

VirtualBox, Ubuntu 20.04 and ROS Noetic Downloading Process Tutorial

شرح طريقة تحميل VirtualBox, Ubuntu 20.04 and ROS Noetic

In this tutorial, the process of downloading VirtualBox -which one of the virtual machines (VM) software- will be explained in detail and the virtual machines can be defined as:

“A virtual environment that functions as a virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system” ^[1].

Then, we will use it to install Ubuntu 20.04 operating system and ROS which stands for Robot Operating System. The VirtualBox will help to download many operating systems and applications without interfering with the host operating system ^[1].

في هذا الدرس، طريقة تنزيل VirtualBox -وهو واحد من برامج الآلات الافتراضية- سيتم شرحها بالتفصيل، وتعرف الآلات الافتراضية بأنها:

"بيئة افتراضية تعمل كنظام كومبيوتر مع CPU، ذاكرة، واجهة للشبكة وذاكرة للتخزين، يتم انشاءها داخل نظام تشغيل مادي" ^[1].

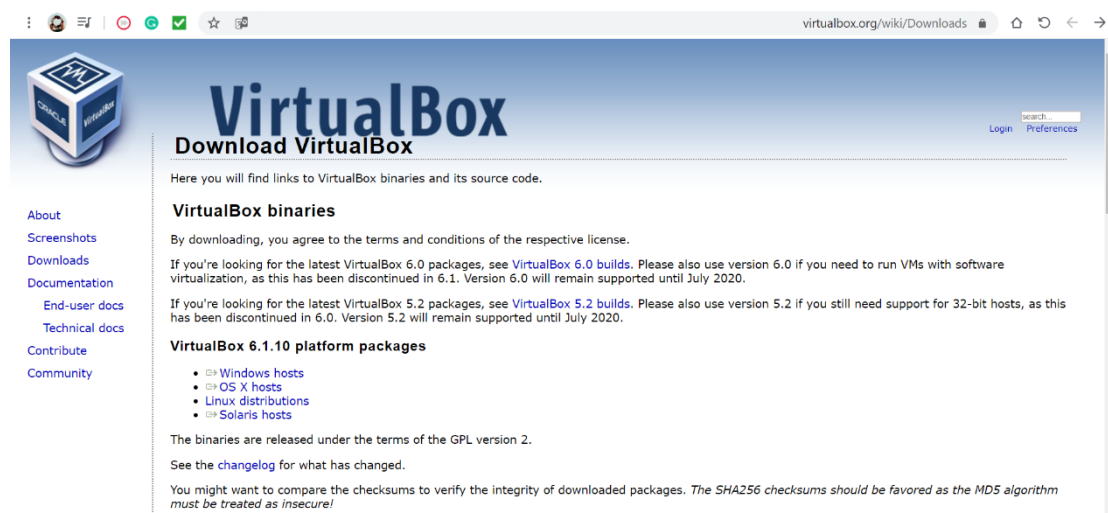
بعد ذلك، سوف نقوم بتحميل نظام تشغيل Ubuntu 20.04 و ROS والذي يعني نظام تشغيل الروبوتات. سوف يساعد VirtualBox على تحميل العديد من أنظمة التشغيل والتطبيقات بدون التقاطع مع نظام التشغيل المستضيف ^[1].

Downloading process and VirtualBox setting

طريقة التحميل وإعداد VirtualBox

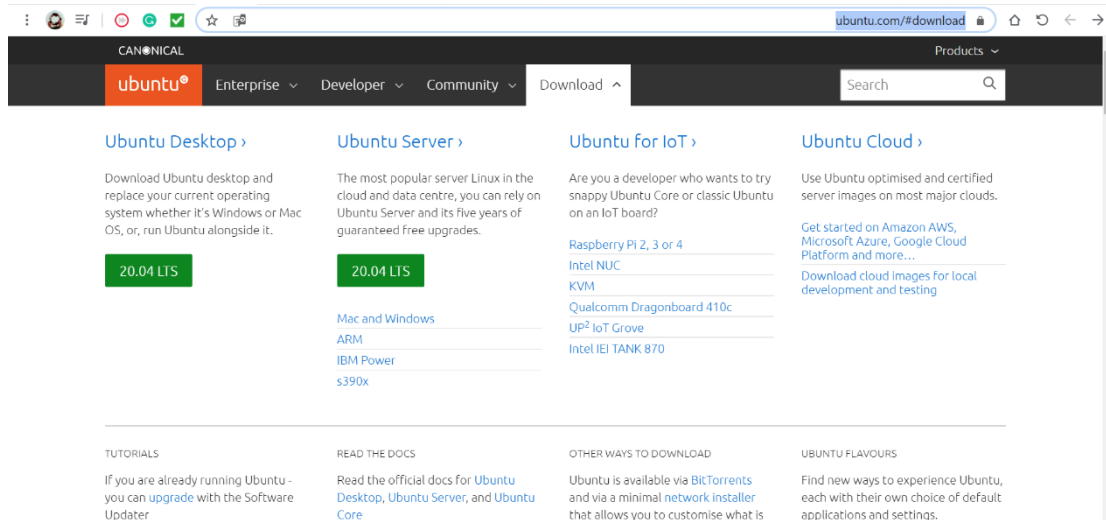
- Visit <https://www.virtualbox.org/wiki/Downloads> and choose the software package that fits your OS.

أ. أذهب للموقع <https://www.virtualbox.org/wiki/Downloads> واختر حزمة البرامج التي تناسب نظام تشغيل جهازك.



