

M5 Version:

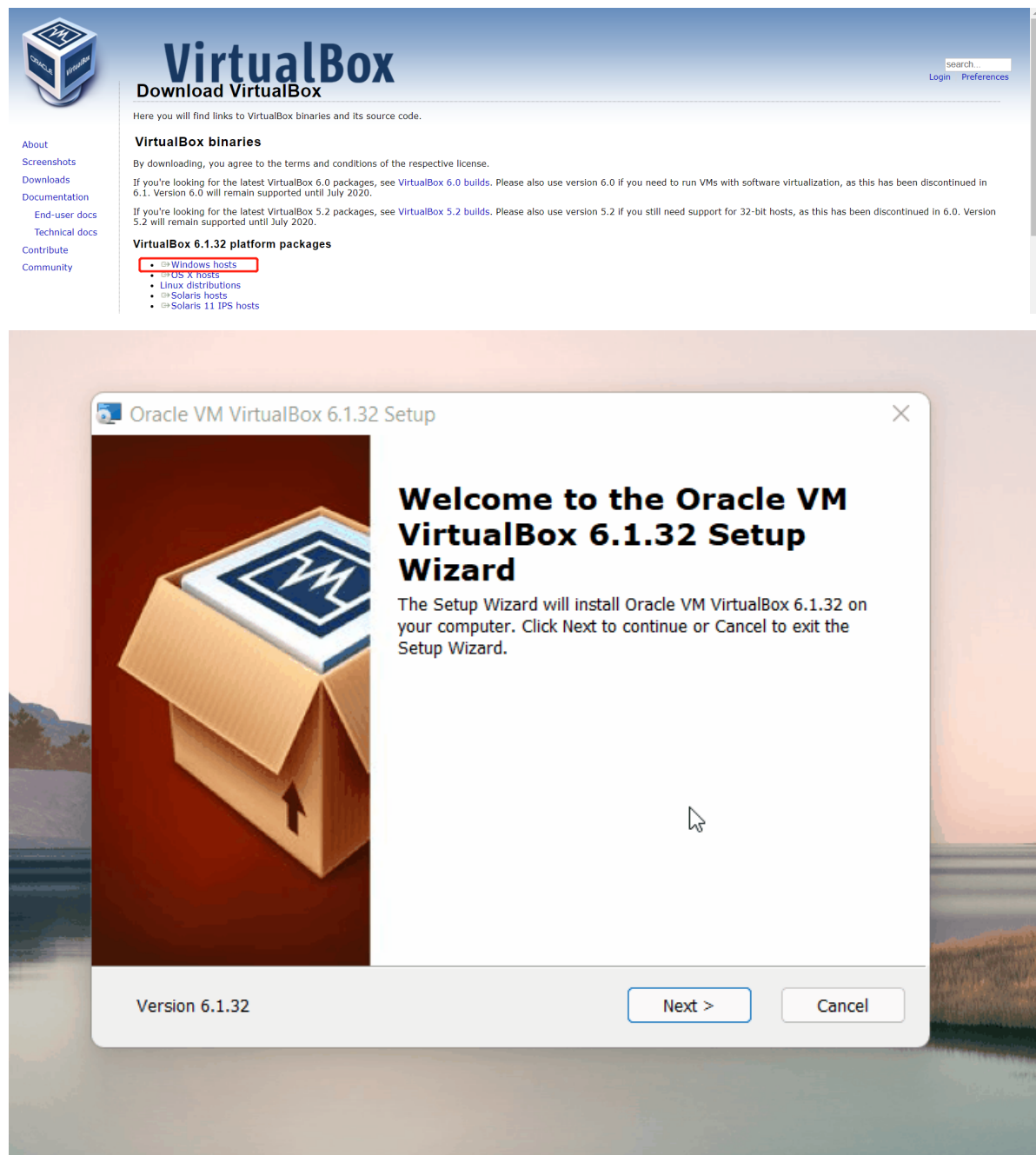
Install different versions of ubuntu system in Linux

1 Virtual machine installation

Go to [Official website](#) to download the virtual machine Virtual Box or go to [Official website](#) to download the virtual machine VMware.

Of course, if you already have your virtual machine, you may skip this step.

We chose to download the Virtual box because it is free.

