

# 从 VMware 安装 Ubuntu 22.04 到 RM 视觉项目环境配置培训手册

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编写日期：2025-08-08

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适用对象：26 赛季视觉组新人

# 目录

(此处建议在 Word 中使用“引用 -> 目录”自动生成)

## 1. 培训目标

- 熟悉 VMware 虚拟机安装与 Ubuntu 系统配置流程
- 掌握视觉项目所需环境的安装步骤
- 能够独立完成代码拉取与运行测试

## 2. 系统与软件要求

项目	版本/要求
VMware	17.x 及以上
Ubuntu	22.04 LTS
Python	3.8+
CUDA (可选)	11.8 / 12.x

## 3. VMware 虚拟机安装与配置

1. 下载 VMware Workstation 并安装 (Windows 平台)
- 官方地址：<https://www.vmware.com> (下面所有的安装包均会提供)

 VMware17.6.exe	2024/9/3 17:39	应用程序	251,368 KB
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这里只需要管理员运行，然后跟着引导安装即可

2. 创建 Ubuntu 虚拟机

- 分配 CPU/内存 (推荐 2 核/8GB)
- 网络建议 NAT 或桥接

3. 网络配置注意事项：公司内网桥接模式可能需要申请 IP





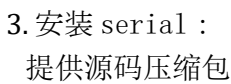
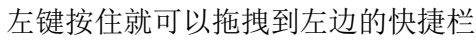


```
Activities Terminal 8月 8 15:39 julijuly@julijuly: ~  
[~][0.88s] CMD Result:success 109|80... connected.orce.py  
欢迎使用一键安装ros和ros2,支持树莓派jetson,本工具由作者小鱼提供  
欢迎使用ros2开发工具,其工具由(角青ros)小鱼提供  
小鱼:如需帮助请查看:https://github.com/yangshun/rospkg 名称:小鱼ros  
=====按下 任意 键 安装并清理三方源, 如果不知道选什么请选1=====  
Run CMD Task[sudo apt install curl -y]  
[~][4.42s] CMD Result:success  
Run CMD Task[sudo apt search group2 ]  
[~][0.47s] CMD Result:success  
Run CMD Task[sudo apt install group2 -y]  
[~][4.21s] CMD Result:success  
正在查找最佳的密钥服务: [https://github.com/ohhoo/rospkg/raw/master/ros.asc', 'https://raw.githubusercontent.com/ros/rospkg2/master/ros.asc']  
https://github.com/ohhoo/rospkg2/raw/master/ros.asc 耗时:0.41s  
https://raw.githubusercontent.com/ros/rospkg2/master/ros.asc 耗时:0.56s  
已自动选择最佳密钥服务:https://github.com/ohhoo/rospkg2/raw/master/ros.asc  
Run CMD Task[curl -s https://github.com/ohhoo/rospkg2/raw/master/ros.asc | sudo apt-key add -]  
[~][0.47s] CMD Result:success pg.d Unfound (see apt-key(8)).  
Run CMD Task[sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys F42ED0F8B17C54]  
[~][11.58s] CMD Result:success " " 1 new signature apt-key(8): F42ED0F8B17C54  
Run CMD Task[curl -s https://github.com/ohhoo/rospkg2/raw/master/ros.asc | sudo gpg --no-default-keyring --keyring gnupg-ring:/etc/apt/trusted.gpg.d/ros.gpg --import]  
[~][0.42s] CMD Result:success n.dation.org" imported  
Run CMD Task[sudo chmod o+at /etc/apt/trusted.gpg.d/ros.gpg]  
[~][0.00s] CMD Result:success  
Run CMD Task[dpkg --get-architecture]  
[~][0.00s] CMD Result:success  
根据您的系统, 为您推荐安装源为 ['http://mirrors.tuna.tsinghua.edu.cn/ros2/ubuntu/']  
创建文件:/etc/apt/sources.list.d/ros-fish.list  
Run CMD Task[sudo apt update]  
[~][8.76s] CMD Result:success then. Packages [6,463 kB]  
Run CMD Task[sudo apt search ros-base ]  
[~][0.58s] CMD Result:success ctionallities like tf2 and urdf.raker using the MQTT protocol.  
恭喜, 成功安装ros2, 接下来可以使用apt安装ros或者使用[1]-键安装ros安装!  
Run CMD Task[sudo apt search ros-base ]  
[~][0.59s] CMD Result:success ctionallities like tf2 and urdf.raker using the MQTT protocol.  
Run Choose Task: [请输入括号内的数字]  
请选择你要安装的具体版本(请注意ros1和ros2区别):  
[1]:shumble(ros2)  
[2]:tram(ros2)  
[3]:rolling(ros2)  
[4]:none  
请输入[1]内的数字以选择:  
[~][0.54s] CMD Result:success s)trained  
Run CMD Task[sudo apt install aptitude -y]  
[~][11.11s] Get:2 http://mirrors.tuna.tsinghua.edu.cn/ubuntu [arm64] amd64 libaptget amd64 1.1.0-1ubuntu1 [arm 68 kB]
```

选择桌面版即可, 这里大概等个 5~6 分钟 (与你给 Ubuntu 的虚拟内存有关)

