



HOW TO INSTALL ROS SYSTEM ON WINDOWS ?

STEP BY STEP

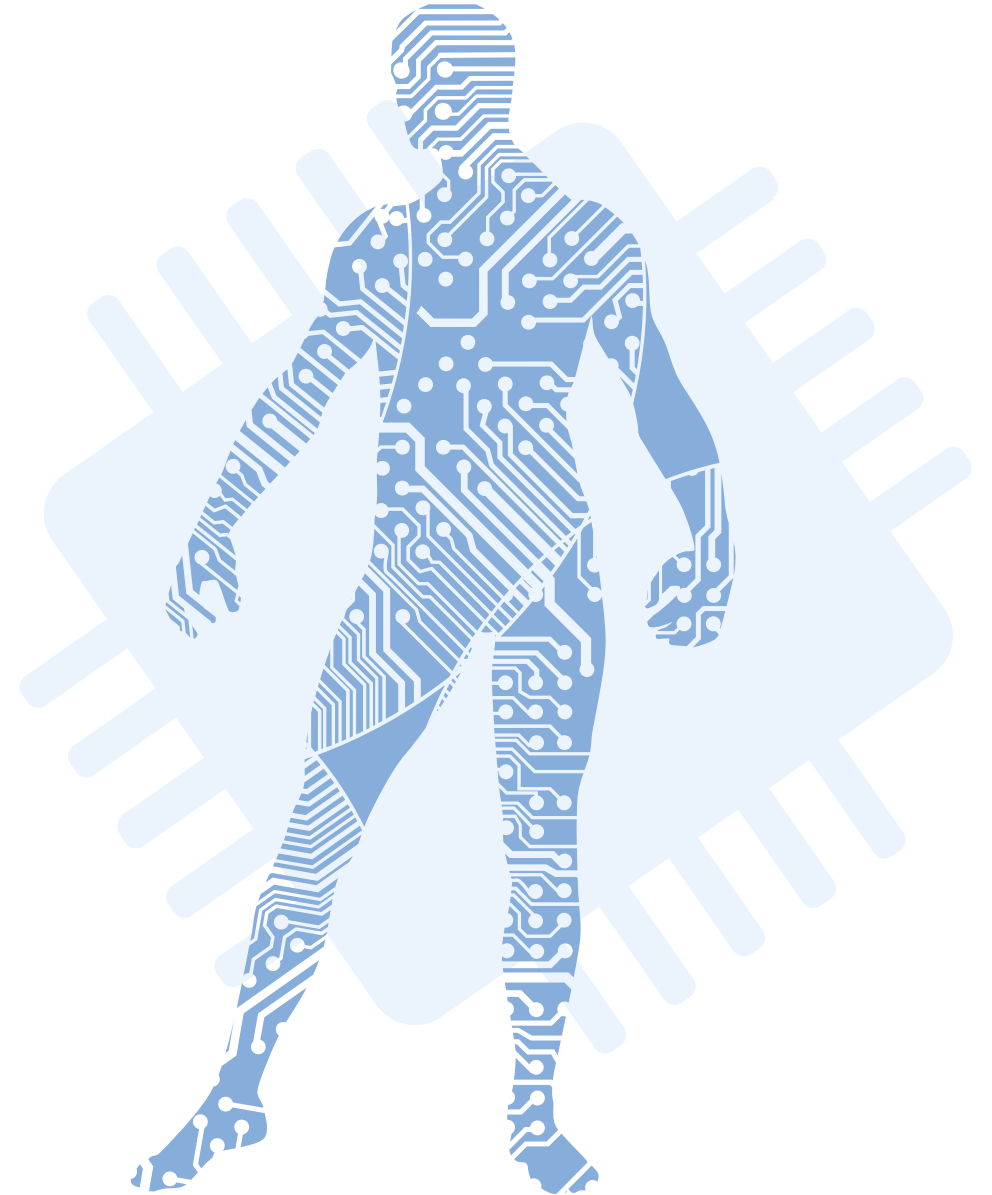
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01

