

Operating Systems Project Report

Project Name: Creating a Basic Virtual Machine (VM)

Project members:

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project Overview :

Virtual Machine: It is essentially a software program that acts like a separate computer system or you can say: It's a logical version of a physical computer.

and It runs on a physical computer (the host) and behaves like a real computer with its own operating system, memory, storage, and applications.

For example: you can use virtual machine software to create isolated environments on this computer, like separate rooms in a house. Each virtual machine acts like a completely independent computer.

Project Description:

our project talking about how to create basic virtual machine, and we've do it in two ways:

- 1)Create Virtual Machine by using VirtualBox in MAC operating system.
- 2) Create Virtual Machine inside Ubuntu system.

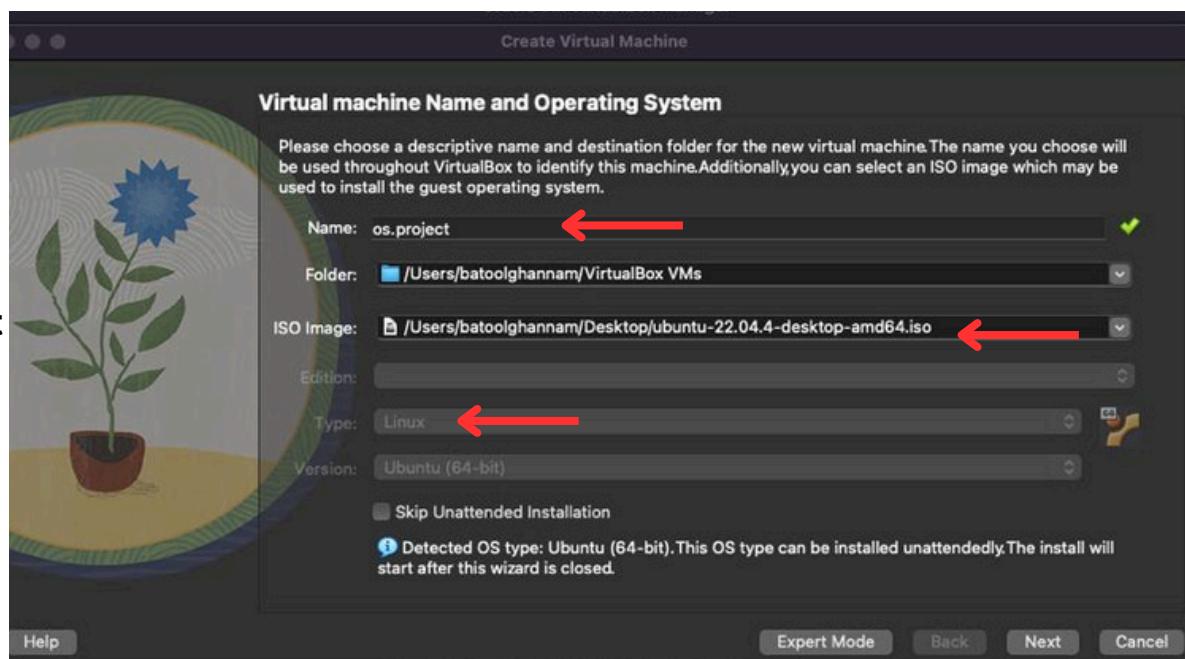
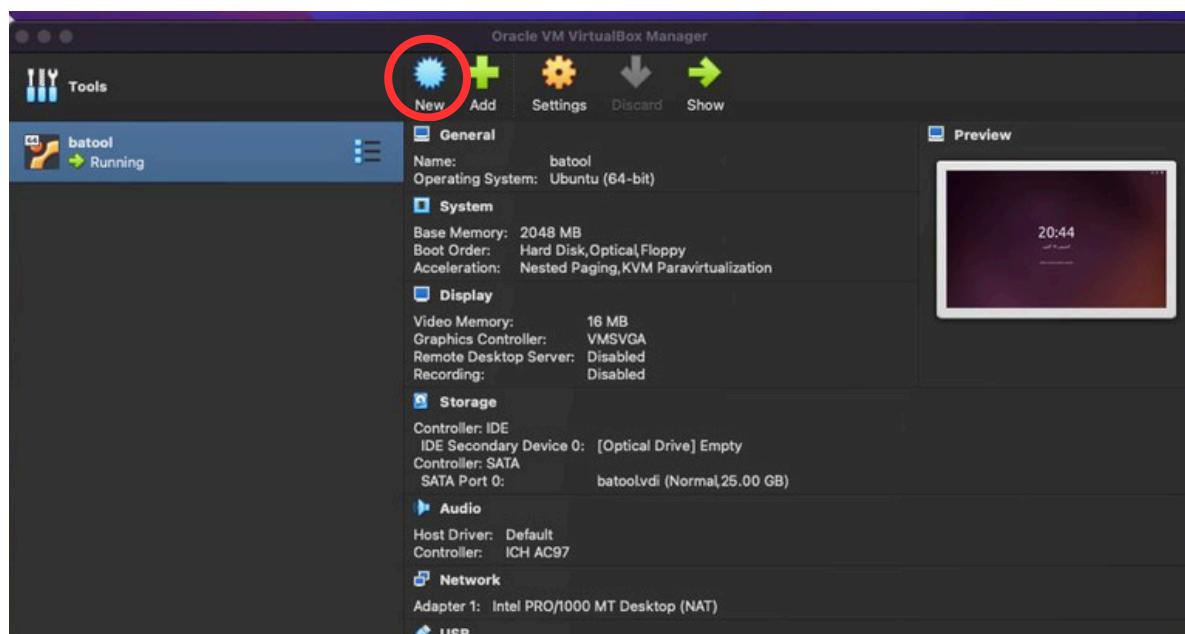
Project Goal:

To demonstrate the creation and configuration of virtual machines using both graphical interfaces (VirtualBox on macOS) and command-line tools (on Ubuntu)

First Way: Create Virtual Machine by using VirtualBox in MAC operating system.

