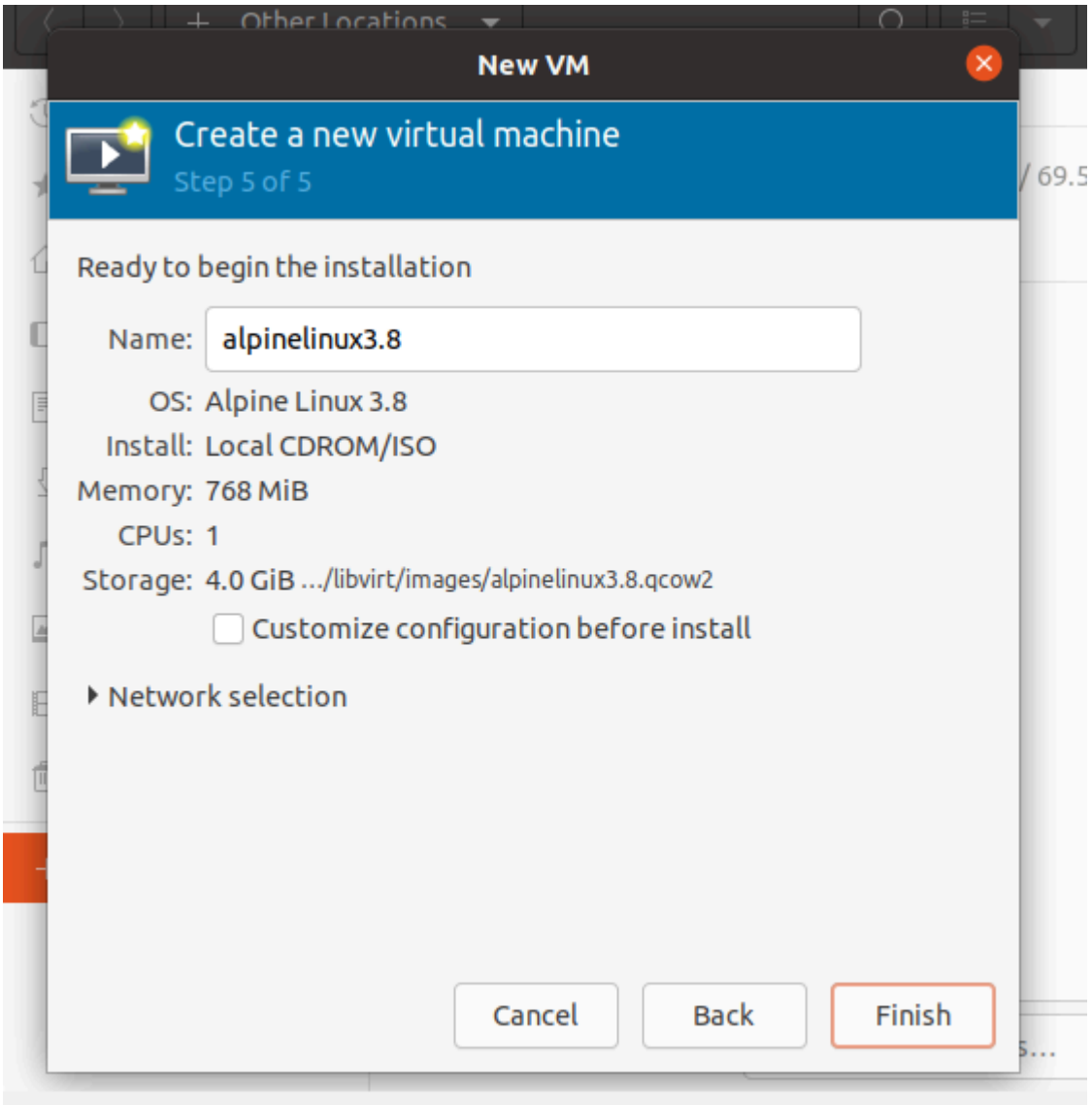
Select the operating system you are installing then hit on forward.