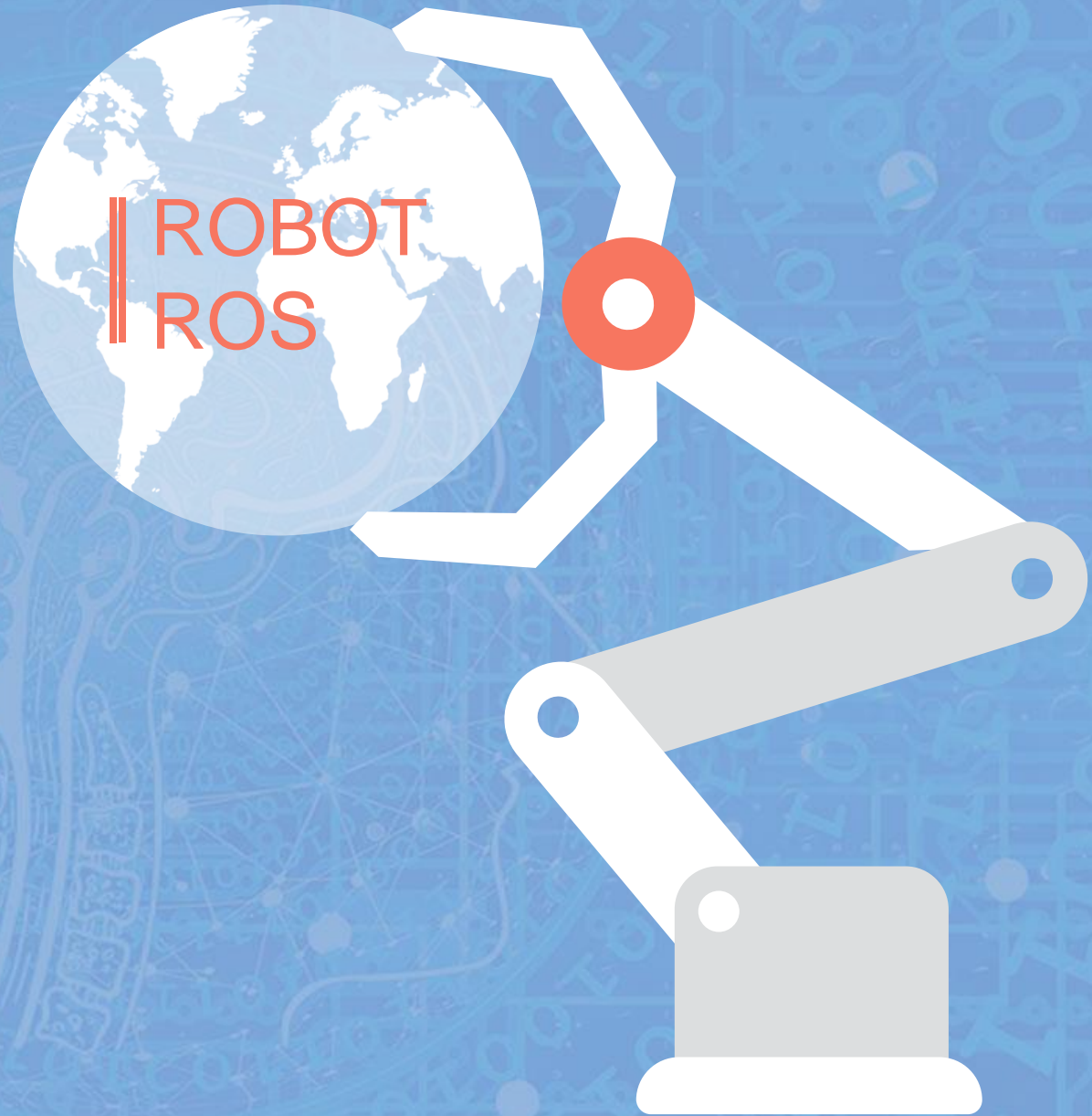


INTRODUCTION

Meaning of ROS

In the past, the development of the robot starts from zero and to avoid repeating the steps of building the robot from zero to any developer, a ROS system has been found.