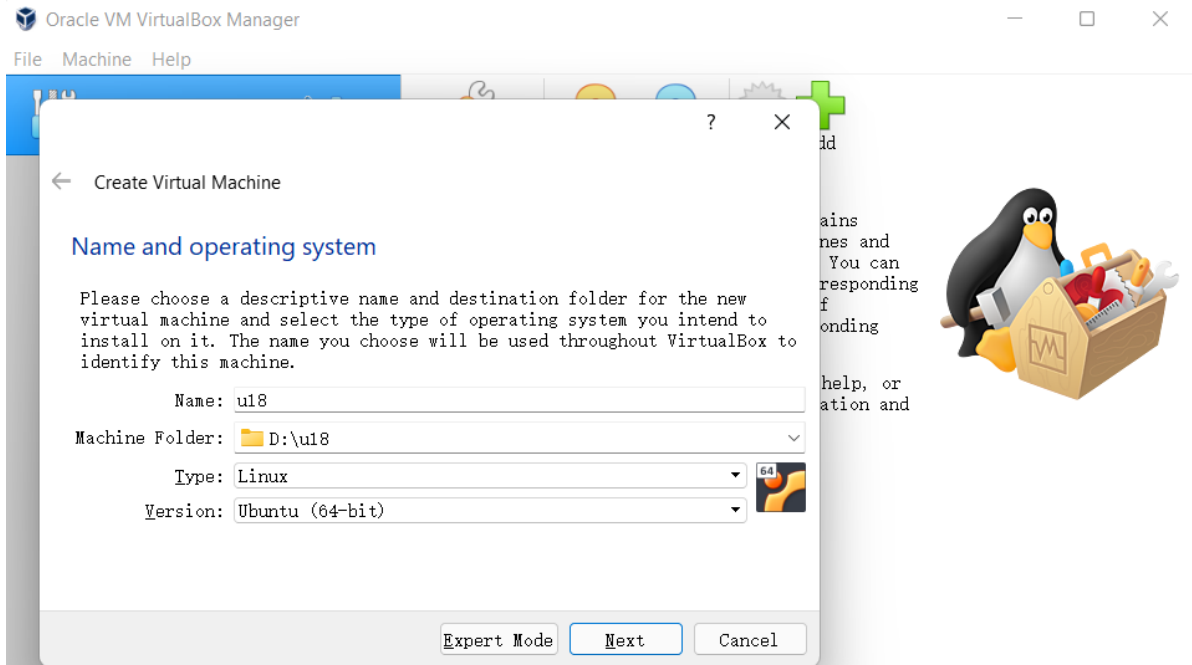


2 Creating a virtual machine

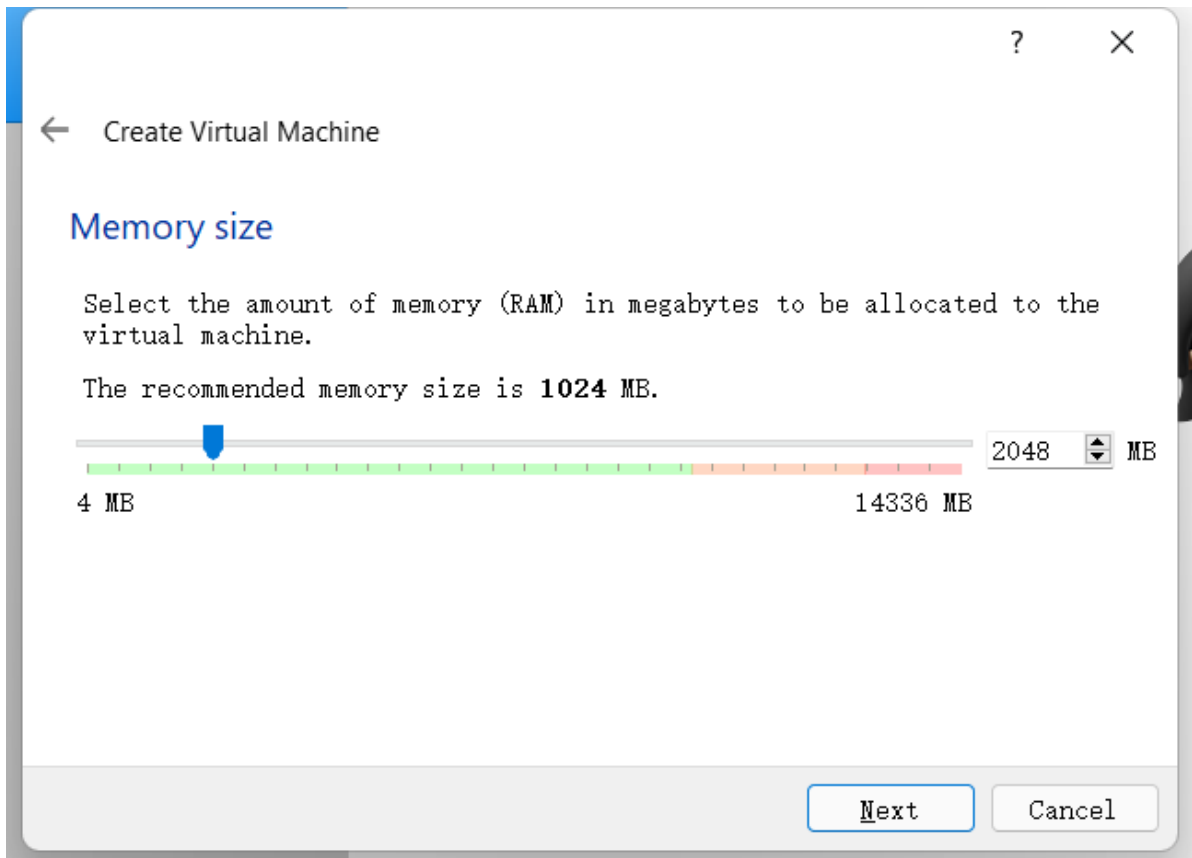
2.1 Creating a virtual machine

Select Create in control

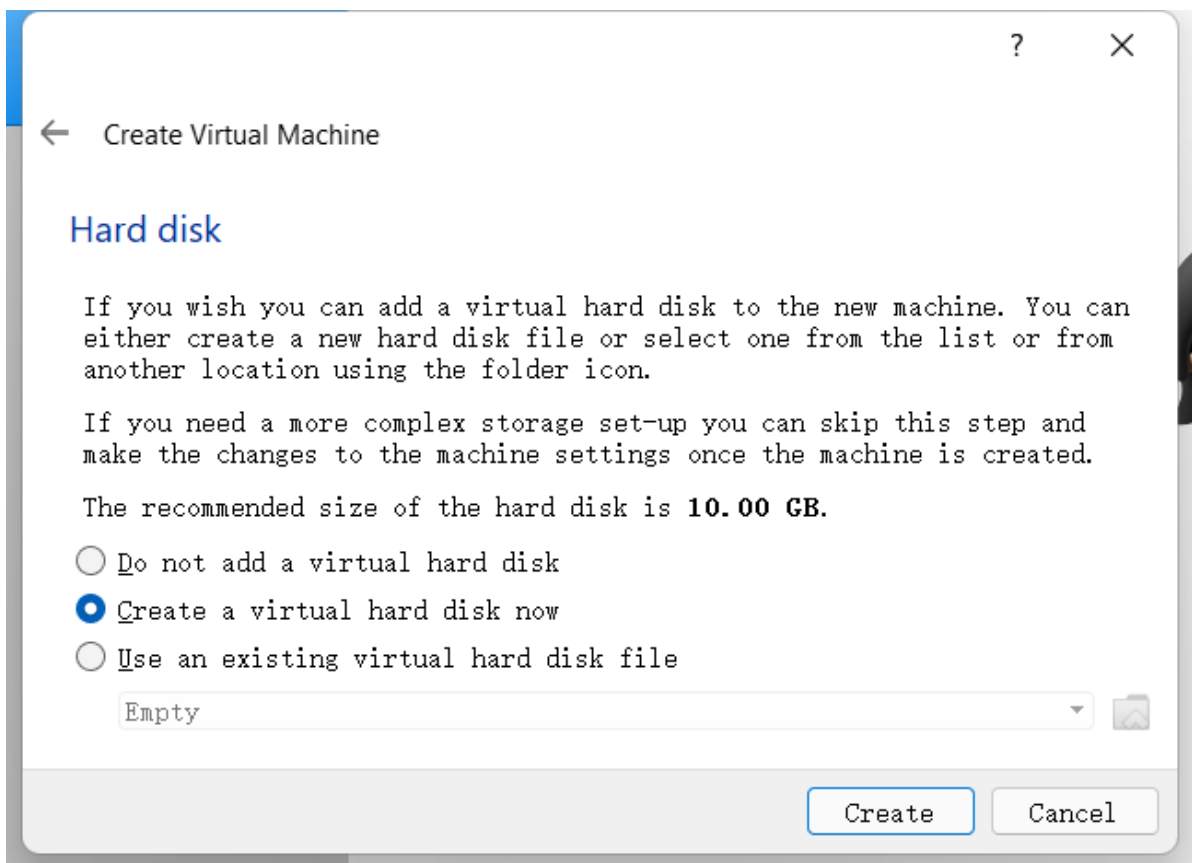
- Input the name of the virtual machine and the location where it is stored, select the type of virtual machine as Linux, select the ubuntu64-bit version, and go to the next step.



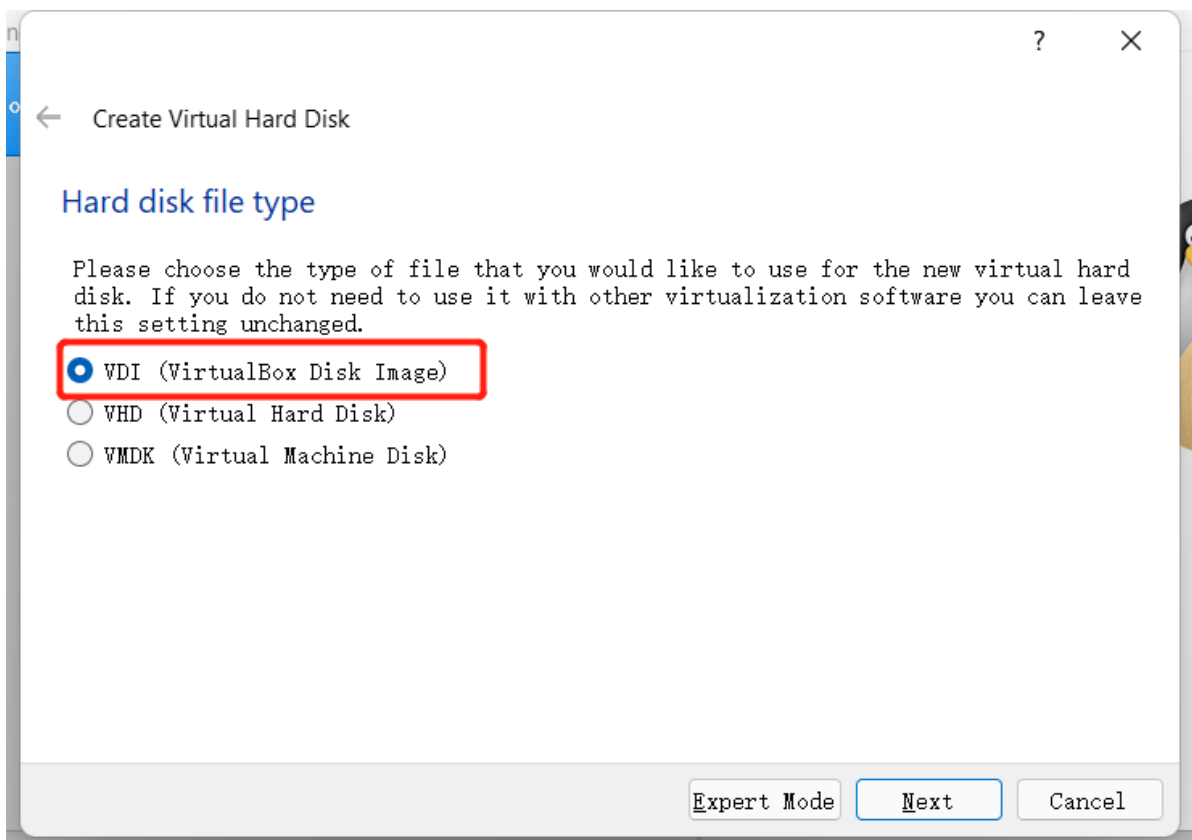
- Configure a memory size according to your own needs, and then go to the next step.