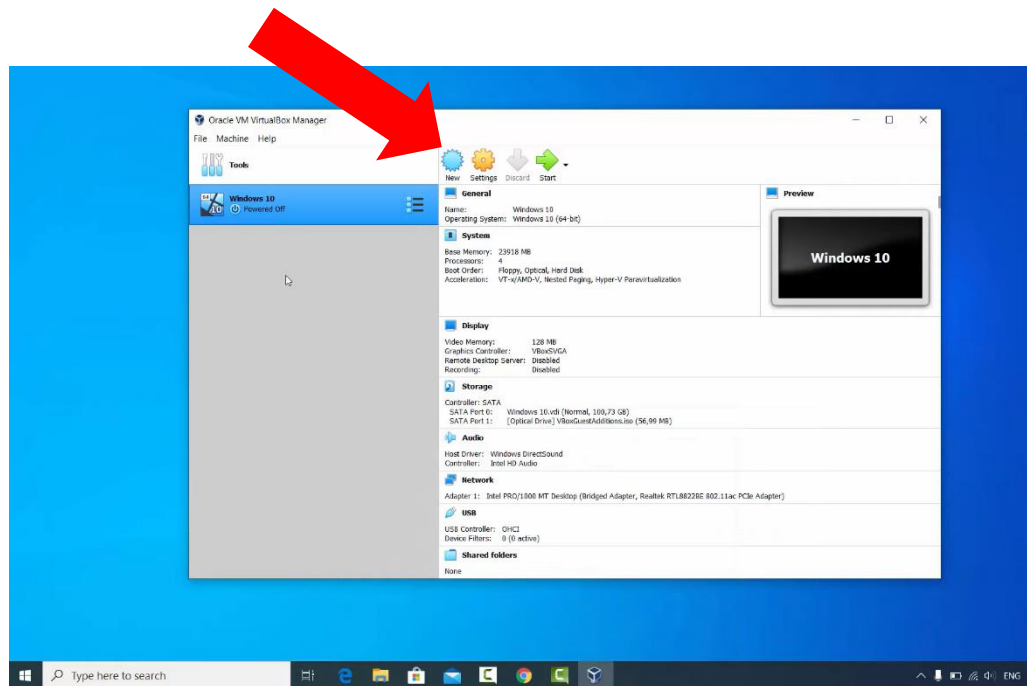
b. Visit <https://ubuntu.com/#download> to download Ubuntu 20.04 OS

ب. زر الموقع <https://ubuntu.com/#download> لتحميل نظام تشغيل Ubuntu 20.04



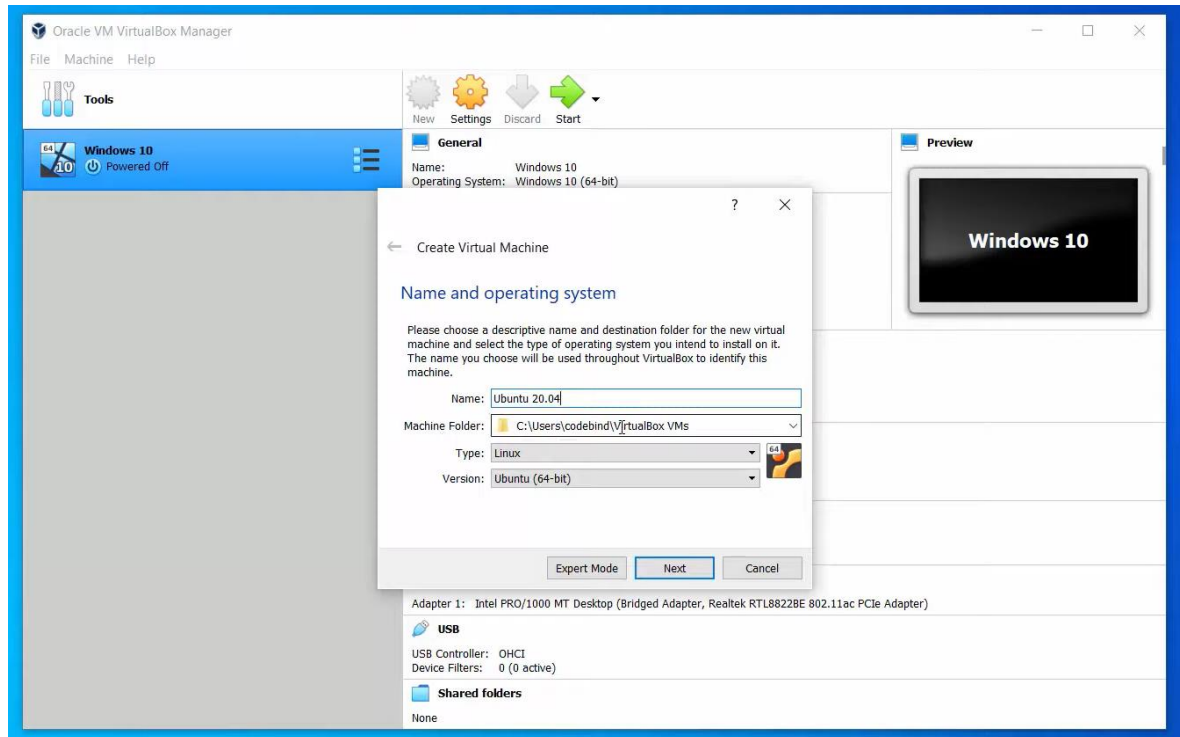
c. Now, to install Ubuntu 20.04 on the VirtualBox, open it and click on the "new" button.

ج. الآن، لتثبيت Ubuntu 20.04 على VirtualBox، افتحه ثم اضغط على زر "new".



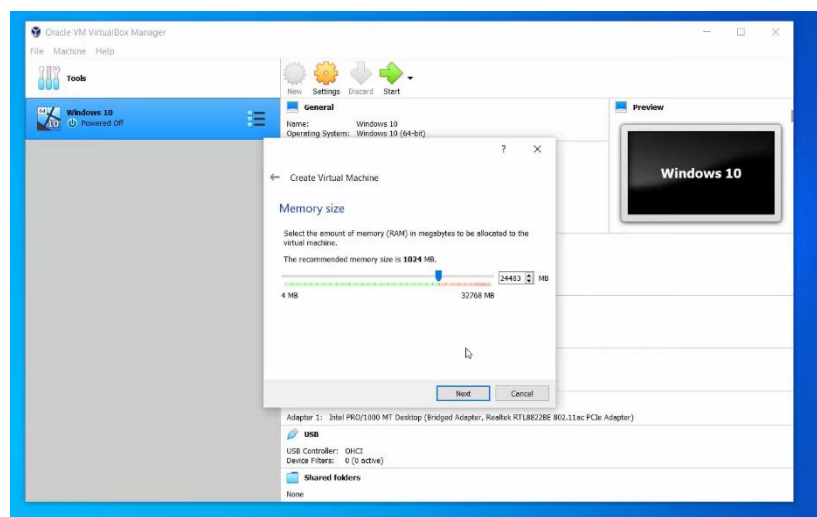
d. Write Ubuntu 20.04 in the name and make sure you chose the right version then click Next.