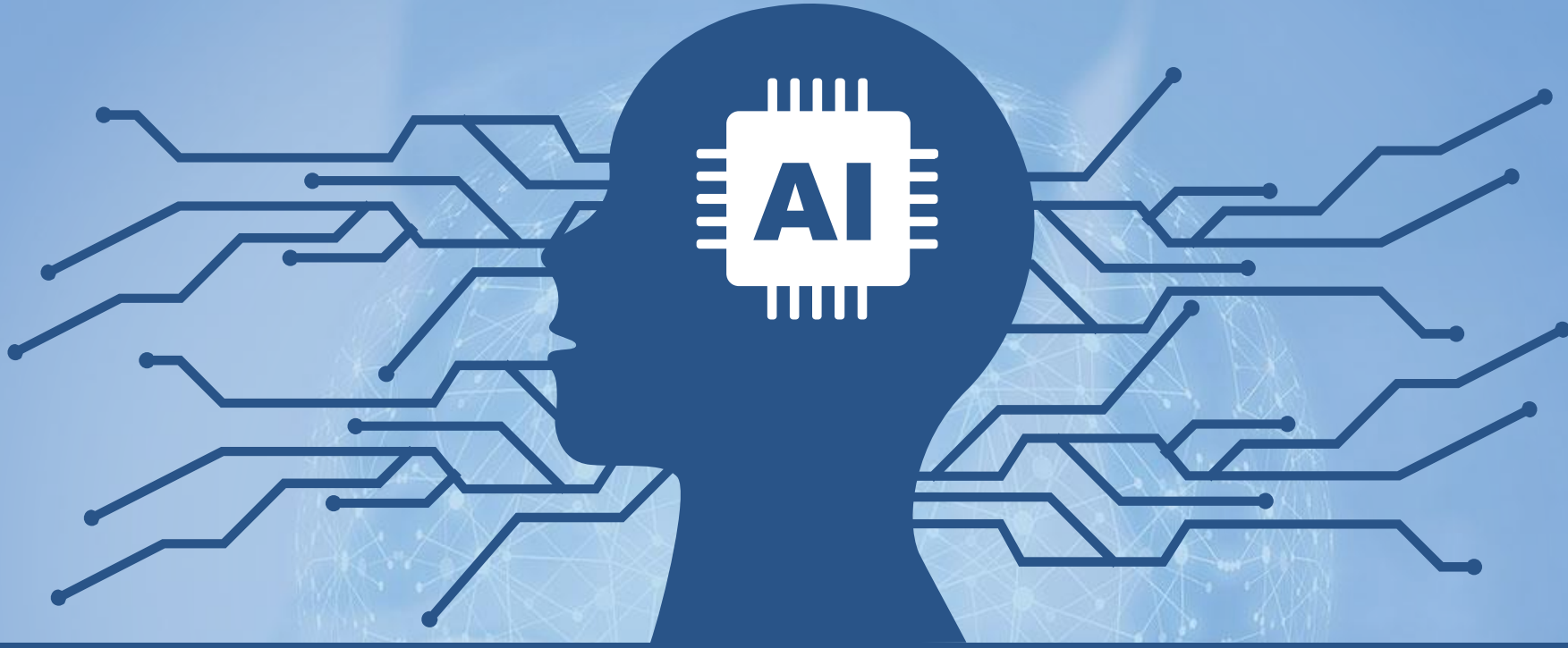
It is a platform used to develop robots with a simple code modification rather than writing a new code. ROS is a system but it is not an operating system like the windows system, but it needs an operating system to work on, specifically the **Ubuntu system**, so we call this robotics system as a **meta-operating-system**, any operating system that exists with another system.



02



Principle of working
ROS



How does the ROS system work?

