Download Ros Operating System

For this we need to install three programs in order which is:

1.Virtual box

2. Ubuntu 20.04.4 LTS (Focal Fossa)

3.Ros melodic

Steps:

1.install Virtual box from https://www.virtualbox.org/wiki/Downloads

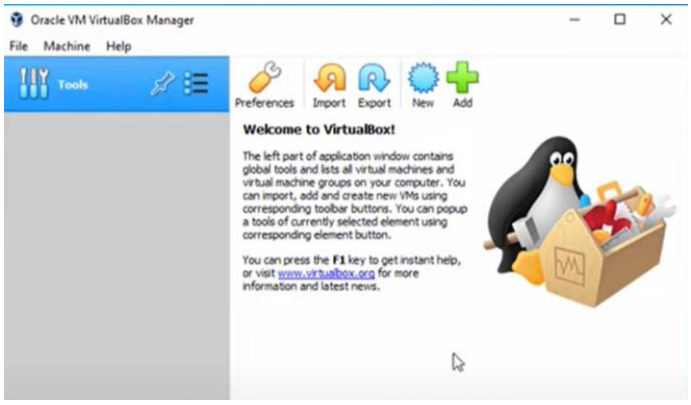
Then select your os to start download

VirtualBox 6.1.36 platform packages

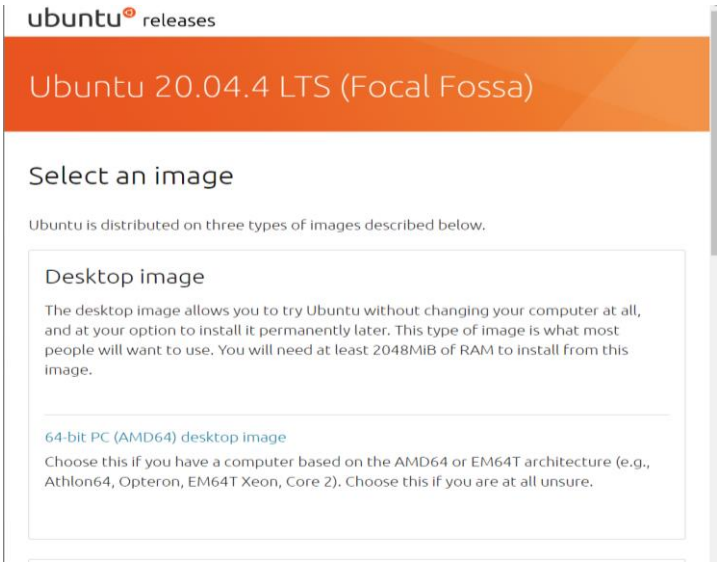
- Windows hosts
- OS X hosts
- Linux distributions
- Solaris hosts
- Solaris 11 IPS hosts

Then after finish download start install on your computer press next until start install.

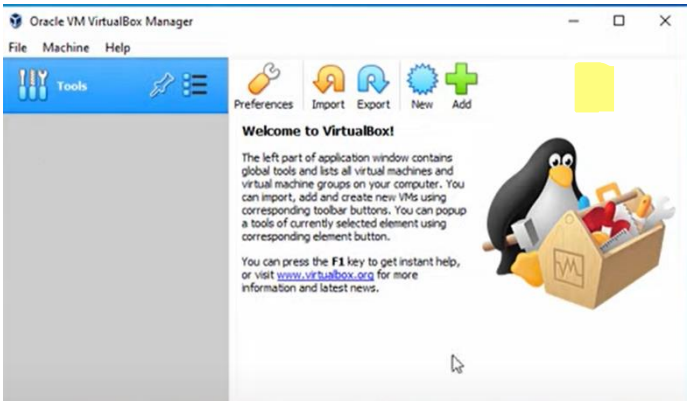
The home page will be like this



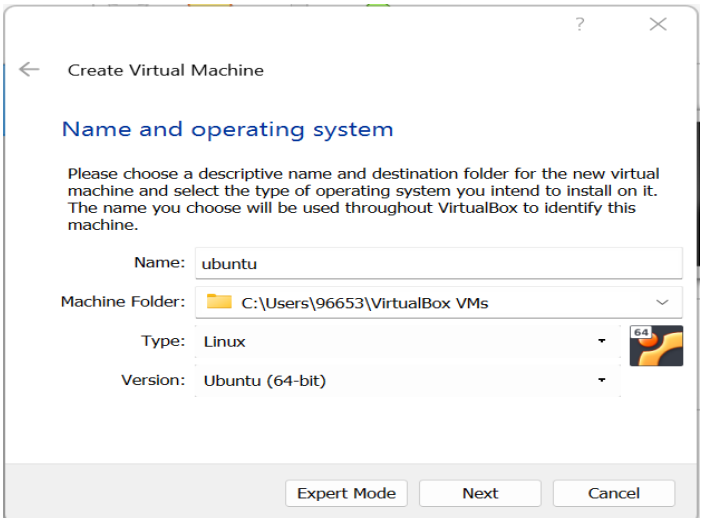
2.download and install Ubuntu 20.04.4 LTS (Focal Fossa) from https://releases.ubuntu.com/20.04/



