# 1. Use depth camera


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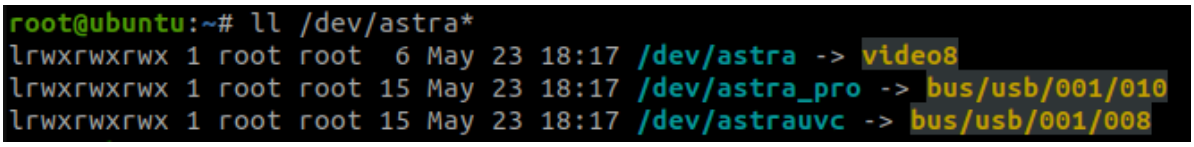
    1.1. Description of program function
    1.2. Program Code Reference path
    1.3. Program Startup
    1.4. Visualize images
        1.4.1 rqt_image_view
        1.4.2. rviz2
        1.4.3. Web display


Before driving the depth camera, the Astra camera device needs to be identified at the cart end. The environment has been set up in the system image. After SSH connects to the car, type in the terminal,

```
ll /dev/astra*
```




If the following figure is displayed, the Astra camera device is successfully connected. If no result is displayed, reinsert the camera USB.

## 1.1. Description of program function

After the program is run, Astra camera can be driven to obtain color RGB, Depth depth, infrared IR image information and depth point cloud information.

> Official website link：https://orbbec3d.com/develop/
>
> Astra Camera：https://github.com/orbbec/ros_astra_camera
>
> Developer community：https://developer.orbbec.com.cn/download.html?id=53

## 1.2. Program Code Reference path

After SSH connection car, the location of the function source code is located at,

```
/userdata/software/astramini_ws/src/ros2_astra_camera/astra_camera/launch
```

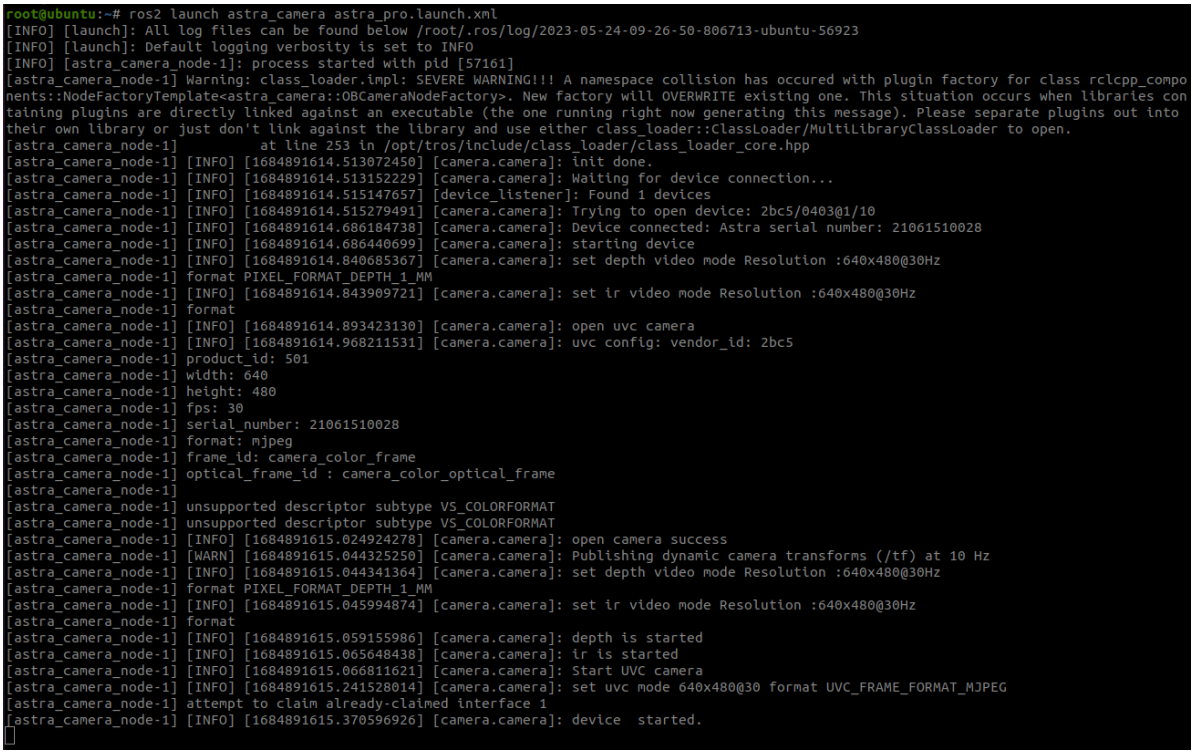
## 1.3. Program Startup

Launch startup command,

| launch file | Camera model |
| --- | --- |
| ros2 launch astra_camera astra_pro.launch.xml | Astrapro |
| ros2 launch astra_camera astro_pro_plus.launch.xml | Astraproplus |
| ros2 launch astra_camera astra.launch.xml | Astramini |