د. أكتب Ubuntu 20.04 أمام الاسم وتأكد من اختيارك للإصدار الصحيح ثم اضغط "Next".



e. The next many steps is varying from one user to another and it depends on your desires and your computer capabilities to determine the memory size, storage of the hard desk etc. (if you don't have a good reason to change it, leave it as default and for memory size you can move the pointer till the end of the green bar).

هـ. الخطوات التالية تختلف من مستخدم لآخر وتعتمد على رغباتك وقدرات جهازك لتحديد حجم الذاكرة والتخزين وغيرها. (إذا لم يكن لديك سبب جيد لتغييرها اتركها كما هي، ولحجم الذاكرة يمكن سحب المؤشر لنهاية الخط الأخضر)



← Create Virtual Machine

Hard disk

If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.

If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.

The recommended size of the hard disk is **10,00 GB**.

- ☐ Do not add a virtual hard disk
- ☒ Create a virtual hard disk now
- ☐ Use an existing virtual hard disk file

Windows 10.vdi (Normal, 100,73 GB)

Create

Cancel

← Create Virtual Hard Disk

Hard disk file type

Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.

- ☒ VDI (VirtualBox Disk Image)
- ☐ VHD (Virtual Hard Disk)
- ☐ VMDK (Virtual Machine Disk)

Expert Mode

Next

Cancel

ادراج قرص صلب افتراضي وتحديد نوعه (VDI)

← Create Virtual Hard Disk

Storage on physical hard disk

Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).

A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

- ☒ Dynamically allocated
- ☐ Fixed size

Next

Cancel

← Create Virtual Hard Disk

File location and size

Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.

C:\Users\codebind\VirtualBox VMs\Ubuntu 20.04\Ubuntu 20.04

Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.

4,00 MB 2,00 TB 10,00 GB

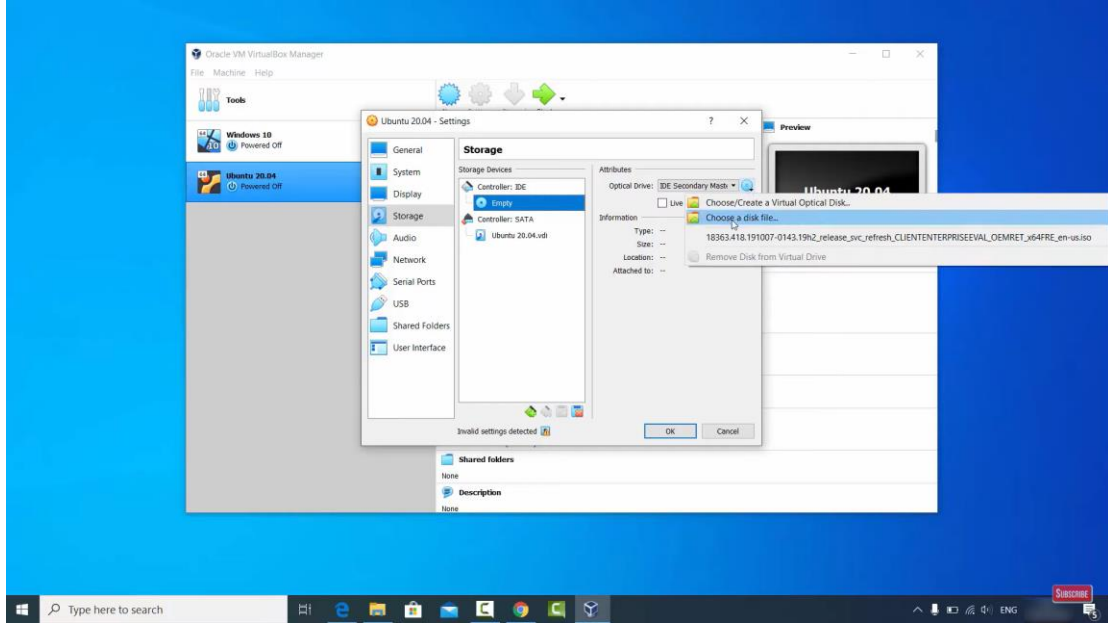
Create

Cancel

تحديد نوع التخزين على القرص الصلب وتحديد حجمه ومكانه

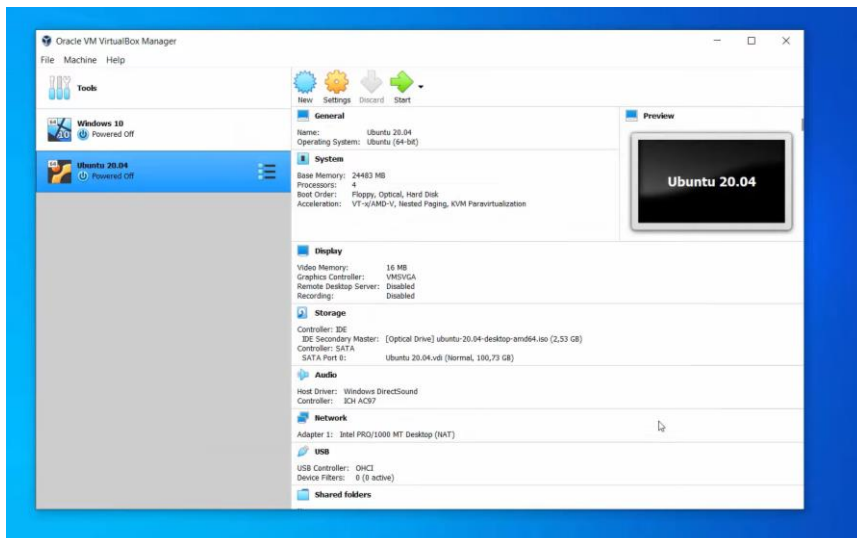
f. After setting your VirtualBox, click on Ubuntu from the left bar, and from the top click on setting, storage, and from storage devices click on “empty” under “Controller IDE”, and from the attributes, click on “choose a disk file” from optical drive. Then find the Ubuntu 20.04 that you have downloaded in step “b” and then click “ok”.