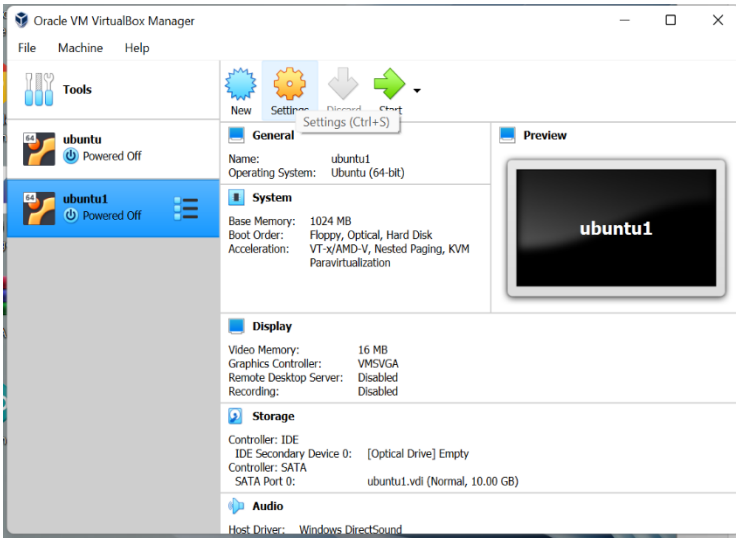
Click on the link to start download, then go to virtual box click new

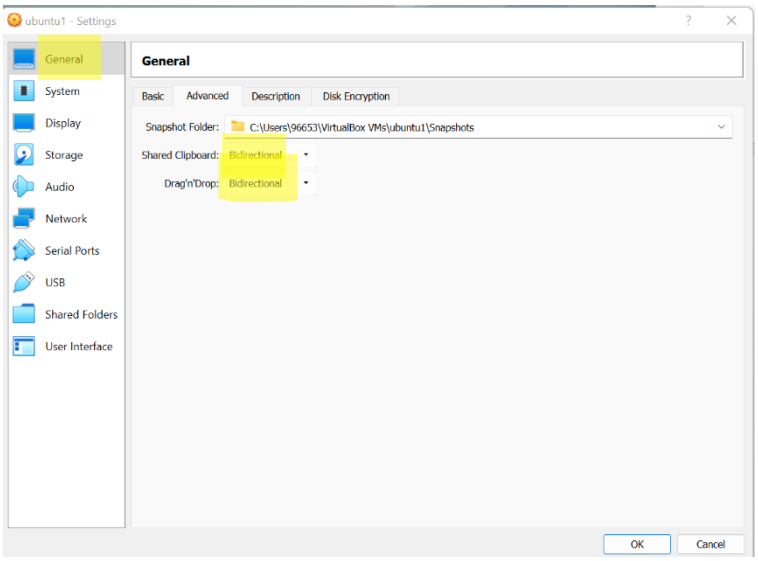


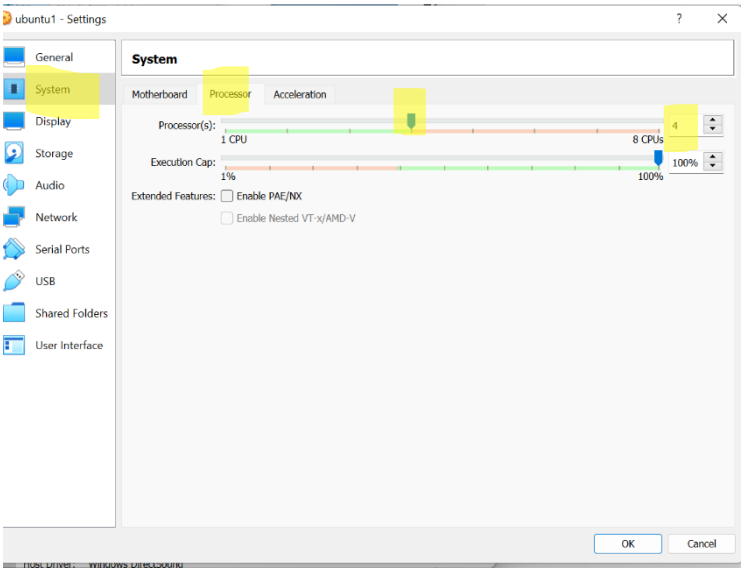
Then name it and click next if you want you can edit the setting like size of memory but it's not necessary

