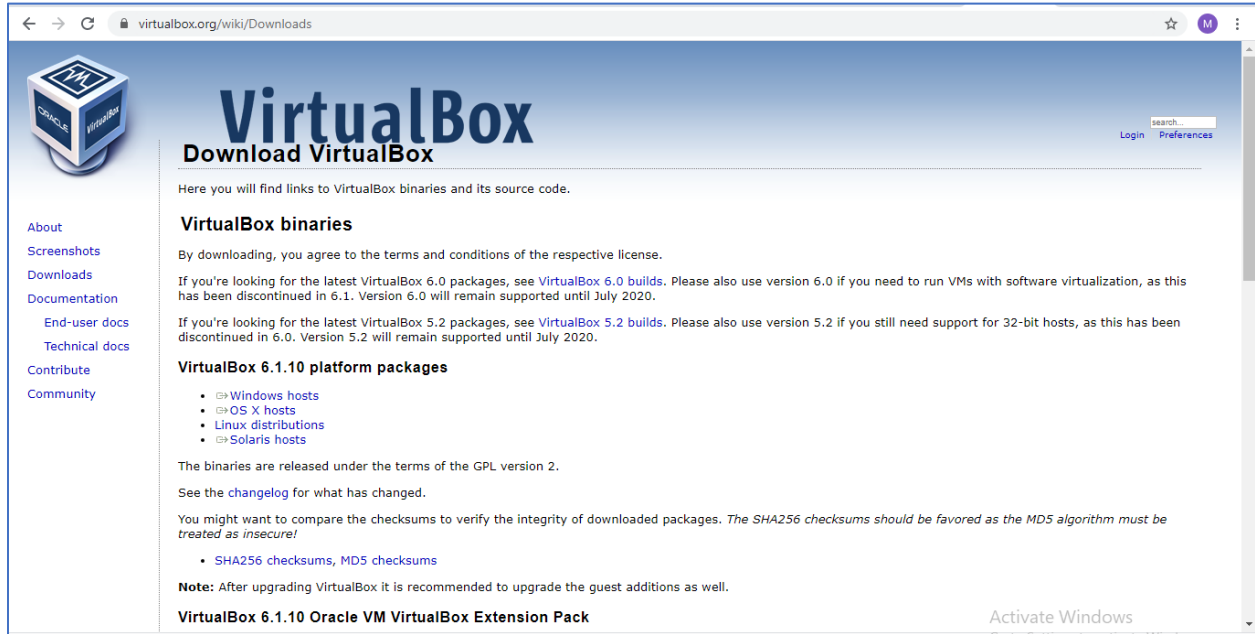


كيفية تحميل نظام Ubuntu How to install Ubuntu OS

1. نبدأ بتحميل Virtual Box ثم تثبيته.

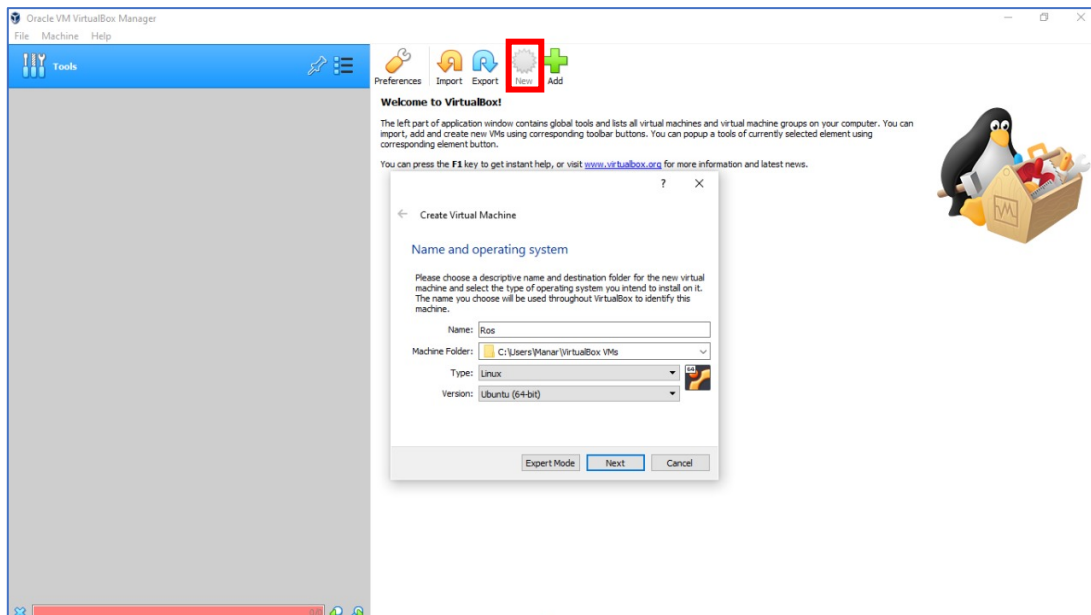
1. Download Virtual Box then install it.

رابط التحميل / Download link: <https://www.virtualbox.org/wiki/Downloads>



2. انقر على New ثم قم بكتابة Name واختر Type: Linux و Version: ubuntu في الاخير انقر على Next.

2. Click on New then write the Name and choose Type: Linux and Version: ubuntu after that click on Next.



?

×

←

Create Virtual Machine

Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **1024 MB**.

4 MB8192 MB

1024

MB

Next

Cancel

?

×

←

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

Empty

▼

📁

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)