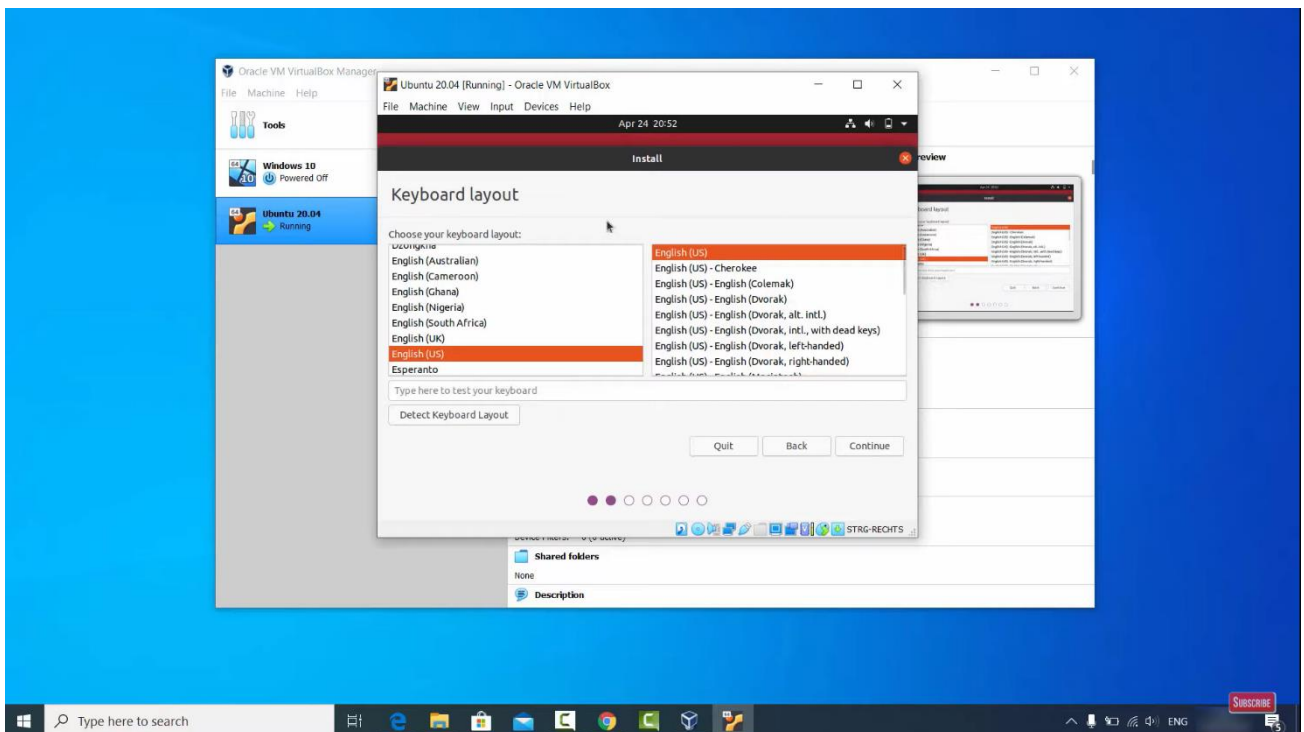
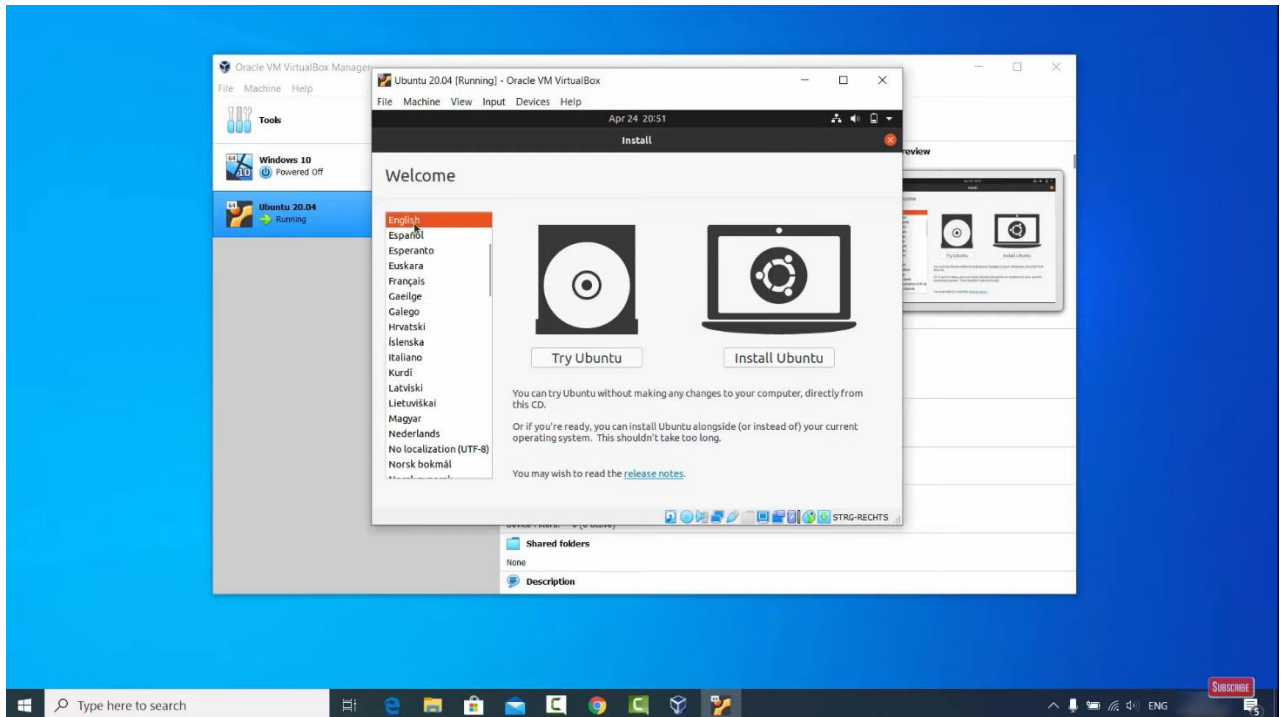
و. بعد اعداد VirtualBox اضغط على Ubuntu من اللوح الأيسر، ثم من الأعلى اضغط على setting ثم storage ثم من خانة storage devices اضغط على “empty” تحت “Controller IDE”، ثم من تحت attributes اضغط على “choose a disk file” من optical drive. ثم ابحث عن Ubuntu 20.04 الذي حملته في خطوه "ب" ثم اضغط "OK".