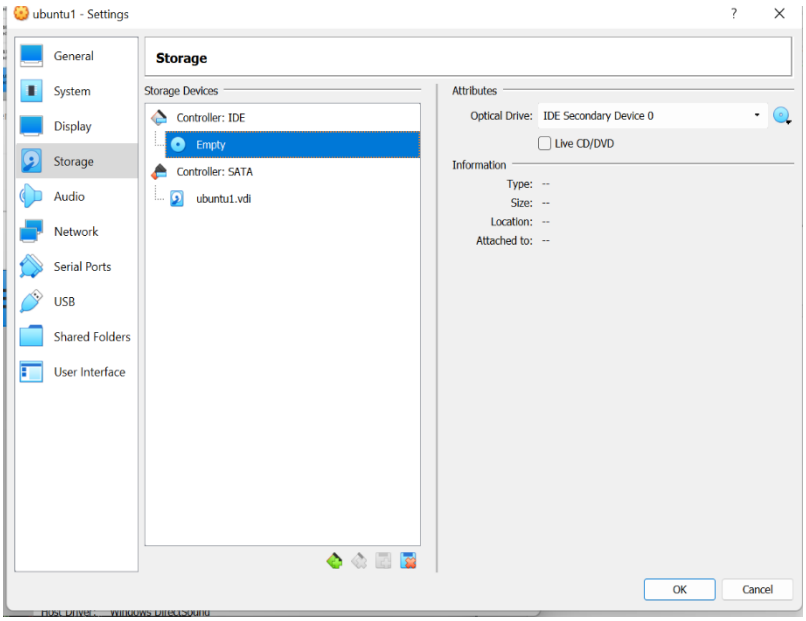


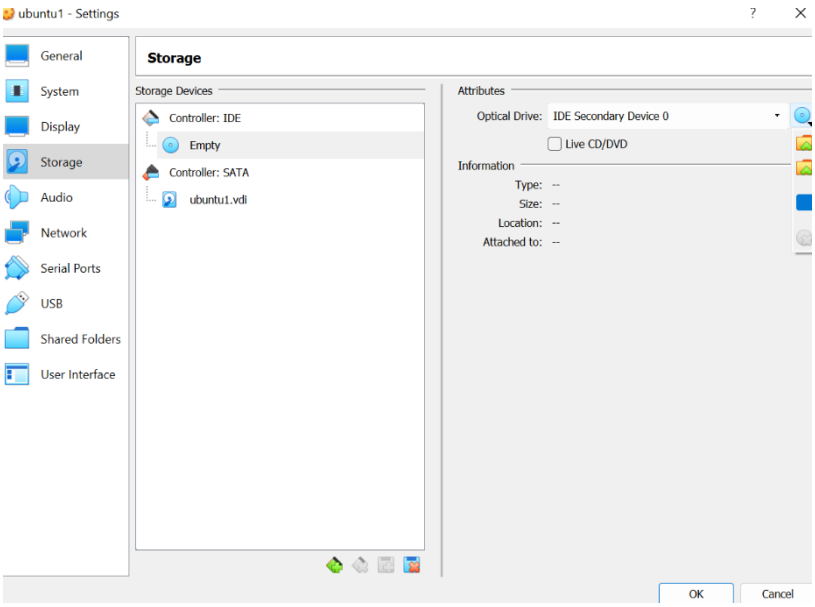
click on setting to add ubuntu

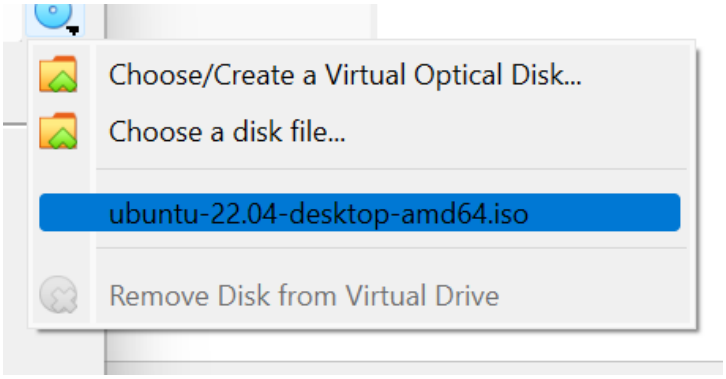


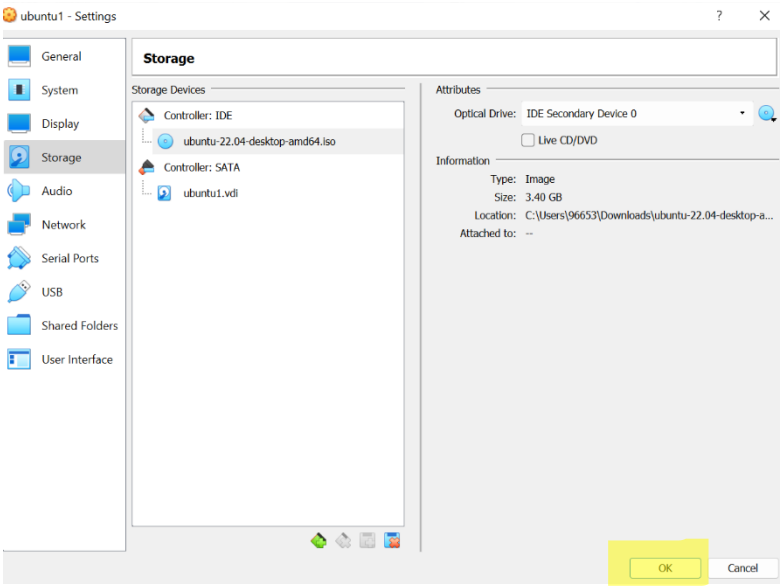


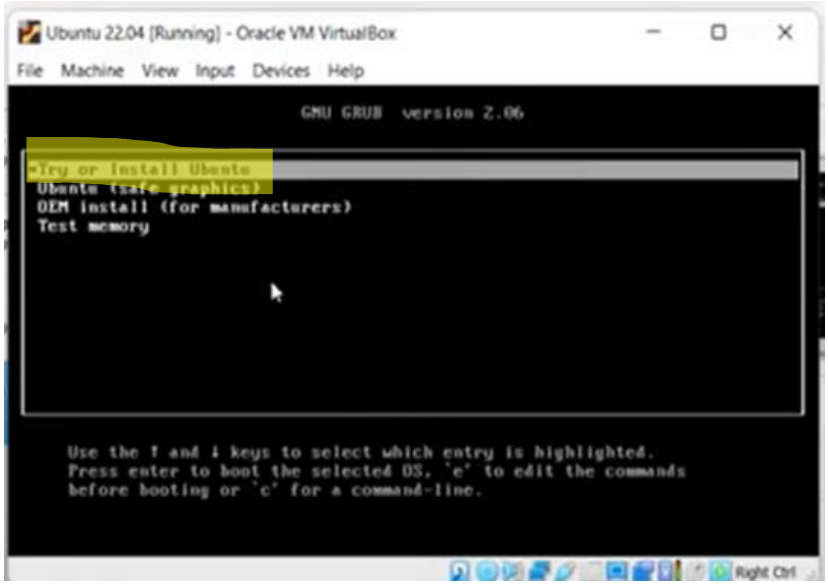


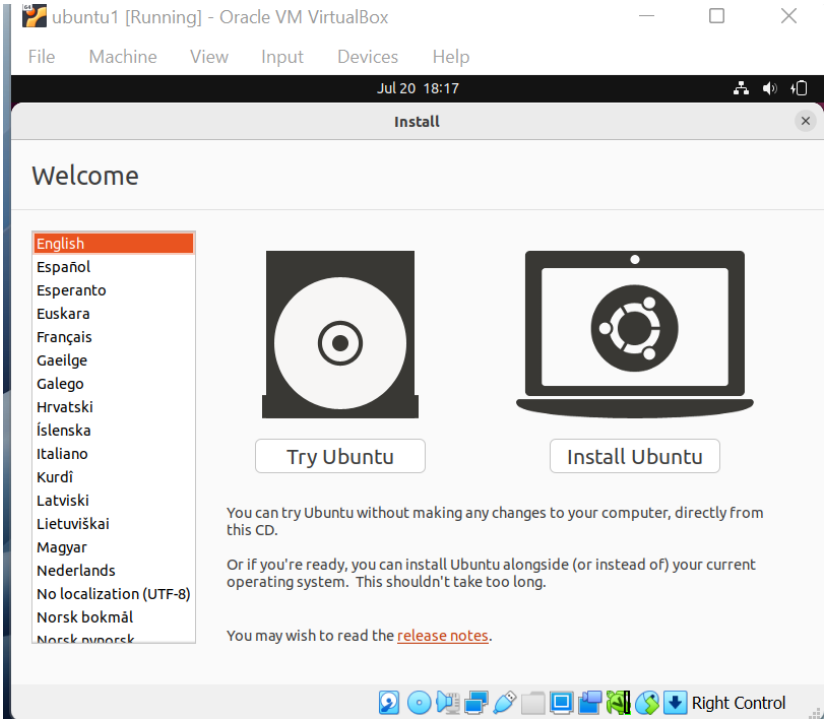

ubuntu1 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Storage
Storage Devices
Controller: IDE
Empty
Controller: SATA
ubuntu1.vdi
Attributes