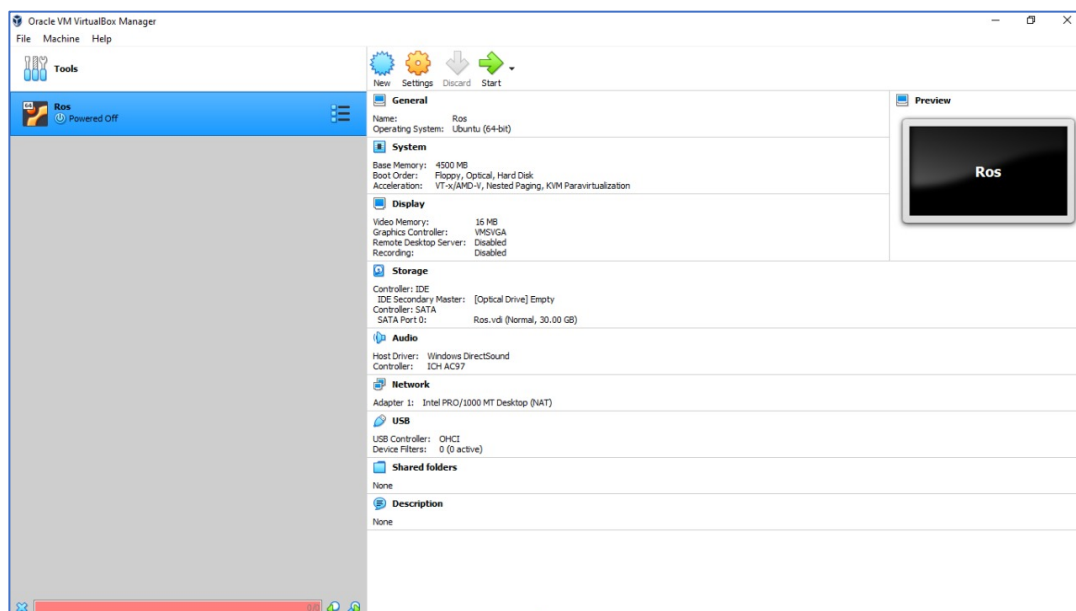
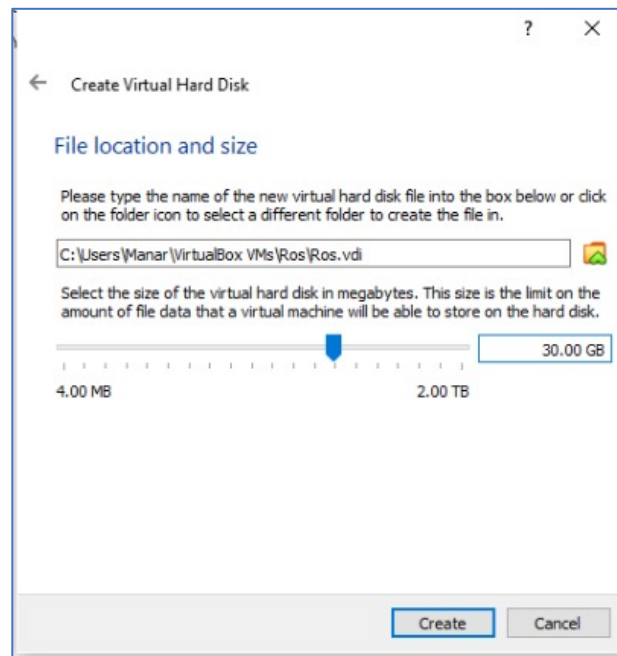
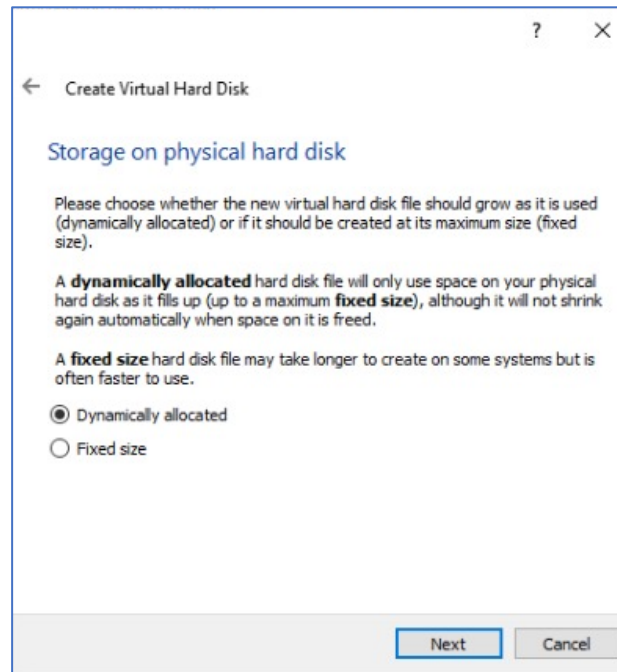
☐ VHD (Virtual Hard Disk)

☐ VMDK (Virtual Machine Disk)