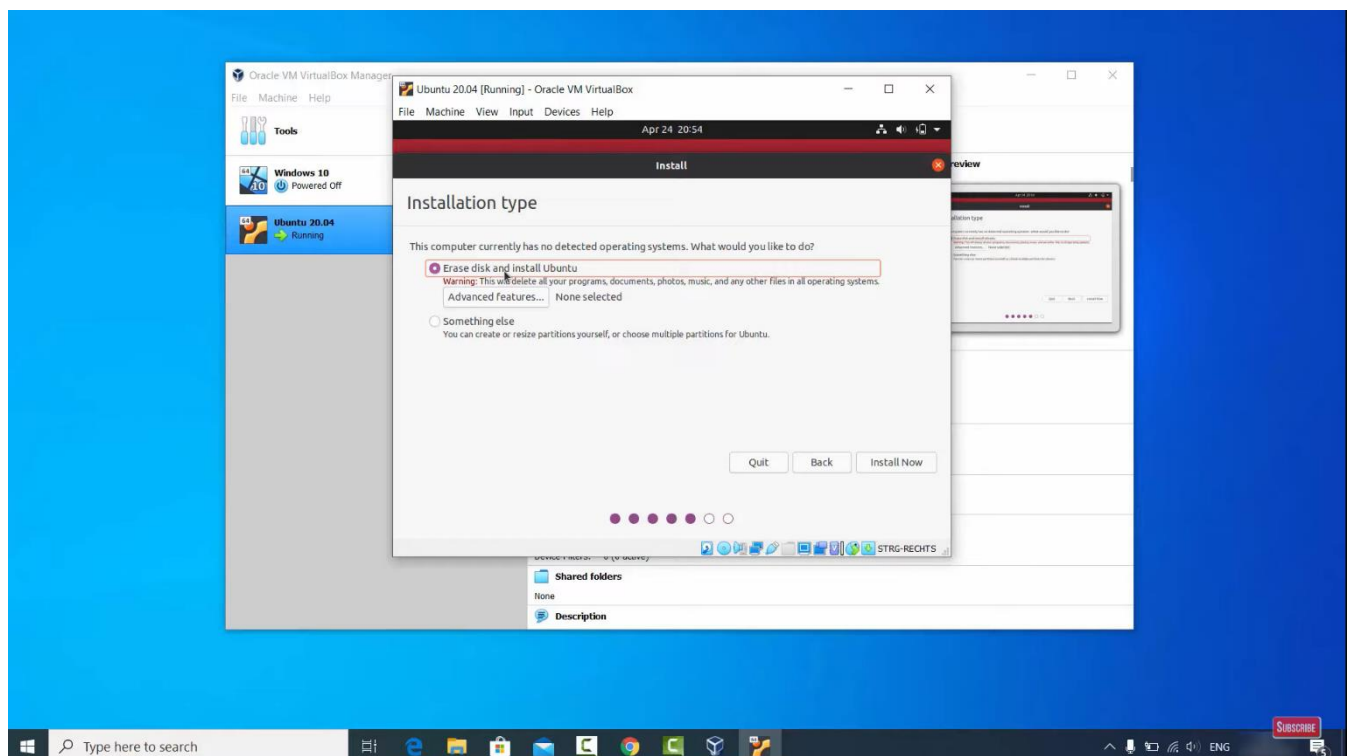
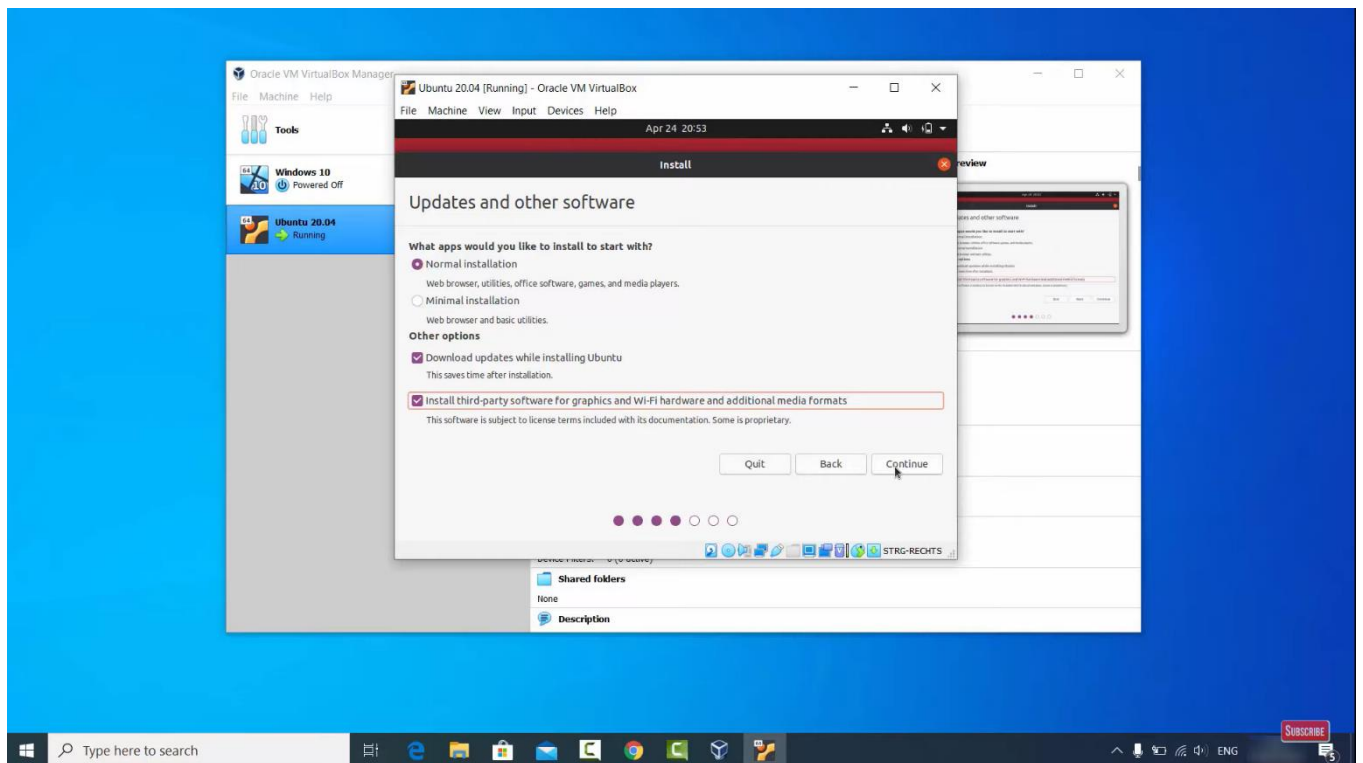