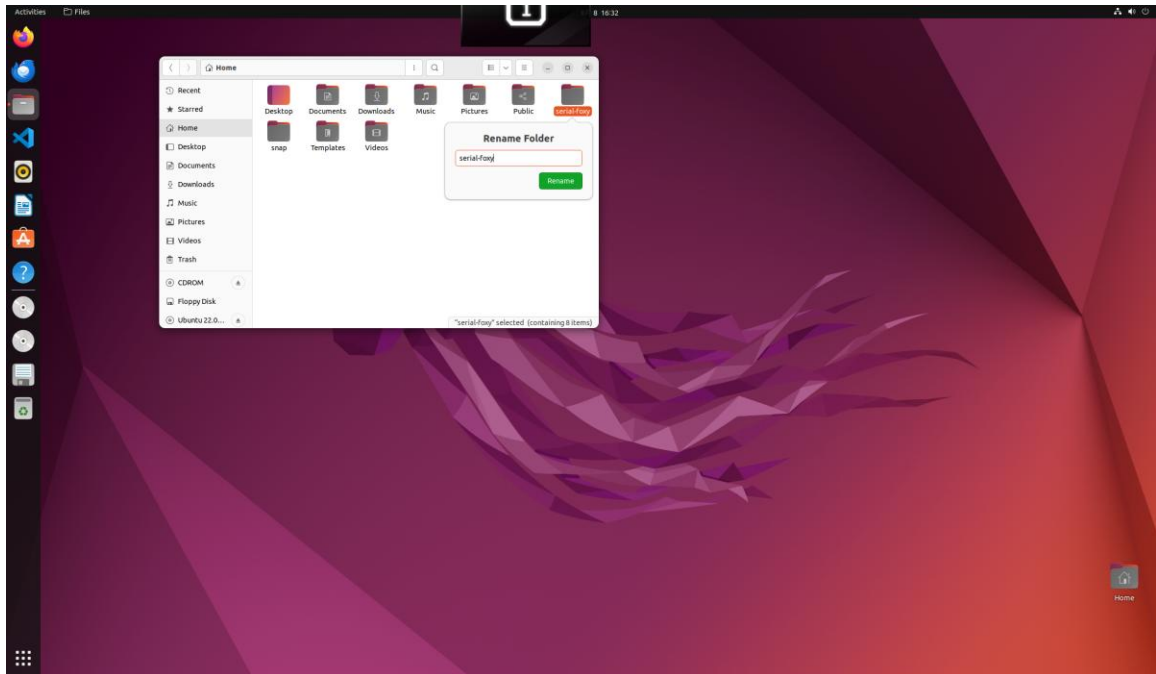
```
Activities Terminal 8月 8 15:40 julijuly@julijuly: ~  
请输入[1]内的数字以选择:  
[~][0.54s] CMD Result:success  
Run CMD Task[sudo apt update]  
[~][11.11s] CMD Result:success then. Packages [6,463 kB]  
Run CMD Task[sudo apt search curl ]  
[~][0.58s] CMD Result:success my-dubutub.22.04 amd64ub-dubutub.22.04 all4 all1  
Run CMD Task[sudo apt install curl -y]  
[~][4.42s] CMD Result:success ul:17) ...url amd64 7.81.0-1ubuntu1.28 [194 kB]  
Run CMD Task[sudo apt search group2 ]  
[~][0.47s] CMD Result:success package)ubuntu2.4 all  
Run CMD Task[sudo apt install group2 -y]  
[~][4.21s] CMD Result:success alled.).md64 group2 all 2.2.27-3ubuntu2.4 [5,144 B]  
正在查找最佳的密钥服务: [https://github.com/ohhoo/rospkg2/raw/master/ros.asc', 'https://raw.githubusercontent.com/ros/rospkg2/master/ros.asc']  
https://github.com/ohhoo/rospkg2/raw/master/ros.asc 耗时:0.41s  
https://raw.githubusercontent.com/ros/rospkg2/master/ros.asc 耗时:0.56s  
已自动选择最佳密钥服务:https://github.com/ohhoo/rospkg2/raw/master/ros.asc  
Run CMD Task[curl -s https://github.com/ohhoo/rospkg2/raw/master/ros.asc | sudo apt-key add -]  
[~][0.47s] CMD Result:success pg.d Unfound (see apt-key(8)).  
Run CMD Task[sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys F42ED0F8B17C54]  
[~][11.58s] CMD Result:success " " 1 new signature apt-key(8): F42ED0F8B17C54  
Run CMD Task[curl -s https://github.com/ohhoo/rospkg2/raw/master/ros.asc | sudo gpg --no-default-keyring --keyring gnupg-ring:/etc/apt/trusted.gpg.d/ros.gpg --import]  
[~][0.42s] CMD Result:success n.dation.org" imported  
Run CMD Task[sudo chmod o+at /etc/apt/trusted.gpg.d/ros.gpg]  
[~][0.00s] CMD Result:success  
Run CMD Task[dpkg --get-architecture]  
[~][0.00s] CMD Result:success  
根据您的系统, 为您推荐安装源为 ['http://mirrors.tuna.tsinghua.edu.cn/ros2/ubuntu/']  
创建文件:/etc/apt/sources.list.d/ros-fish.list  
Run CMD Task[sudo apt update]  
[~][8.76s] CMD Result:success then. Packages [6,463 kB]  
Run CMD Task[sudo apt search ros-base ]  
[~][0.58s] CMD Result:success ctionallities like tf2 and urdf.raker using the MQTT protocol.  
恭喜, 成功安装ros2, 接下来可以使用apt安装ros或者使用[1]-键安装ros安装!  
Run CMD Task[sudo apt search ros-base ]  
[~][0.59s] CMD Result:success ctionallities like tf2 and urdf.raker using the MQTT protocol.  
Run Choose Task: [请输入括号内的数字]  
请选择你要安装的具体版本(请注意ros1和ros2区别):  
[1]:shumble(ros2)  
[2]:tram(ros2)  
[3]:rolling(ros2)  
[4]:none  
请输入[1]内的数字以选择:  
[~][0.54s] CMD Result:success s)trained  
Run CMD Task[sudo apt install aptitude -y]  
[~][11.11s] Get:2 http://mirrors.tuna.tsinghua.edu.cn/ubuntu [arm64] amd64 libaptget amd64 1.1.0-1ubuntu1 [arm 68 kB]
```





将其解压到 home 目录下，重命名为 serial





双击进去里面有个 **readme.pdf** 像这样，安装他的引导，打开终端输入下列命令即可

Get the code:

```
# open a new terminal
cd serial
mkdir build
```

Build:

```
cd build
cmake ..
make
```

Install:

```
sudo make install
```

这里就是编译这里的源码，然后把库载入系统

A terminal window showing the installation of the 'serial' package. The user is in the directory ~/serial/build. The terminal output shows the execution of 'cmake --install .' which installs the package and its dependencies. The output includes system checks for compilers and Python, followed by the execution of 'cmake --install .' which installs the package and its dependencies. The user's prompt is 'july@julykali:~/serial/build'.