Expert Mode

Next

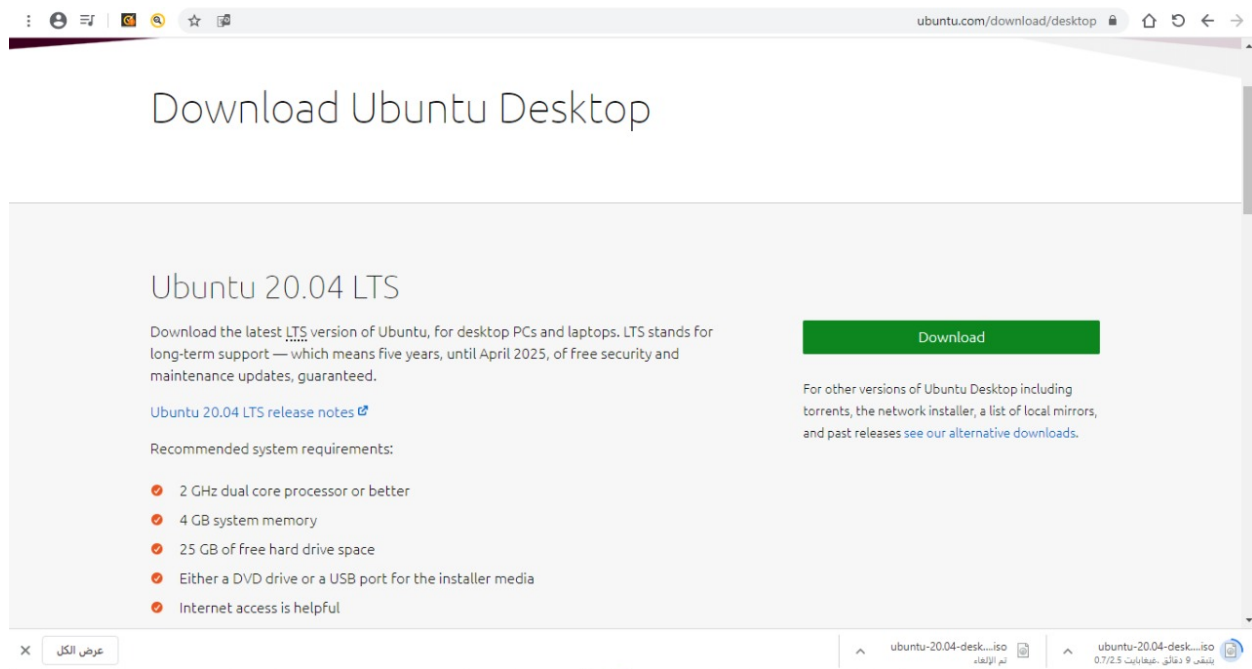
Cancel



3. الآن نبدأ بتحميل Ubuntu

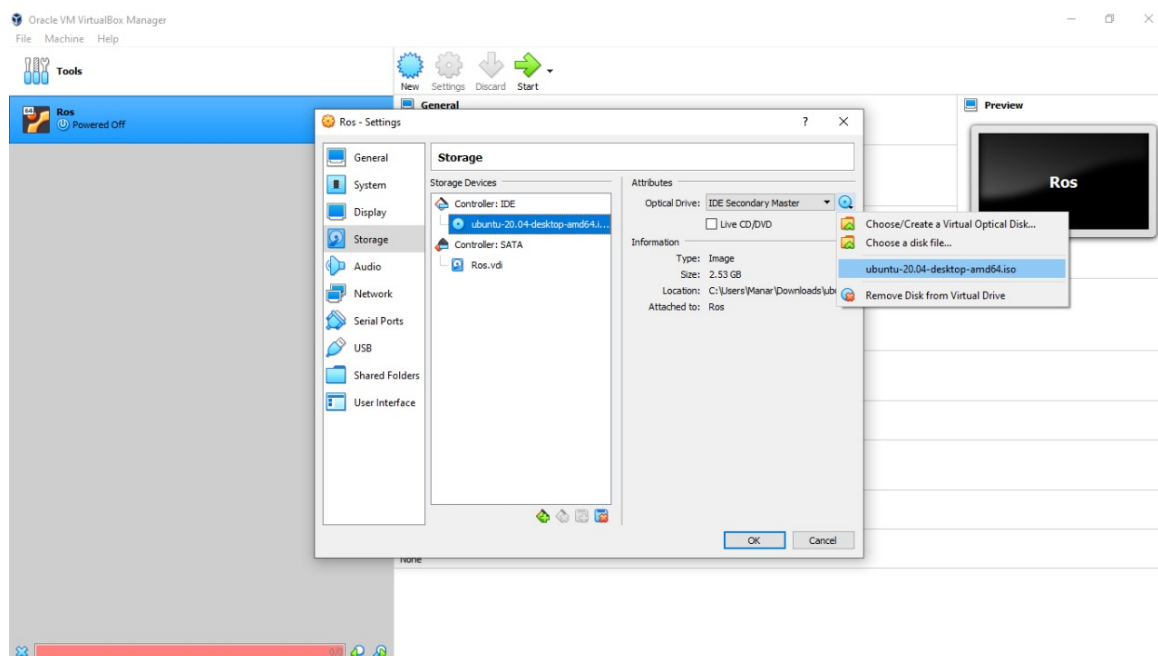
3. Now download Ubuntu

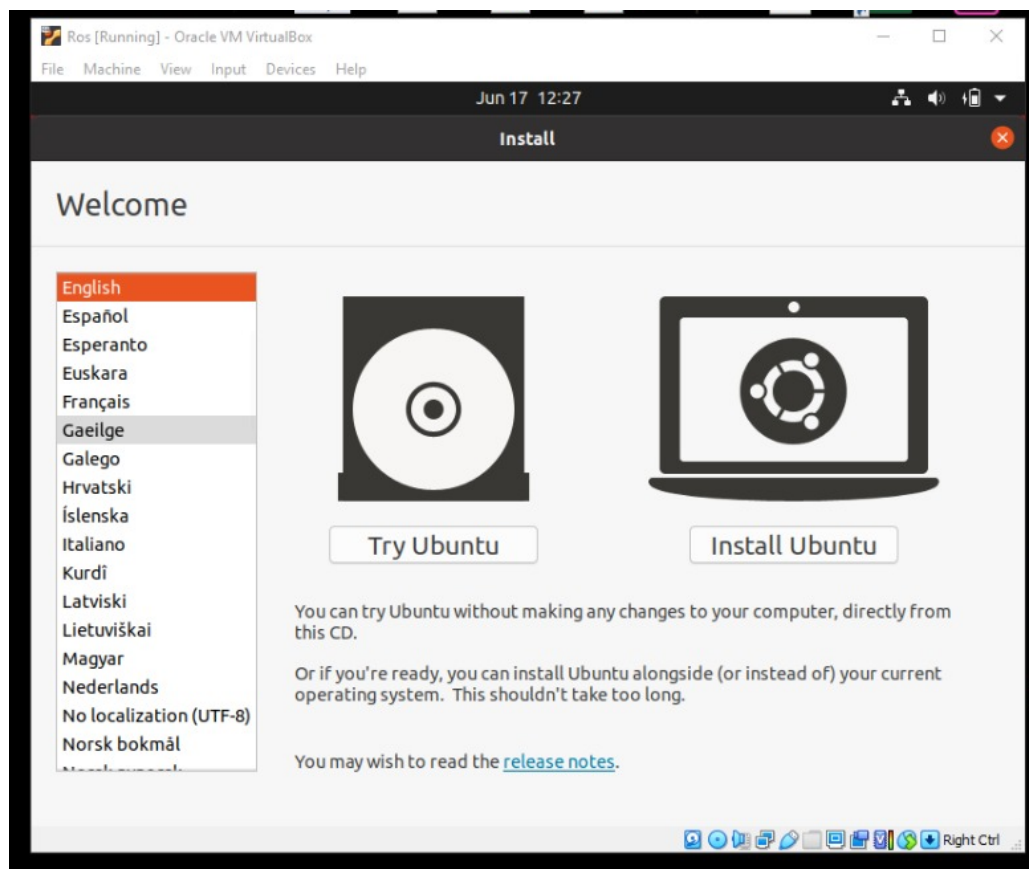
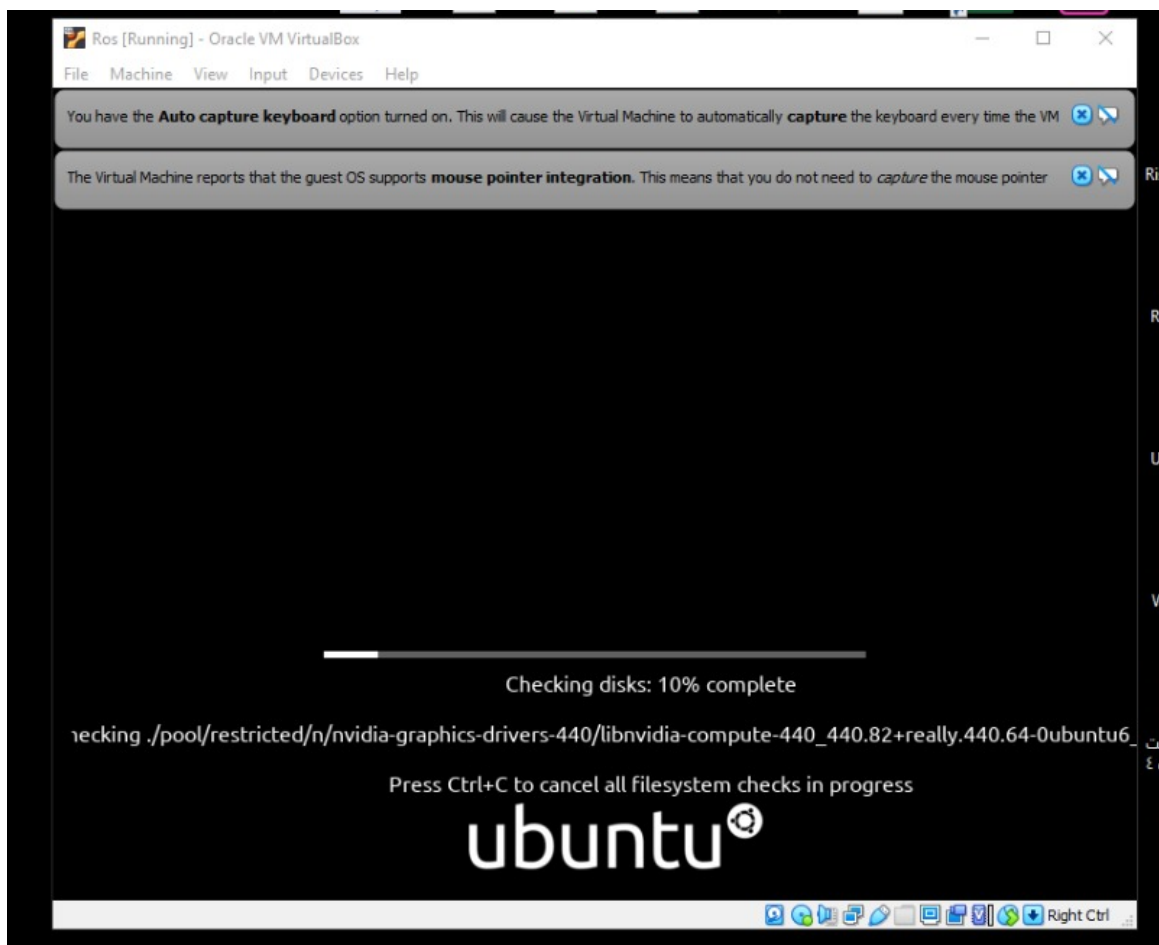
رابط التحميل / Download link : <https://ubuntu.com/download/desktop>