Step1/ create new Virtual Machine AND name it:

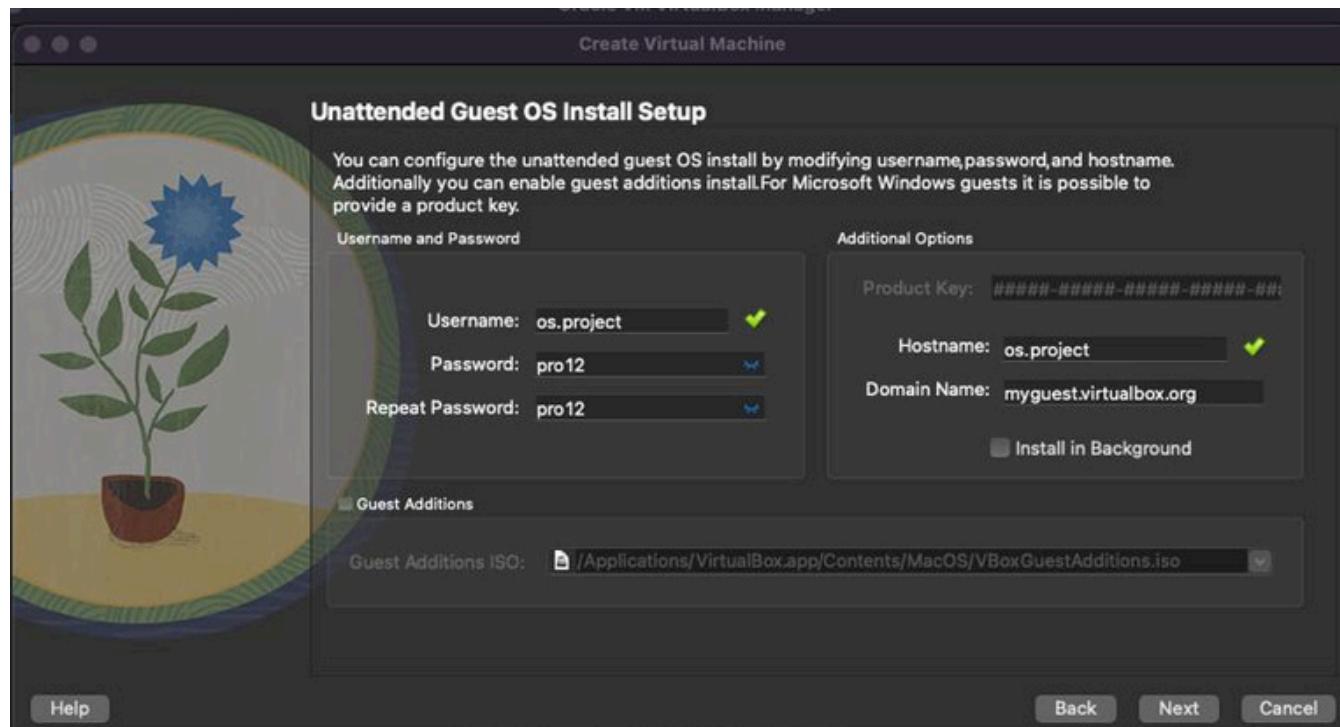
- 1) Open the VirtualBox application.
- 2) Click on “New” the blue button.
- 3) Enter name for your Virtual Machine
- 4) Select the type of OS you want, and the version .
- 5) add the ISO image



Click Next

First Way:

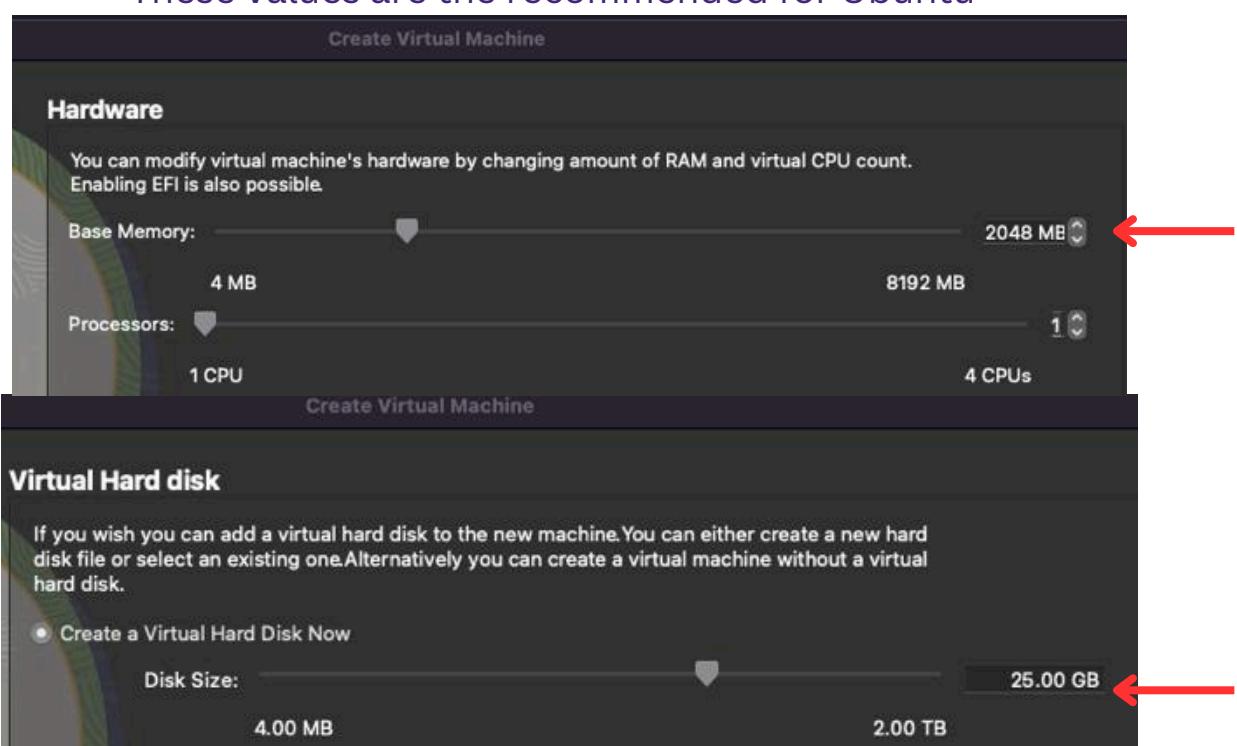
Step2/ set a username and password for our VM:



Step3/ change the RAM amount:

- 1) change the machine hardware to 2048MG
- 2) Change the virtual hard disk to 2GB

These values are the recommended for Ubuntu

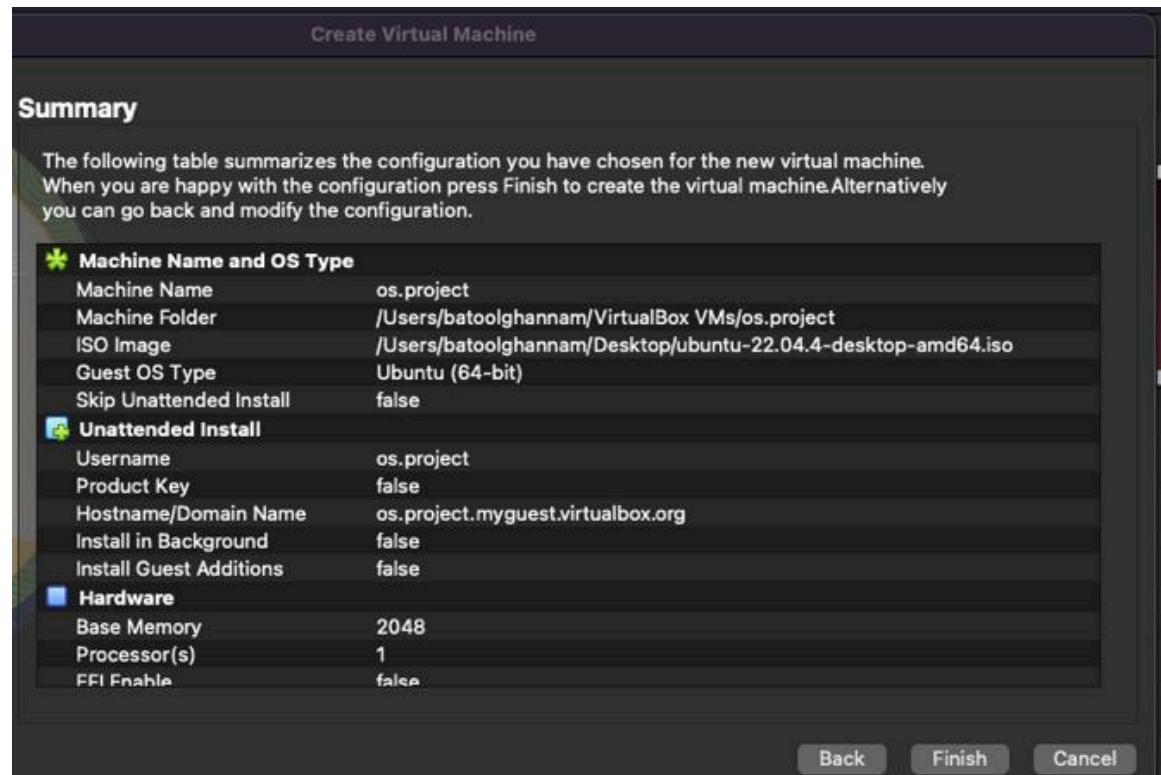


First Way:

Step4/ our VM general information:

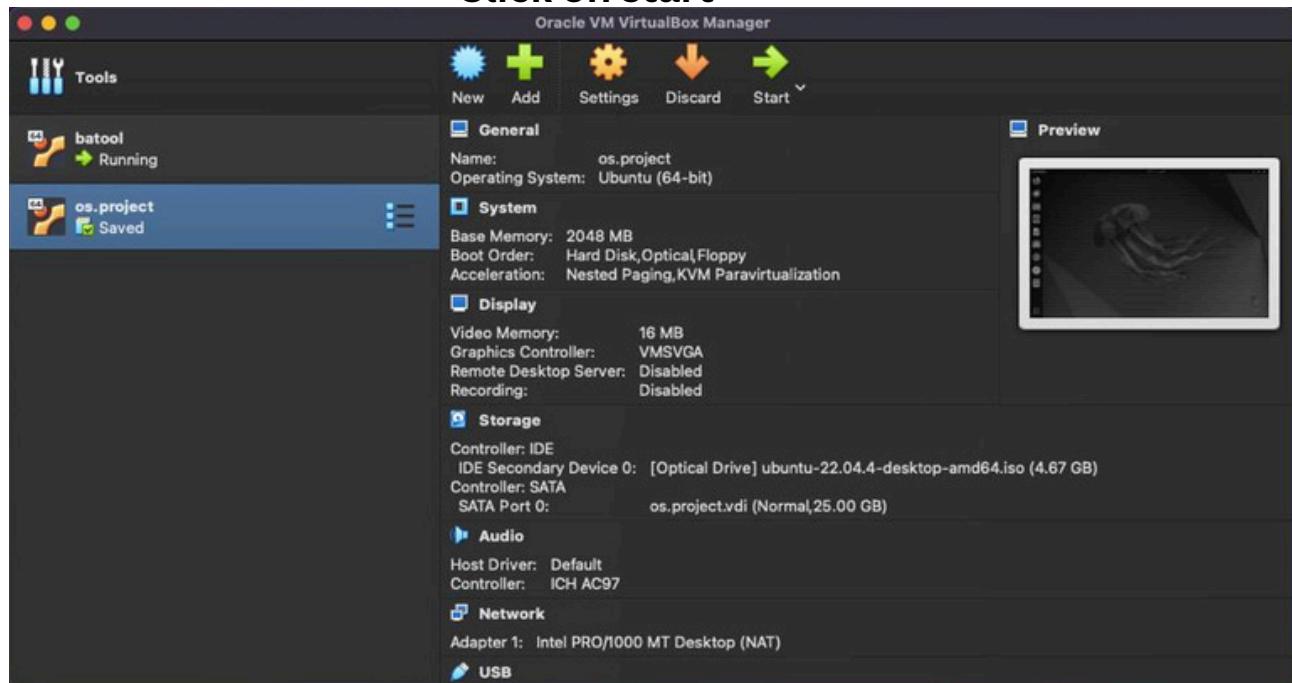
these information (summary) will appear after you complete the previous steps.
it's summarised all configuration you've chosen.