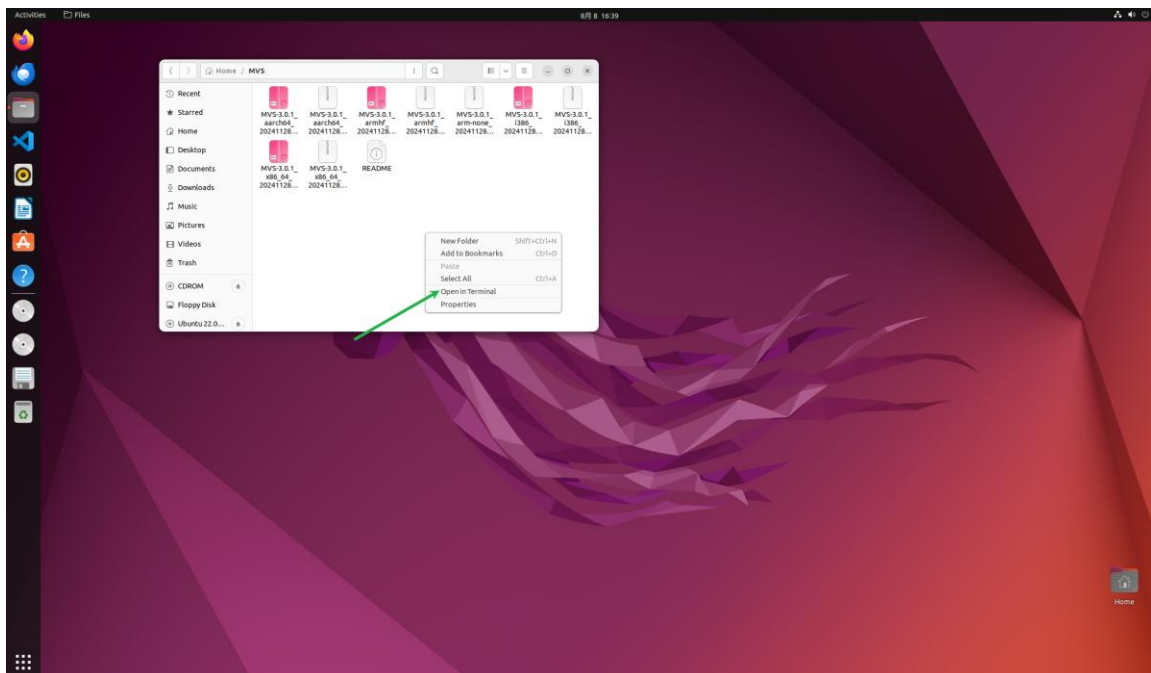
#### 4. 安装 海康工业相机驱动 MVS :

提供驱动压缩包，同样解压到 home 目录

 MVS.zip	2025/8/8 16:24	压缩(zipped)文件夹	545,160 KB
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解压后双击打开，在 **MVS** 目录下右键在终端打开输入如下命令：

```
sudo dpkg -i MVS-3.0.1_x86_64_20241128.deb
```



如下图，重启即可生效。

```
Activities Terminal 8/8 10:41 julyjuly@julyjuly: ~mvs

julyjuly@julyjuly:~mvs$ sudo dnf -t mvs-3.0.1
mvs-3.0.1_aarch64_20241128.deb mvs-3.0.1_1386_20241128.deb
mvs-3.0.1_armhf_20241128.deb mvs-3.0.1_arm_20241128.deb
julyjuly@julyjuly:~mvs$ sudo dnf -t mvs-3.0.1_x86_64_20241128.deb
[sudo] password for julyjuly:
Selecting previously unselected package mvs.
(Reading database ... 291122 files and directories currently installed.)
Preparing to unpack mvs-3.0.1_x86_64_20241128.deb ...
Unpacking mvs (2022-10-24) ...
Setting up mvs (2022-10-24) ...
Install mvs.Please wait...
cp: cannot stat '/opt/mvs/bin/fonts/*': No such file or directory
Set up the SDK environment...
Adding rules for vendor ID 2bdf.
The /etc/udev/rules.d/80-drivers-SDK-2bdf.rules rule has been created.
Adding rules for virtual serial device.
The /etc/udev/rules.d/80-drivers-SDK-virtualserial.rules rule has been created.
create link to dynamic library
Starting execute script...
Setting user's memory size to 2000
Setting socket maxnum buffer size to 10485760
Configuration of the .o.filter.
For more information, read the BMS knowledge note:
https://access.redhat.com/knowledge/solutions/53031
Supported modes:
0 - No source validation (recommended).
1 - RFC3284 Strict Reverse Path.
2 - RFC3284 Loose Reverse Path.
Setting the mode to No source validation.
The network stack will be restarted.
Install MVS complete!
Tips: You should be launch a new terminal or execute source command for the bash environment!
julyjuly@julyjuly:~mvs$
```

