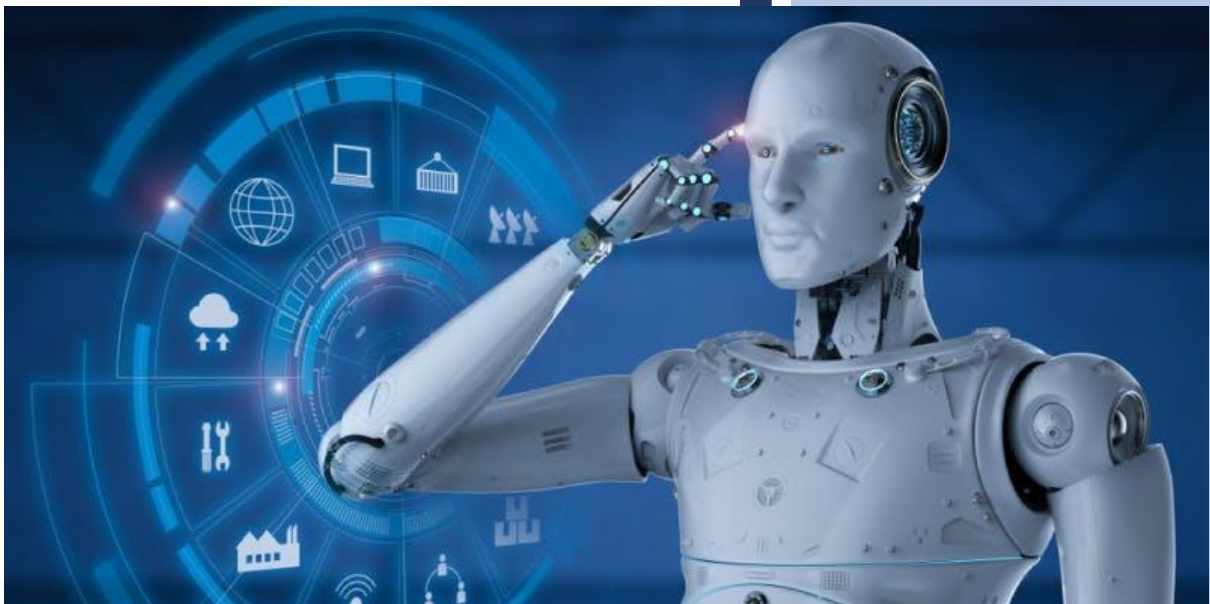


2020

ROS Installation Tutorial



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SMART METHODS

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What is ROS?

ROS stands for (Robot Operating System). It is known as a Robot Application Development Platform. It is an open-source meta-OS (Operating System) for your Robot. It provides hardware abstraction, low-level control, and message passing between the devices and its network. ROS supports Python, C++, Lisp, and other languages.

ROS is all you need to transition from a hobbyist to a professional developer in the robotics domain! It is a [free open-source](#).

ROS has many distributions. Some of them are:

1. ROS Noetic Ninjemys
2. ROS Melodic Morenia
3. ROS Lunar Loggerhead
4. ROS Kinetic Kame

In this tutorial [ROS Noetic](#) will be discussed because we are using [Ubuntu 20.04](#).

Steps for installing ROS in Ubuntu 20.04:

STEP 1: Install VirtualBox

You should install the [Linux based Ubuntu](#) operating system in your machine because ROS runs on the Linux based operating systems.

Even though ROS can be made to run on other Linux based operating systems, it works best with the Ubuntu because many of the core ROS functionalities depend on the packages hosted by Ubuntu distribution.

Install Virtual-Box to install the Linux based Ubuntu operating system using their website:

<https://www.virtualbox.org/wiki/Downloads>

STEP 2: Install Ubuntu

You can follow this tutorial to install Ubuntu : <https://2u.pw/XDeX0>

Make sure the Ubuntu version is [20.04](#).

STEP 3: Setting up Ubuntu

1. Open the Terminal on Ubuntu and run the following command:

```
sudo apt update
```

```
sana@sana-VirtualBox:~$ sudo apt update
```

- Next, run the following command, it may take a long time.

```
sudo apt upgrade
```