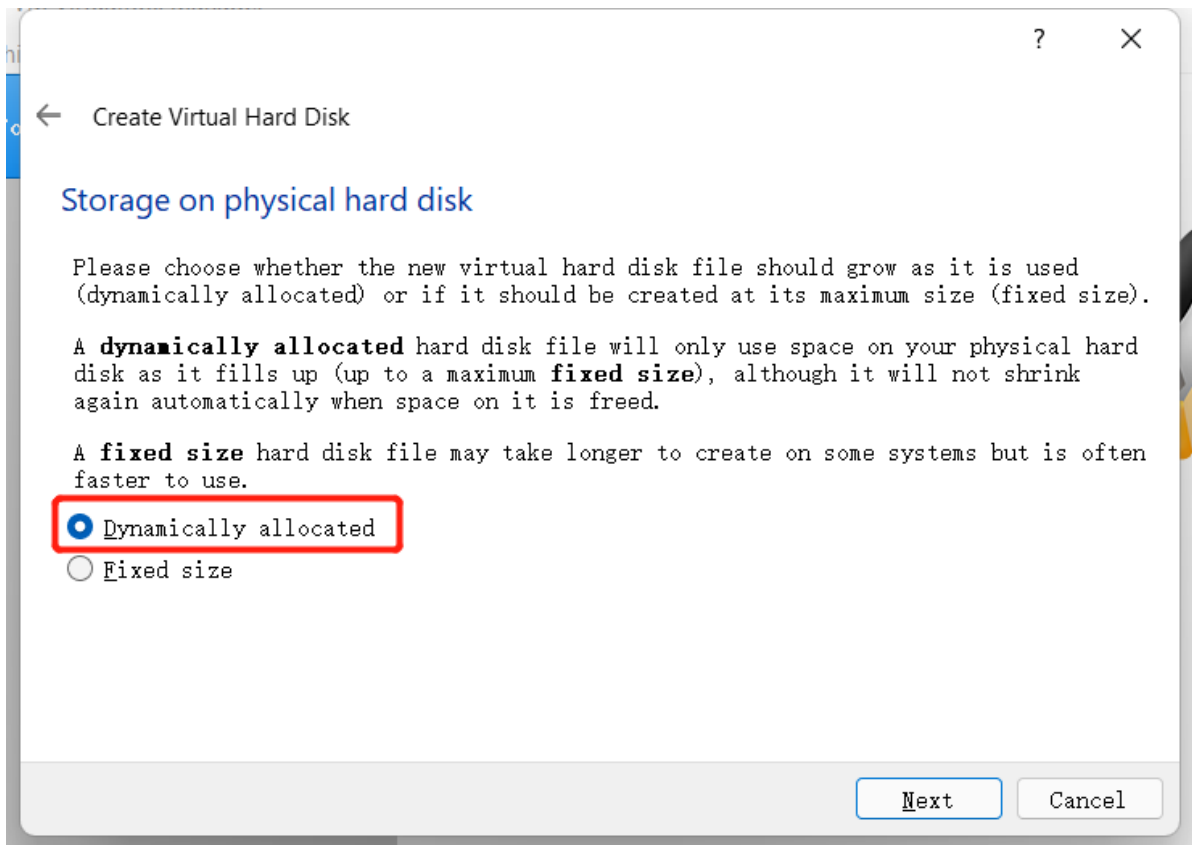
- Choose **Create a virtual hard disk now** to create it.



- Select the virtual hard disk type as **VDI** type, and go to the next step.



- Allocate the size of the virtual hard disk. Since an ubuntu system needs to be installed, and the operation will be performed in the system, it is recommended that the size should not be less than 20G.



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.



3 Importing the ubuntu system

3.1 Downloading the ubuntu system

Select the ubuntu version according to your own needs and install it:

Note: ROS2 needs to download **version 20.04**.

- [Version 16.04](#)
- [Version 18.04](#)
- [Version 20.04](#)

The installation method and process of the three versions are the same. Here, we take the version 18.04 version for an example.

If you need help burning these images to disk, see the [Image Burning Guide](#).

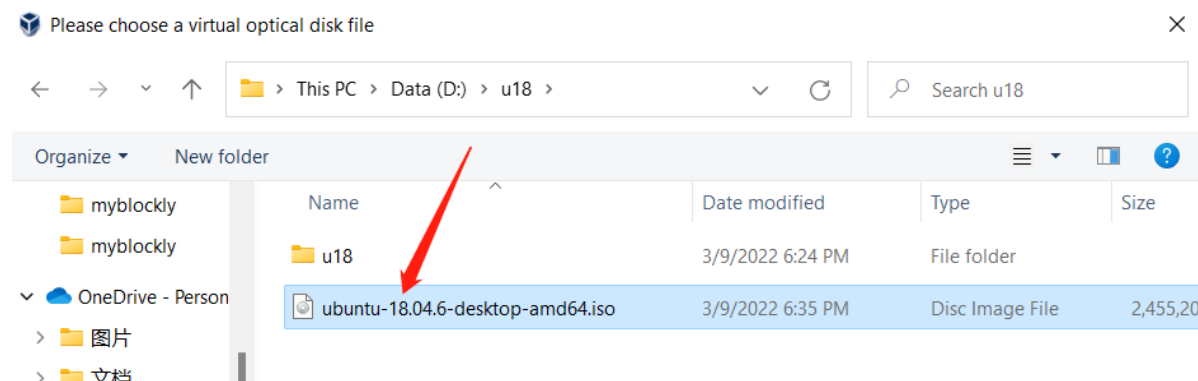
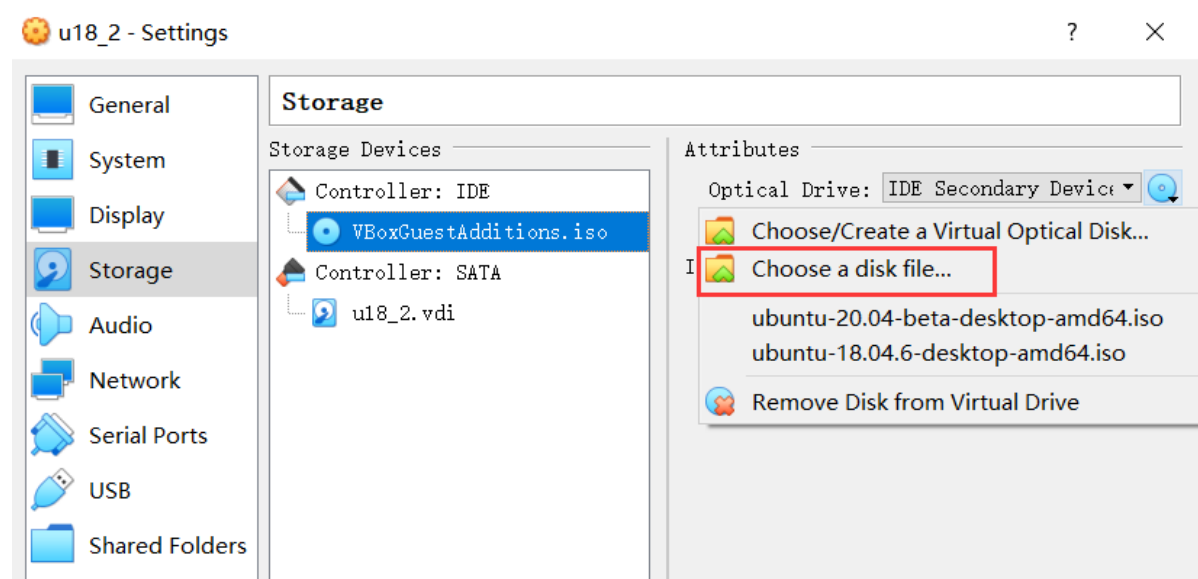
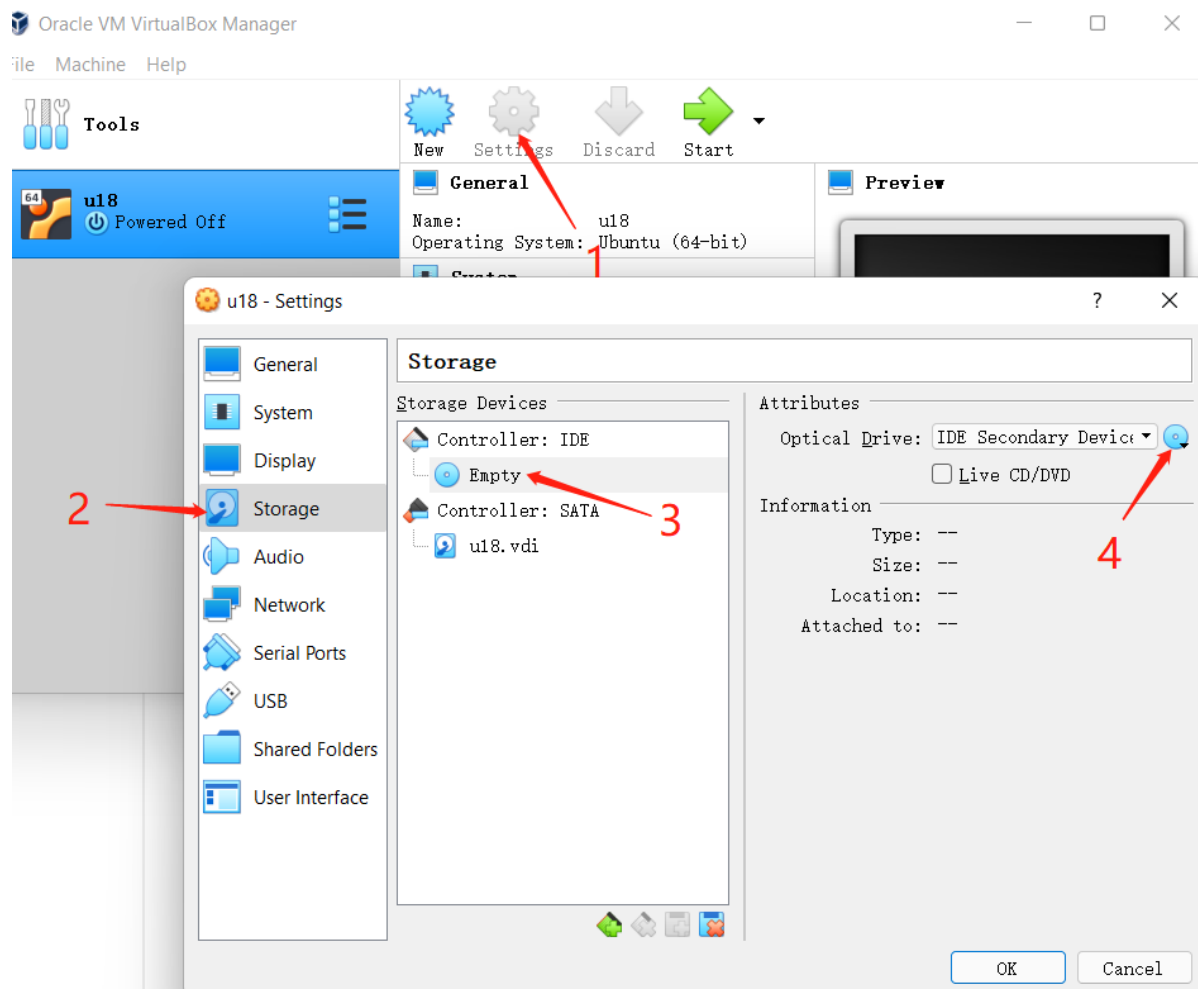
Name	Last modified	Size	Description
Parent Directory		-	
MD5SUMS-metalink	2020-02-12 13:42	296	
MD5SUMS-metalink.gpg	2020-02-12 13:42	916	
SHA256SUMS	2021-09-16 21:58	202	
SHA256SUMS.gpg	2021-09-16 21:58	833	
ubuntu-18.04.6-desktop-amd64.iso	2021-09-15 20:42	2.3G	Desktop image for 64-bit PC (AMD64) computers (standard download)
ubuntu-18.04.6-desktop-amd64.iso.torrent	2021-09-16 21:46	188K	Desktop image for 64-bit PC (AMD64) computers (BitTorrent download)
ubuntu-18.04.6-desktop-amd64.iso.zsync	2021-09-16 21:46	4.7M	Desktop image for 64-bit PC (AMD64) computers (zsync metafile)
ubuntu-18.04.6-desktop-amd64.list	2021-09-15 20:42	7.8K	Desktop image for 64-bit PC (AMD64) computers (file listing)
ubuntu-18.04.6-desktop-amd64.manifest	2021-09-15 20:36	59K	Desktop image for 64-bit PC (AMD64) computers (contents of live filesystem)
ubuntu-18.04.6-live-server-amd64.iso	2021-09-15 20:42	969M	Server Install Image for 64-bit PC (AMD64) computers (standard download)