## 5.安装自动求导库 Ceres：

在终端输入：

sudo apt update


sudo apt install libceres-dev

```
Activities Terminal 8/8 10:50 julyjuly@julyjuly: ~

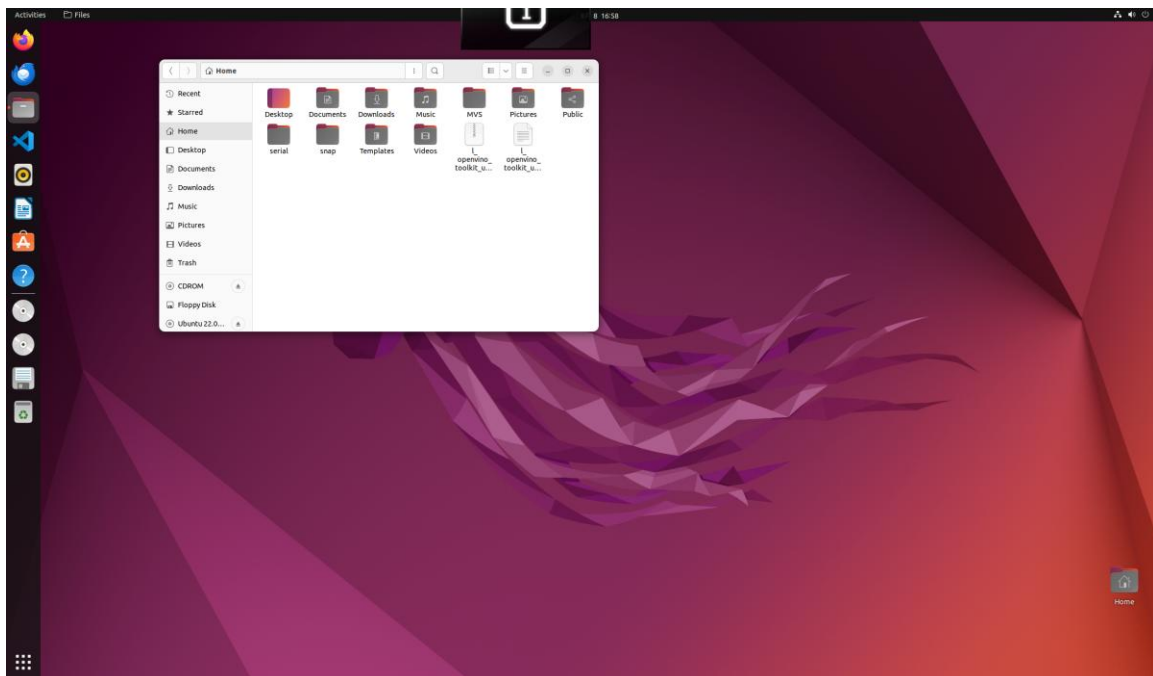
julyjuly@julyjuly:~$ sudo apt update
[sudo] password for julyjuly:
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Get:2 http://packages.microsoft.com/repos/code stable/main amd64 Packages [19.9 kB]
Get:3 http://packages.microsoft.com/repos/code stable/main arm64 Packages [20.1 kB]
Get:4 http://packages.microsoft.com/repos/code stable/main armhf Packages [20.0 kB]
Get:5 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy InRelease
Get:6 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy InRelease
Get:7 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy-updates InRelease
Get:8 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy-backports InRelease
Fetched 189 kB in 3s (68.1 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
240 packages can be upgraded. Run 'apt list --upgradable' to see them.
julyjuly@julyjuly:~$ sudo apt install libceres-dev
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
libamd2 libbtf1 libcamd2 libcolamd2 libceres2 libcholmod2 libcsparse3
libfflags-dev libfflags2.2 libgoogle-glog-dev libgoogle-glogv5
libgraphblas-dev libgraphblas libklut libldl2 libmetis libmagma2
libmetis libmklplut libmagma2 libmagma2 libmagma2 libmagma2 libmagma2
libmagma2 libmagma2 libmagma2 libmagma2 libmagma2 libmagma2
The following NEW packages will be installed:
libamd2 libbtf1 libcamd2 libcolamd2 libceres-dev libceres2 libcholmod2
libcsparse3 libfflags-dev libfflags2.2 libgoogle-glog-dev libgoogle-glogv5
libgraphblas-dev libgraphblas libklut libldl2 libmetis libmagma2
libmetis libmklplut libmagma2 libmagma2 libmagma2 libmagma2
8 upgraded, 24 newly installed, 0 to remove and 240 not upgraded.
Need to get 26.6 MB of archives.
After this operation, 197 MB of additional disk space will be used.
Do you want to continue? [y/n] y
Get:1 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libamd2 amd64 1:15.10.1dfsg-4build1 [21.4 kB]
Get:2 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libbtf1 amd64 1:15.10.1dfsg-4build1 [22.3 kB]
Get:3 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libcamd2 amd64 1:15.10.1dfsg-4build1 [22.3 kB]
Get:4 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libcolamd2 amd64 1:15.10.1dfsg-4build1 [25.2 kB]
Get:5 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 libmetis libmetis5 amd64 5.1.0.dfsg-7build1 [181 kB]
Get:6 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libcholmod2 amd64 1:15.10.1dfsg-4build1 [186 kB]
Get:7 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libcsparse3 amd64 1:15.10.1dfsg-4build1 [78.8 kB]
Get:8 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 libfflags2.2 amd64 2:2.2-2 [78.1 kB]
Get:9 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libgoogle-glogv5 amd64 0.5.0+really-0.4.2 [60.3 kB]
Get:10 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libgoogle-glog-dev amd64 1:15.10.1dfsg-4build1 [78.8 kB]
Get:11 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libceres2 amd64 2.0.8dfsg1-5 [834 kB]
Get:12 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 libfflags-dev amd64 2:2.2-2 [19.7 kB]
Get:13 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 libgraphblas-dev amd64 1:15.10.1dfsg-4build1 [1,883 kB]
Get:14 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libgoogle-glog-dev amd64 0.5.0+really-0.4.2 [51.9 kB]
Get:15 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libklut amd64 1:15.10.1dfsg-4build1 [77.6 kB]
Get:16 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libldl2 amd64 1:15.10.1dfsg-4build1 [11.7 kB]
Get:17 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [130.5 kB]
Get:18 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmklplut amd64 1:15.10.1dfsg-4build1 [210 kB]
Get:19 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmetis libmetis5 amd64 5.1.0.dfsg-7build1 [181 kB]
Get:20 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [210 kB]
Get:21 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [210 kB]
Get:22 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [210 kB]
Get:23 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [210 kB]
Get:24 http://cn.archive.ubuntu.com/ubuntu jammy/universe amd64 libmagma2 amd64 1:15.10.1dfsg-4build1 [210 kB]
Fetched 26.6 MB in 49s (538 kB/s)
Selecting previously unselected package libamd2:amd64.
(Reading database ... 291139 files and directories currently installed.)
Preparing to unpack .../libamd2_1:15.10.1dfsg-4build1_amd64.deb ...
Unpacking libamd2:amd64 (1:15.10.1dfsg-4build1) ...
Selecting previously unselected package libbtf1:amd64.
Preparing to unpack .../libbtf1_1:15.10.1dfsg-4build1_amd64.deb ...
Unpacking libbtf1:amd64 (1:15.10.1dfsg-4build1) ...
Selecting previously unselected package libcamd2:amd64.
Preparing to unpack .../libcamd2_1:15.10.1dfsg-4build1_amd64.deb ...
Unpacking libcamd2:amd64 (1:15.10.1dfsg-4build1) ...
Selecting previously unselected package libcolamd2:amd64.
Preparing to unpack .../libcolamd2_1:15.10.1dfsg-4build1_amd64.deb ...
Unpacking libcolamd2:amd64 (1:15.10.1dfsg-4build1) ...
```

6. 安装 cpu 加速 openvino2023 :

提供关键 openvino2023 库压缩包及校验包

 I_openvino_toolkit_ubuntu22_2023.3.0.137...	2025/4/6 11:52	压缩存档文件夹	52,420 KB
 I_openvino_toolkit_ubuntu22_2023.3.0.137...	2025/4/6 11:51	SHA256 文件	1 KB