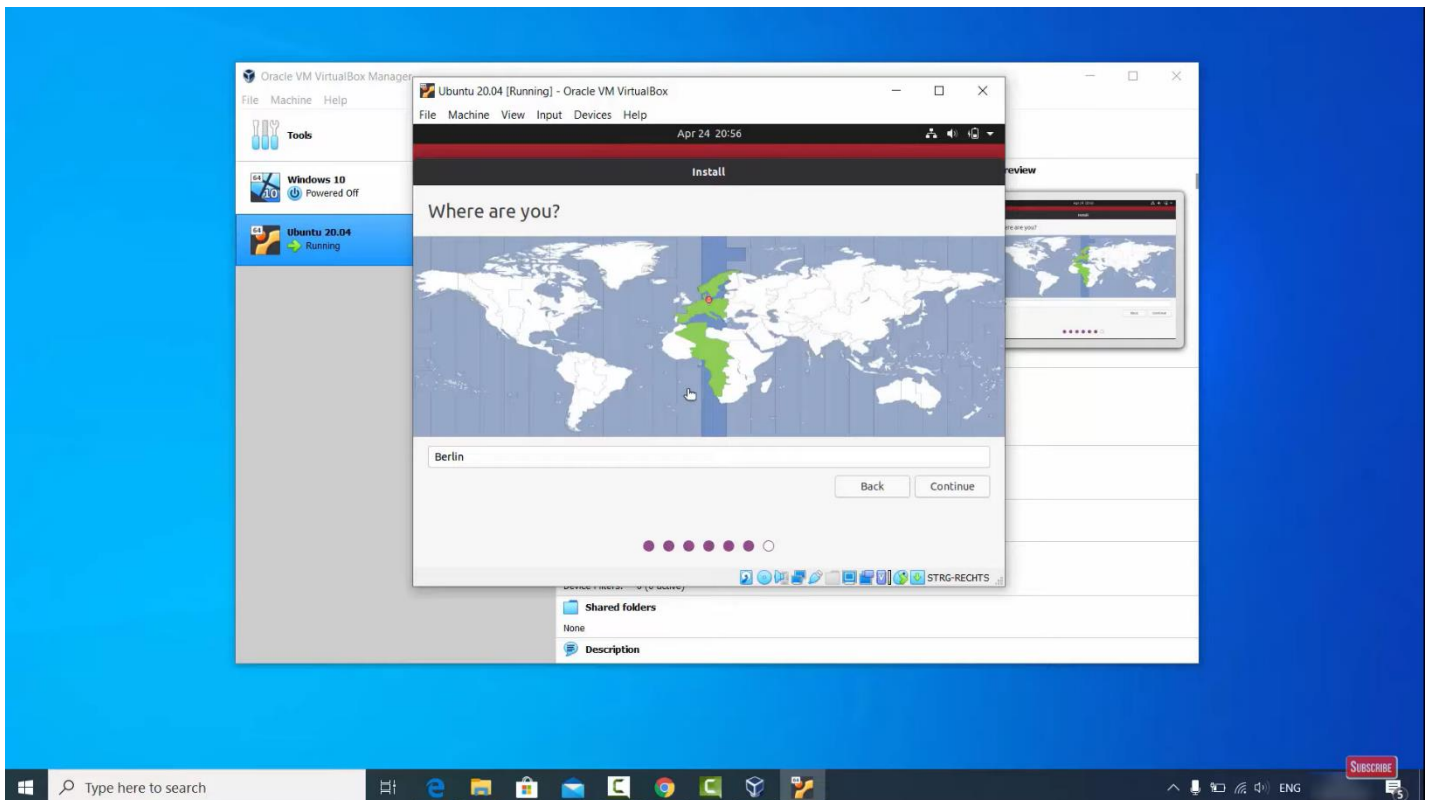
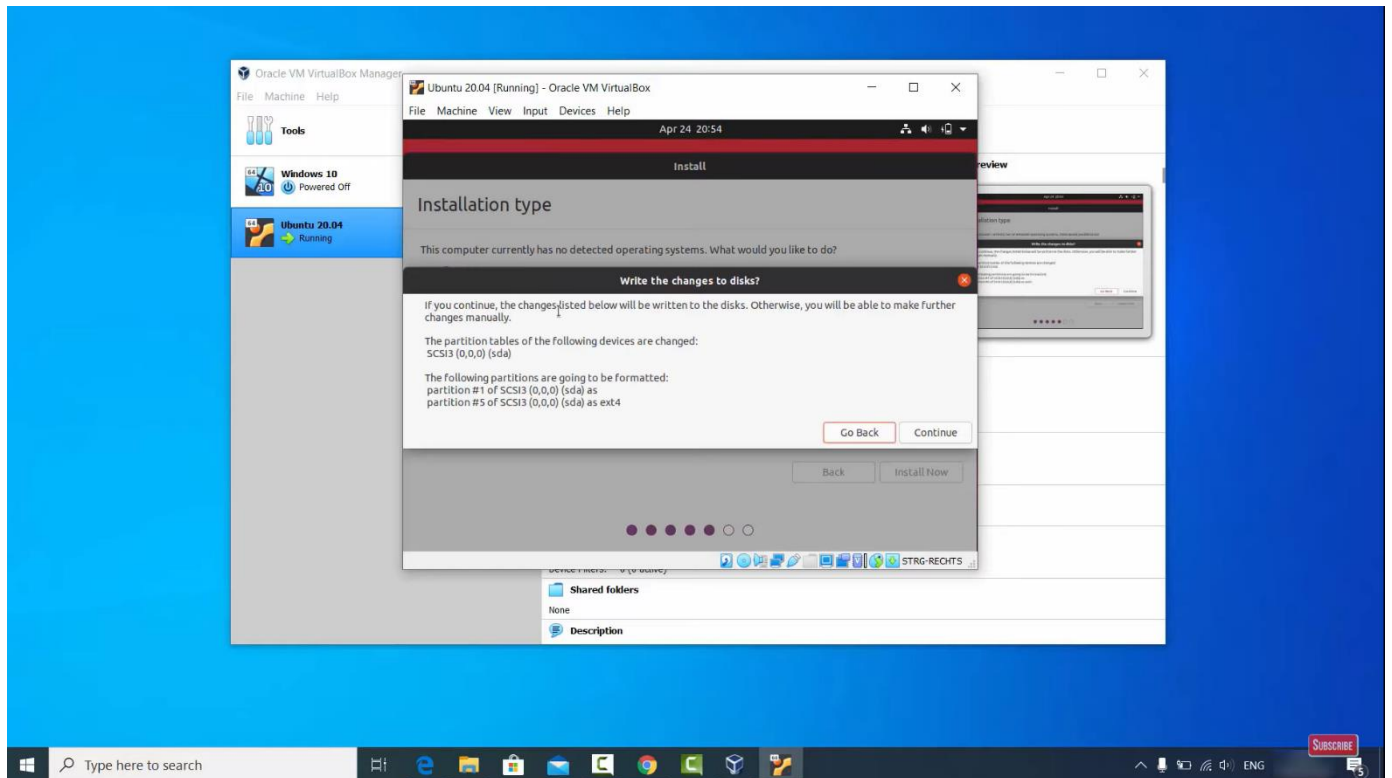
g. Now click on Ubuntu from the left bar and click “Start” from the top. The next many steps for installing Ubuntu depends on your preferences and your devise.