After the downloading is complete, there will be a file shown in the figure:

名称	修改日期	类型	大小
今天 (2)			
ubuntu-20.04.3-desktop-amd64.iso	2022/1/12 15:08	ISO 文件	2,999,93
ubuntu-18.04.6-desktop-amd64.iso	2022/1/12 14:45	ISO 文件	2,455,20

3.2 Importing ubuntu into a visual machine

Find the previously installed virtual machine in the Virtual box, enter **Setup**, and assign a CD to the controller in **Storage**:



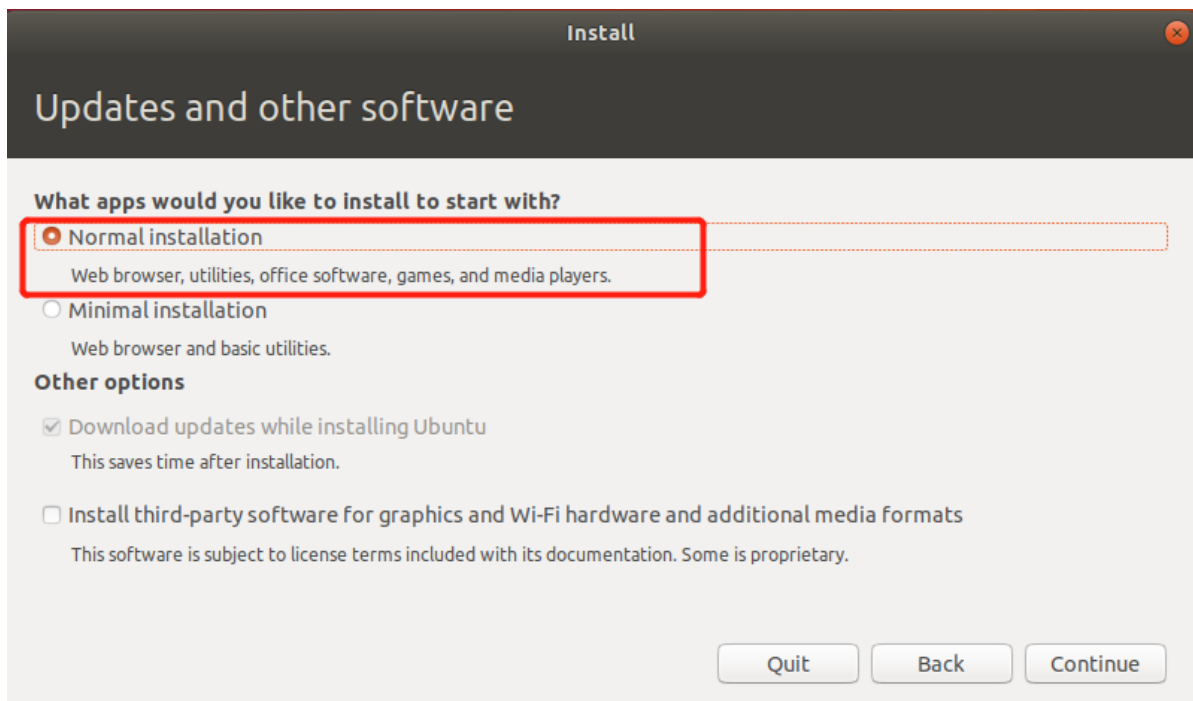
Then open the virtual machine for ubuntu installation, and click start.

3.3 Installing ubuntu

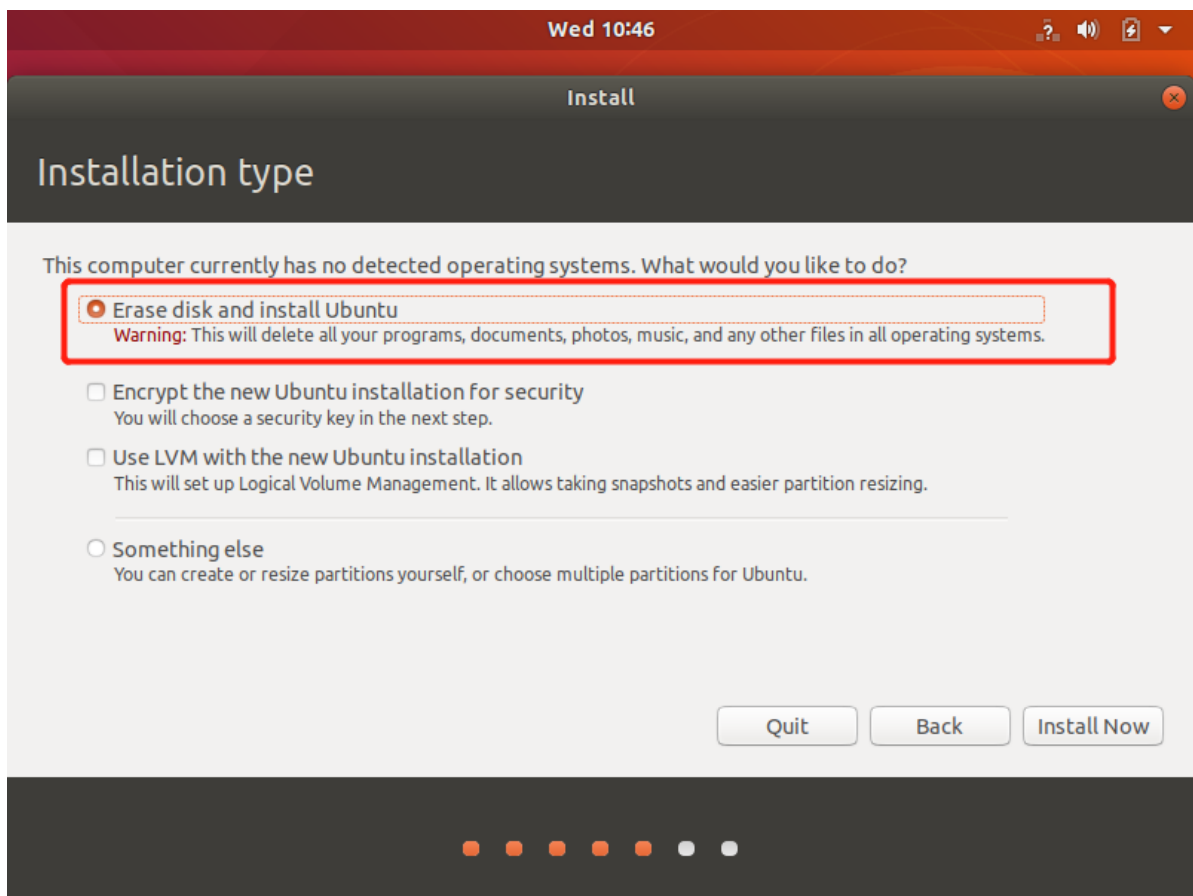
- Wait for the system to start, enter a **welcome** interface, select "Chinese (Simplified)", and click the "Install Ubuntu" button;