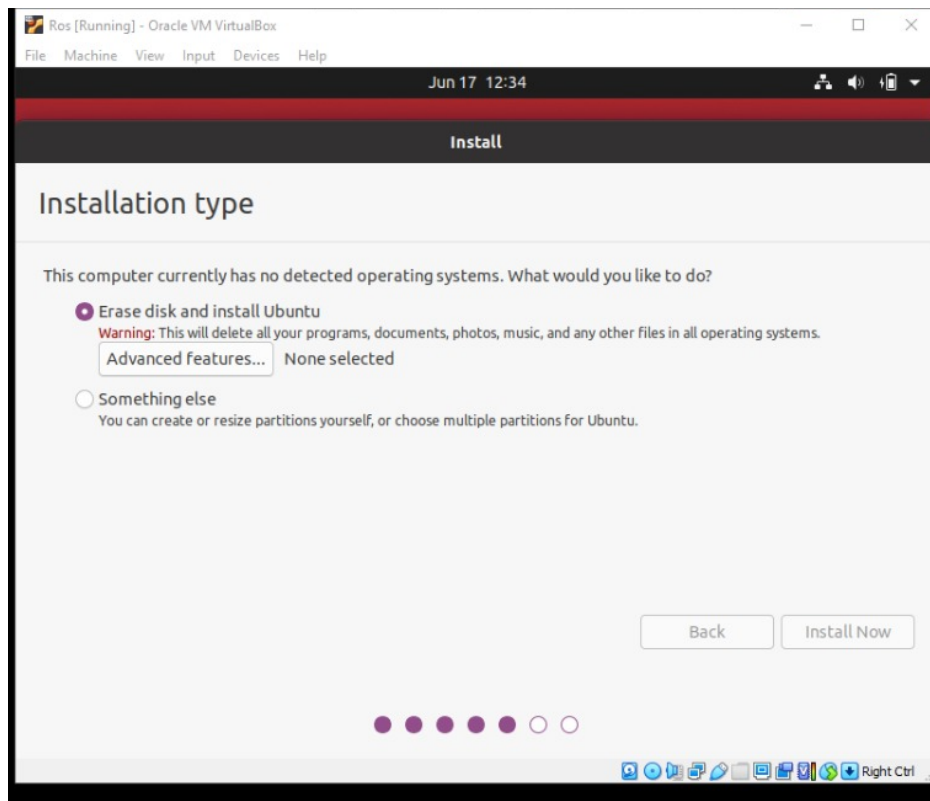
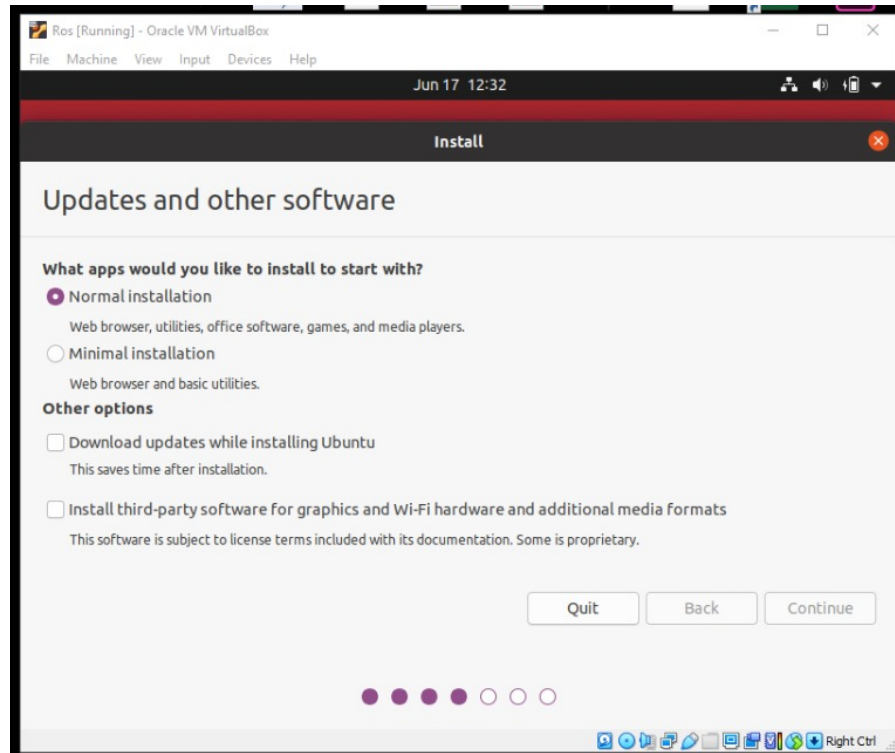


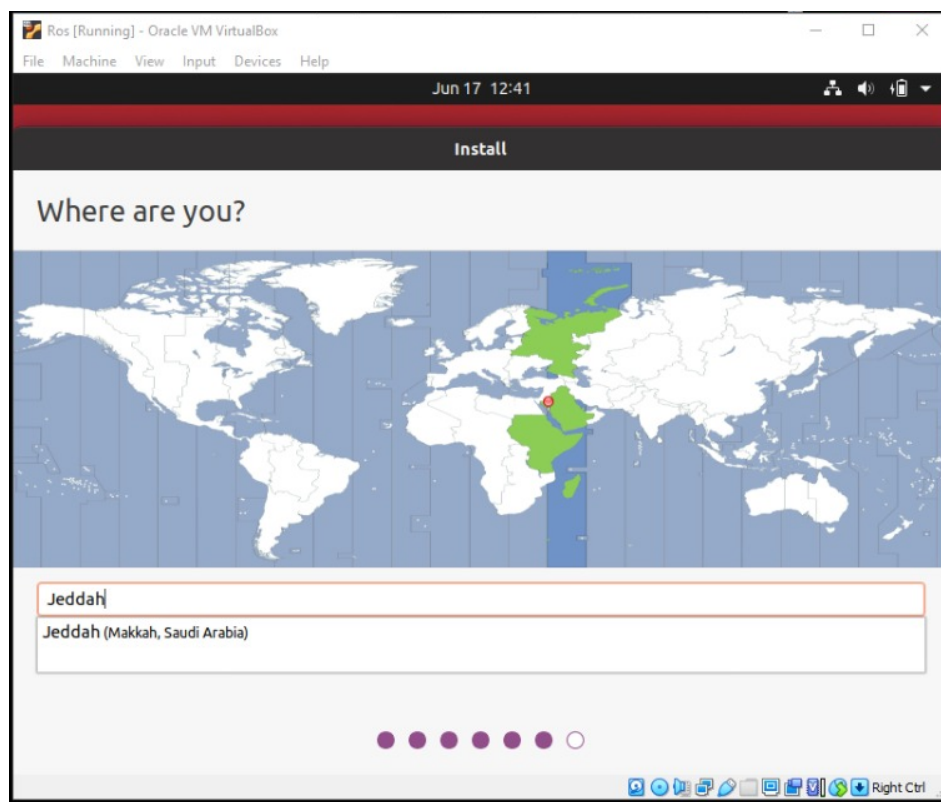
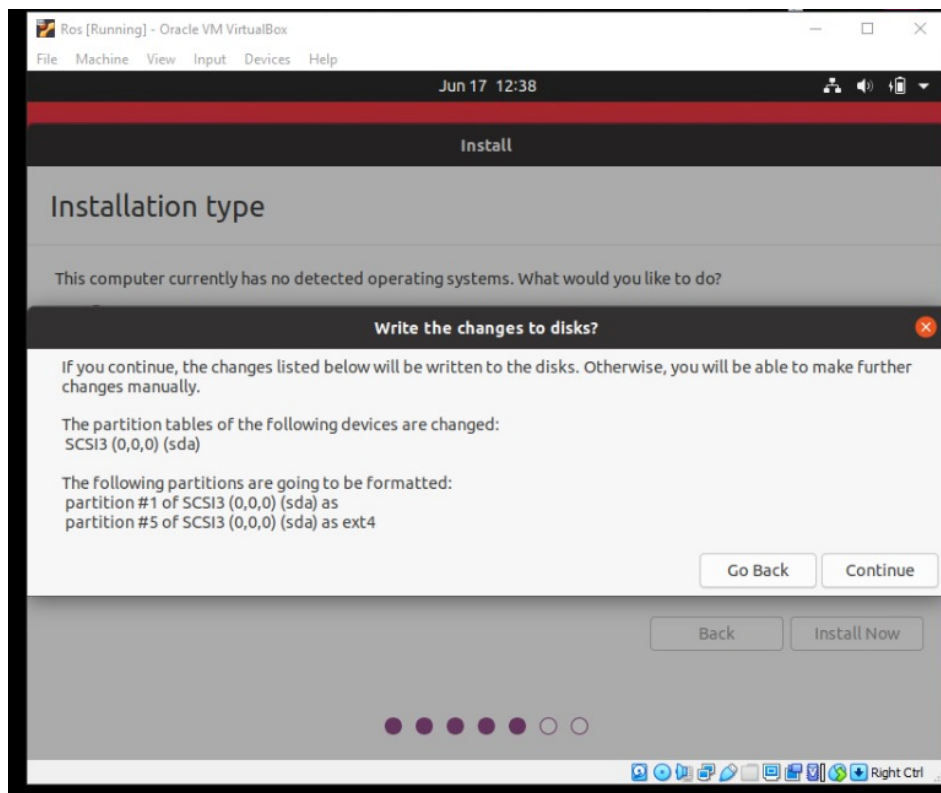
3. بعد الانتهاء من تحميل Ubuntu. انقر على Setting ثم Storage ثم اختر Ubuntu في حال لم يكن ظاهر لك فقم باختياره من Choose a disk file