拷贝到 home 目录下，打开终端

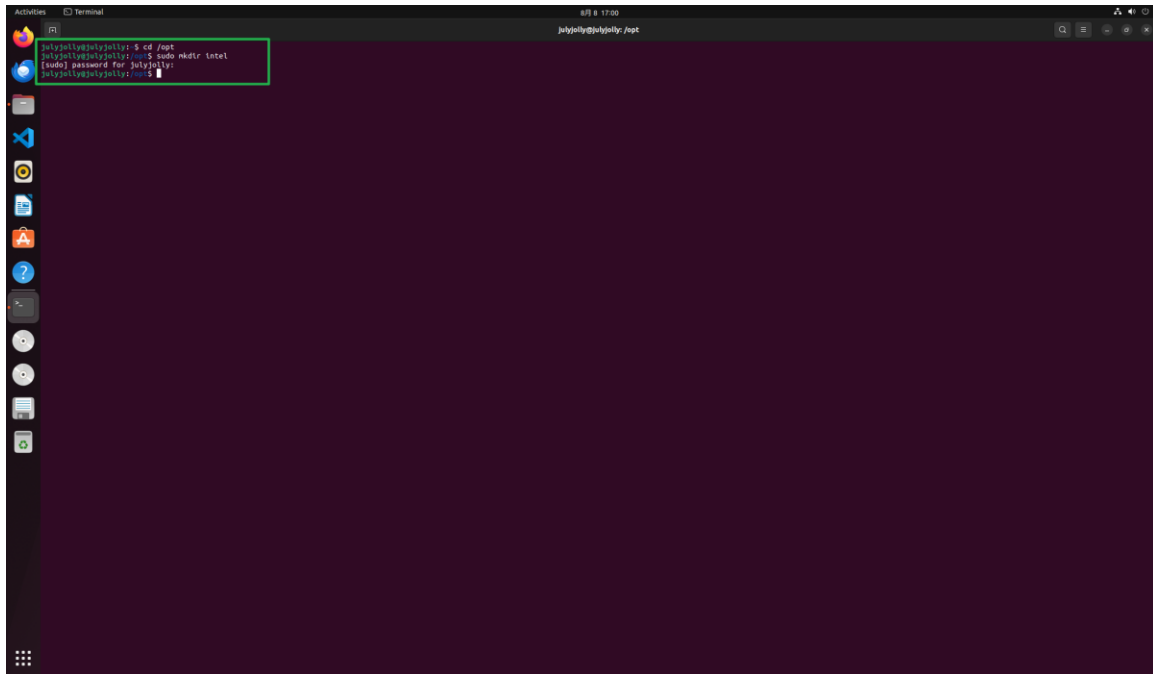


输入

```
cd /opt
```

```
sudo mkdir intel
```

创建存放 openvino 库的文件夹

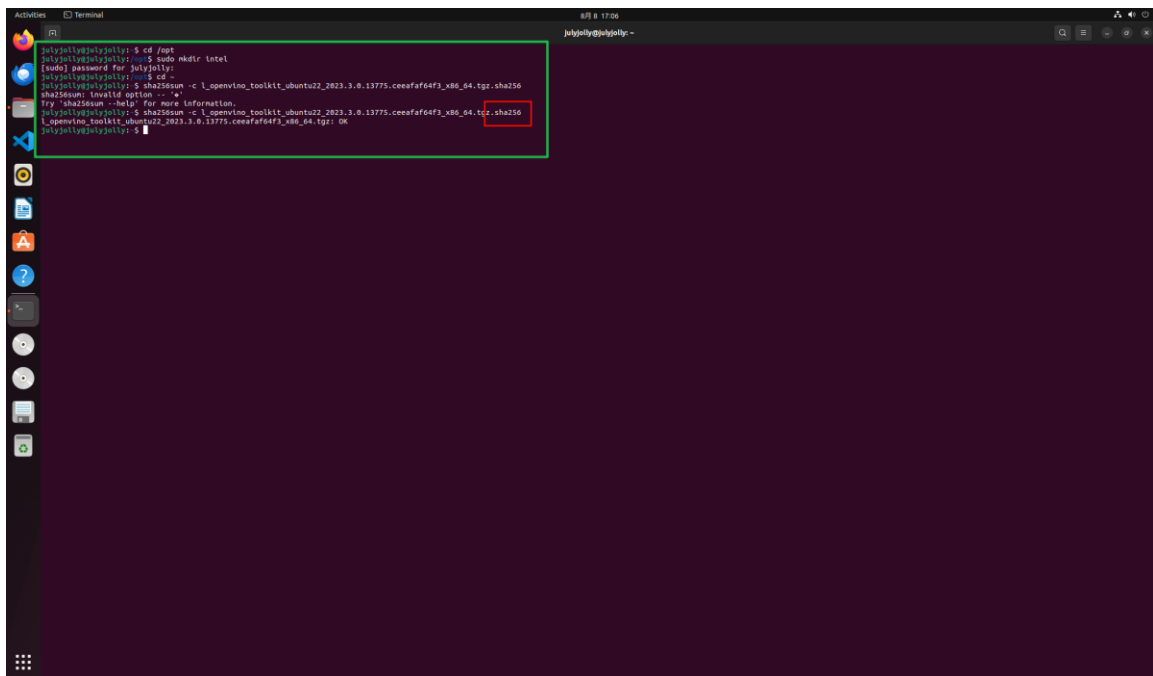
A terminal window with a dark purple background. The prompt is 'julyjolly@julyjolly: ~'. The user has entered 'cd /opt' and 'sudo mkdir intel'. The terminal shows the password prompt and the user's input 'julyjolly'.

输入: `cd ~` 返回 home 目录

输入: `sha256sum -c`

`l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf64f3_x86_64.tgz.sha256`

这个命令用来校验库，第一次复制进去可能会打印报错日志，第二遍手敲 `sha256sum -c l_op` 在 `tab` 补齐即可，补齐别忘了 `.sha256`

A terminal window showing the execution of the `sha256sum` command. The user enters `sha256sum -c l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf64f3_x86_64.tgz.sha256`. The output shows the file name and a checkmark, indicating the file is OK. The terminal also shows the user's input 'julyjolly' and the prompt 'julyjolly@julyjolly: ~'.

输入

```
sudo tar xf l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf64f3_x86_64.tgz -C /opt/intel
```