Click Finish



Now your VM is ready to be used

Click on start



First Way:

Additional steps:

Step8/ here we run the VM and go to the terminal to use some commands to insure that our VM is working successfully

we use this command to retrieves the information in the system

```
osproject@os:~$ su
Password:
root@os:/home/osproject# sudo apt-get update
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:2 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:4 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Fetched 257 kB in 3s (78.3 kB/s)
Reading package lists... Done
```

we use this command to install the **Git** Because we want to put our project in the GitHub

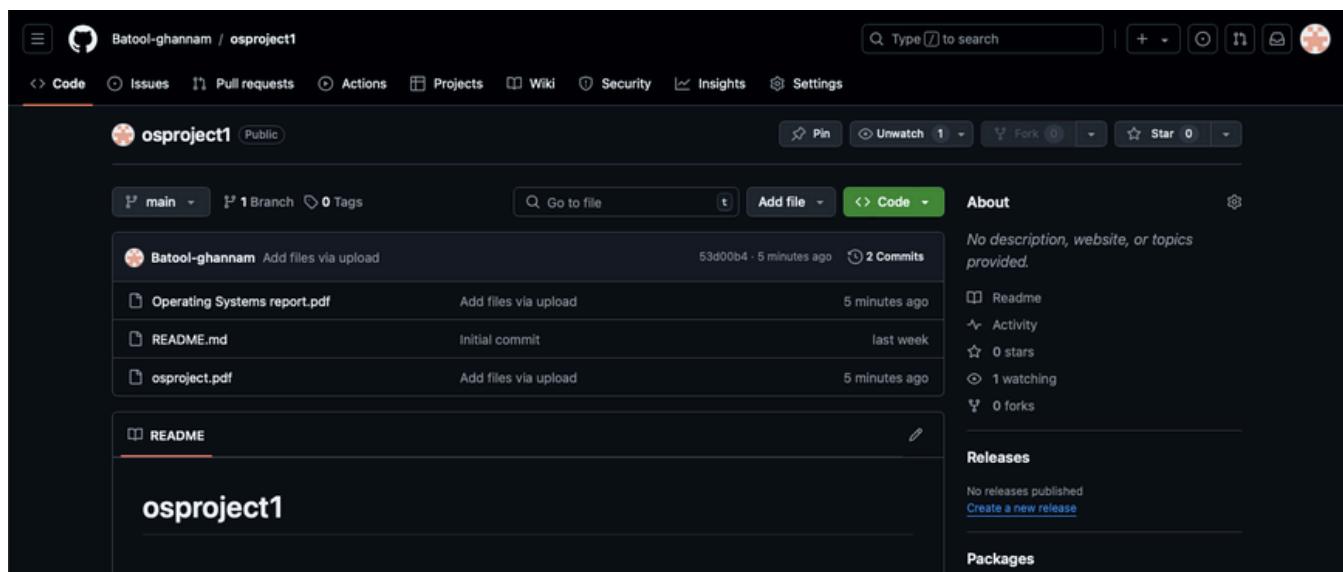
```
root@os:/home/osproject# sudo apt-get install git curl ssh
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  git-man libcurl4 liberror-perl ncurses-term openssh-client openssh-server
  openssh-sftp-server ssh-import-id
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-email git-gui gitk gitweb
  git-cvs git-mediawiki git-svn keychain libpam-ssh monkeysphere ssh-askpass
  molly-guard
The following NEW packages will be installed:
  curl git git-man liberror-perl ncurses-term openssh-server openssh-sftp-server
  ssh ssh-import-id
The following packages will be upgraded:
  libcurl4 openssh-client
2 upgraded, 9 newly installed, 0 to remove and 256 not upgraded.
Need to get 5097 kB/6291 kB of archives.
After this operation, 27.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-sftp-server amd64 1:8.9p1-3ubuntu0.10 [38.9 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 openssh-server amd64 1:8.9p1-3ubuntu0.10 [435 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 ssh all 1:8.9p1
```

we use this command to put our repository link to upload our project in it

```
root@os:/home/osproject# git clone https://github.com/Batool-ghannam/osproject1.git
Cloning into 'osproject1'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
root@os:/home/osproject#
```

our GitHub repository:

<https://github.com/Batool-ghannam/osproject1.git>



The screenshot shows the GitHub repository page for 'osproject1'. The repository is public and has 2 commits. The commits are:

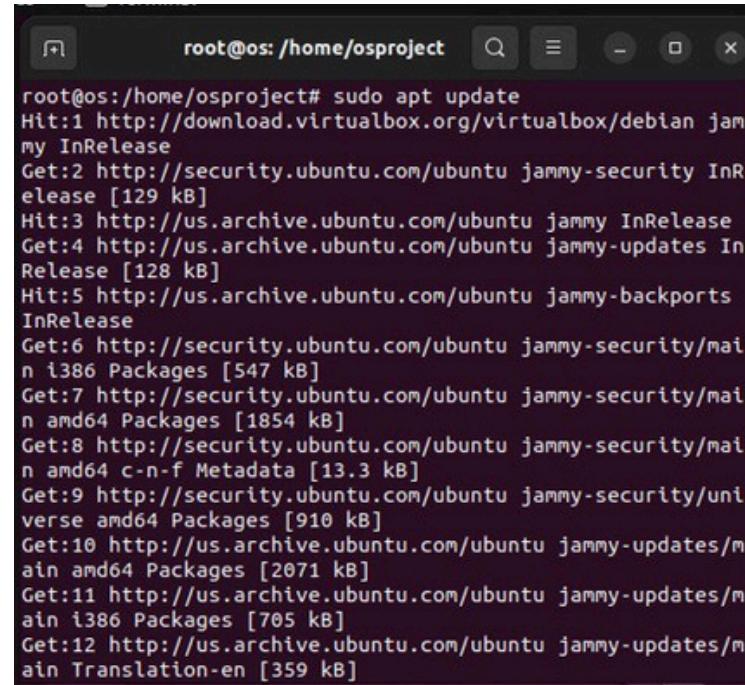
- Batool-ghannam Add files via upload (5 minutes ago)
- Operating Systems report.pdf Add files via upload (5 minutes ago)
- README.md Initial commit (last week)
- osproject.pdf Add files via upload (5 minutes ago)

The repository has 0 stars, 1 watching, and 0 forks. There are no releases or packages published.



