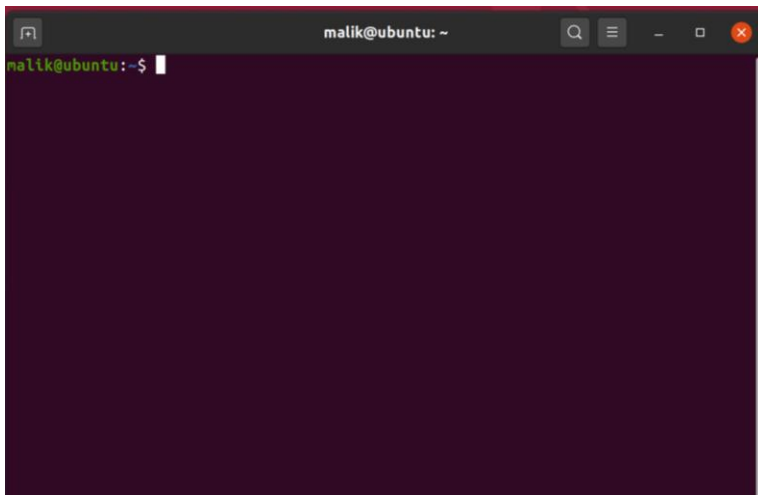


ROS installation steps on Ubuntu 20.4

Robot Operating System is robotics middleware. Although ROS is not an operating system, it provides services designed for a heterogeneous computer cluster such as hardware abstraction, low-level device control, implementation of commonly used functionality

Step 1 : open the terminal you can use the keyboard shortcut “CTRL+ALT+T”



Step 2 : Setup your sources.list Setup your computer 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'
```

Step 3 : Set up your keys

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

```
malik@ubuntu:~$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
[sudo] password for malik:
malik@ubuntu:~$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
Executing: /tmp/apt-key-gpghome.FmetL0CA0N/gpg.1.sh --keyserver hkp://keyserver.ubuntu.com:80 --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
gpg: key F42ED6FBAB17C654: "Open Robotics <info@osrfoundation.org>" not changed
gpg: Total number processed: 1
gpg: unchanged: 1
malik@ubuntu:~$
```

Step 4 : First, make sure your Debian package index is up-to-date by using this command to update

```
sudo apt update
```

Step 5: installing ROS

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

Y

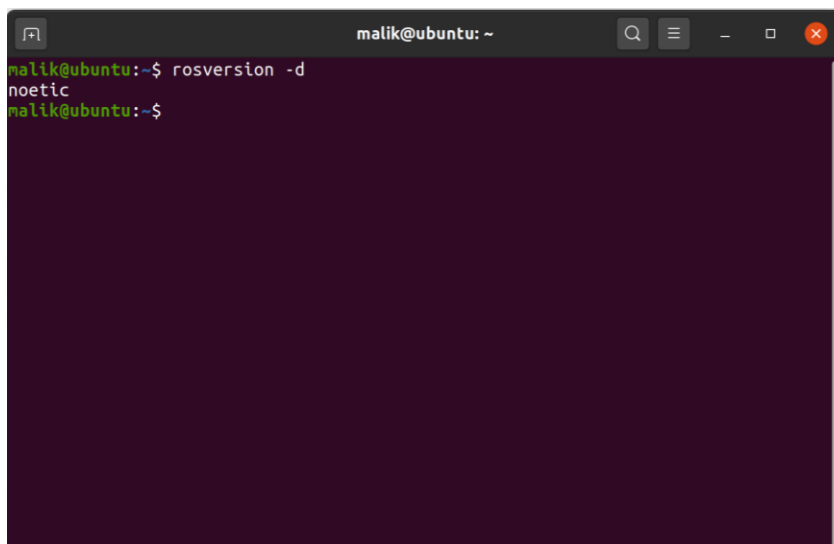
```
malik@ubuntu:~$ sudo apt install ros-noetic-desktop-full
amd64 0.7.1-1focal.20200529.061314 [9,008 B]
Get:247 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-pcl-ros a
md64 1.7.1-1focal.20200529.070110 [960 kB]
Get:248 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-perceptio
n-pcl amd64 1.7.1-1focal.20200529.072938 [2,884 B]
Get:249 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-vision-op
encv amd64 1.15.0-1focal.20200529.065313 [2,616 B]
Get:250 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-perceptio
n amd64 1.5.0-1focal.20200529.073204 [1,872 B]
Get:251 http://packages.ros.org/ros/ubuntu focal/main amd64 libignition-transpor
t8 amd64 8.0.0-1focal [147 kB]
Get:252 http://packages.ros.org/ros/ubuntu focal/main amd64 libgazebo11 amd64 11
.0.0-2~focal [8,555 kB]
Get:253 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5dbus5 amd
64 5.12.8+dfsg-0ubuntu1 [208 kB]
Get:254 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5network5
amd64 5.12.8+dfsg-0ubuntu1 [674 kB]
Get:255 http://us.archive.ubuntu.com/ubuntu focal/main amd64 libxcb-xinerama0 am
d64 1.14-2 [5,260 B]
Get:256 http://us.archive.ubuntu.com/ubuntu focal/main amd64 libxcb-xinput0 amd6
4 1.14-2 [29.3 kB]
Get:257 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5gui5 amd6
4 5.12.8+dfsg-0ubuntu1 [2,971 kB]
10% [257 libqt5gui5 1,059 kB/2,971 kB 36%] [252 libgazebo11 7,602 kB/8,555 kB 8
```

And now for the final step

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

To make sure our installation succeeded we can use this command if it show noetic this indicates a successful installation

```
rosversion -d
```

A terminal window titled 'malik@ubuntu: ~' with search, menu, and window control icons. The terminal shows the command 'rosversion -d' being executed, which outputs 'noetic' on the next line. The prompt returns to 'malik@ubuntu:~\$' on the following line.

```
malik@ubuntu:~$ rosversion -d  
noetic  
malik@ubuntu:~$
```