Optical Drive:
IDE Secondary Device 0
Live CD/DVD
Information
Type: --
Size: --
Location: --
Attached to: --
OK
Cancel

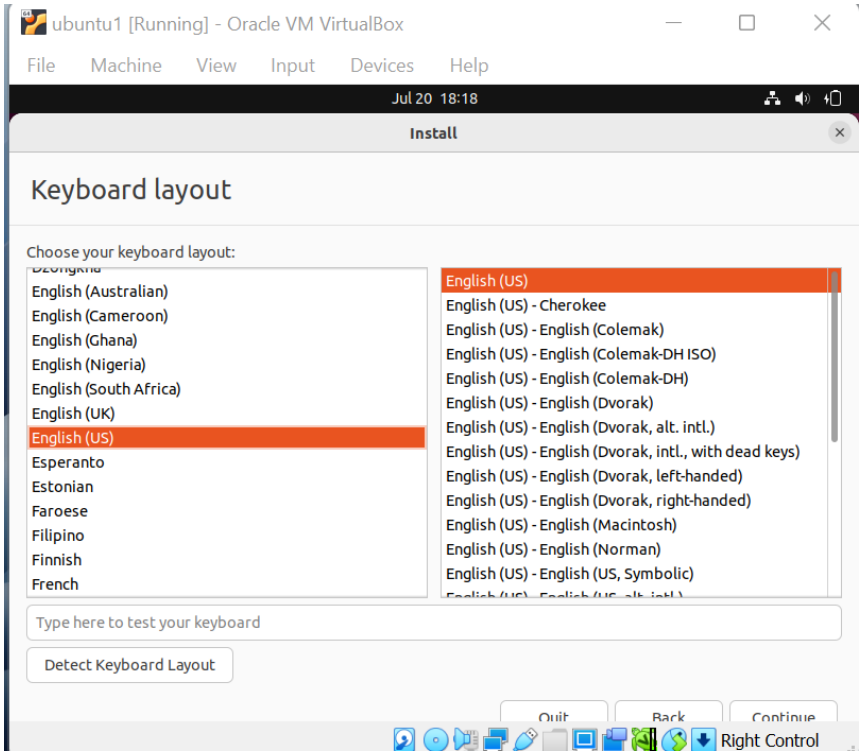

ubuntu1 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Storage
Storage Devices
Controller: IDE
Empty
Controller: SATA
ubuntu1.vdi
Attributes
Optical Drive:
IDE Secondary Device 0
Live CD/DVD
Information
Type: --
Size: --
Location: --
Attached to: --
OK
Cancel