Second Way:Create Virtual Machine inside Ubuntu system.

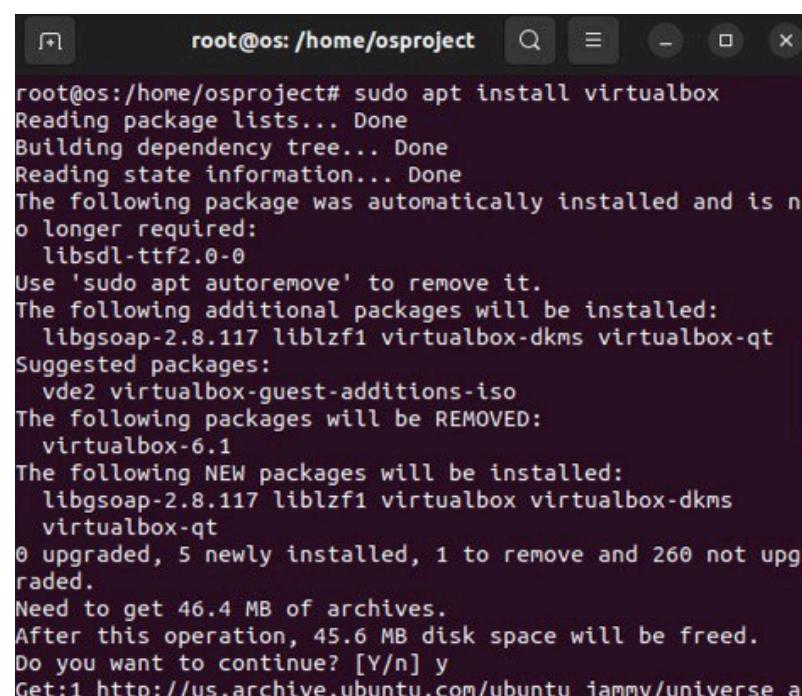
sudo apt update



```
root@os:/home/osproject# sudo apt update
Hit:1 http://download.virtualbox.org/virtualbox/debian jammy InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:3 http://us.archive.ubuntu.com/ubuntu jammy InRelease
Get:4 http://us.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:5 http://us.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main i386 Packages [547 kB]
Get:7 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1854 kB]
Get:8 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [13.3 kB]
Get:9 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [910 kB]
Get:10 http://us.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2071 kB]
Get:11 http://us.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [705 kB]
Get:12 http://us.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [359 kB]
```

this command downloads the package information from the Internet.
and It is useful to get info on the updated version of packages or their dependencies.

sudo apt install virtualbox

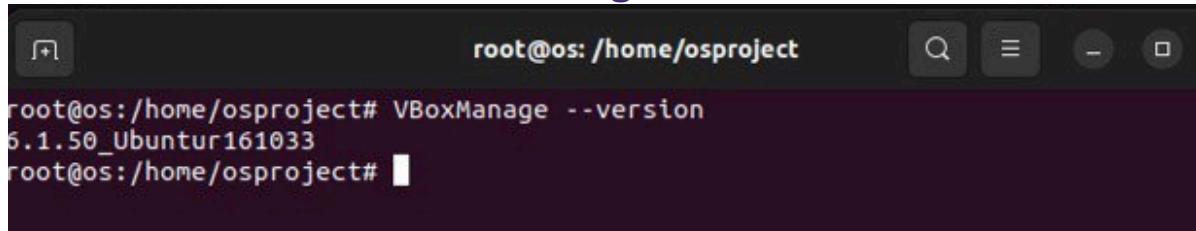


```
root@os:/home/osproject# sudo apt install virtualbox
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  libSDL-ttf2.0-0
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libgsoap-2.8.117 liblzf1 virtualbox-dkms virtualbox-qt
Suggested packages:
  vde2 virtualbox-guest-additions-iso
The following packages will be REMOVED:
  virtualbox-6.1
The following NEW packages will be installed:
  libgsoap-2.8.117 liblzf1 virtualbox virtualbox-dkms
  virtualbox-qt
0 upgraded, 5 newly installed, 1 to remove and 260 not upgraded.
Need to get 46.4 MB of archives.
After this operation, 45.6 MB disk space will be freed.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu jammy/universe a
```

this command is used to install VirtualBox package from the official repository on the Ubuntu

Second Way:Create Virtual Machine inside Ubuntu system.

VBoxManage --version

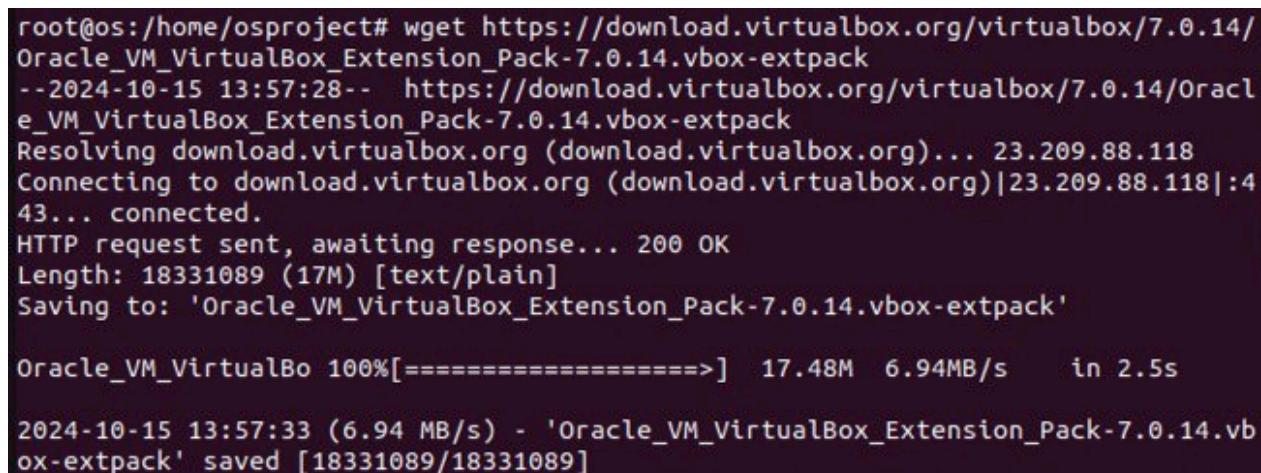


```
root@os:/home/osproject# VBoxManage --version
5.1.50_Ubuntur161033
root@os:/home/osproject#
```