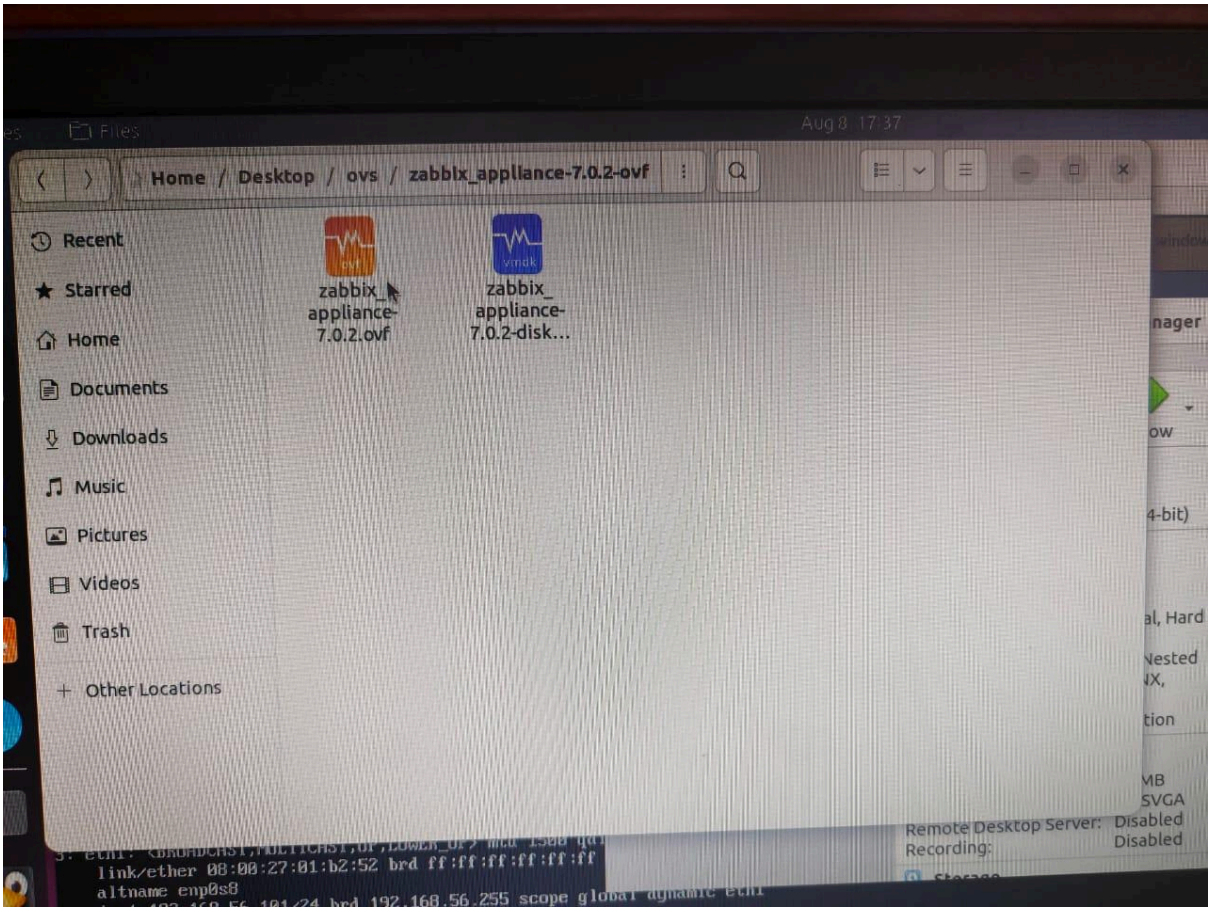
Step 5
Give the RAM and CPU Core to the OS.


New VM
Create a new virtual machine
Step 3 of 5
Choose Memory and CPU settings:
Memory:
768
Up to 3911 MiB available on the host
CPUs:
1
Up to 6 available
Cancel
Back
Forward