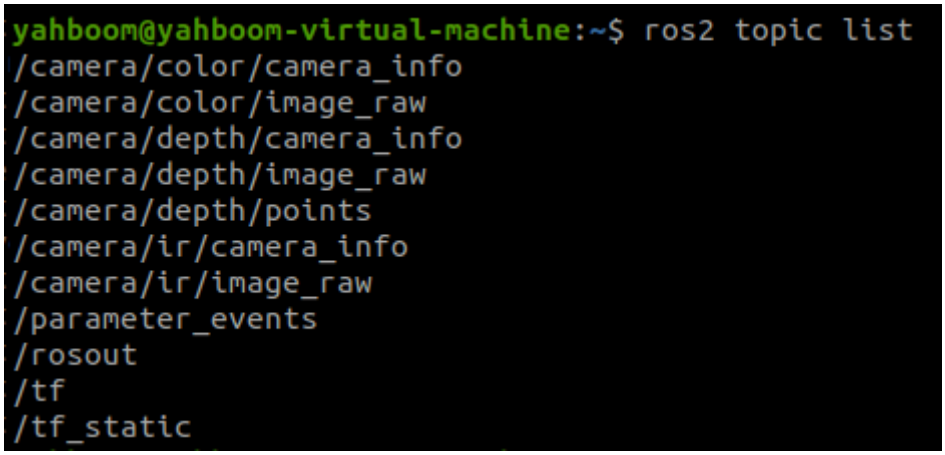
Take Astrapro camera as an example, after SSH connection to the car, terminal input,

```
ros2 launch astra_camera astra_pro.launch.xml
```




You can run the following command to view the topic, enter in the VM terminal,

```
ros2 topic list
```




The main topics are as follows,

| Topic name | Topic content |
| --- | --- |
| /camera/color/image_raw | RGB color image data |
| /camera/depth/image_raw | Depth Image data |
| /camera/depth/points | Depth Indicates the depth point cloud data |
| /camera/ir/image_raw | IR infrared image data |

# 1.4. Visualize images

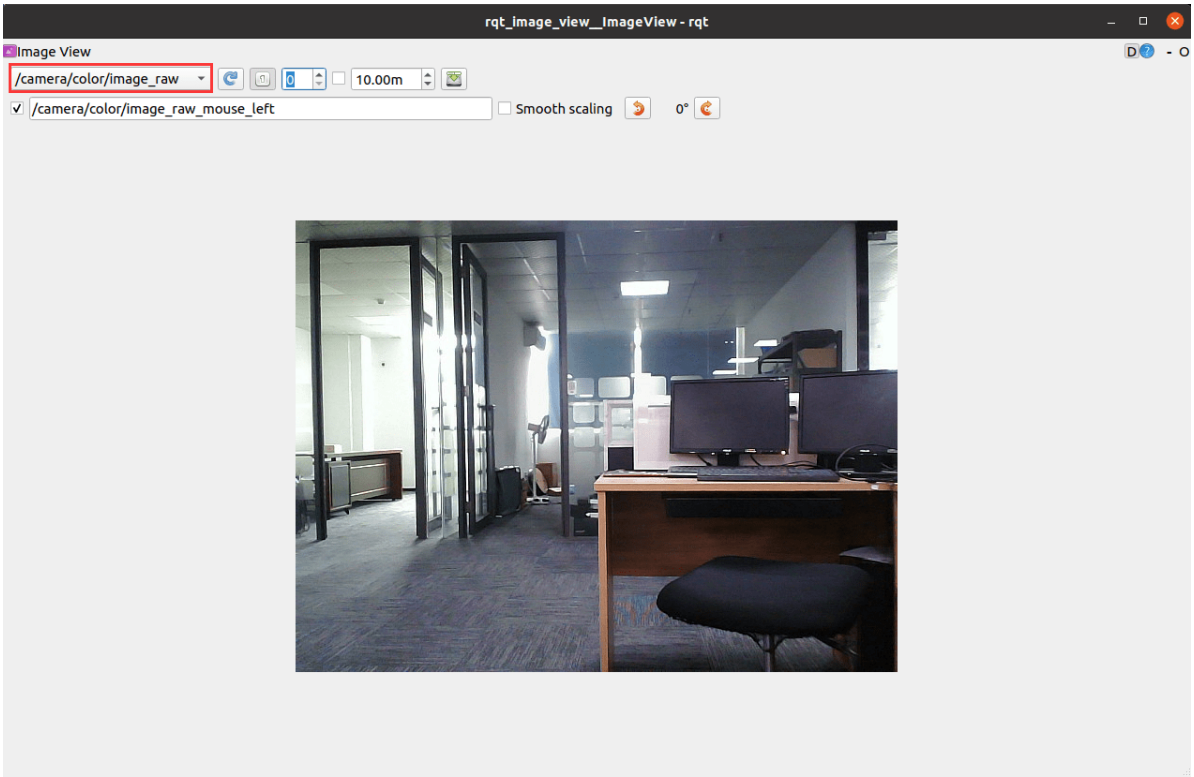
After the camera is started, you can display the topic image in the following ways.