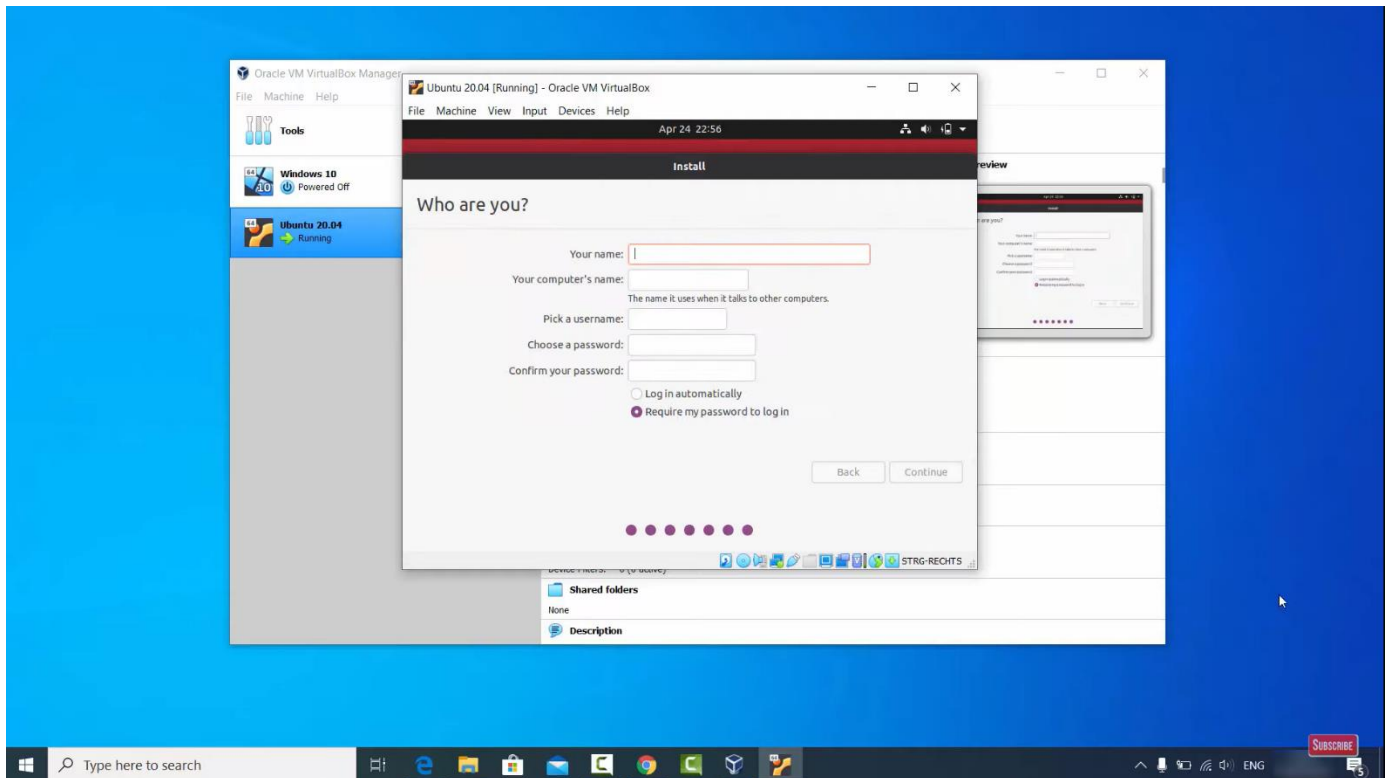
ز. الان اضغط على Ubuntu من اللوحة على اليسار ثم اضغط على "Start" من الأعلى. الخطوات التالية لتثبيت Ubuntu تعتمد على تفضيلاتك وعلى جهازك.