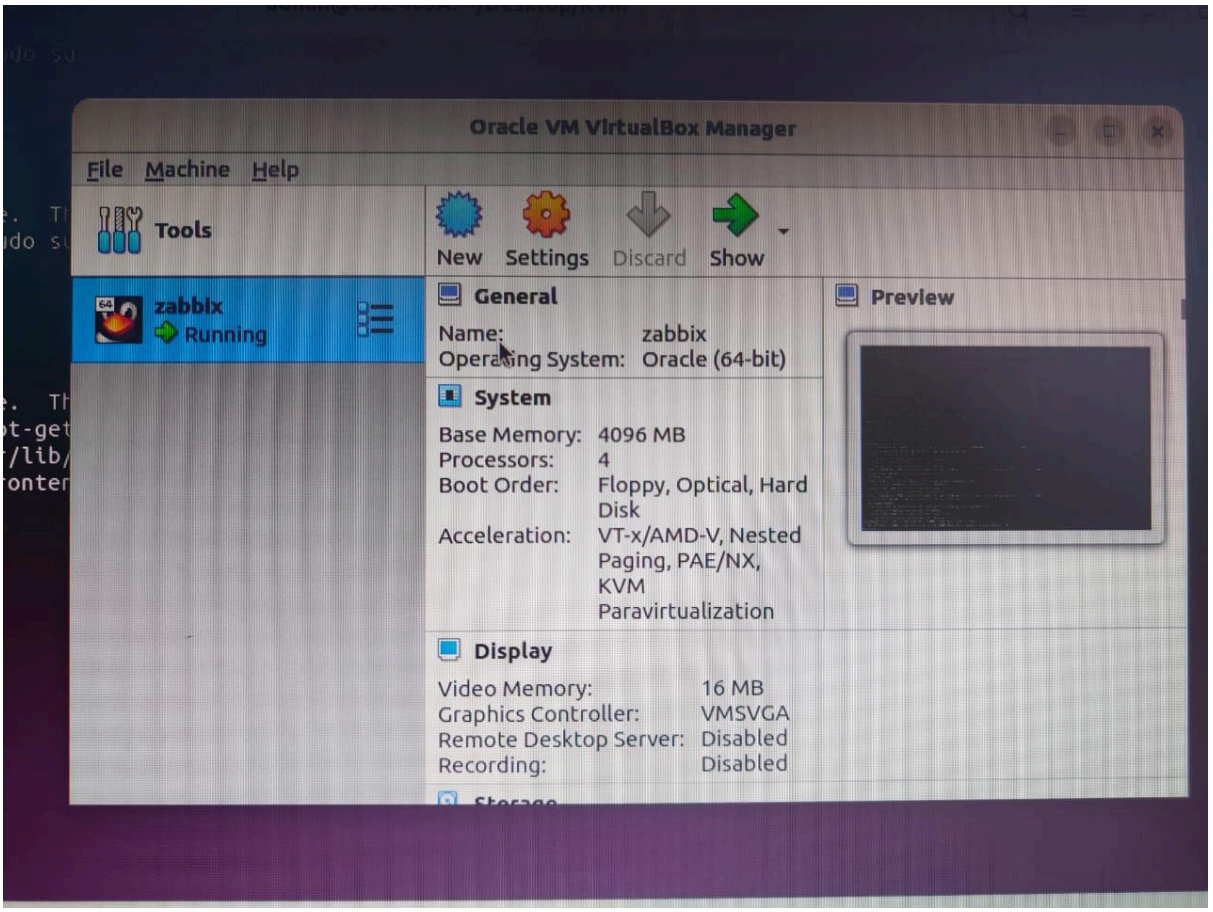

New VM
Create a new virtual machine
Step 4 of 5
Enable storage for this virtual machine
Create a disk image for the virtual machine
4.0
GiB
53.8 GiB available in the default location
Select or create custom storage
Manage...
Cancel
Back
Forward