## 1.4.1 rqt_image_view

Use the rqt_image_view tool to view the image data, enter in the virtual machine terminal,

```
ros2 run rqt_image_view rqt_image_view
```

Then select the corresponding image topic to be displayed in the upper left corner. Here, take the display of RGB images as an example.

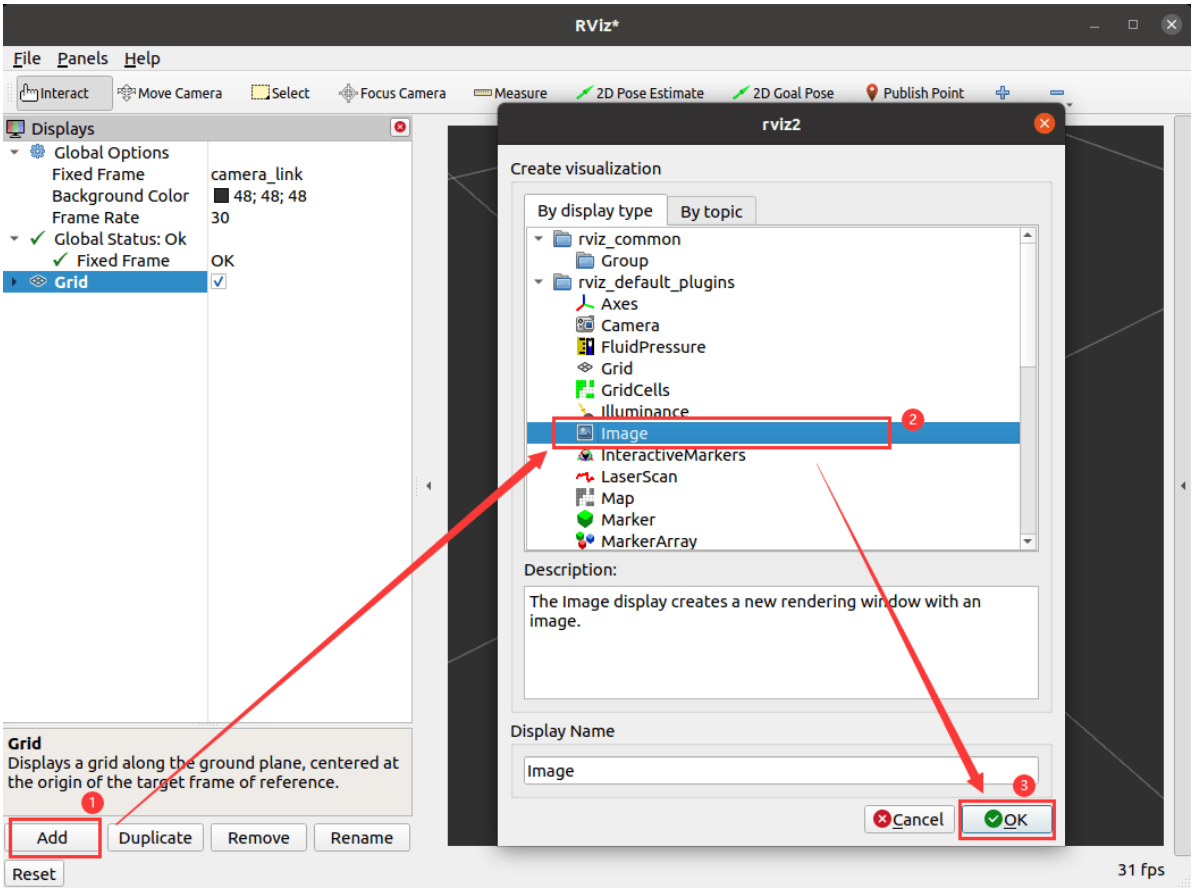



## 1.4.2. rviz2

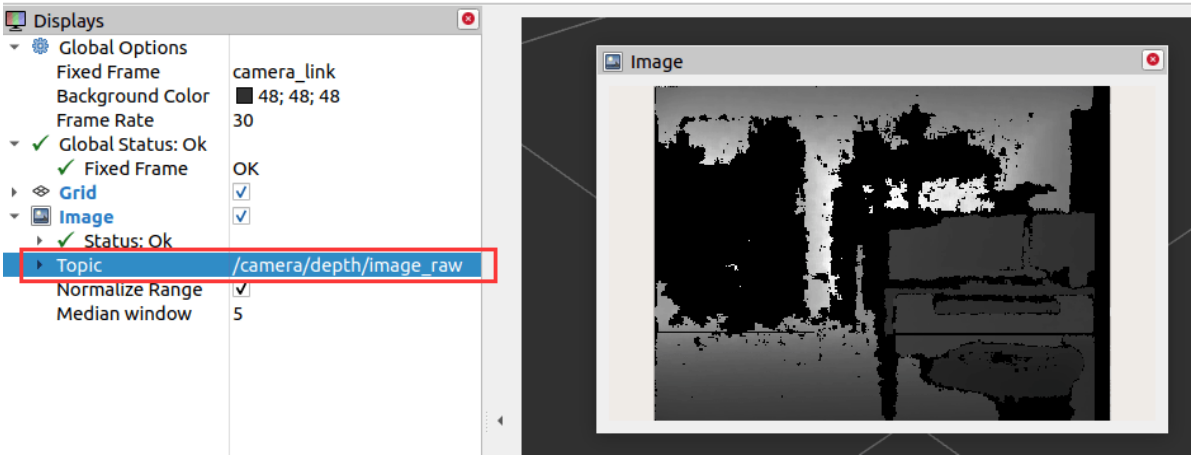
Use rviz2 to display images or deep point clouds, enter in the virtual machine terminal,

```
rviz2
```