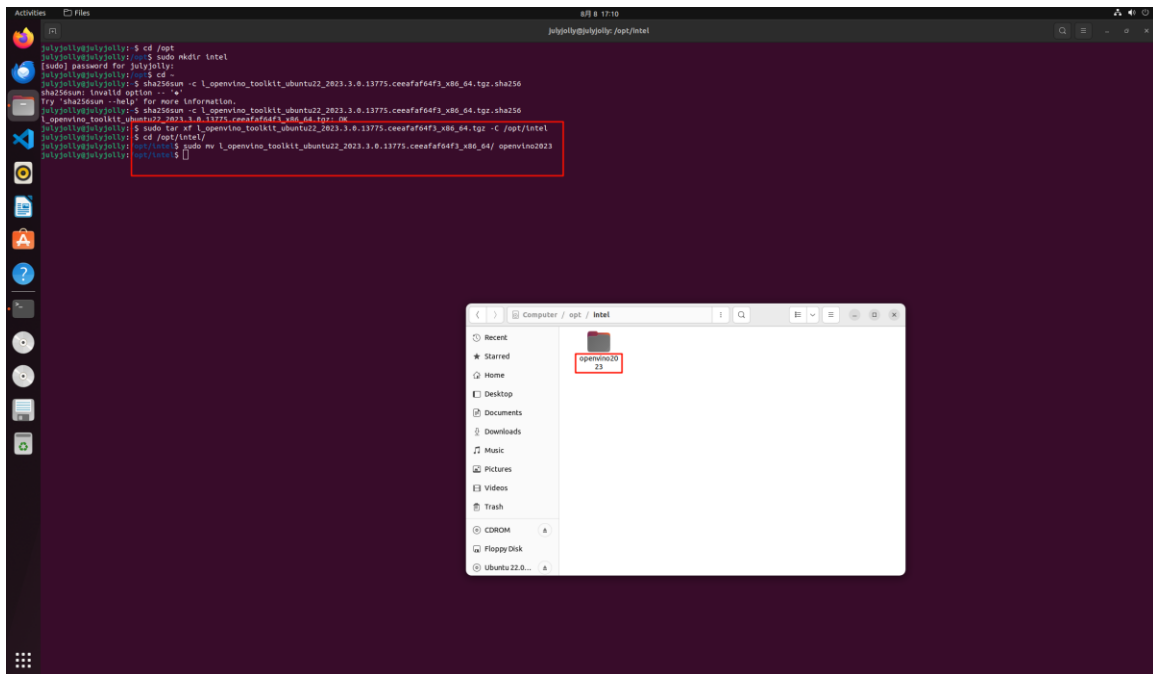
将 openvino 库解压到 intel 文件夹

然后，输入

```
cd /opt/intel/
```

```
sudo mv l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf64f3_x86_64/ openvino2023
```

将 intel 的 openvino 改名为 openvino2023



输入 `cd ~` 回到 home 目录，接着依次输入下面命令行安装 openvino APT

```
wget https://apt.repos.intel.com/intel-gpg-keys/GPG-PUB-KEY-INTEL-SW-PRODUCTS.PUB
```

```
sudo apt-key add GPG-PUB-KEY-INTEL-SW-PRODUCTS.PUB
```

```
echo "deb https://apt.repos.intel.com/opencvino/2023 ubuntu22 main" | sudo tee /etc/apt/sources.list.d/intel-openvino-2023.list
```

```
sudo apt update
```

```
apt-cache search openvino
```

```
sudo apt install openvino-2023.1.0
```

```
Activities Terminal 8月 8 17:16
julyjolly@julyjolly: ~$ cd /opt
julyjolly@julyjolly: /opt$ sudo mkdir intel
[sudo] password for julyjolly:
julyjolly@julyjolly: /opt$ cd
julyjolly@julyjolly: /opt$ sha256sum -c l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf6f3_x86_64.tgz.sha256
sha256sum: invalid option -- 'c'
Try 'sha256sum --help' for more information.
julyjolly@julyjolly: /opt$ sha256sum -c l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf6f3_x86_64.tgz.sha256
l_openvino_toolkit_ubuntu22_2023.3.0.13775.cceafaf6f3_x86_64.tgz: OK
HTTP request sent, awaiting response... 200 OK
Length: 4738 (4.6K) [application/vnd.xstream-package]
Saving to: 'CPC-PUB-KEY-INTEL-SW-PRODUCTS.pub'
CPC-PUB-KEY-INTEL-SW-PRODUCTS.PUB 100%[=====] 4.63K --.-KB/s in 0s
2023-08-08 17:15:30 (3.64 GB/s) - 'CPC-PUB-KEY-INTEL-SW-PRODUCTS.PUB' saved [4738/4738]
julyjolly@julyjolly: /opt$ sudo apt-key add CPC-PUB-KEY-INTEL-SW-PRODUCTS.PUB
Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
OK
julyjolly@julyjolly: /opt$ deb https://apt.repos.intel.com/opencvino/2023 ubuntu22 main | sudo tee /etc/apt/sources.list.d/intel-openvino-2023.list
deb https://apt.repos.intel.com/opencvino/2023 ubuntu22 main
julyjolly@julyjolly: /opt$ sudo apt update
Hit:1 http://mirrors.tuna.tsinghua.edu.cn/ros2/ubuntu jammy InRelease
Hit:2 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:3 https://apt.repos.intel.com/opencvino/2023 ubuntu22 InRelease [7,776 B]
Hit:4 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy InRelease
Hit:5 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy-updates InRelease
Hit:6 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy-backports InRelease
Get:8 https://apt.repos.intel.com/opencvino/2023 ubuntu22/main amd64 Packages [18.1 kB]
Get:9 https://apt.repos.intel.com/opencvino/2023 ubuntu22/main all Packages [6,300 B]
Fetched 38.4 kB in 1s (26.2 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
240 packages can be upgraded. Run 'apt list --upgradable' to see them.
Hit:1 https://apt.repos.intel.com/opencvino/2023/dist/ubuntu22 InRelease: key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
Hit:2 https://apt.repos.intel.com/opencvino/2023/dist/ubuntu22 InRelease
libopenvino-2023.0.0 - OpenVINO Toolkit
libopenvino-2023.0.1 - OpenVINO Toolkit
libopenvino-2023.0.2 - OpenVINO Toolkit
libopenvino-2023.1.0 - OpenVINO Toolkit
libopenvino-2023.2.0 - OpenVINO Toolkit
libopenvino-2023.3.0 - OpenVINO Toolkit
libopenvino-2023.4.0 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.0.0 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.0.1 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.0.2 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.1.0 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.2.0 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.3.0 - OpenVINO Toolkit
libopenvino-auto-batch-plugin-2023.4.0 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.0.0 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.0.1 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.0.2 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.1.0 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.2.0 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.3.0 - OpenVINO Toolkit
libopenvino-auto-plugin-2023.4.0 - OpenVINO Toolkit
libopenvino-dev-2023.0.0 - OpenVINO Toolkit
libopenvino-dev-2023.0.1 - OpenVINO Toolkit
libopenvino-dev-2023.0.2 - OpenVINO Toolkit
libopenvino-dev-2023.1.0 - OpenVINO Toolkit
libopenvino-dev-2023.2.0 - OpenVINO Toolkit
libopenvino-dev-2023.3.0 - OpenVINO Toolkit
```