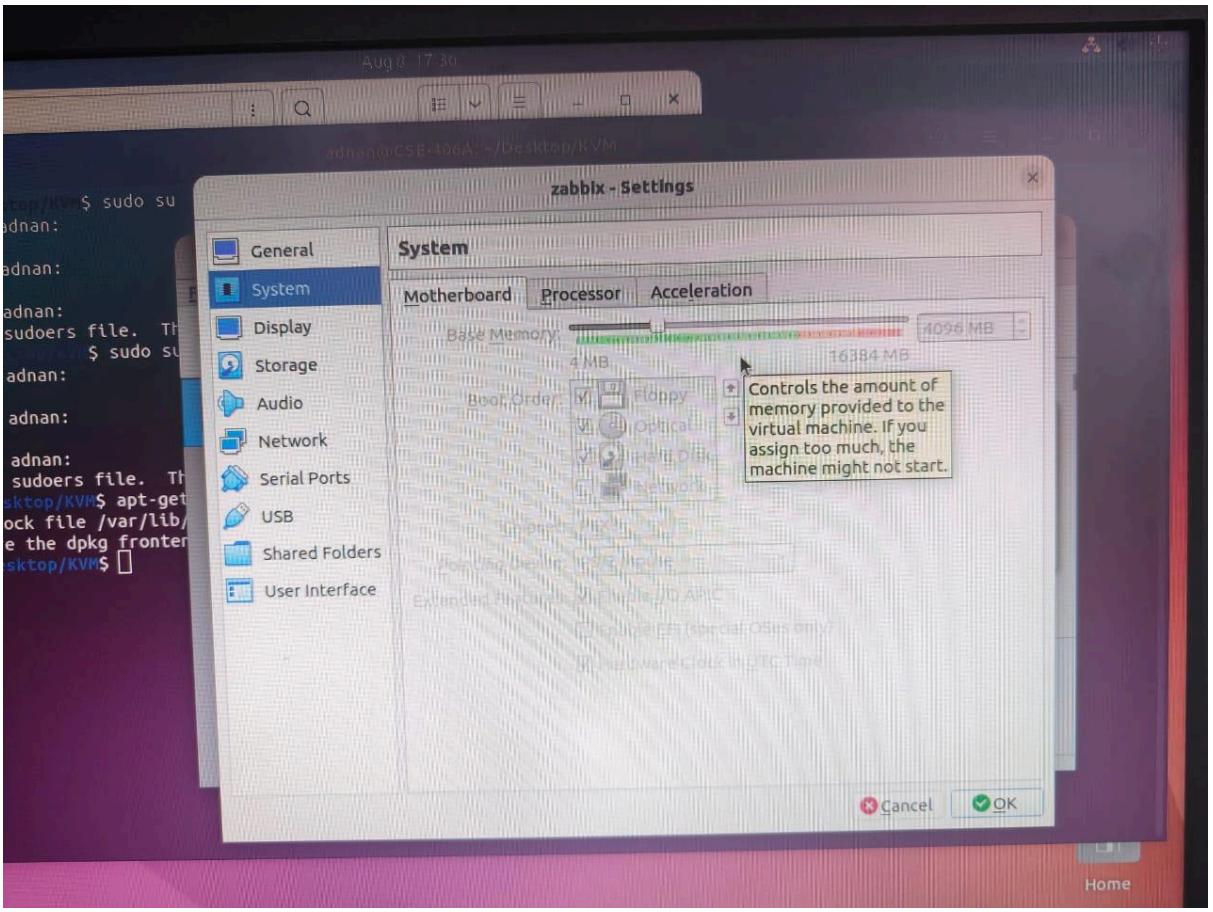

New VM
Create a new virtual machine
Step 5 of 5
Ready to begin the installation
Name: alpinelinux3.8
OS: Alpine Linux 3.8
Install: Local CDROM/ISO
Memory: 768 MiB
CPUs: 1
Storage: 4.0 GiB .../libvirt/images/alpinelinux3.8.qcow2
Customize configuration before install
Network selection
Cancel
Back
Finish

VMware Workstation VM Creation Screenshot:

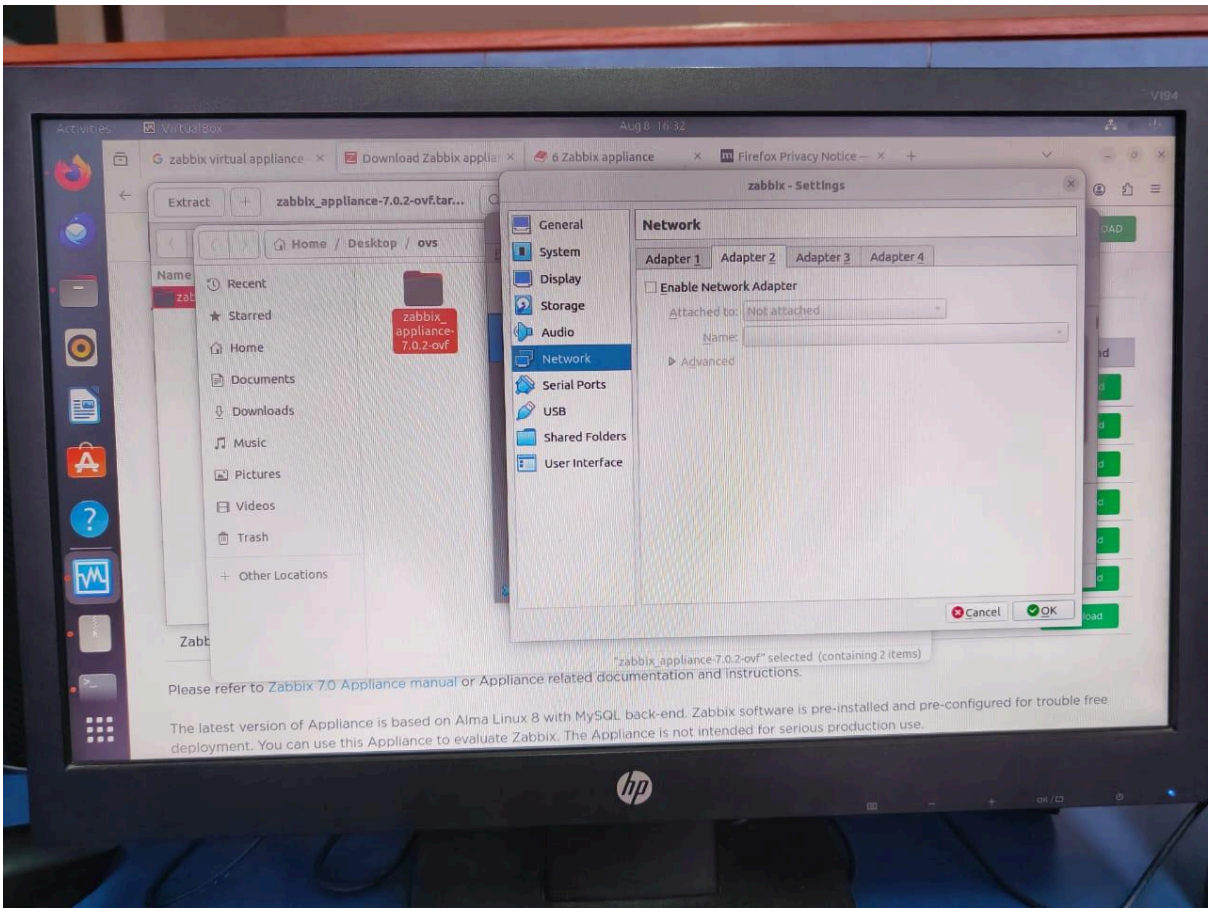


Download the


Oracle VM VirtualBox Manager
File Machine Help
Tools
New Settings Discard Show
zabbix
Running
General
Name: zabbix
Operating System: Oracle (64-bit)
System
Base Memory: 4096 MB
Processors: 4
Boot Order: Floppy, Optical, Hard Disk
Acceleration: VT-x/AMD-V, Nested Paging, PAE/NX, KVM Paravirtualization
Display
Video Memory: 16 MB
Graphics Controller: VMSVGA
Remote Desktop Server: Disabled
Recording: Disabled
Preview



Caption: Creating a virtual machine in VMware Workstation.



Caption: Configuring virtual machine settings in VirtualBox.