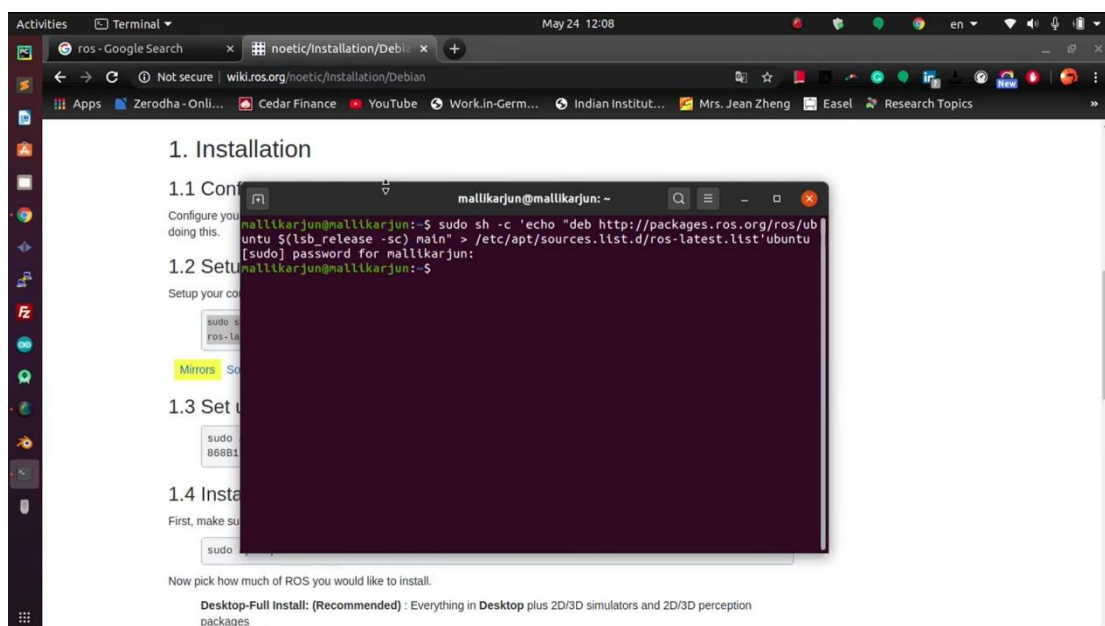






h. For downloading ROS Noetic on your VirtualBox, go to <http://wiki.ros.org/noetic/Installation/Ubuntu>, and from your terminal copy and paste the first command configure your Ubuntu repositories and enter your password and press "Enter".

ج. لتنزيل ROS Noetic على VirtualBox، اذهب الى <http://wiki.ros.org/noetic/Installation/Ubuntu> ثم انسخ سطر البرمجة الأول لتهيئة مستودع Ubuntu وادخل كلمة المرور ثم اضغط "Enter".



I. Follow the website instructions to completely download Desktop-full ROS and wait till it is done, then copy the commands to set the environment.

ط. اتباع تعليمات الموقع لتحميل ROS نسخة سطح المكتب الكاملة وانتظر حتى انتهاء التحميل ثم أعد البيئة المناسبة بنسخ الكود تحت "Environment setup"

wiki.ros.org/noetic/Installation/Ubuntu | غير آمن

Mirrors Source Debs are also available

1.3 Set up your keys

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

If you experience issues connecting to the keyserver, you can try substituting `hkp://pgp.mit.edu:80` or `hkp://keyserver.ubuntu.com:80` in the previous command.

Alternatively, you can use `curl` instead of the `apt-key` command, which can be helpful if you are behind a proxy server:

```
curl -sSL 'http://keyserver.ubuntu.com/pks/lookup?op=get&search=0xC1CF6E31E6BADE8868B172B4F42ED6FBAB17C654' | sudo apt-key add -
```

1.4 Installation

First, make sure your Debian package index is up-to-date:

```
sudo apt update
```

Now pick how much of ROS you would like to install.

Desktop-Full Install: (Recommended) : Everything in **Desktop** plus 2D/3D simulators and 2D/3D perception packages

```
sudo apt install ros-noetic-desktop-full
```

or [click here](#)

j. Finally you can check your ROS version by typing "rosversion -d" in the terminal

ي. واخيراً بأمكنك التأكد من نسختك المحملة بكتابة "rosversion -d" في الترمينال.

How to Install ROS Noetic Ninjemys on Ubuntu OS 20.04 LTS Focal Fossa #01

1.5 Environment setup

You must source this script in every `bash` terminal you use ROS in.

```
source /opt/ros/noetic/setup.bash
```

It can be convenient to add this line to your `~/.bashrc` file so that you don't have to type it every time you open a terminal.

Bash

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

zsh

```
echo "source /opt/ros/noetic/setup.zsh" >> ~/.zshrc
```

2. Tutorial

Now, to test your installation, open a terminal and type:

```
rosversion -d
```

Output: `noetic`

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References:

- [1] RedHat, "What is a virtual machine", Internet:
<https://www.redhat.com/en/topics/virtualization/what-is-a-virtual-machine>, 2020
[accessed: 18, Jun. 2020].
- [2] VirtualBox and Ubuntu 20.04 downloading
<https://www.youtube.com/watch?v=x5MhydijWmc>
- [3] ROS downloading
<https://www.youtube.com/watch?v=w4ekgzYG0bM>