等待即可

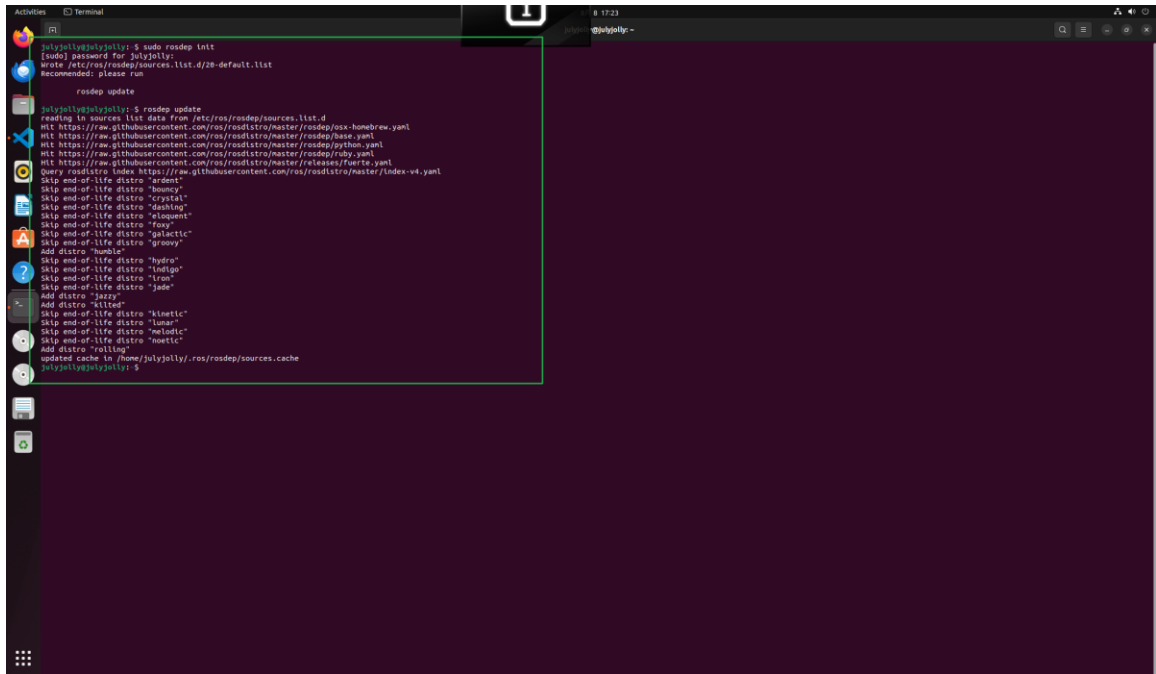
```
1. Couldn't find any package by glob 'openvino-2023.0'
julyjolly@julyjolly: /opt$ sudo apt install openvino-2023.1.0
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libopenvino-2023.1.0 libopenvino-auto-batch-plugin-2023.1.0 libopenvino-auto-plugin-2023.1.0 libopenvino-dev-2023.1.0 libopenvino-hetero-plugin-2023.1.0 libopenvino-intel-cpu-plugin-2023.1.0
  libopenvino-ir-frontend-2023.1.0 libopenvino-onnx-frontend-2023.1.0 libopenvino-paddle-frontend-2023.1.0 libopenvino-pytorch-frontend-2023.1.0 libopenvino-tensorflow-frontend-2023.1.0
  nlohmann-json3-dev openvino-libraries-2023.1.0 openvino-libraries-dev-2023.1.0 openvino-samples-2023.1.0 openvino-samples-python-2023.1.0 python3-openvino-2023.1.0
Suggested packages:
  ocl-icd-opencl-dev opencl-headers
The following NEW packages will be installed:
  libopenvino-2023.1.0 libopenvino-auto-batch-plugin-2023.1.0 libopenvino-auto-plugin-2023.1.0 libopenvino-dev-2023.1.0 libopenvino-hetero-plugin-2023.1.0 libopenvino-intel-cpu-plugin-2023.1.0
  libopenvino-ir-frontend-2023.1.0 libopenvino-onnx-frontend-2023.1.0 libopenvino-paddle-frontend-2023.1.0 libopenvino-pytorch-frontend-2023.1.0 libopenvino-tensorflow-frontend-2023.1.0
  nlohmann-json3-dev openvino-libraries-2023.1.0 openvino-libraries-dev-2023.1.0 openvino-samples-2023.1.0 openvino-samples-python-2023.1.0 python3-openvino-2023.1.0
0 upgraded, 21 newly installed, 0 to remove and 240 not upgraded.
Need to get 37.5 MB of archives.
After this operation, 152 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 libopuglmlvs amd64 1.12.1-1 [91.7 kB]
Get:2 http://mirrors.tuna.tsinghua.edu.cn/ubuntu jammy/universe amd64 nlohmann-json3-dev all 3.10.5-2 [167 kB]
Get:3 https://apt.repos.intel.com/opencvino/2023 ubuntu22/main amd64 libopenvino-2023.1.0 amd64 2023.1.0.12185 [6,066 kB]
Get:4 https://apt.repos.intel.com/opencvino/2023 ubuntu22/main amd64 libopenvino-auto-batch-plugin-2023.1.0 amd64 2023.1.0.12185 [99.3 kB]
180 B [4004 B]
```

7.rosdep init 以及 rosdep update :