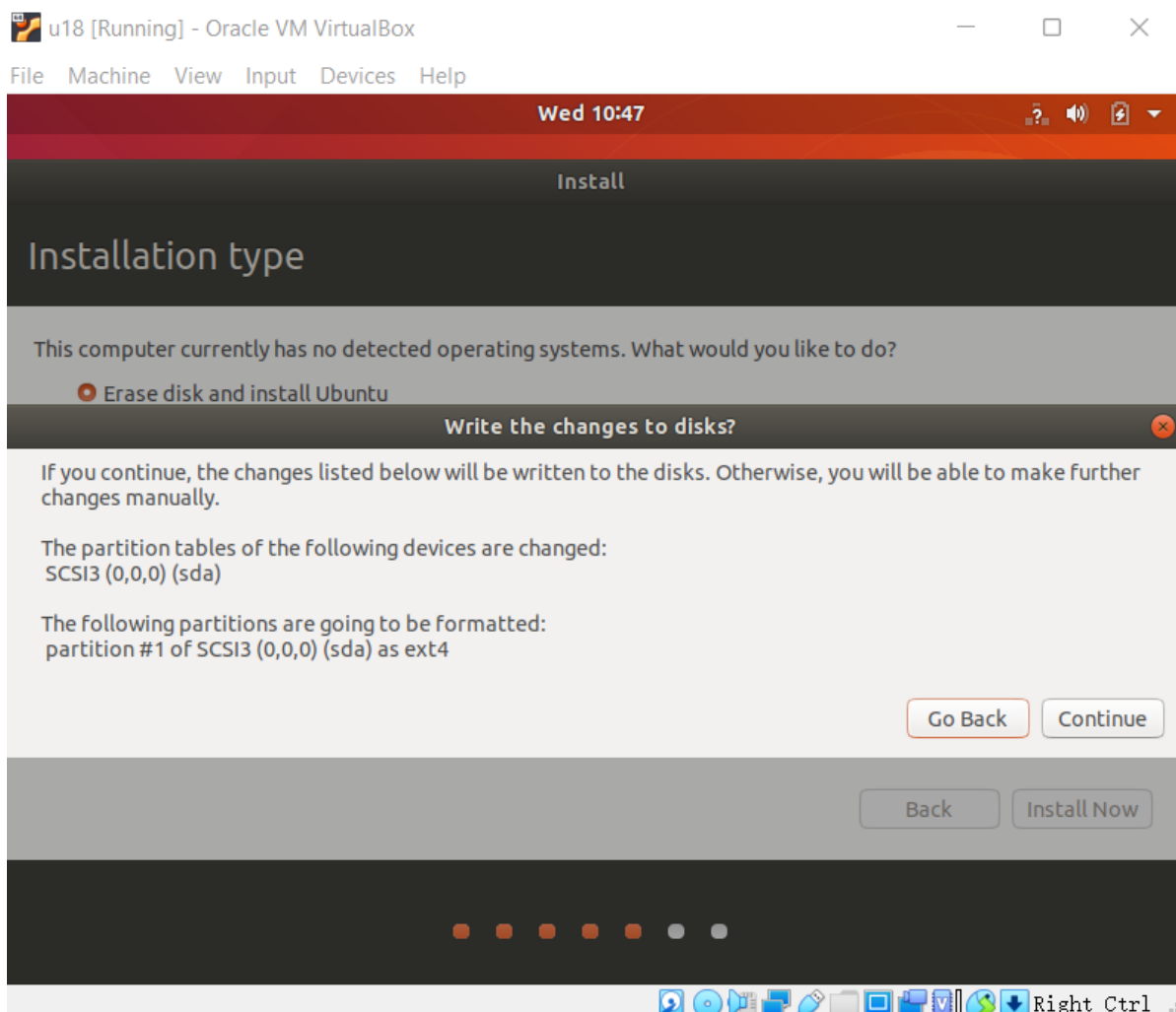
- Click "Continue" button;



- Select the "Clear entire disk and install Ubuntu" option, and click the "Install Now" button;



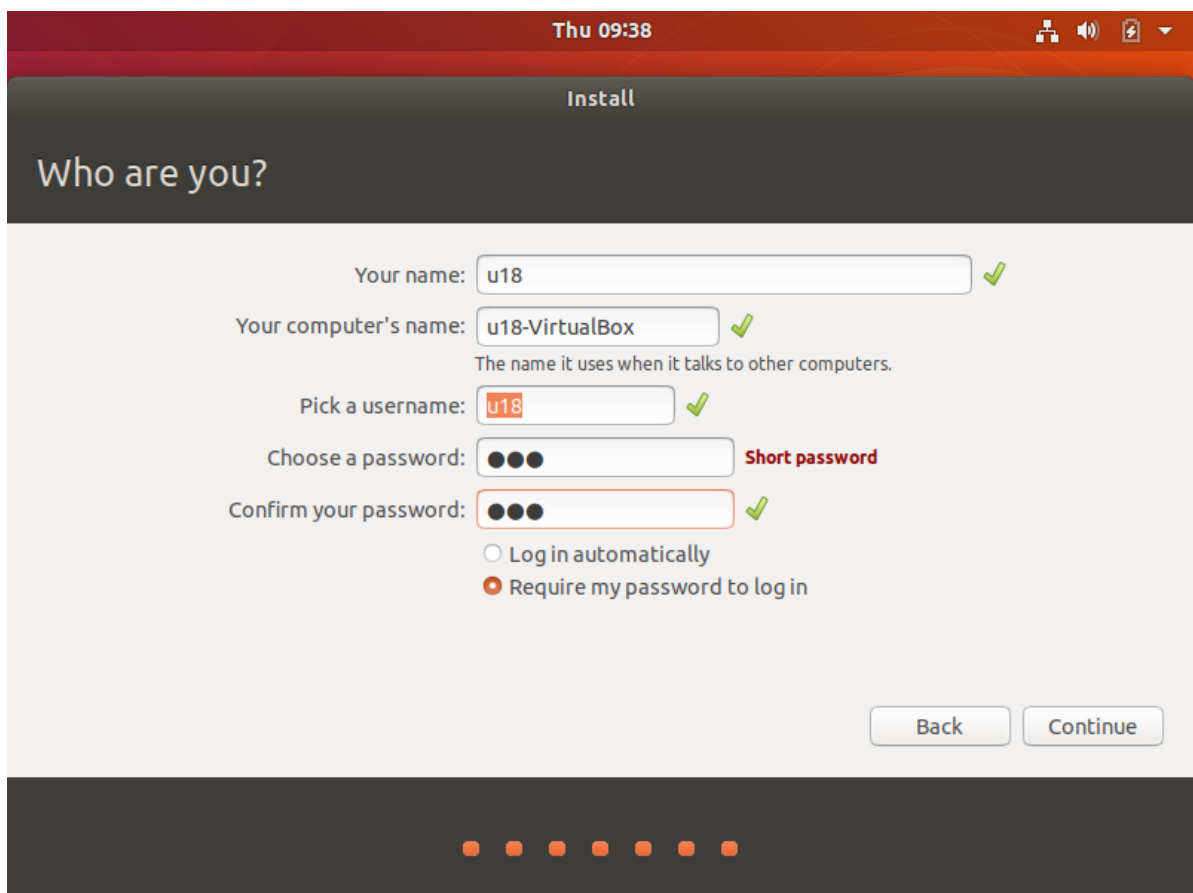
- Click the "Continue" button in the pop-up dialog box;



- Set a geographic position and click the "Continue" button;