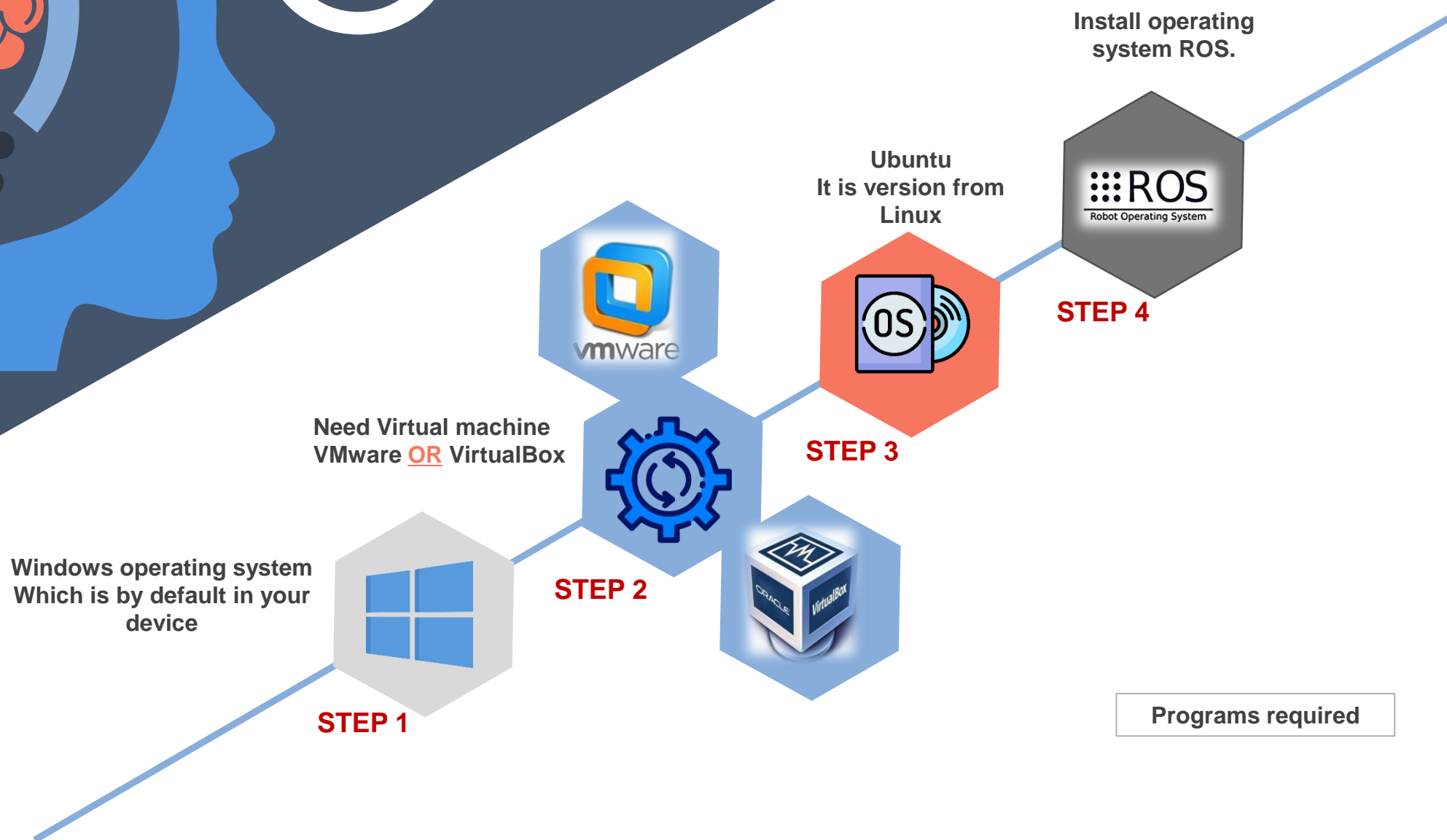
The system starts with a ROS Master node. This master node allows other nodes to communicate with each other.

Every task that works in ROS is considered a node and communicates with each other via messages, so there is a tool called bag files that records these messages. The advantage of using nodes is that if one is stopped, this does not affect the work of the system and continues to work.

03



Programs required
To install **ROS**



04



Installation steps

step by step

INSTALLING STEPS

Install ubuntu
<https://ubuntu.com/download/desktop>

For VirtualBox
Install:
<https://www.virtualbox.org/>

For helping install ubuntu + VirtualBox
<https://www.youtube.com/watch?v=PvjwhBqZkVM>

For VMware
Install:
<https://www.vmware.com/>

USER INTERFACE (UI) OF VIRTUAL MACHINE

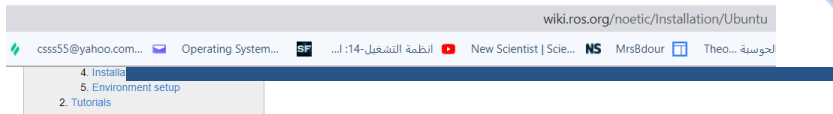
- ITS time to install ROS

Button

After click the button,
write terminal to install ROS



INSTALLATION ROS



1. Installation

1.1 Configure your Ubuntu repositories

Configure your Ubuntu repositories to allow "restricted," "universe," and "multiverse." You can [follow the Ubuntu guide](#) for instructions on doing this.