this command is used to see the latest VirtualBox version installed via the Ubuntu repository

wget

https://download.virtualbox.org/virtualbox/7.0.14/Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack



```
root@os:/home/osproject# wget https://download.virtualbox.org/virtualbox/7.0.14/Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack
--2024-10-15 13:57:28-- https://download.virtualbox.org/virtualbox/7.0.14/Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack
Resolving download.virtualbox.org (download.virtualbox.org)... 23.209.88.118
Connecting to download.virtualbox.org (download.virtualbox.org)|23.209.88.118|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 18331089 (17M) [text/plain]
Saving to: 'Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack'

Oracle_VM_VirtualBo 100%[=====] 17.48M 6.94MB/s in 2.5s

2024-10-15 13:57:33 (6.94 MB/s) - 'Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack' saved [18331089/18331089]
```

this command is used to The current extension pack version on the VirtualBox website is 7.0.14.

And it's adds additional features to VirtualBox, such as:
-VirtualBox RDP (Remote Desktop Protocol).
-Disk encryption.

Second Way: Create Virtual Machine inside Ubuntu system.

**sudo VBoxManage extpack install
Oracle_VM_VirtualBox_Extension_Pack-7.0.14.vbox-extpack**

```
root@os:/home/osproject# sudo VBoxManage extpack install Oracle_VM_VirtualBox_Ex  
tension_Pack-7.0.14.vbox-extpack  
VirtualBox Extension Pack Personal Use and Evaluation License (PUEL)
```

this command is used to install the Oracle VM VirtualBox Extension Pack that we've previously downloaded.

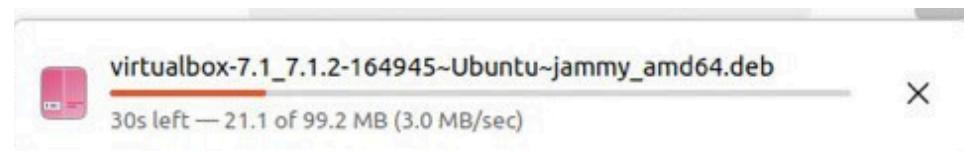
This is an output after we choose the appropriate version and download the VirtualBox

```
root@os: /home/osproject  
  
or Santa Clara counties in California in any dispute arising  
relating to this Agreement. Upon 45 days written notice, Or  
audit your use of the Product to confirm that you are in co  
with the terms of this Agreement. You agree to cooperate wi  
audit and provide reasonable assistance and access to infor  
such audit shall not unreasonably interfere with your norma  
operations. You agree to pay within 30 days of written noti  
any fees applicable to your unlicensed use of the Product.  
that Oracle shall not be responsible for any of your costs  
cooperating with the audit. If a legal action or proceeding  
by either party in connection with the enforcement of this  
the prevailing party shall be entitled to its costs and att  
fees actually incurred in connection with such action or pr  
  
Do you agree to these license terms and conditions (y/n)? y  
  
License accepted. For batch installation add  
--accept-license=33d7284dc4a0ece381196fda3cfe2ed0e1e8e7ed7f  
c  
to the VBoxManage command line.  
  
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...  
Successfully installed "Oracle VM VirtualBox Extension Pack"  
root@os:/home/osproject#
```

Choose the appropriate
version

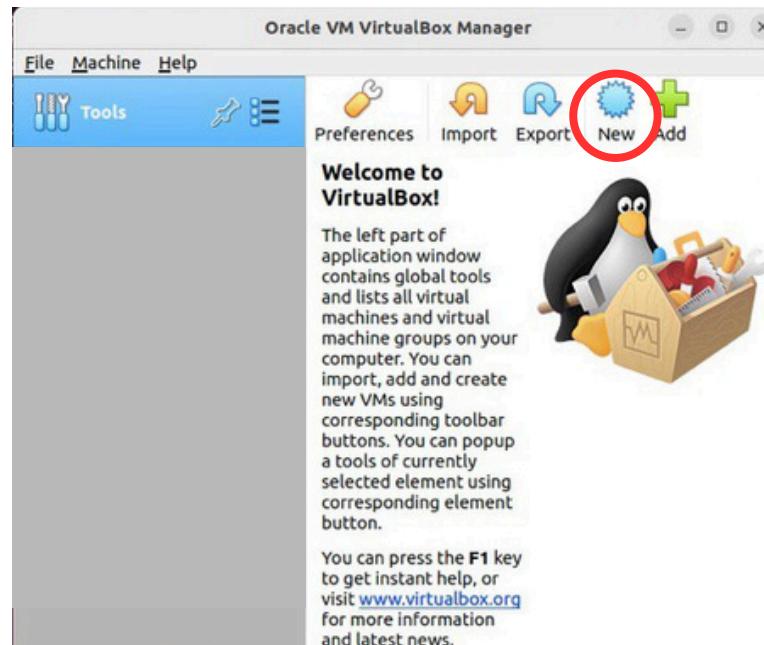
- ➔ Oracle Linux 9 / Red Hat Enterprise Linux 9
- ➔ Oracle Linux 8 / Red Hat Enterprise Linux 8
- ➔ Ubuntu 24.04
- ➔ **Ubuntu 22.04**
- ➔ Ubuntu 20.04
- ➔ Debian 12
- ➔ Debian 11