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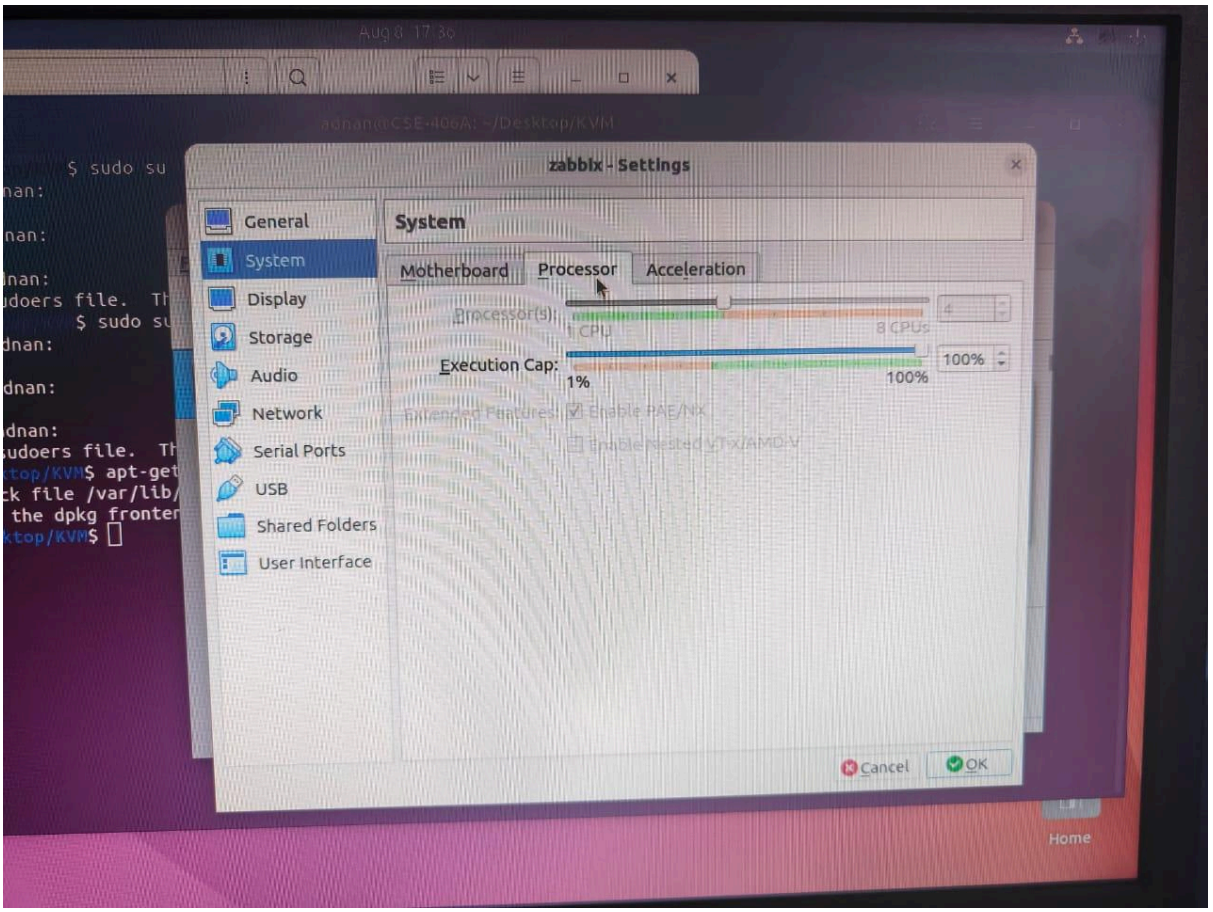