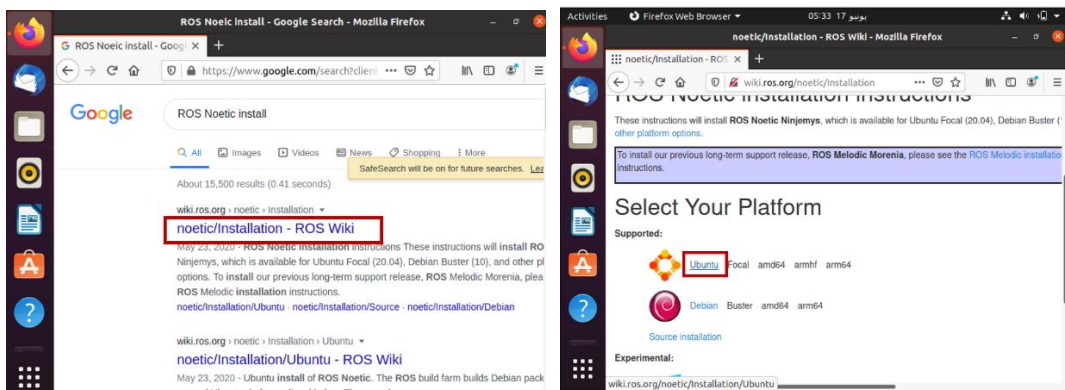
```
sana@sana-VirtualBox:~$  
sana@sana-VirtualBox:~$ sudo apt upgrade
```

It will ask if you want to continue? Type Y.

To avoid any errors remember to ensure that the VirtualBox on its latest version.

STEP 4: Install ROS

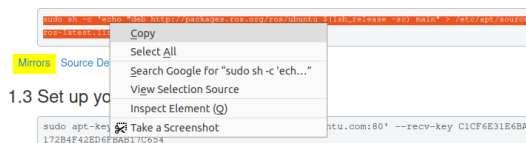
- Open the browser on your Ubuntu and type **“ROS Noetic Install”**. Open **ROS Wiki** website and choose Ubuntu.



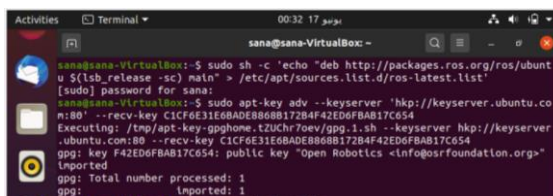
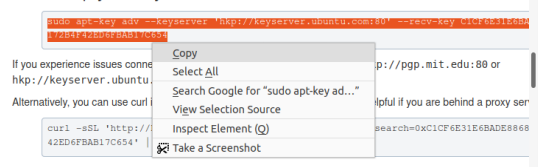
- Scroll down to the **“Set your sources.list”**. Copy that command and paste it in the Terminal. Do the same with the command under the **“Set up your key”**. Copy the command and paste it in the Terminal.

1.2 Setup your sources.list

Setup your computer to accept software from packages.ros.org.



1.3 Set up your keys



- Update the packages by running the following command on the Terminal

```
sudo apt-get update
```

```
gpg: Total number processed: 1  
gpg: Imported: 1  
sana@sana-VirtualBox:~$ sudo apt-get update
```

4. Go back to the browser and scroll down to the **“Installation”**.

[illegible]

STEP 5: Installation settings

1. Install python – rosdep using the following command:

```
sana@sana-VirtualBox:~$ sudo apt install python3-rosdep
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  python3-catkin-pkg python3-rosdep-modules python3-roscdistro
  python3-roscdistro-modules
The following NEW packages will be installed:
  python3-catkin-pkg python3-rosdep python3-rosdep-modules python3-roscdistro
  python3-roscdistro-modules
0 upgraded, 5 newly installed, 0 to remove and 0 not upgraded.
Need to get 95.0 kB of archives.
After this operation, 666 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://packages.ros.org/ros/ubuntu focal/main amd64 python3-catkin-pkg all 0.4.20-100 [3480 B]
Get:2 http://packages.ros.org/ros/ubuntu focal/main amd64 python3-roscdistro-modules all 0.8.2-1 [31.5 kB]
Get:3 http://packages.ros.org/ros/ubuntu focal/main amd64 python3-rosdep-modules all 0.8.2-100 [6232 B]
```

2. Initialize and update rosdep. Run the following commands in the Terminal:

rosdep update

STEP 6: Check ROS version

Run the following command to check the version of ROS, It should display (**noetic**):

```
rosversion -d
```

If it shows **<unknown>** you can fix this problem by following these two steps:

1. **Close** the Terminal. Open it again and retype the command. If it still shows **<unknown>** then you should move to the solution 2.
2. Type the following commands:

```
sudo -i
```

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

```
source ~/.bashrc
```

```
rosversion -d
```

```
sana@sana-VirtualBox:~$ sudo -i
[sudo] password for sana:
root@sana-VirtualBox:~# echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
r Thunderbird Mail alBox:~# source ~/.bashrc
root@sana-VirtualBox:~# rosversion -d
noetic
root@sana-VirtualBox:~# exit
logout
sana@sana-VirtualBox:~$
```

Congratulation! You successfully installed ROS in your machine

REFERENCES

- <https://www.virtualbox.org/wiki/Downloads>
- <https://2u.pw/XDeX0>
- <http://wiki.ros.org/noetic/Installation/Ubuntu>
- <http://wiki.ros.org/Distributions>
- <https://www.udemy.com/course/ros-basics-program-robots/learn/lecture/8892580#overview>