Download the VirtualBox



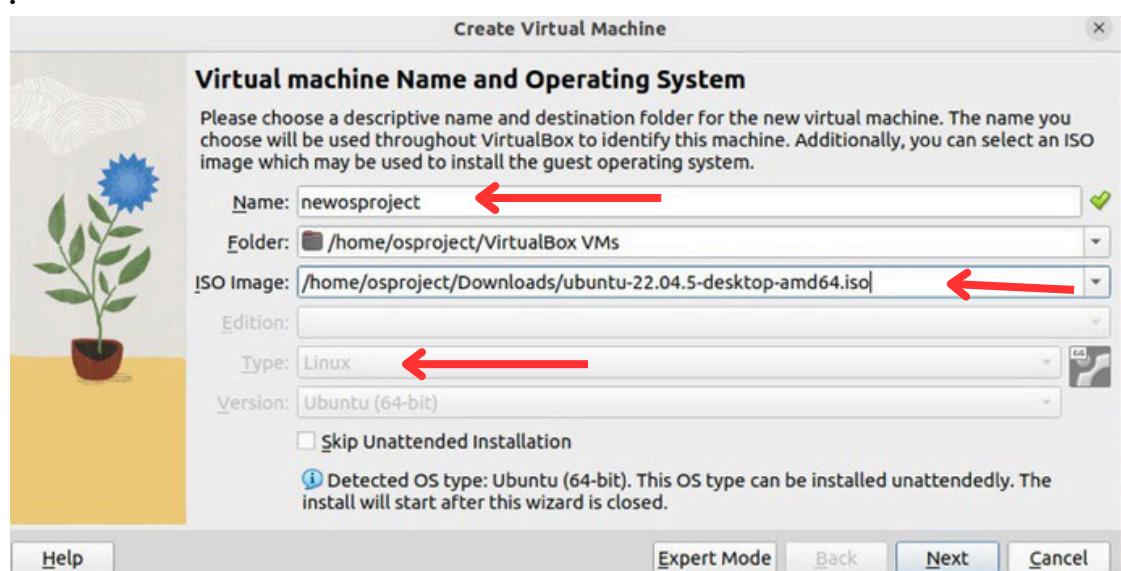
Second Way: Create Virtual Machine inside Ubuntu system.

After downloading the VirtualBox successfully, this page will appear when you open it



- 1) Click on “New” the blue button.
- 2) Enter name for your Virtual Machine.
- 3) Select the type of OS you want.
- 4) add the ISO image
- and the version .

Click Next



Second Way: Create Virtual Machine inside Ubuntu system.

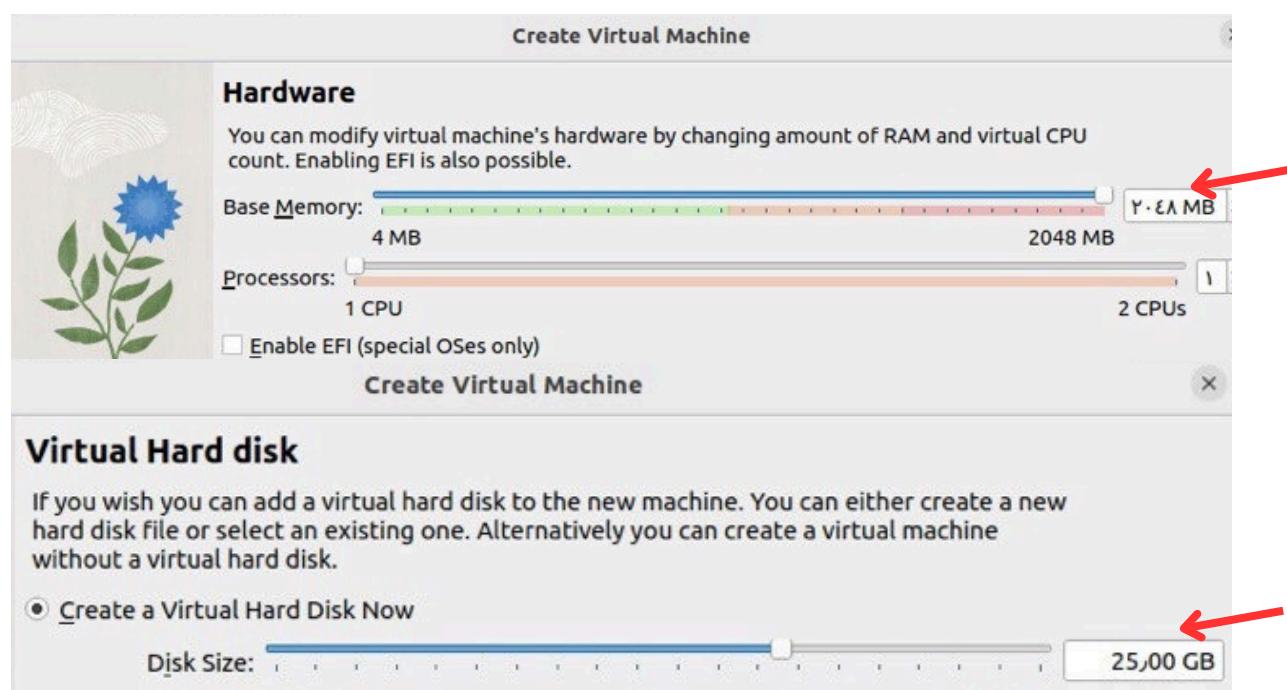
set a username and password for our VM:



change the RAM amount:

- 1) change your machine hardware to 2048MG.
- 2) Change the virtual hard disk to 2GB.