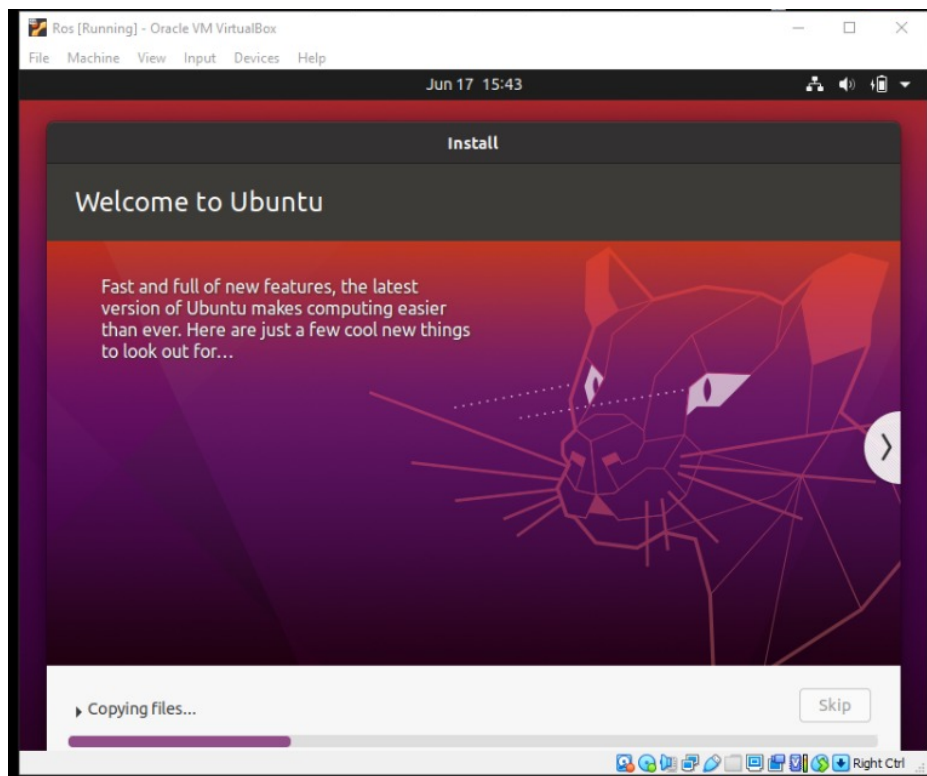
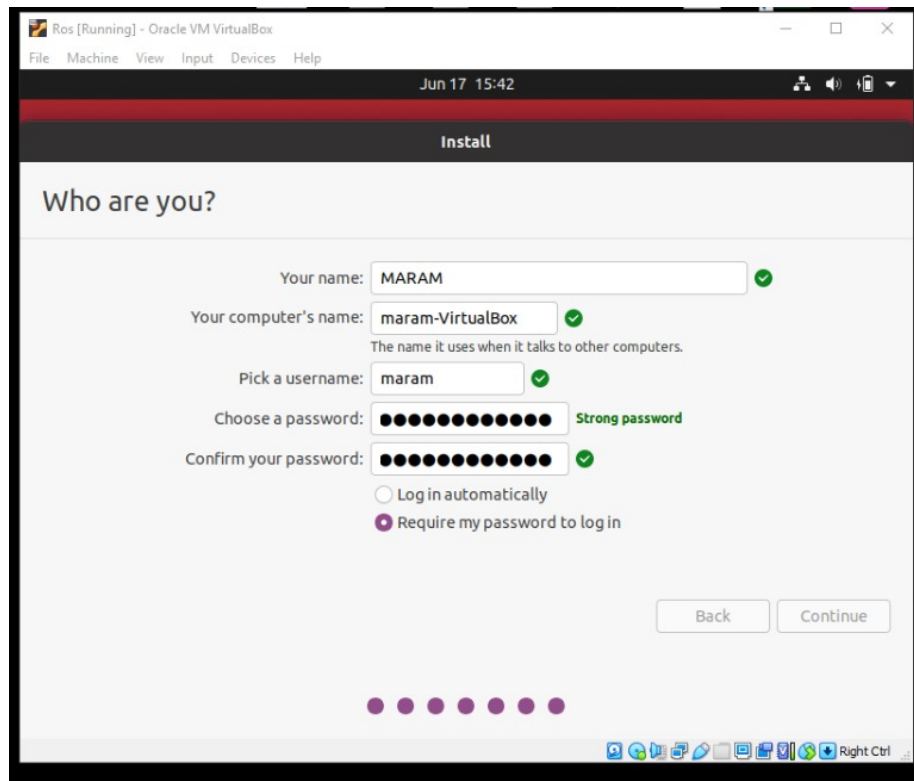
4. After completing the download of Ubuntu. Click on Setting then Storage then choose Ubuntu, if it is not apparent to you click on Choose a disk file