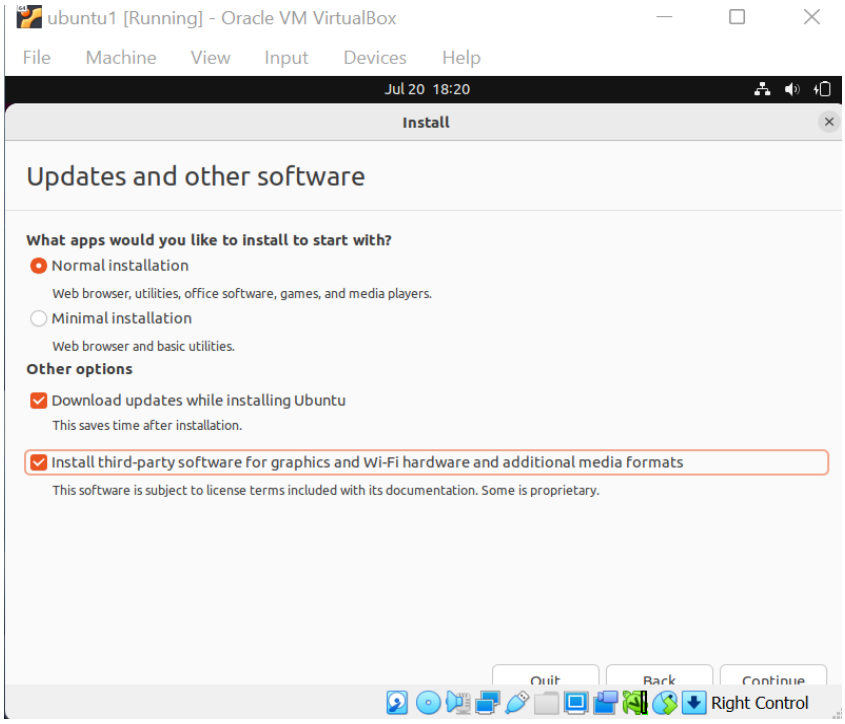

Choose/Create a Virtual Optical Disk...
Choose a disk file...
ubuntu-22.04-desktop-amd64.iso
Remove Disk from Virtual Drive

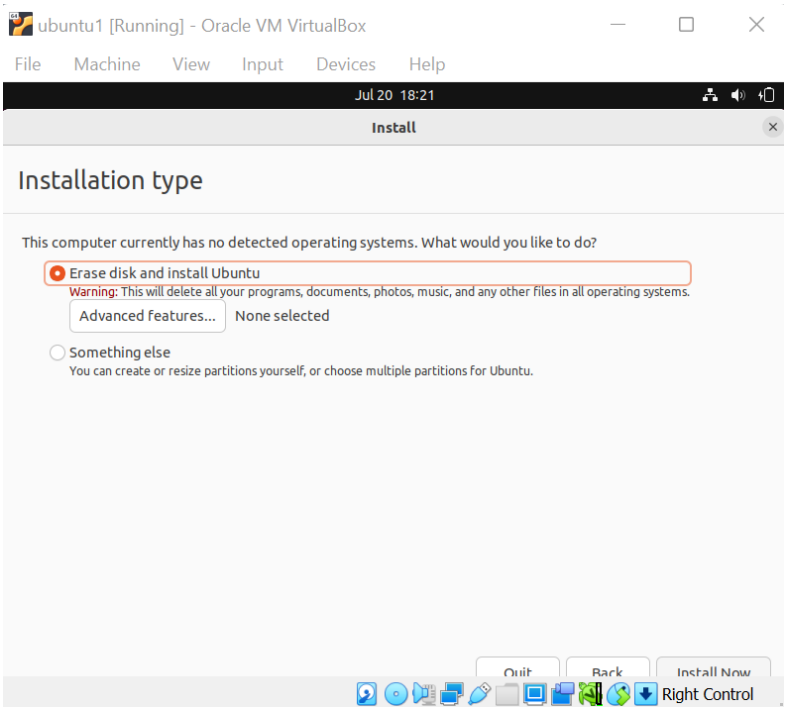

ubuntu1 - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Storage
Storage Devices
Controller: IDE
ubuntu-22.04-desktop-amd64.iso
Controller: SATA
ubuntu1.vdi
Attributes
Optical Drive: IDE Secondary Device 0
Live CD/DVD
Information
Type: Image
Size: 3.40 GB
Location: C:\Users\96653\Downloads\ubuntu-22.04-desktop-a...
Attached to: --
OK
Cancel


Ubuntu 22.04 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
GNU GRUB version 2.06
*Try or Install Ubuntu
Ubuntu (safe graphics)
OEM install (for manufacturers)
Test memory
Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands
before booting or `c' for a command-line.
Right Ctrl