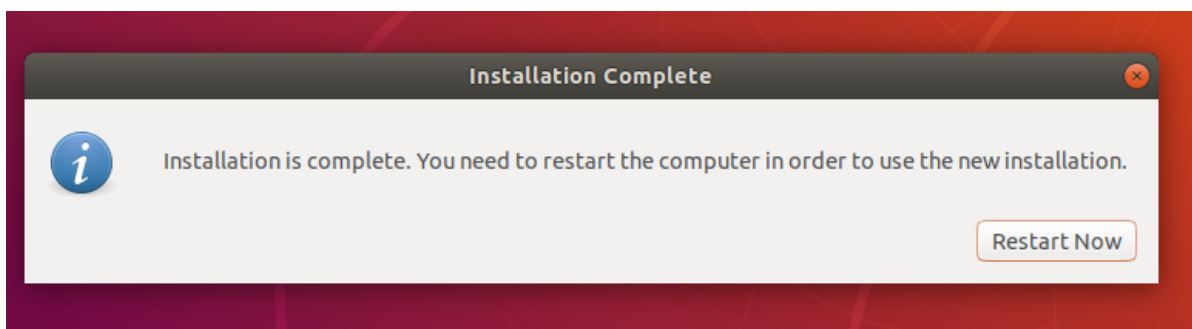
- Set a user name and password, and click the “Continue” button;



- Enter the system installation interface, and wait patiently;



- After installation is complete, click the "Restart now" button in the pop-up dialog box to complete the installation.



1 ROS Environment building

1.1 Installing ROS

Building a basic development environment requires the installation of the robot operating system (short for ROS), MoveIt and a git version manager. The installation methods and procedures are described respectively below.

For **myCobot 280-M5** and **myCobot 320-M5 devices**, refer to the installation methods and procedures described below. For **myCobot 280-PI** and **myCobot 320-PI** devices, you only need to install the mycobot_ros installation package.

1.1.1 Selecting a version

There is a one-to-one relationship between ROS and ubuntu. Different versions of ubuntu correspond to different versions of ROS. The reference website is as follows: <http://wiki.ros.org/Distributions>

- Here are the ROS versions supported by Ubuntu:

- Ubuntu 16.04 / ROS Kinetic
- Ubuntu 18.04 / ROS Melodic
- Ubuntu 20.04 / ROS Noetic

Install the ROS version corresponding to the Ubuntu version you have installed.

If the versions are different, the downloading will fail. The system we choose here is Ubuntu 18.04, so the corresponding ROS version is ROS Melodic.

NOTE: At present, we do not provide any reference for installing ROS in windows. If necessary, refer to <https://www.ros.org/install/>

1.1.2 Installing ROS

1 Adding a software source

There is no ROS software source in the software source list of Ubuntu itself, so you need to Configure the ROS software source into the software list repository first, and then download ROS. Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command:

- official source:

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

- If the download speed is slow, it is recommended to select a nearby mirror source to replace the above command. For example, Tsinghua University is:

```
sudo sh -c '. /etc/lsb-release && echo "deb
http://mirrors.tuna.tsinghua.edu.cn/ros/ubuntu/ `lsb_release -cs` main" >
/etc/apt/sources.list.d/ros-latest.list'
```

Here you will be asked to input a user password. Just input the user password set when Ubuntu is installed.

2 Setting a key

Configuring a public key. This step is to let the system confirm that our path is safe, so that there is no problem in downloading the file. Otherwise it will be deleted immediately after downloading:

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

The execution result is displayed as follows:

```
u18@u18-VirtualBox:~$ sudo apt-key adv --keyserver 'hkp://keyserver.ubuntu.com:
80' --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
Executing: /tmp/apt-key-gpghome.ncwvc7DwDj/gpg.1.sh --keyserver hkp://keyserver
.ubuntu.com:80 --recv-key C1CF6E31E6BADE8868B172B4F42ED6FBAB17C654
gpg: key F42ED6FBAB17C654: public key "Open Robotics <info@osrfoundation.org>"
imported
gpg: Total number processed: 1
gpg:         imported: 1
u18@u18-VirtualBox:~$
```

3 Installation

After adding a new software source, you need to update the software source list. Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command:

```
sudo apt-get update
```

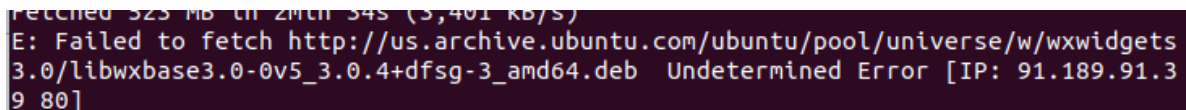
Execute **Installing ROS**. Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command according to your Ubuntu version:

```
# Ubuntu 16.04
sudo apt install ros-kinetic-desktop-full
# Ubuntu 18.04
sudo apt install ros-melodic-desktop-full
# Ubuntu 20.04
sudo apt install ros-noetic-desktop-full
```

It is recommended to install the complete ROS here to prevent the lack of libraries and dependencies.

The installation process takes a long time, so please wait with patience.

- If the following error message appears on the console terminal during the installation process, you need to replace the software source list in /etc/apt/sources.list.



```
Fetched 323 MB in 2min 34s (3,401 kB/s)
E: Failed to fetch http://us.archive.ubuntu.com/ubuntu/pool/universe/w/wxwidgets_3.0/libwxbase3.0-0v5_3.0.4+dfsg-3_amd64.deb Undetermined Error [IP: 91.189.91.39 80]
```

- Open a console terminal (shortcut key: Ctrl+Alt+T), enter the following command:

```
sudo gedit /etc/apt/sources.list
```

- Replace all official software sources in the sources.list with the following Alibaba Cloud software sources:

Ubuntu 16.04 version:

```
deb http://mirrors.aliyun.com/ubuntu/ xenial main
deb-src http://mirrors.aliyun.com/ubuntu/ xenial main

deb http://mirrors.aliyun.com/ubuntu/ xenial-updates main
deb-src http://mirrors.aliyun.com/ubuntu/ xenial-updates main

deb http://mirrors.aliyun.com/ubuntu/ xenial universe
deb-src http://mirrors.aliyun.com/ubuntu/ xenial universe
deb http://mirrors.aliyun.com/ubuntu/ xenial-updates universe
deb-src http://mirrors.aliyun.com/ubuntu/ xenial-updates universe

deb http://mirrors.aliyun.com/ubuntu/ xenial-security main
deb-src http://mirrors.aliyun.com/ubuntu/ xenial-security main
deb http://mirrors.aliyun.com/ubuntu/ xenial-security universe
deb-src http://mirrors.aliyun.com/ubuntu/ xenial-security universe
```

Ubuntu 18.04 version:

```
deb http://mirrors.aliyun.com/ubuntu/ bionic main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic main restricted universe
multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-security main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-security main restricted
universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-updates main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-updates main restricted universe
multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-proposed main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-proposed main restricted
universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-backports main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-backports main restricted
universe multiverse
```

Ubuntu 20.04 version:

```
deb http://mirrors.aliyun.com/ubuntu/ focal main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal main restricted universe
multiverse

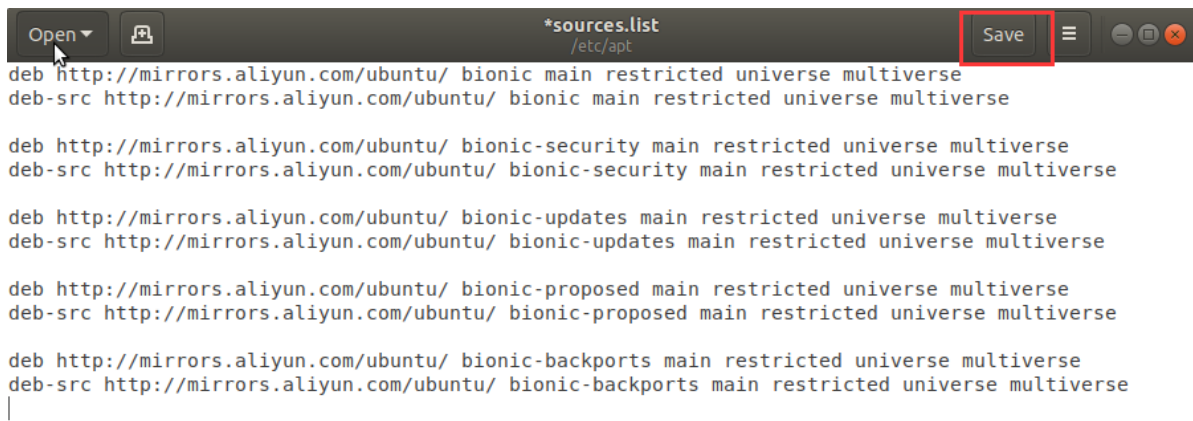
deb http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-security main restricted universe
multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-updates main restricted universe
multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-proposed main restricted universe
multiverse

deb http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted universe
multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ focal-backports main restricted
universe multiverse
```

-After the configuration is complete, the contents of the sources.list file are as follows, click Save and Exit.



```
*sources.list
/etc/apt

deb http://mirrors.aliyun.com/ubuntu/ bionic main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-security main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-security main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-updates main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-updates main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-proposed main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-proposed main restricted universe multiverse

deb http://mirrors.aliyun.com/ubuntu/ bionic-backports main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ bionic-backports main restricted universe multiverse
|
```

- To update the list of software sources, enter in the console terminal:

```
sudo apt-get update
```

- Enter the instructions to install ROS in the console terminal:

```
# Ubuntu 16.04
sudo apt install ros-kinetic-desktop-full
# Ubuntu 18.04
sudo apt install ros-melodic-desktop-full
# Ubuntu 20.04
sudo apt install ros-noetic-desktop-full
```

The installation process takes a long time, so please wait with patience.