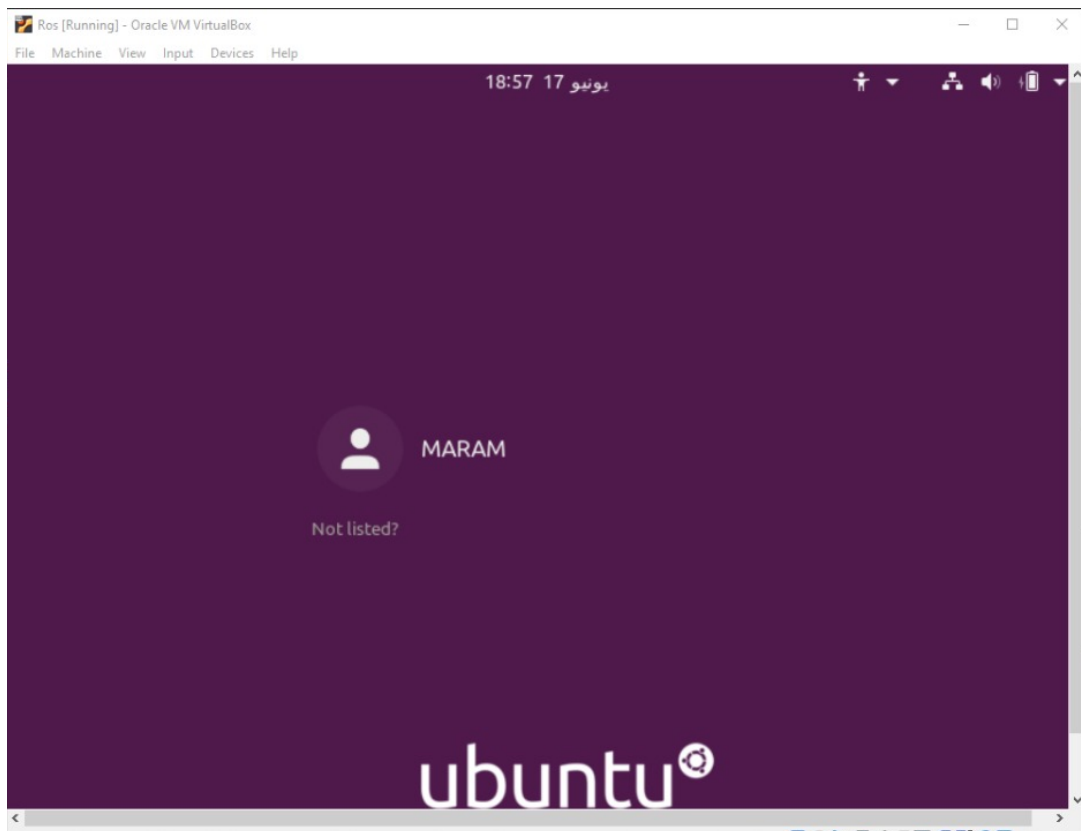
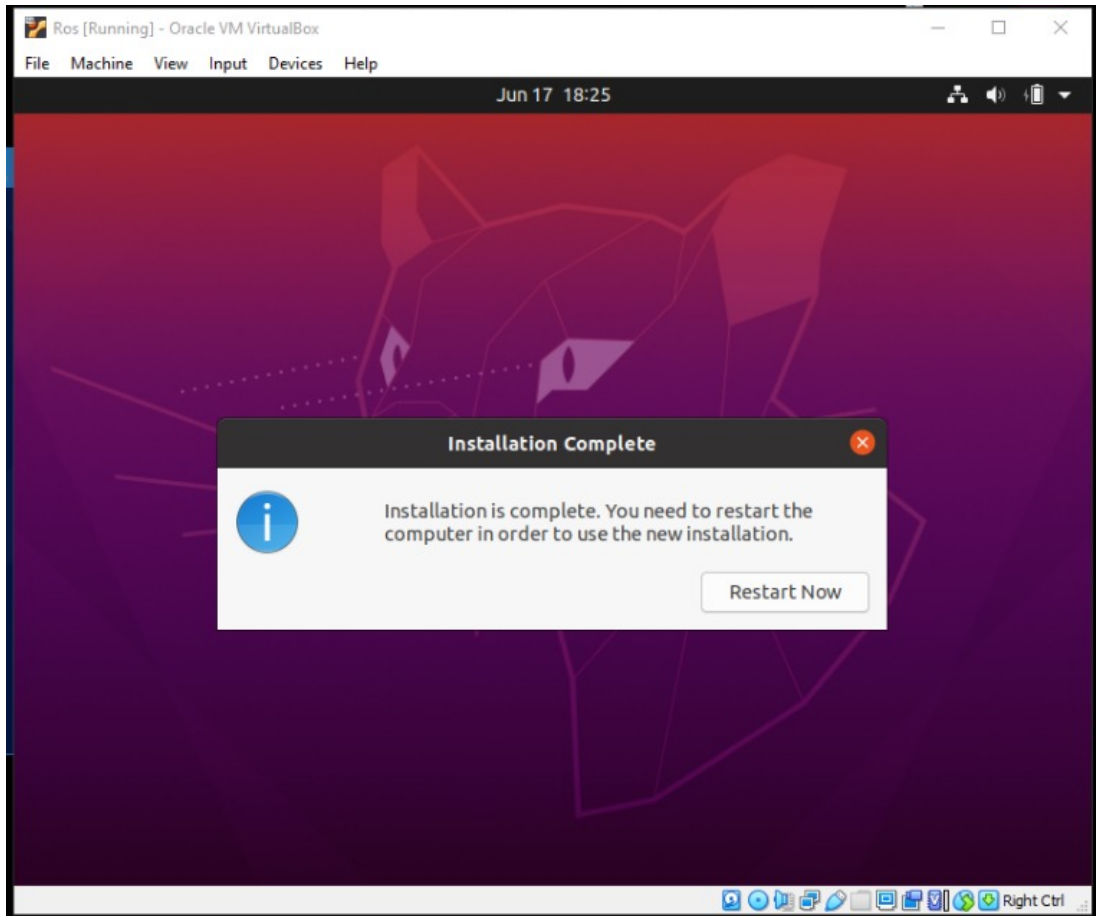












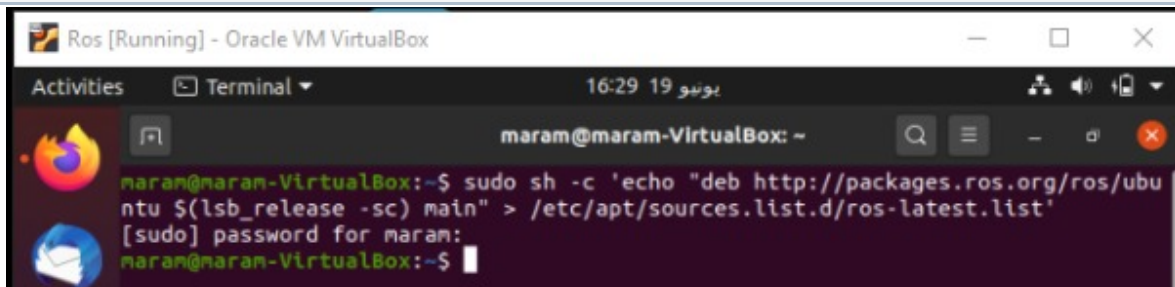
كيفية تحميل نظام ROS على نظام Ubuntu

How to install ROS on Ubuntu OS

- 1- Open Terminal then write the command for Set-up your computer to accept software from packages.ros.org.

١- قم بفتح Terminal ثم قم بكتابة أمر إعداد الكمبيوتر لقبول البرامج.