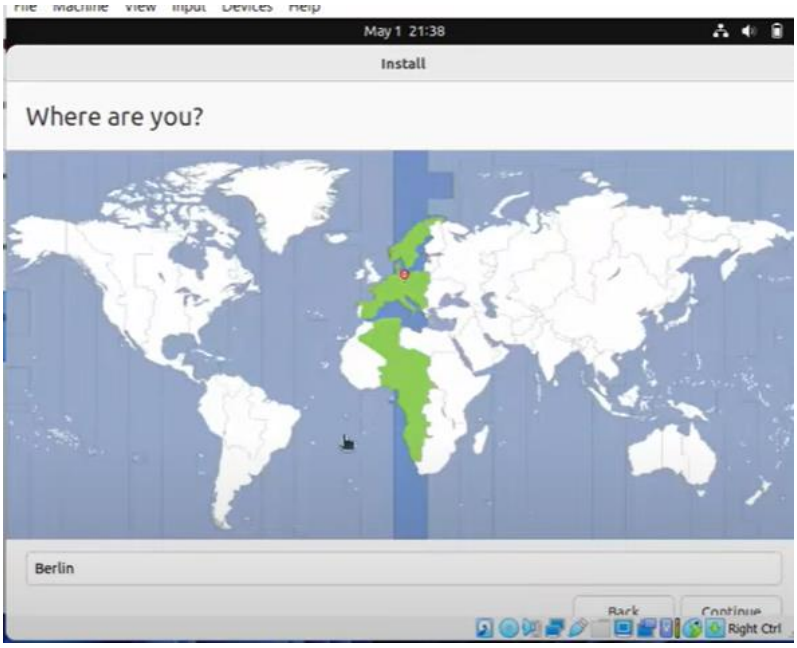

ubuntu1 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Jul 20 18:17
Install
Welcome
English
Español
Esperanto
Euskara
Français
Gaeilge
Galego
Hrvatski
Íslenska
Italiano
Kurdî
Latviski
Lietuviškai
Magyar
Nederlands
No localization (UTF-8)
Norsk bokmål
Try Ubuntu
Install Ubuntu
You can try Ubuntu without making any changes to your computer, directly from this CD.
Or if you're ready, you can install Ubuntu alongside (or instead of) your current operating system. This shouldn't take too long.
You may wish to read the release notes.
Right Control


ubuntu1 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Jul 20 18:18
Install
Keyboard layout
Choose your keyboard layout:
English (Australian)
English (Cameroon)
English (Ghana)
English (Nigeria)
English (South Africa)
English (UK)
English (US)
Esperanto
Estonian
Faroese
Filipino
Finnish
French
English (US)
English (US) - Cherokee
English (US) - English (Colemak)
English (US) - English (Colemak-DH ISO)
English (US) - English (Colemak-DH)
English (US) - English (Dvorak)
English (US) - English (Dvorak, alt. intl.)
English (US) - English (Dvorak, intl., with dead keys)
English (US) - English (Dvorak, left-handed)
English (US) - English (Dvorak, right-handed)
English (US) - English (Macintosh)
English (US) - English (Norman)
English (US) - English (US, Symbolic)
Type here to test your keyboard
Detect Keyboard Layout
Quit
Back
Continue
Right Control

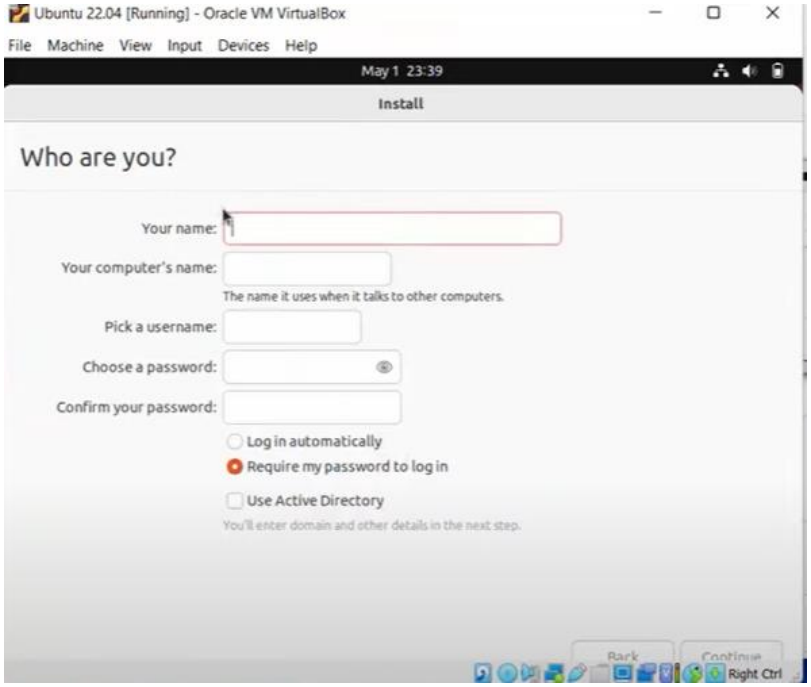

ubuntu1 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Jul 20 18:20
Install
Updates and other software
What apps would you like to install to start with?
Normal installation
Web browser, utilities, office software, games, and media players.
Minimal installation
Web browser and basic utilities.
Other options
Download updates while installing Ubuntu
This saves time after installation.
Install third-party software for graphics and Wi-Fi hardware and additional media formats
This software is subject to license terms included with its documentation. Some is proprietary.
Quit
Back
Continue
Right Control