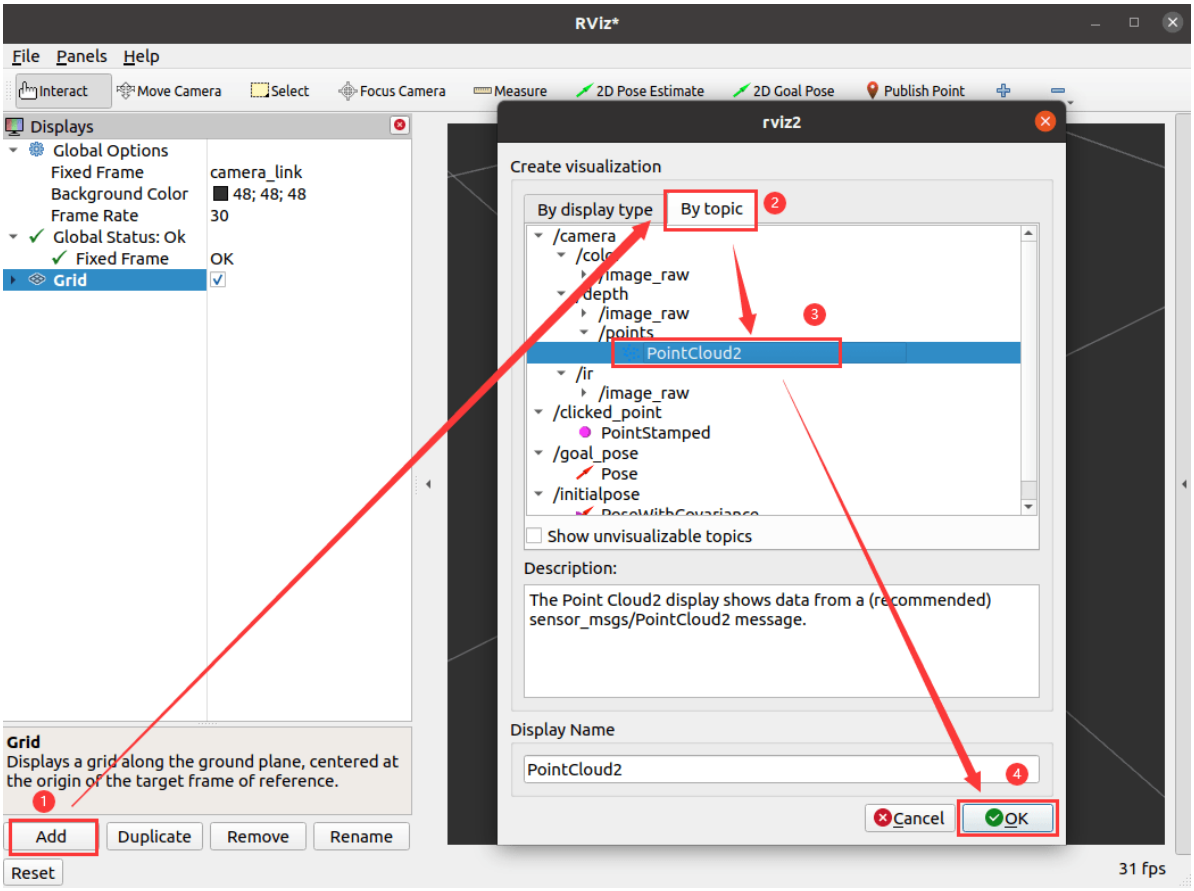
(1) Add Image information to rviz.