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

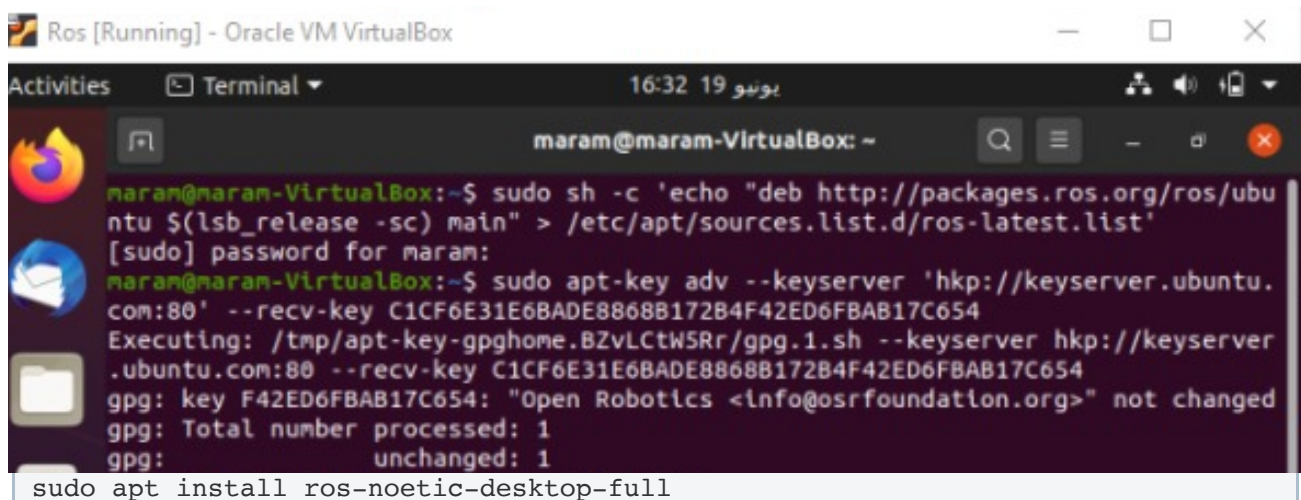


The screenshot shows a terminal window titled 'Ros [Running] - Oracle VM VirtualBox'. The terminal prompt is 'maram@maram-VirtualBox: ~'. The user has entered the command: `sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'`. The terminal shows the password prompt '[sudo] password for maram:' and the command has been executed successfully, returning to the prompt 'maram@maram-VirtualBox:~\$'.

- 2- Set up your keys

٢- قم بكتابة الأوامر التالية لبداية التحميل

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



The screenshot shows a terminal window titled 'Ros [Running] - Oracle VM VirtualBox'. The terminal prompt is 'maram@maram-VirtualBox: ~'. The user has entered the command: `sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'`. The terminal shows the password prompt '[sudo] password for maram:'. The user has then entered the command: `sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654`. The terminal shows the output: `Executing: /tmp/apt-key-gpghome.BZvLctW5Rr/gpg.1.sh --keyserver hkp://keyserver.ubuntu.com:80 --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654`. The terminal shows the output: `gpg: key F42ED6FBAB17C654: "Open Robotics <info@osrfoundation.org>" not changed`. The terminal shows the output: `gpg: Total number processed: 1`. The terminal shows the output: `gpg: unchanged: 1`. The user has then entered the command: `sudo apt-get update`. The terminal shows the output: `sudo apt install ros-noetic-desktop-full`.


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

4- The last step: Create ROS packages

٤- الخطوة الأخيرة: إنشاء ملفات ROS

```
cd Documents/
mkdir wallE_ws
cd wallE_ws/
mkdir src
cd src/
catkin_init_workspace
ls
cd ..
ls
catkin_make
ls
ls build/
ls devel/
ls src/
cd src/
catkin_create_pkg rebot_tutorials rospy roscpp std_msgs
ls
ls rebot_tutorials/
cd ..
catkin_make
```

A terminal window screenshot showing the execution of ROS package creation commands. The user is in a virtual machine named 'maram-VirtualBox'. The commands executed are: source /opt/ros/noetic/setup.bash, echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc, source ~/.bashrc, echo "source /opt/ros/noetic/setup.zsh" >> ~/.zshrc, source ~/.zshrc, cd Documents/, mkdir wallE_ws, cd wallE_ws/, mkdir src, cd src/, catkin_init_workspace, ls, cd .., ls, catkin_make, ls, ls build/, ls devel/, ls src/, cd src/, catkin_create_pkg rebot_tutorials rospy roscpp std_msgs, ls, ls rebot_tutorials/, cd .., catkin_make. The output shows the creation of a symlink for CMakeLists.txt and the successful execution of catkin_make.

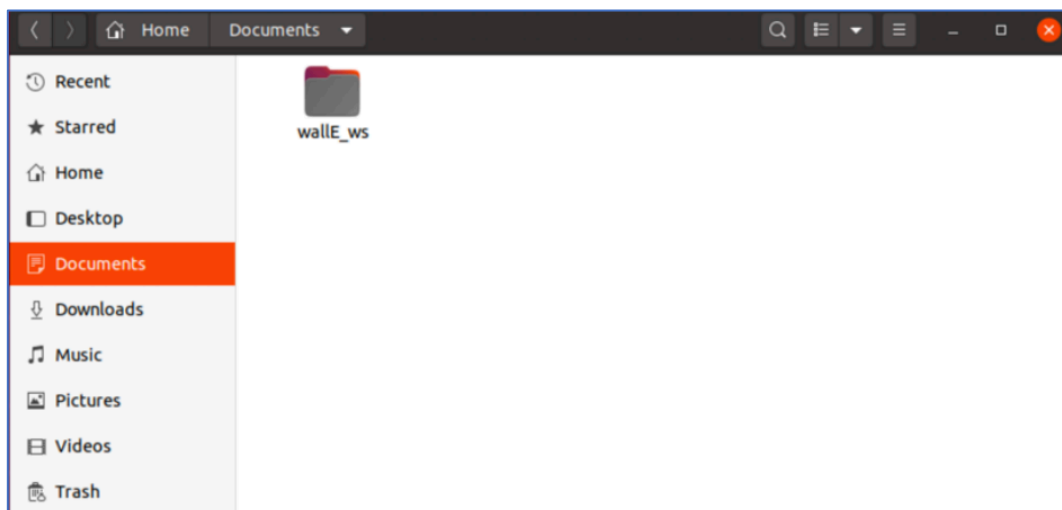
```
maram@maram-VirtualBox:~$ source /opt/ros/noetic/setup.bash
maram@maram-VirtualBox:~$ echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
maram@maram-VirtualBox:~$ source ~/.bashrc
maram@maram-VirtualBox:~$ echo "source /opt/ros/noetic/setup.zsh" >> ~/.zshrc
maram@maram-VirtualBox:~$ source ~/.zshrc
bash: cd: -q: invalid option
cd: usage: cd [-L|[-P [-e]] [-@]] [dir]
emulate: command not found
maram@maram-VirtualBox:~$ cd Documents/
maram@maram-VirtualBox:~/Documents$ mkdir wallE_ws
maram@maram-VirtualBox:~/Documents$ cd wallE_ws/
maram@maram-VirtualBox:~/Documents/wallE_ws$ mkdir src
maram@maram-VirtualBox:~/Documents/wallE_ws$ cd src/
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ catkin_init_workspace
Creating symlink "/home/maram/Documents/wallE_ws/src/CMakeLists.txt" pointing to
"/opt/ros/noetic/share/catkin/cmake/toplevel.cmake"
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ ls
CMakeLists.txt
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ cd ..
maram@maram-VirtualBox:~/Documents/wallE_ws$ ls
src
maram@maram-VirtualBox:~/Documents/wallE_ws$ catkin_make
```