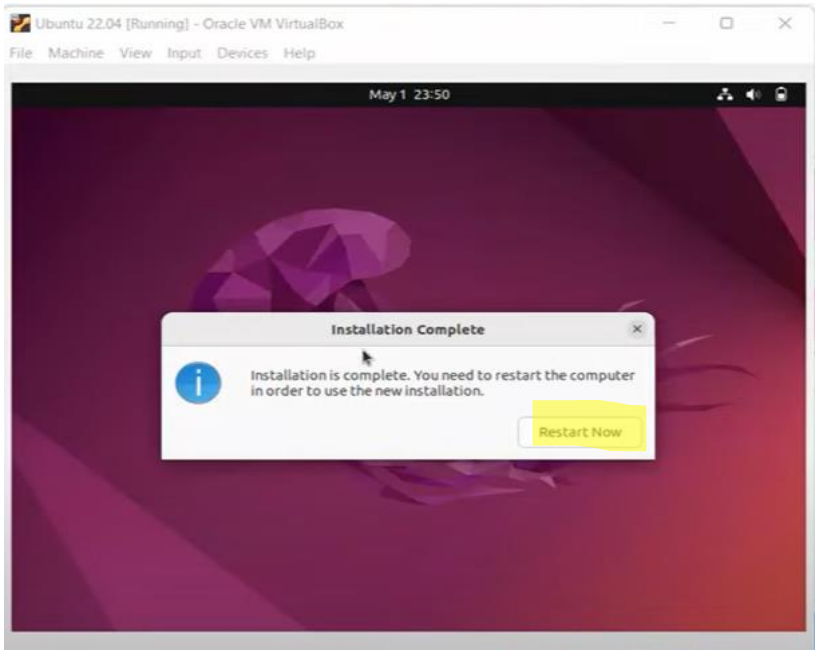


Enter your region

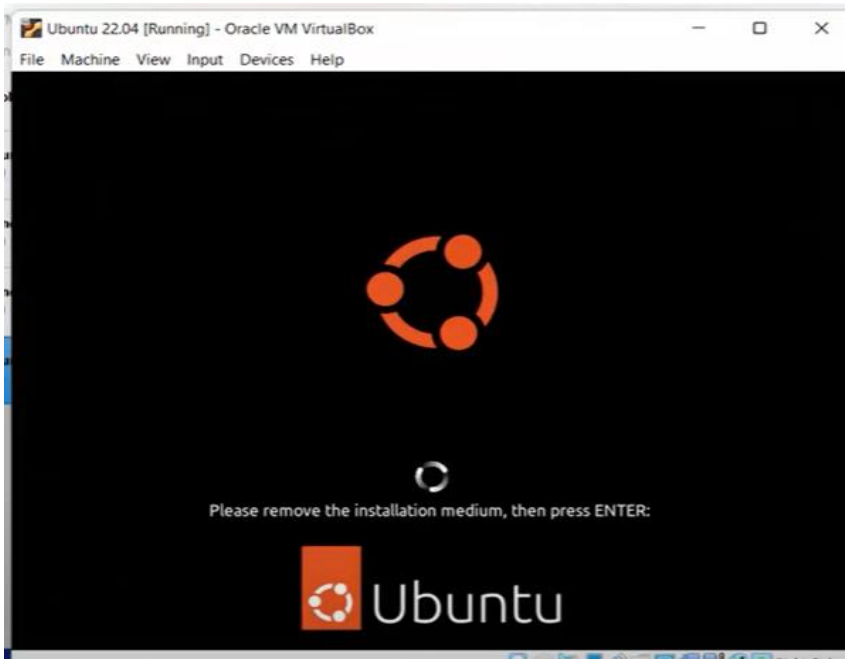


Enter your info



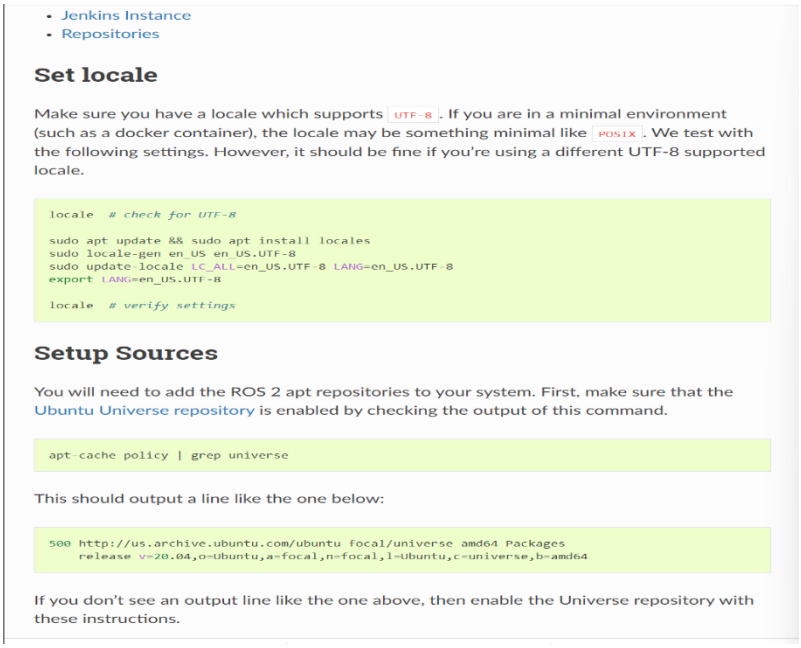


Press enter



It will be started and allow you to use it.