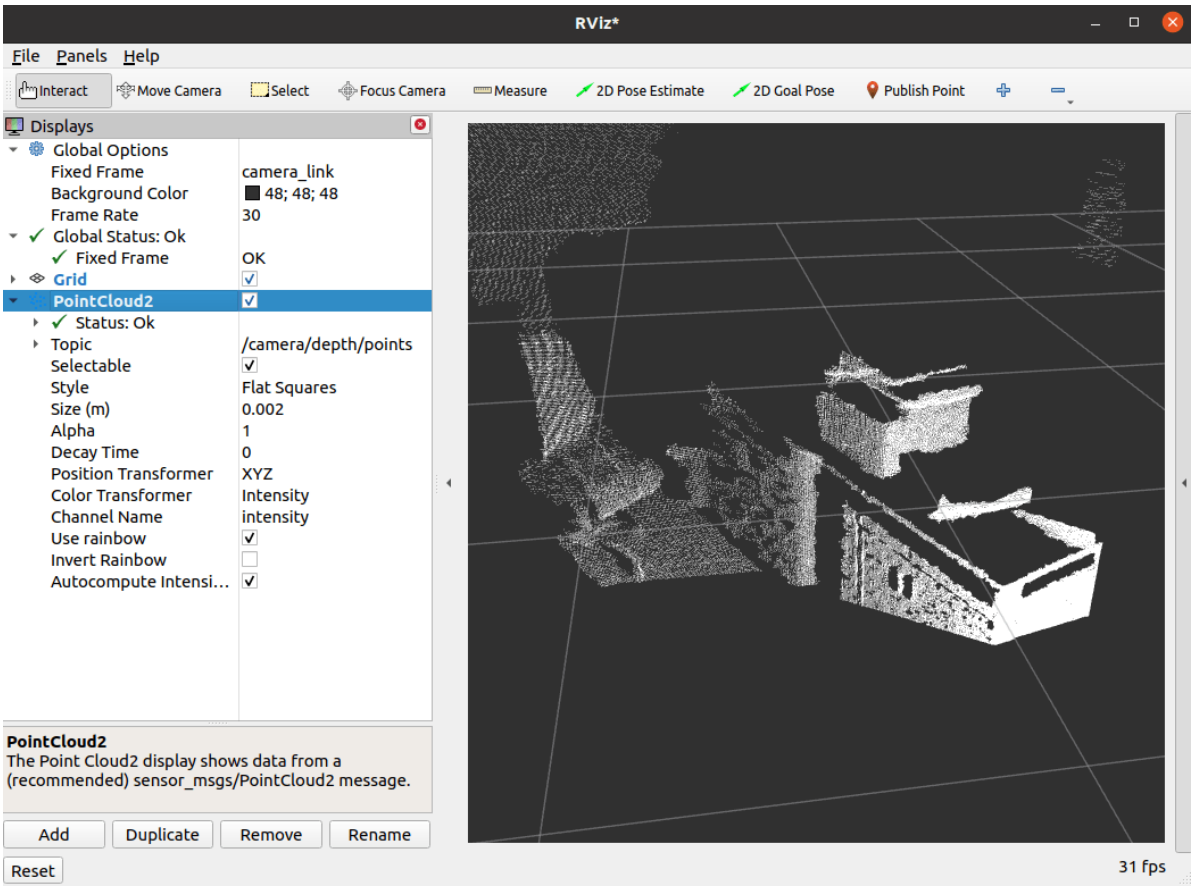

Change **Fixed Frame** to **camera_link** and select a suitable Topic in the topic bar to display the image. Here, the depth map is shown as an example.




(2) Add depth point cloud information to rviz,




Change **Fixed Frame** to **camera_link** to view the point cloud information.




In fact, if you only need in-depth information, Astra pro just needs to launch the following command,

```
ros2 launch astra_camera astra.launch.xml
```

## 1.4.3. Web display

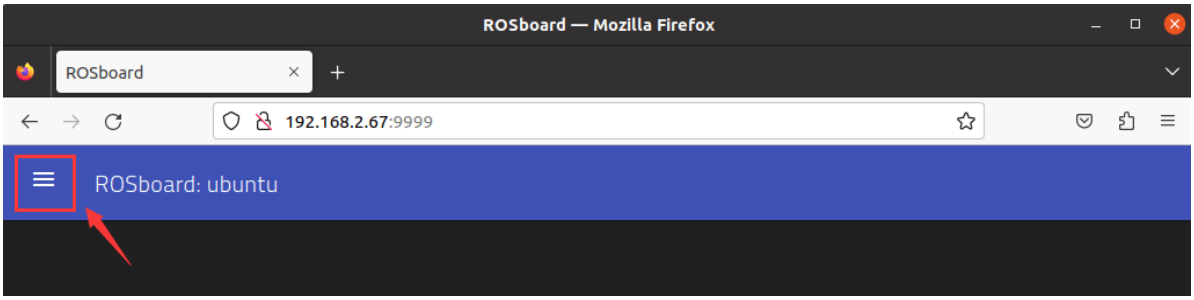
In the subsequent courses related to the functions of depth camera, the ROSboard tool is developed to achieve web-side interaction. Here, the tool is preliminarily used for image display.