1.2 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'
```

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:

- You have to follow the steps that give you at official website :

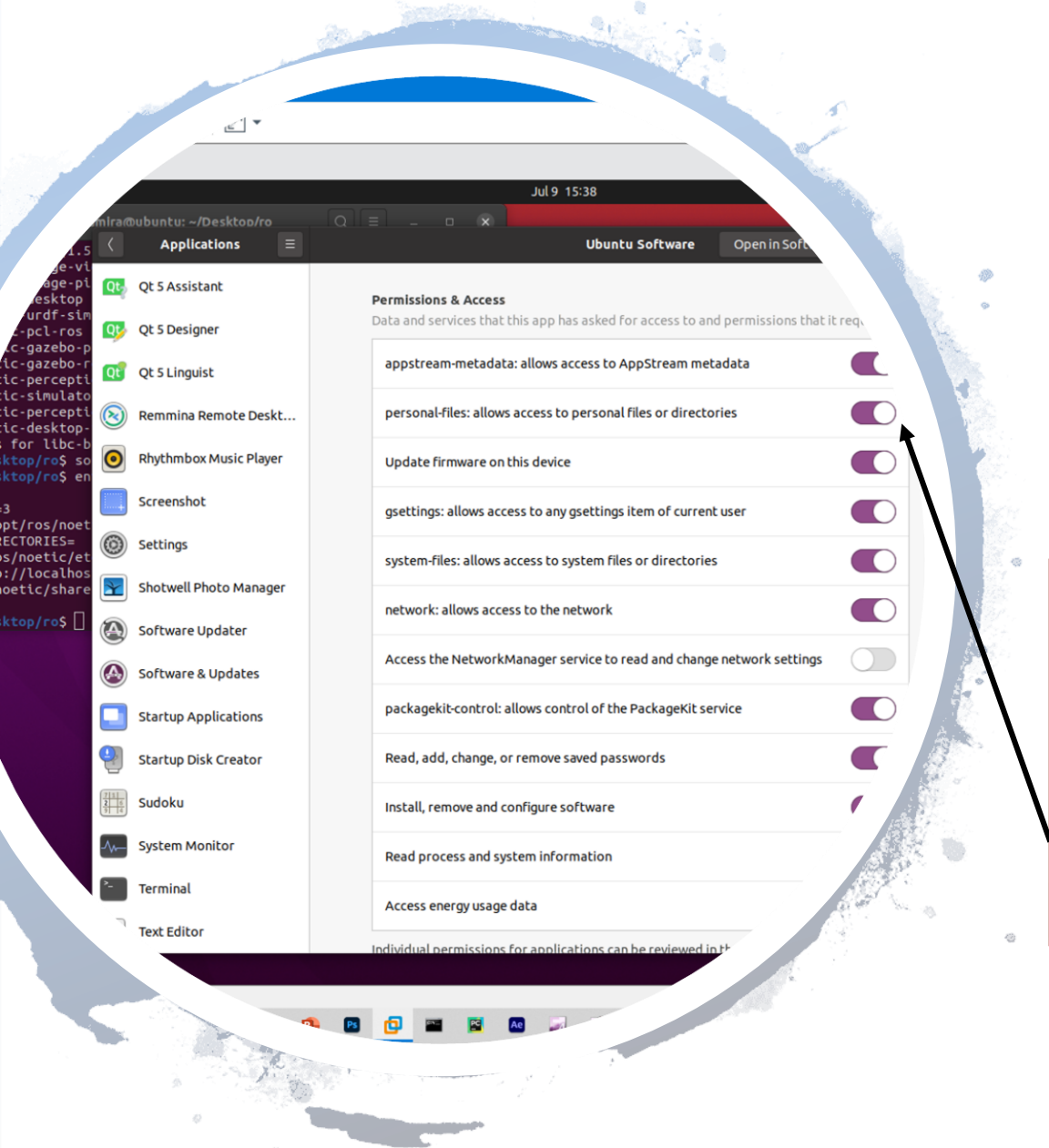
<http://wiki.ros.org/noetic/Installation/Ubuntu>

Explain commands in next slide

INSTALLATION ROS

- For step1 be sure configure your Ubuntu repositories to allow "restricted," "universe," and "multiverse"

Go to:
setting at VM >>
ubuntu software >>
check for second point (allow access to personal file)



INSTALLATION

ROS

- **Now, open the terminal and just copy the codes that at official website:**
- **1. Setup your sources.list**
 - `sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'`
- **2. Set up your keys**
 - `sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654`
- **3. Installation**
 - `sudo apt update`
- **4. Desktop-Full Install: (Recommended)**
 - `sudo apt install ros-noetic-desktop-full`
- **5. Environment setup**
 - `source /opt/ros/noetic/setup.bash`

References:

For VMware

Install:

<https://www.vmware.com/>

For VirtualBox

Install:

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

Install ubuntu

[https://ubuntu.com/download/de
sktop](https://ubuntu.com/download/desktop)

For helping install ubuntu + VirtualBox

[https://www.youtub
e.com/watch?v=Pvj
whBqZkVM](https://www.youtube.com/watch?v=PvjwhBqZkVM)

For helping install ROS

[https://appuals.com/fix-unable-
correct-problems-held-broken-
packages/](https://appuals.com/fix-unable-correct-problems-held-broken-packages/)

ROS

[https://atadiat.com/ar/programmi
ng-robot-operating-system-
introduction/](https://atadiat.com/ar/programming-robot-operating-system-introduction/)



Thank You