4 Configuring the ROS environment to the system

rosdep allows you to easily install the source codes you want to compile, or the system dependencies required by some ROS core components. Execute the following commands in sequence in the terminal, and open a console terminal (shortcut key: Ctrl+Alt+T).

If your system does not have rosdep installed, use the command `sudo apt install python-rosdep` to install it.

If the system of the Ubuntu installed by you is version 20.04, use the command `sudo apt install python3-rosdep` to it install. After completion, execute the rosdep initialization command.

```

u18@u18-VirtualBox:~$ sudo rosdep init
[sudo] password for u18:
sudo: rosdep: command not found
u18@u18-VirtualBox:~$ sudo apt install python-rosdep
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  docutils-common docutils-doc libpython-stdlib python python-catkin-pkg
  python-catkin-pkg-modules python-chardet python-dateutil python-docutils
  python-minimal python-olefile python-pil python-pkg-resources
  python-pygments python-pyparsing python-roman python-rosdep-modules
  python-rospkg python-rospkg-modules python-setuptools python-six python-yaml python2.7
  python2.7-minimal sgml-base xml-core
Suggested packages:
  python-doc python-tk fonts-linuxlibertine | ttf-linux-libertine
  texlive-lang-french texlive-latex-base texlive-latex-recommended
  python-pil-doc python-pil-dbg ttf-bitstream-vera python-pyparsing-doc
  python-setuptools-doc python2.7-doc binfmt-support sgml-base-doc debhelper
The following NEW packages will be installed:
  docutils-common docutils-doc libpython-stdlib python python-catkin-pkg
  python-catkin-pkg-modules python-chardet python-dateutil python-docutils
  python-minimal python-olefile python-pil python-pkg-resources
  python-pygments python-pyparsing python-roman python-rosdep
  python-rosdep-modules python-rospkg python-rospkg-modules
  python-setuptools python-six python-yaml python2.7 python2.7-minimal
  sgml-base xml-core
0 upgraded, 29 newly installed, 0 to remove and 119 not upgraded.

```

initialize rosdep:

```
sudo rosdep init
```

If the following error message appears:

```

u182@u182-VirtualBox:~$ sudo rosdep init
ERROR: cannot download default sources list from:
https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/sources.list.d/20-
default.list
Website may be down.

```

Solution: Modify the hosts file and enter the following command in the console terminal:

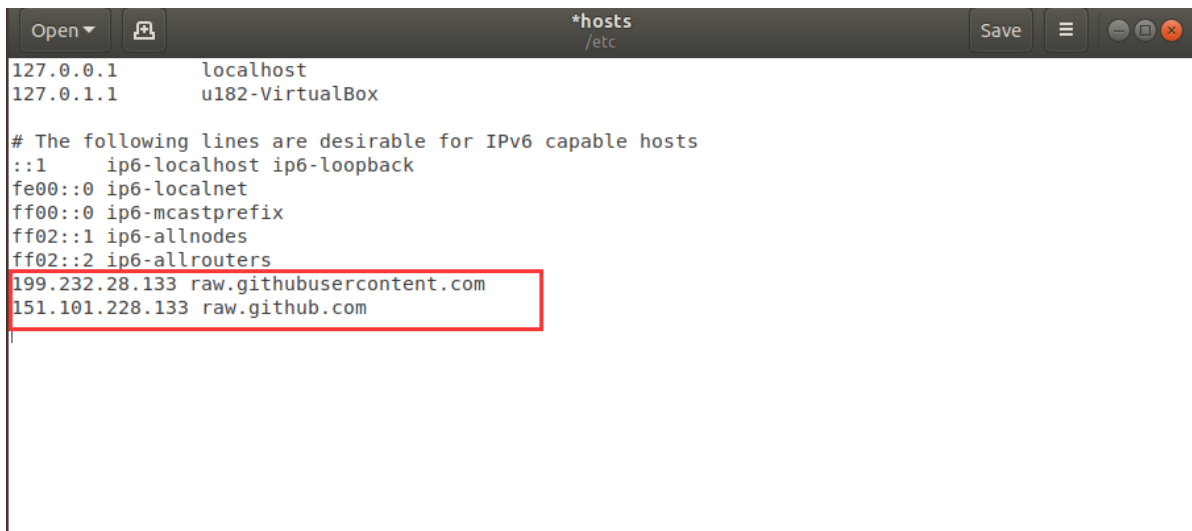
```
sudo gedit /etc/hosts
```

At the end of the file content, add the IP addresses of the following two URLs to access:

```

199.232.28.133 raw.githubusercontent.com
151.101.228.133 raw.githubusercontent.com

```



```
Open ▾  *hosts /etc Save ≡ ⌵ ⌵ ⌵ ⌵
127.0.0.1    localhost
127.0.1.1    u182-VirtualBox

# The following lines are desirable for IPv6 capable hosts
::1        ip6-localhost ip6-loopback
fe00::0    ip6-localnet
ff00::0    ip6-mcastprefix
ff02::1    ip6-allnodes
ff02::2    ip6-allrouters
199.232.28.133 raw.githubusercontent.com
151.101.228.133 raw.githubusercontent.com
```

After the modification is complete, execute in the console terminal:

```
sudo rosdep init
rosdep update
```

After the initialization is completed, in order to avoid re-validating the ROS function path every time the terminal window is closed, we can **set the path to an environment variable**, so that each time you open a new terminal, the ROS function path will automatically take effect. Execute the following commands in sequence in the terminal, and open a console terminal (shortcut key: Ctrl+Alt+T):

5 Set up the ros environment

Bash

Execute the following commands:

```
# Ubuntu 16.04
echo "source /opt/ros/kinetic/setup.bash" >> ~/.bashrc
# Ubuntu 18.04
echo "source /opt/ros/melodic/setup.bash" >> ~/.bashrc
# Ubuntu 20.04
echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
source ~/.bashrc
```

Zsh

If you replace bash with zsh, then:

```
# Ubuntu16.04
echo "source /opt/ros/kinetic/setup.bash" >> ~/.zshrc
# Ubuntu18.04
echo "source /opt/ros/melodic/setup.bash" >> ~/.zshrc
# Ubuntu20.04
echo "source /opt/ros/noetic/setup.bash" >> ~/.zshrc
source ~/.zshrc
```


6 Installing a ROS extra dependency

Input the following command in the terminal to install a ROS extra dependency, and open a console terminal (shortcut key: Ctrl+Alt+T):

```
sudo apt-get install python-rosinstall python-rosinstall-generator python-wstool  
build-essential
```

If your Ubuntu system is version 20.04, please execute the following command to install:

```
sudo apt install python3-rosdep python3-rosinstall python3-rosinstall-generator  
python3-wstool build-essential  
# Ubuntu 16.04  
sudo apt install ros-kinetic-joint-state-publisher-gui  
# Ubuntu 18.04  
sudo apt install ros-melodic-joint-state-publisher-gui  
# Ubuntu 20.04  
sudo apt install ros-noetic-joint-state-publisher-gui
```

1.1.3 Verifying ROS

The startup of the ROS system requires a ROS Master, that is, a node manager. We can input the roscore command in the terminal to start the ROS Master.

To verify whether ROS has been installed successfully, open a console terminal (shortcut key: Ctrl+Alt+T) and execute the following command in the terminal:

```
roscore
```

When the following interface is displayed, it means that ROS has been installed successfully.

```
u18@u18-VirtualBox: ~
File Edit View Search Terminal Help
u18@u18-VirtualBox:~$ roscore
... logging to /home/u18/.ros/log/37027a36-751c-11ec-aa4a-0800279b746a/roslaunch
-u18-VirtualBox-1909.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://u18-VirtualBox:37059/
ros_comm version 1.14.12

SUMMARY
=====

PARAMETERS
* /rostdistro: melodic
* /rosversion: 1.14.12

NODES

auto-starting new master
process[master]: started with pid [1921]
ROS_MASTER_URI=http://u18-VirtualBox:11311/

setting /run_id to 37027a36-751c-11ec-aa4a-0800279b746a
process[rosout-1]: started with pid [1933]
started core service [/rosout]
```

The roscore command starts a node manager, which is used for node management. In a ros system, there is and only one node manager, which is the prerequisite for the operation of the ros node, so before executing the start of the ros node, roscore needs to be executed in the first step.