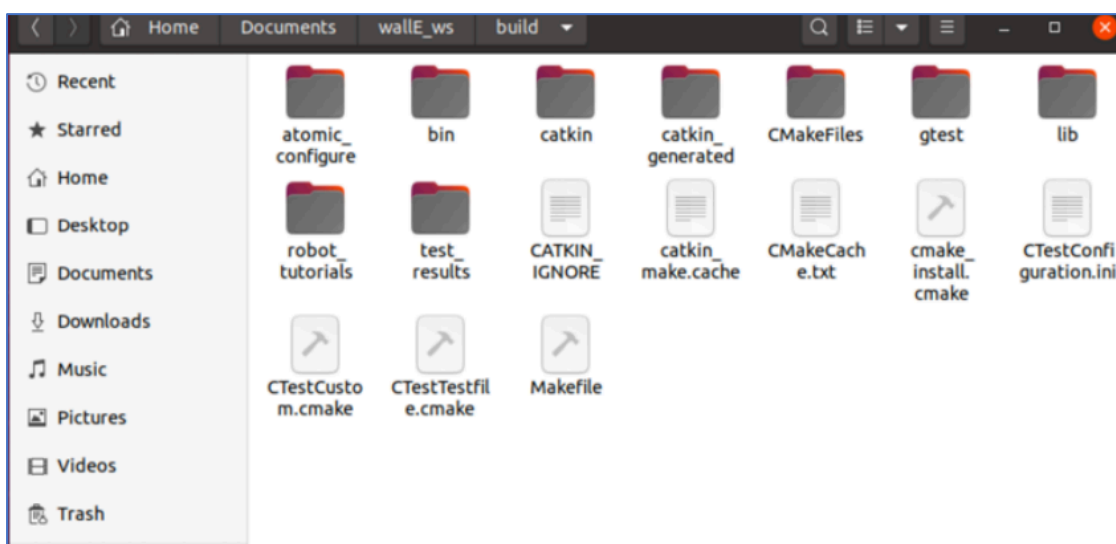
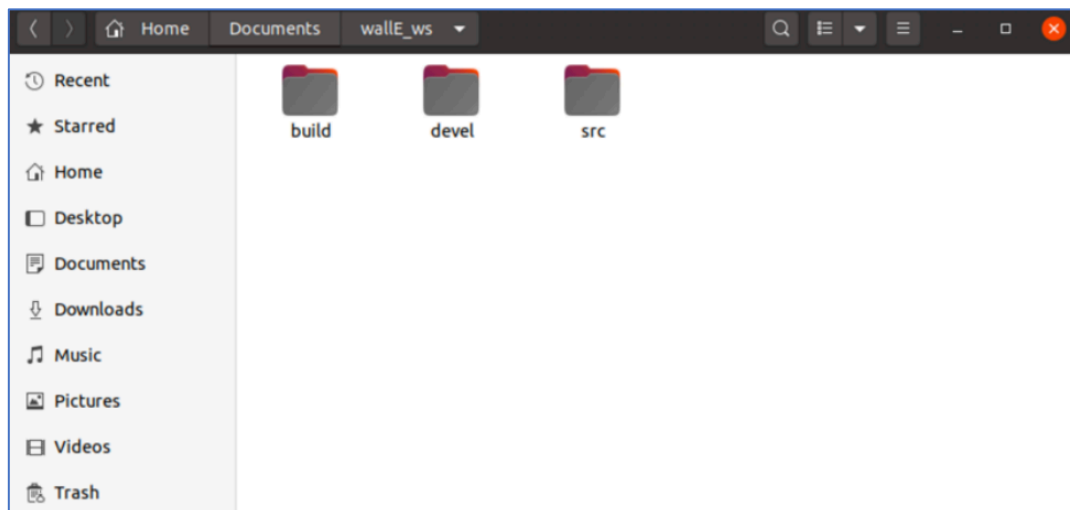
```
#### Running command: "make -j1 -l1" in "/home/maram/Documents/wallE_ws/build"
####
maram@maram-VirtualBox:~/Documents/wallE_ws$ ls
build devel src
maram@maram-VirtualBox:~/Documents/wallE_ws$ ls build/
atomic_configure  CATKIN_IGNORE  cmake_install.cmake  gtest
bin               catkin_make.cache  CTestConfiguration.ini  lib
catkin            CMakeCache.txt   CTestCustom.cmake      Makefile
catkin_generated  CMakeFiles       CTestTestfile.cmake    test_results
maram@maram-VirtualBox:~/Documents/wallE_ws$ ls devel/
cmake.lock  lib          local_setup.sh  setup.bash  _setup_util.py
env.sh      local_setup.bash  local_setup.zsh  setup.sh    setup.zsh
maram@maram-VirtualBox:~/Documents/wallE_ws$ ls src/
CMakeLists.txt
maram@maram-VirtualBox:~/Documents/wallE_ws$ cd src/
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ catkin_create_pkg rebot_tutorial
als rospy roscpp std_msgs
Created file rebot_tutorials/package.xml
Created file rebot_tutorials/CMakeLists.txt
Created folder rebot_tutorials/include/rebot_tutorials
Created folder rebot_tutorials/src
Successfully created files in /home/maram/Documents/wallE_ws/src/rebot_tutorial
s. Please adjust the values in package.xml.
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ ls
CMakeLists.txt  rebot_tutorials
maram@maram-VirtualBox:~/Documents/wallE_ws/src$
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ ls rebot_tutorials/
CMakeLists.txt  include  package.xml  src
maram@maram-VirtualBox:~/Documents/wallE_ws/src$
```

```
als rospy roscpp std_msgs
Created file rebot_tutorials/package.xml
Created file rebot_tutorials/CMakeLists.txt
Created folder rebot_tutorials/include/rebot_tutorials
Created folder rebot_tutorials/src
Successfully created files in /home/maram/Documents/wallE_ws/src/rebot_tutorial
s. Please adjust the values in package.xml.
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ ls
CMakeLists.txt  rebot_tutorials
maram@maram-VirtualBox:~/Documents/wallE_ws/src$
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ ls rebot_tutorials/
CMakeLists.txt  include  package.xml  src
maram@maram-VirtualBox:~/Documents/wallE_ws/src$ cd ..
maram@maram-VirtualBox:~/Documents/wallE_ws$ catkin_make
Base path: /home/maram/Documents/wallE_ws
Source space: /home/maram/Documents/wallE_ws/src
Build space: /home/maram/Documents/wallE_ws/build
Devel space: /home/maram/Documents/wallE_ws/devel
Install space: /home/maram/Documents/wallE_ws/install
####
#### Running command: "cmake /home/maram/Documents/wallE_ws/src -DCATKIN_DEVEL_
PREFIX=/home/maram/Documents/wallE_ws/devel -DCMAKE_INSTALL_PREFIX=/home/maram/
Documents/wallE_ws/install -G Unix Makefiles" in "/home/maram/Documents/wallE_w
s/build"
####
CMake Warning (dev) in CMakeLists.txt:
No project() command is present. The top-level CMakeLists.txt file must
contain a literal, direct call to the project() command. Add a line of
code such as
```

هكذا نكون قد انتهينا من انشاء Catkin init workspace

سنجد جميع الملفات الخاصة بالنظام بداخل Documents / wallE_ws





Done by: Manar Alsofiani