3. install Ros on ubuntu, First visit the site from the firefox in ubuntu as you see the site has a set of commands with explain https://docs.ros.org/en/foxy/Installation/Ubuntu-Install-Debians.html



- Jenkins Instance
- Repositories

Set locale

Make sure you have a locale which supports `UTF-8`. If you are in a minimal environment (such as a docker container), the locale may be something minimal like `POSIX`. We test with the following settings. However, it should be fine if you're using a different UTF-8 supported locale.

```
locale  # check for UTF-8

sudo apt update && sudo apt install locales
sudo locale-gen en_US en_US.UTF-8
sudo update-locale LC_ALL=en_US.UTF-8 LANG=en_US.UTF-8
export LANG=en_US.UTF-8

locale  # verify settings
```

Setup Sources

You will need to add the ROS 2 apt repositories to your system. First, make sure that the Ubuntu Universe repository is enabled by checking the output of this command.

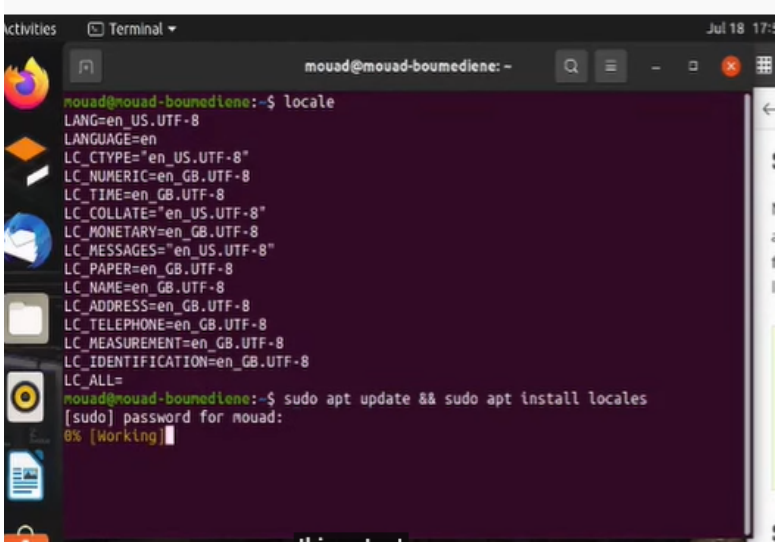
```
apt-cache policy | grep universe
```

This should output a line like the one below:

```
500 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 Packages
    release v=20.04,o=Ubuntu,a=focal,n=focal,l=Ubuntu,c=universe,b=amd64
```

If you don't see an output line like the one above, then enable the Universe repository with these instructions.

Then open terminal and write the first command make



sure it is given you the same result, and then continue one by one in the same way like in the link https://youtu.be/POhKxEhT3LA.

Download Ros Operating System on jetson nano

Installation

Open a new terminal by pressing Ctrl + Alt + t or executing the “Terminal” application using the Ubuntu 18 launch system.

Set up the Jetson Nano to accept software from *packages.ros.org*:

```
$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu
$(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-
latest.list'
```

Add a new apt key:

```
$ sudo apt-key adv --keyserver
'hkp://keyserver.ubuntu.com:80' --recv-key
C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
```

[*Note: the ROS GPG key has changed due to a security issue on the ROS build farm server. If you configured your Jetson Nano for ROS following this guide before the 24th June 2019, please follow this guide to replace the old key in the correct way*]

Update the Debian packages index:

```
$ sudo apt update
```

Install the ROS Desktop package, including support for `rqt`, `rviz`and other useful robotics packages:

```
$ sudo apt install ros-melodic-desktop
```

Note: “ROS Desktop Full” is a more complete package, however, it is not recommended for an embedded platform; 2D/3D simulators will be installed with it and they take too much space on ROM, and are too computationally hungry to be used on the Nano.

It is recommended to load the ROS environment variables automatically when you execute a new shell session. Update your `.bashrc` script:

```
$ echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc
$ source ~/.bashrc
```

Install and initialize rosdep. rosdep enables you to easily install system dependencies for source code you want to compile and is required to run some core components in ROS:

```
$ sudo apt install python-rosdep python-rosinstall python-
rosinstall-generator python-wstool build-essential

$ sudo rosdep init

$ rosdep update
```

Now the Jetson Nano is ready to execute ROS packages and become the brain of your autonomous robot.

Configure a catkin workspace

To start running your own ROS packages or install other packages from the source (such as the ZED ROS wrapper for example), you must create and configure a `catkin` workspace.

Install the following dependencies:

```
$ sudo apt-get install cmake python-catkin-pkg python-empy
python-nose python-setuptools libgtest-dev python-
rosinstall python-rosinstall-generator python-wstool
build-essential git
```

Create the catkin root and source folders:

```
$ mkdir -p ~/catkin_ws/src
$ cd ~/catkin_ws/
```

Configure the catkin workspace by issuing a first “empty” build command:

```
$ catkin_make
```

Finally, update your `.bashrc` script with the information about the new workspace:

```
$ echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
$ source ~/.bashrc
```

Your catkin workspace is now ready to compile your ROS packages from source directly onto the Jetson Nano.

Resources

1. https://youtu.be/z3FFnIO1Q9M
2. https://youtu.be/v1JVqd8M3Yc
3. https://www.stereolabs.com/blog/ros-and-nvidia-jetson-nano/