For more detailed installation instructions, you can refer to the official installation instructions by visiting the website: <http://wiki.ros.org/ROS/Installation>

1.2 MoveIt Installation

MoveIt is the composition of a series of function packages for movement operations in ros, mainly including motion planning, collision detection, kinematics, 3D perception, operation control and other functions.

1.2.1 Updating the software source list

Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window to **update the software source list**:

```
sudo apt-get update
```

1.2.2 Installing MoveIt

Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window to execute the **installation of MoveIt**:

```
# Ubuntu16.04
sudo apt-get install ros-kinetic-moveit
# Ubuntu 18.04
sudo apt-get install ros-melodic-moveit
# Ubuntu20.04
sudo apt-get install ros-noetic-moveit
```

1.3 git Installation

1.3.1 Adding a software source

Add the software source for installing git to the software source list of ubuntu, open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window:

```
sudo add-apt-repository ppa:git-core/ppa
```

1.3.2 Updating the software source list

Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window to **update the software source list**:

```
sudo apt-get update
```

1.3.3 Installing git

Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window to **execute the installation of git**:

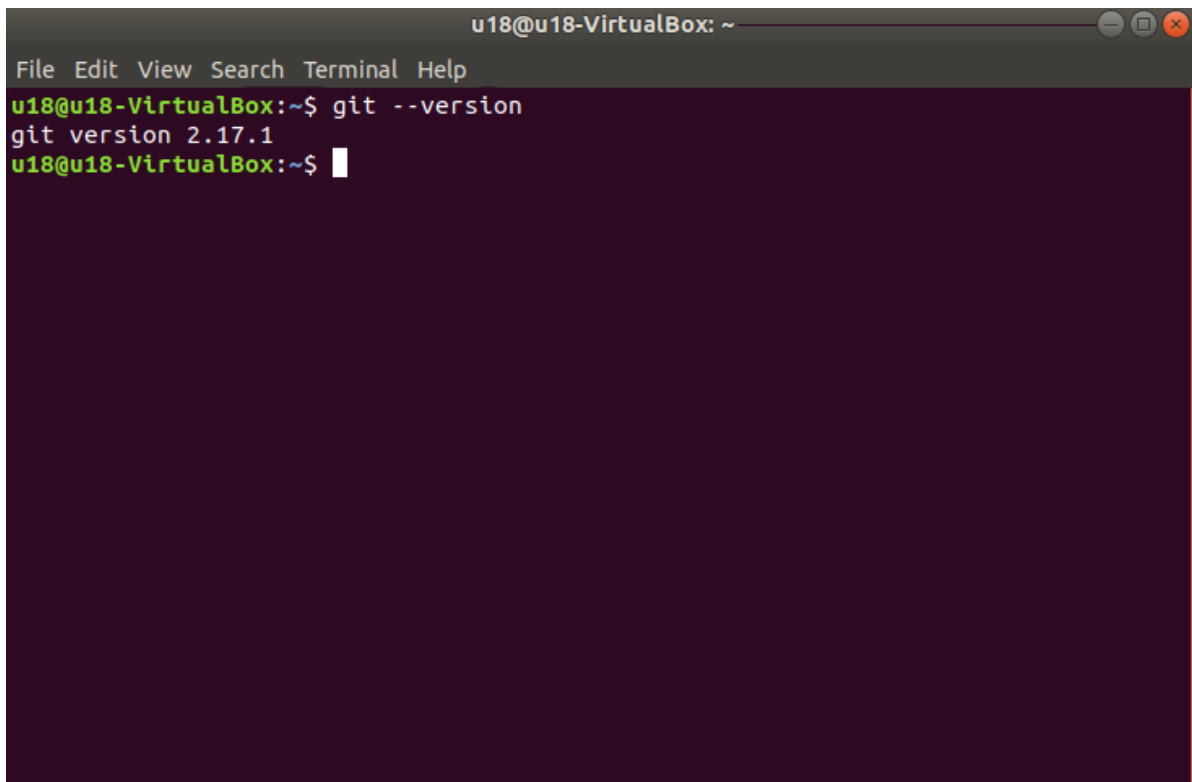
```
sudo apt-get install git
```

1.3.4 Verifying git

Read the git version, open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command on the terminal window:

```
git --version
```

The git version number can be displayed in the terminal as follows, that is, the installation is successful.

A terminal window titled 'u18@u18-VirtualBox: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'git --version' being executed, resulting in the output 'git version 2.17.1'. The prompt 'u18@u18-VirtualBox:~\$' is visible at the end of the line.

```
u18@u18-VirtualBox: ~
File Edit View Search Terminal Help
u18@u18-VirtualBox:~$ git --version
git version 2.17.1
u18@u18-VirtualBox:~$
```

1.3.5 Use

During the subsequent downloading of the ros package, you need to use git. For the use of git, refer to the following link:

- <https://git-scm.com/book/zh/v2>
- <https://www.runoob.com/git/git-tutorial.html>

2 mycobot_ros Installation

`mycobot_ros` is a ROS package launched by Elephant Robotics and applicable to its mycobot series of desktop six-axis robot arms.

Project address: http://github.com/elephantrobotics/mycobot_ros

2.1 Precondition

Before installing the package, make sure you have a ros workspace.

Here is an **example command for creating a workspace**. Open a console terminal (shortcut key: Ctrl+Alt+T) and input the following command in the command line:

```
mkdir -p ~/catkin_ws/src # Create a folder
cd ~/catkin_ws/src      # Enter the folder
catkin_init_workspace    # Initialize the current directory into a ROS
workspace
cd ..                    # Return to the parent directory
catkin_make               # Build the code in the workspace
```

Add workspace environment

Bash

The official default ROS1 workspace is `catkin_ws`.

```
# Ubuntu 16.04
echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
# Ubuntu 18.04
echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
# Ubuntu 20.04
echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc
source ~/.bashrc
```

2.2 Installing the package

NOTE:

- This package depends on ROS and MoveIT. Before using it, make sure that you have installed ROS and MoveIT successfully.
- The interaction of this package with a real robot arm depends on PythonApi - `pymycobot`.
- The Api project location is: <https://github.com/elephantrobotics/pymycobot>
- Quick installation: `pip install pymycobot --upgrade`

When executing the `pip install pymycobot --upgrade` command, if the following error message appears:

```
u182@u182-VirtualBox:~$ pip install pymycobot --upgrade
Command 'pip' not found, but can be installed with:
sudo apt install python-pip
```

Enter the following command to install pip at the prompt

```
sudo apt install python-pip
```

- If your Ubuntu system is version 20.04, please execute the command `sudo apt install python3-pip` to install pip

After the pip installation is complete, the terminal executes again

```
pip install pymycobot --upgrade
```

- The installation method depends on Git, so make sure that Git have been installed in your computer.

The official default ROS1 workspace is `catkin_ws`.

```
cd ~/catkin_ws/src # Enter the src folder of the workspace
# Clone the code on github
git clone https://github.com/elephantrobotics/mycobot_ros.git
cd ..             # return to the workspace
catkin_make # Build the code in the workspace
source devel/setup.bash # add environment variables
```

PI Version:

The Raspberry Pi version comes with an Ubuntu (V-20.04) system and a built-in development environment, so you don't need to build and manage it, just update the mycobot_ros package.

`mycobot_ros` is a ROS1 package launched by Elephant Robotics and applicable to its mycobot series of desktop six-axis robot arms.

ROS1 Project address: http://github.com/elephantrobotics/mycobot_ros

Robotic arm API driver library address: <https://github.com/elephantrobotics/pymycobot>

1 Update the mycobot_ros package

In order to ensure that users can use the latest official package in time (new users do not need to update), they can go to the `/home/er/catkin_ws/src` folder through the file manager and open the console terminal (shortcut Ctrl+Alt+T), enter the following command to update:

```
# Clone the code on github
cd ~/catkin_ws/src
git clone https://github.com/elephantrobotics/mycobot_ros.git # Please check the
attention section below before deciding whether to execute this command
cd .. # Back to work area
catkin_make # Build the code in the workspace
source devel/setup.bash # add environment variable
```

Note: If the `mycobot_ros` folder already exists in the `/home/er/catkin_ws/src` (equivalent to `~/catkin_ws/src`) directory, you need to delete the original `mycobot_ros` before executing the above command. Among them, ubuntu in the directory path is the user name of the virtual machine. If it is inconsistent, please modify it.

So far, the ROS1 environment construction has been completed. Please refer to [13.1.3 Rviz Introduction and Use](#) for the use of ROS1.