打开终端输入

sudo rosdep init

rosdep update



```
julyjolly@julyjolly:~$ sudo rosdep init
[sudo] password for julyjolly:
wrote /etc/ros/rosdep/sources.list.d/20-default.list
Recommended: please run

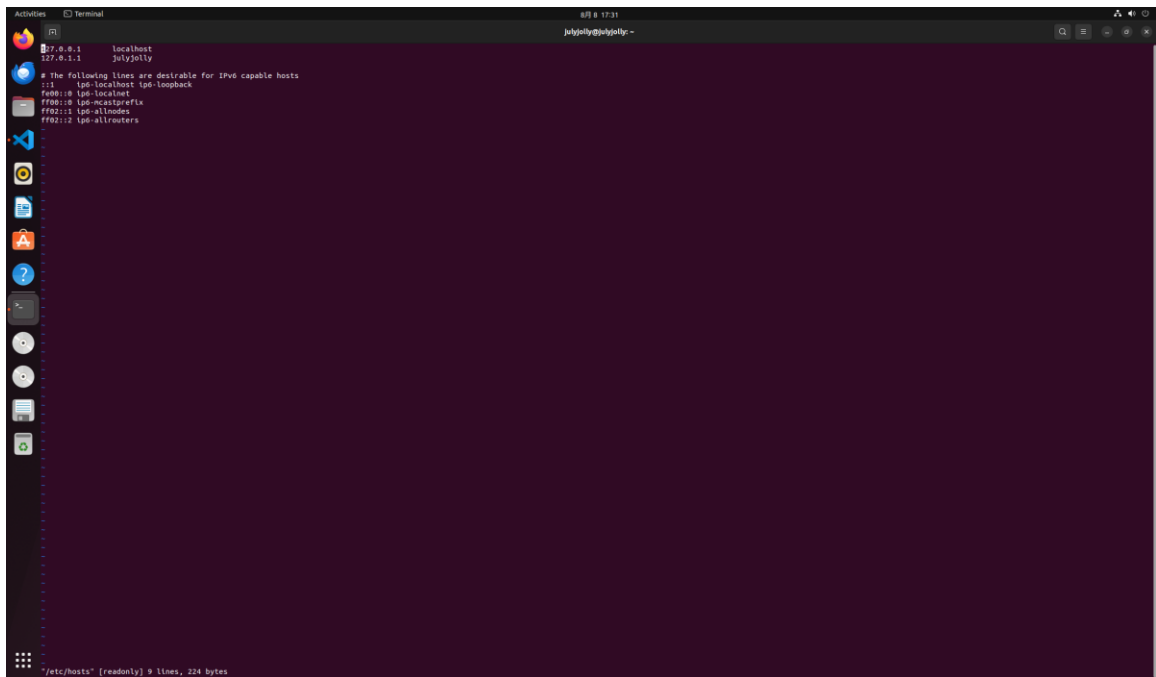
rosdep update

julyjolly@julyjolly:~$ rosdep update
reading in sources list data from /etc/ros/rosdep/sources.list.d
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/osx-homebrew.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/base.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/patches.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/rosdep/ruby.yaml
Hit https://raw.githubusercontent.com/ros/rosdistro/master/releases/fuente.yaml
Query rosdistro index https://raw.githubusercontent.com/ros/rosdistro/master/index-v4.yaml
Skip end-of-life distro "ardent"
Skip end-of-life distro "bouncy"
Skip end-of-life distro "crystal"
Skip end-of-life distro "dashing"
Skip end-of-life distro "eloquent"
Skip end-of-life distro "foxy"
Skip end-of-life distro "galactic"
Skip end-of-life distro "groovy"
Add distro "humble"
Skip end-of-life distro "hydro"
Skip end-of-life distro "indigo"
Skip end-of-life distro "iron"
Skip end-of-life distro "jade"
Add distro "jazzy"
Add distro "kinetic"
Skip end-of-life distro "kinetic"
Skip end-of-life distro "lunar"
Skip end-of-life distro "melodic"
Skip end-of-life distro "noetic"
Add distro "rolling"
update cache in /home/julyjolly/.ros/rosdep/sources.cache
julyjolly@julyjolly:~$
```

我这里运气好一次就通过了，如果没通过也别着急在 `/etc/hosts` 文件中添加相应的 ip 即可，

输入 `vi /etc/hosts`

进去之后就是这样的



```
127.0.0.1 localhost
127.0.1.1 julyjolly

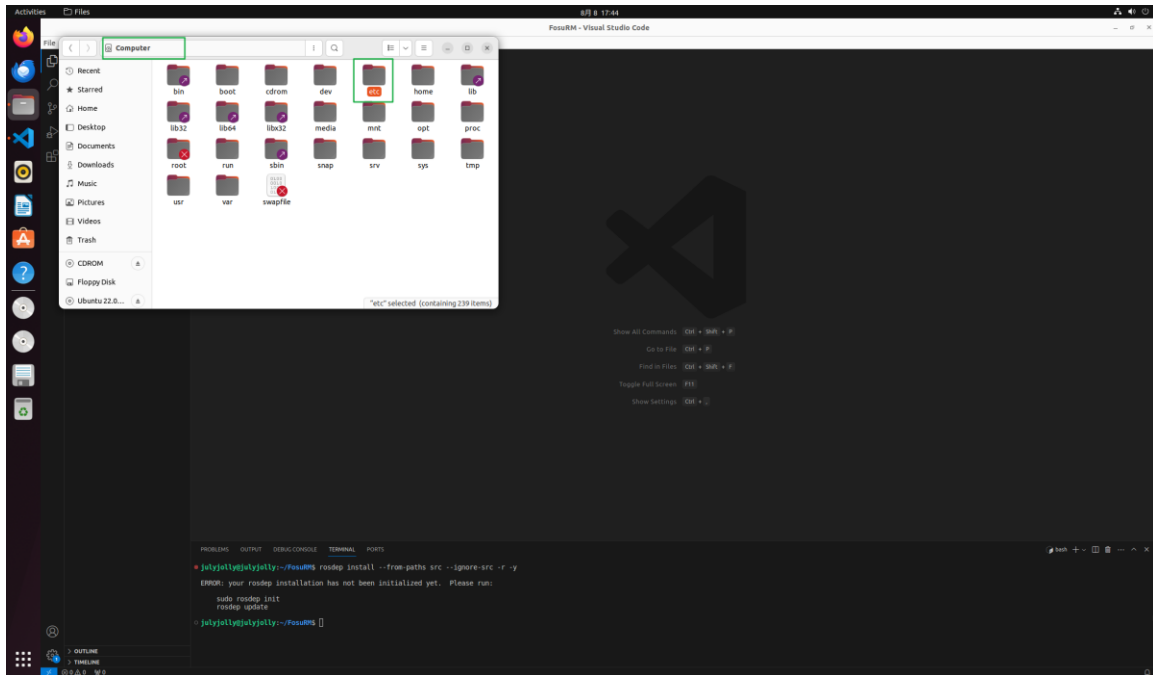
# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
ff00::0 ip6-localhost
ff00::0 ip6-loopback
ff02::0 ip6-allnodes
ff02::0 ip6-allrouters

/etc/hosts [readonly] 9 lines, 224 bytes
```

然后在最后一行输入 [185.199.111.133 raw.githubusercontent.com](https://raw.githubusercontent.com) 就可以了



vi 会很难使用，也可以在文件夹中找到/etc 这个目录，如何找到/etc，只需在 home 目录下，按住你删除文字的那个按键，按两下就会跳转到



双击打开 hosts 再在最后一行添加 [185.199.111.133](http://185.199.111.133) raw.githubusercontent.com 然后保存就好，保存的时候应该要你输入用户的密码。