After SSH connects to the car, terminal input,

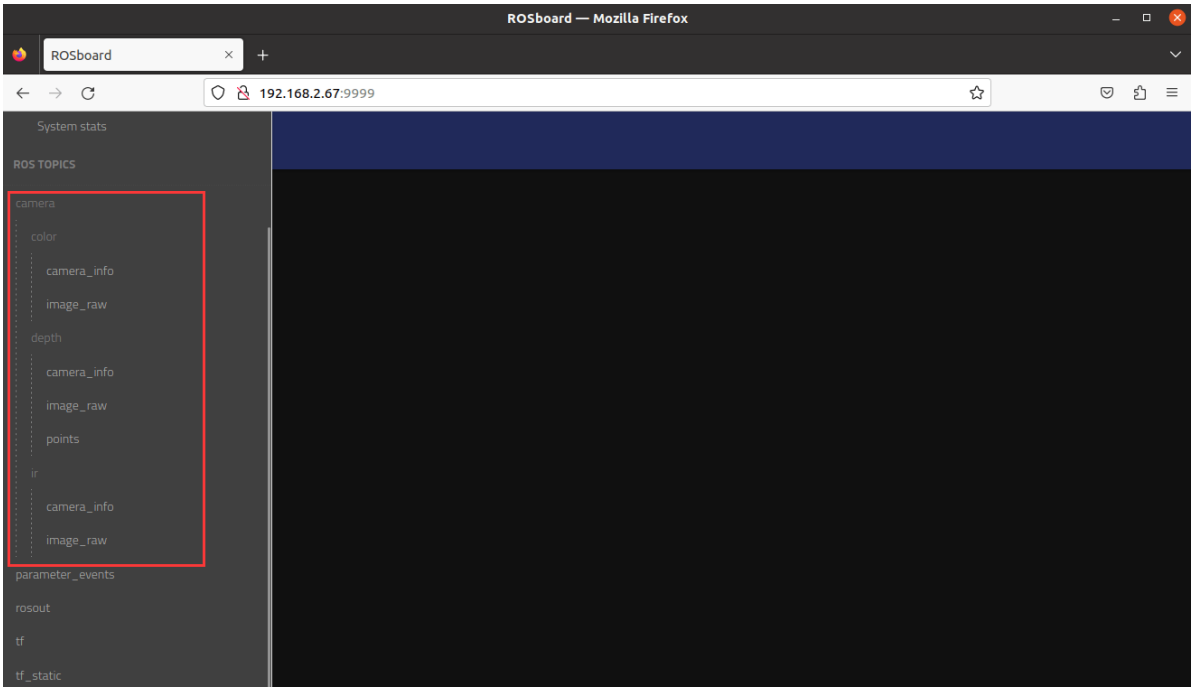
```
ros2 run rosboard rosboard_node
```

Then open the browser on the PC side (note that the computer and the Rising Sun network must be in the same LAN), enter the URL: car IP:9999, for example, my car IP is 192.168.2.67, enter the URL in the browser on the virtual machine side to open the ROSboard webpage:

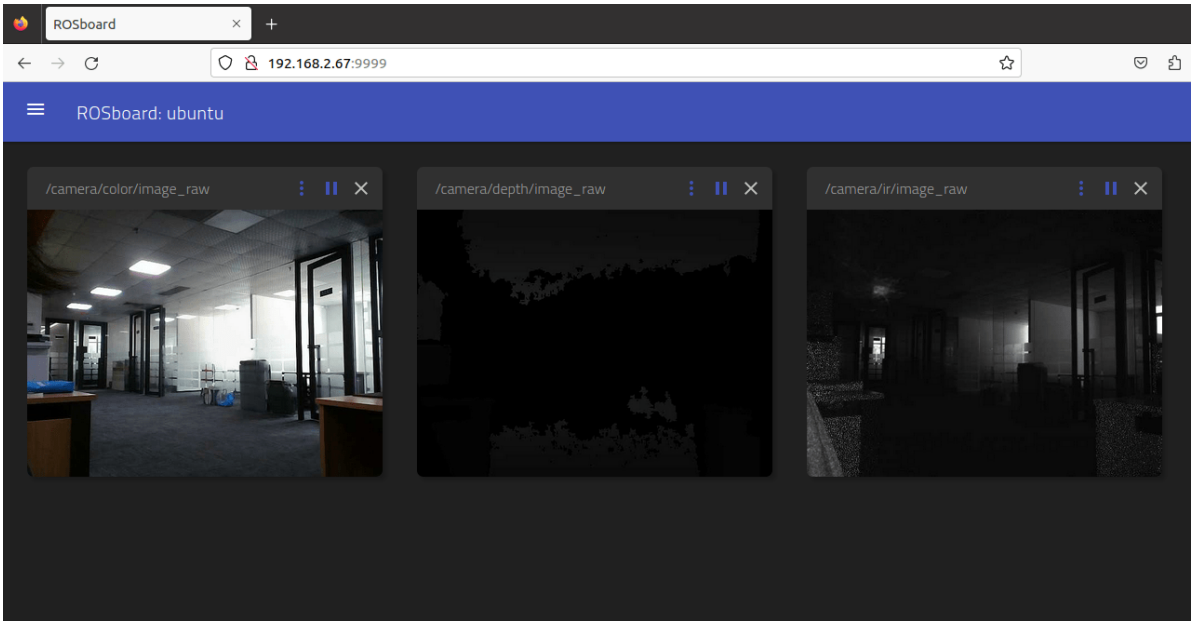
```
192.168.2.67:9999
```




Click the button in the upper left corner to display the ROS topic that currently exists. We can select one or more image topic data to display.




For example, rgb images, depth images, and ir images are displayed here.


ROSboard
192.168.2.67:9999
ROSboard: ubuntu
/camera/color/image_raw
/camera/depth/image_raw
/camera/ir/image_raw