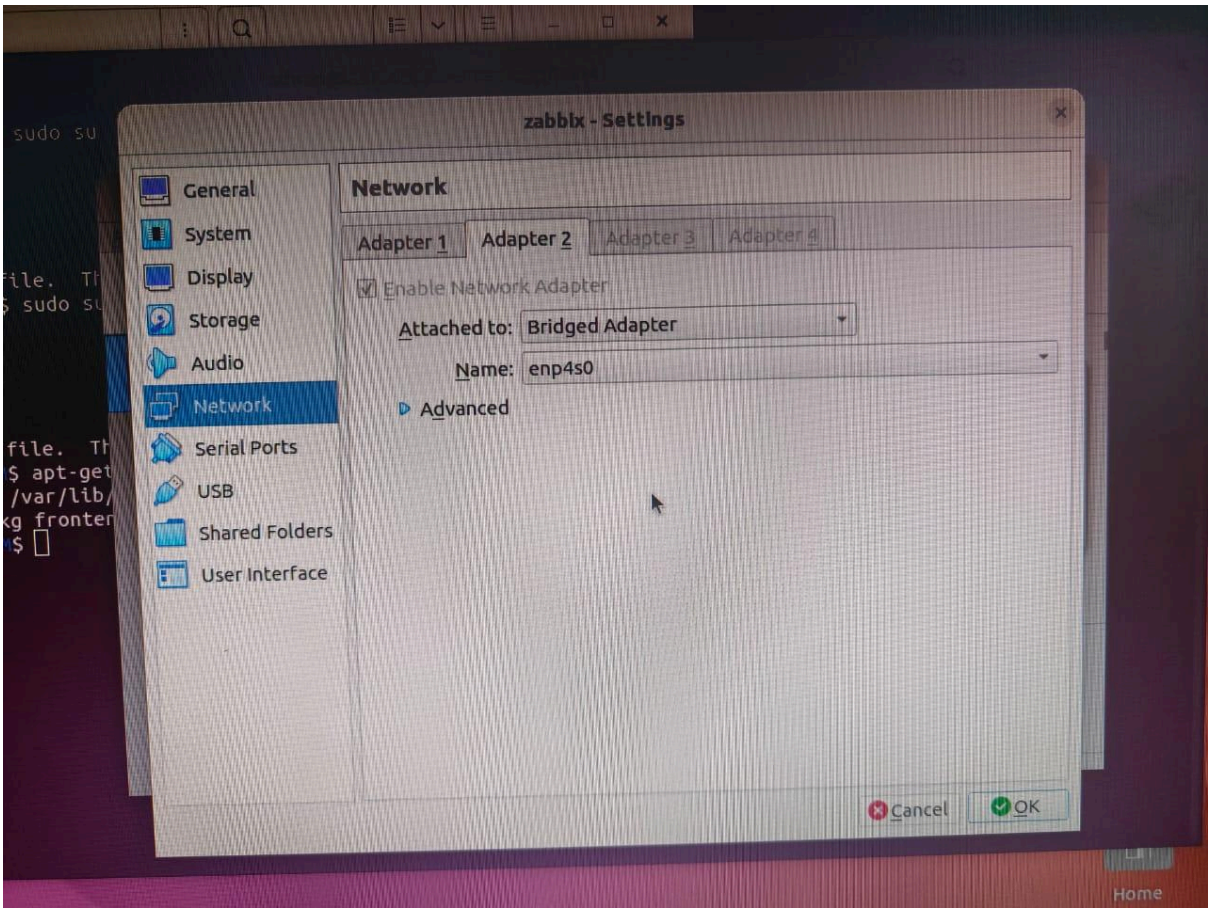
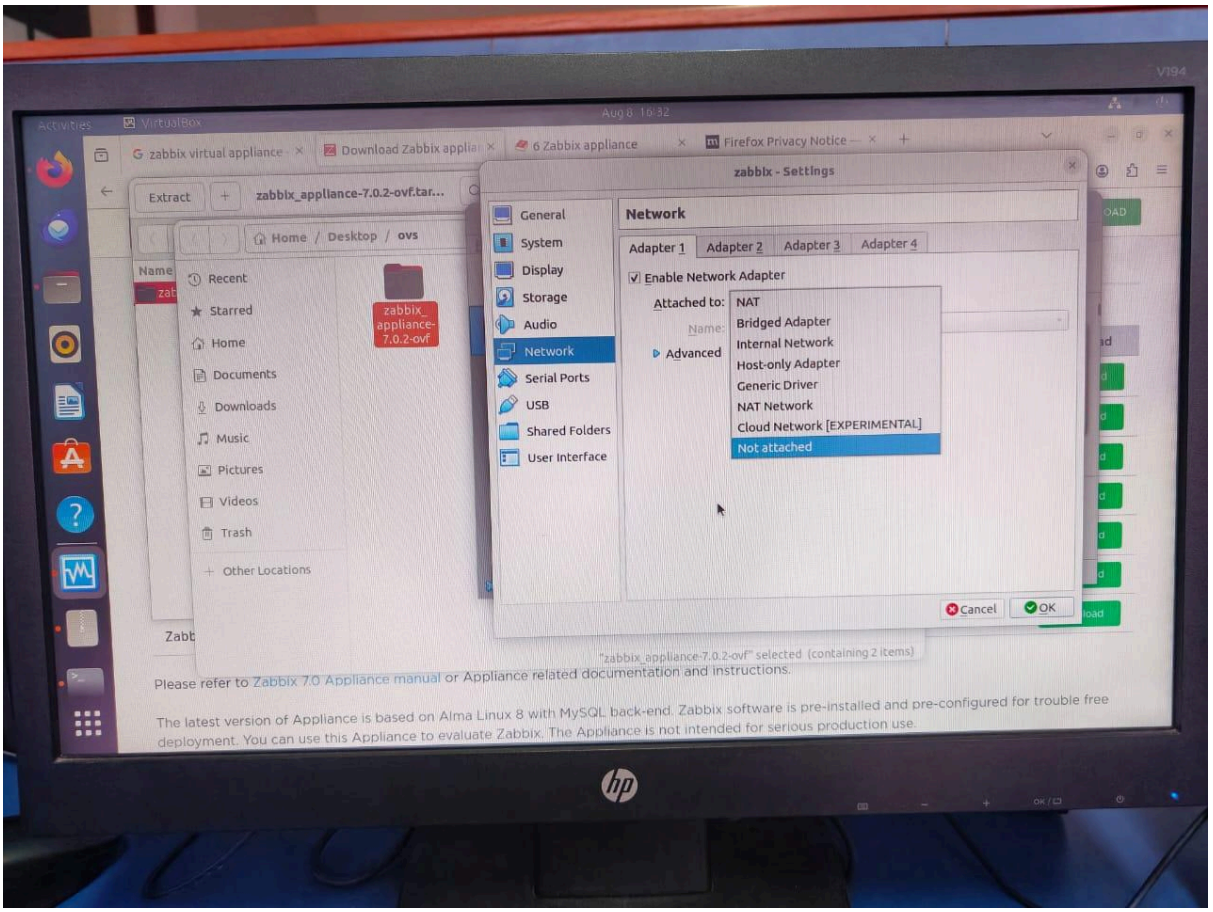
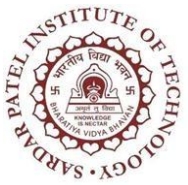