These values are the recommended for Ubuntu

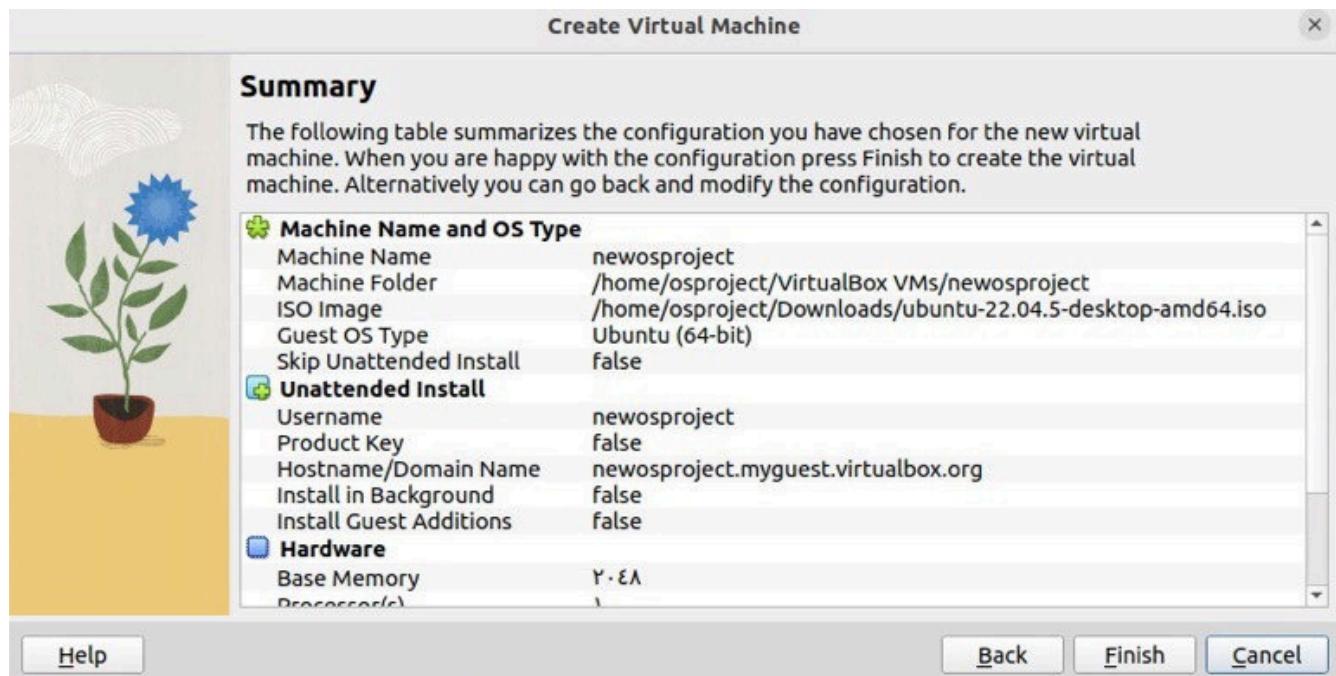


Second Way: Create Virtual Machine inside Ubuntu system.

our VM general information:

these information (summary) will appear after you complete the previous steps.
it's summarised all configuration you've chosen.

Click Finish



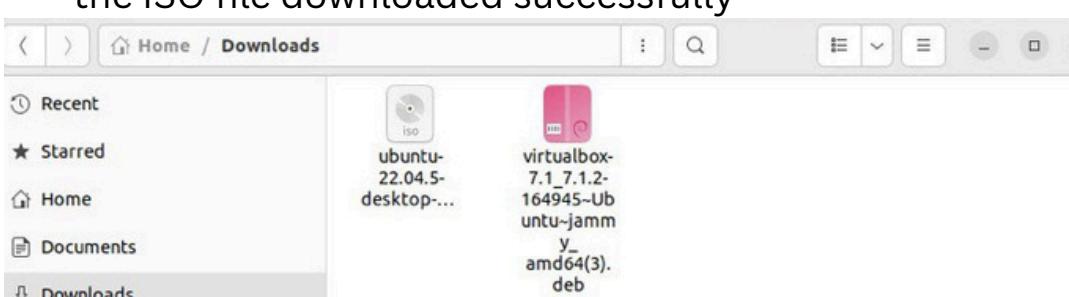
important Note

Some issues are appeared when we want run the VM.

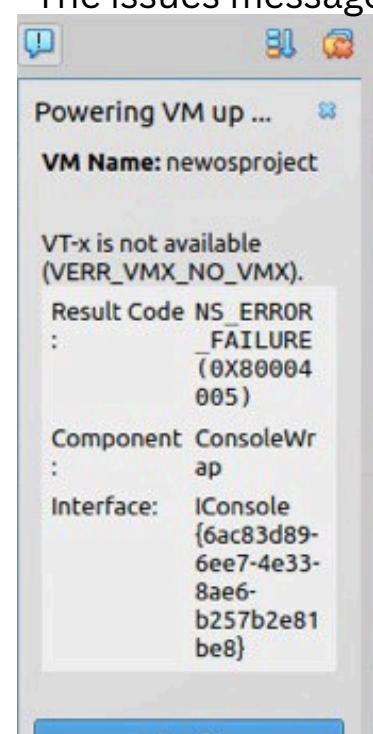
-we've downloaded the ISO file successfully.

but we think the issues appear because the storage of the RAM is full so it's can not run the VM.

The issues message



the ISO file downloaded successfully



Our Outcome After we worked on this project:

we've learned:

- 1- There is several ways to Create Virtual Machine.
- 2- You can Create Virtual Machine inside different Virtual Machine.
- 3- The Virtual Machine used the physical computer resources.
- 4- You should making sure that you have an enough storage space Before create it.

Our References:

Advising about the project steps Meeting	Dr. Hind Alsharif
Ubuntu Website	https://ubuntu.com/server/docs/how-to-create-a-vm-with-multipass
Phoenix Nap Global IT Services Website	https://phoenixnap.com/kb/install-virtualbox-on-ubuntu
Medium Website	https://utsavdesai26.medium.com/set-up-virtual-machine-vm-and-experiment-with-linux-ubuntu-devops-commands-8553bf487a05
Joshua Addae YouTube channel	https://youtu.be/gXpOpoNt26Y?si=pg4-aN8j4jD61lwi