zabbix - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to: Bridged Adapter
Name: enp4s0
Advanced
Cancel
OK
Home


zabbix - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
Name:
Advanced
NAT
Bridged Adapter
Internal Network
Host-only Adapter
Generic Driver
NAT Network
Cloud Network [EXPERIMENTAL]
Not attached
Cancel
OK
Extract
zabbix_appliance-7.0.2-ovf.tar...
Home / Desktop / ovs
Recent
Starred
Home
Documents
Downloads
Music
Pictures
Videos
Trash
Other Locations
zabbix_appliance-7.0.2-ovf
"zabbix_appliance-7.0.2-ovf" selected (containing 2 items)
Please refer to Zabbix 7.0 Appliance manual or Appliance related documentation and instructions.
The latest version of Appliance is based on Alma Linux 8 with MySQL back-end. Zabbix software is pre-installed and pre-configured for trouble free deployment. You can use this Appliance to evaluate Zabbix. The Appliance is not intended for serious production use.



Conclusion:

Setting up and running virtual machines on hosted hypervisors is a relatively simple process. You start by installing the hypervisor software, create a new virtual machine, install the guest operating system, and add any necessary tools to enhance performance. This setup makes it easy to run multiple operating systems on a single computer, which is great for testing, development, or trying out new software without affecting your main system.

There are clear benefits to using hosted hypervisors, like their ease of use and flexibility. They let you easily switch between different environments and run various applications without needing additional hardware. However, they also come with some challenges. Because they rely on the host system's resources, they can slow things down if you're running several VMs or resource-heavy applications.

Each hypervisor tested has its strengths and weaknesses when it comes to performance and usability. Some are more user-friendly and integrate better with the host system, while others offer more control over resources and settings. Ultimately, choosing the right hypervisor depends on what you need—whether it's simplicity, performance, or specific features.

References:

1. KVM Documentation:
https://www.linux-kvm.org/page/Main_Page
2. VMware Workstation Documentation:
https://www.vmware.com/support/pubs/workstation_pubs.html
3. VirtualBox Documentation:
https://www.virtualbox.org/wiki/Documentation

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