

# Use of Depth Camera

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Before driving the depth camera, you need to identify the Astra camera device on the car side. The environment has been set up in the system image. After SSH connects to the car, enter in the terminal,

```
11 /dev/astra*
```

```
● sunrise@ubuntu:~$ 11 /dev/astra*
1rwxrwxrwx 1 root root 15 Nov 14 11:21 /dev/astradepth -> bus/usb/001/032
1rwxrwxrwx 1 root root 15 Nov 14 11:22 /dev/astrauvc -> bus/usb/001/033
```

The result is shown in the figure, indicating that the Astra camera device is successfully connected. If no result is displayed, you can try to re-plug the camera USB.

## 1.1, Program Function Description

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After the program runs, drive the Astra camera, you can get color RGB, depth Depth, infrared IR image information and depth point cloud information.

Basic SDK, document download address:

<https://gitee.com/orbbecdeveloper/OrbbecSDK>

OrbbecViewer tool download address:

<https://github.com/orbbec/OrbbecSDK/releases>

ROS related documents and SDK:

[https://github.com/orbbec/OrbbecSDK\\_ROS1.git](https://github.com/orbbec/OrbbecSDK_ROS1.git)

[https://github.com/orbbec/OrbbecSDK\\_ROS2.git](https://github.com/orbbec/OrbbecSDK_ROS2.git)

PythonSDK download path:

<https://github.com/orbbec/pyorbbecsdk>

## 1.2, program code reference path

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After SSH connects to the car, the location of the function source code is,

```
/home/sunrise/software/library_ws/src/ros2_astra_camera/astra_camera/launch
```

## 1.3, program startup

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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

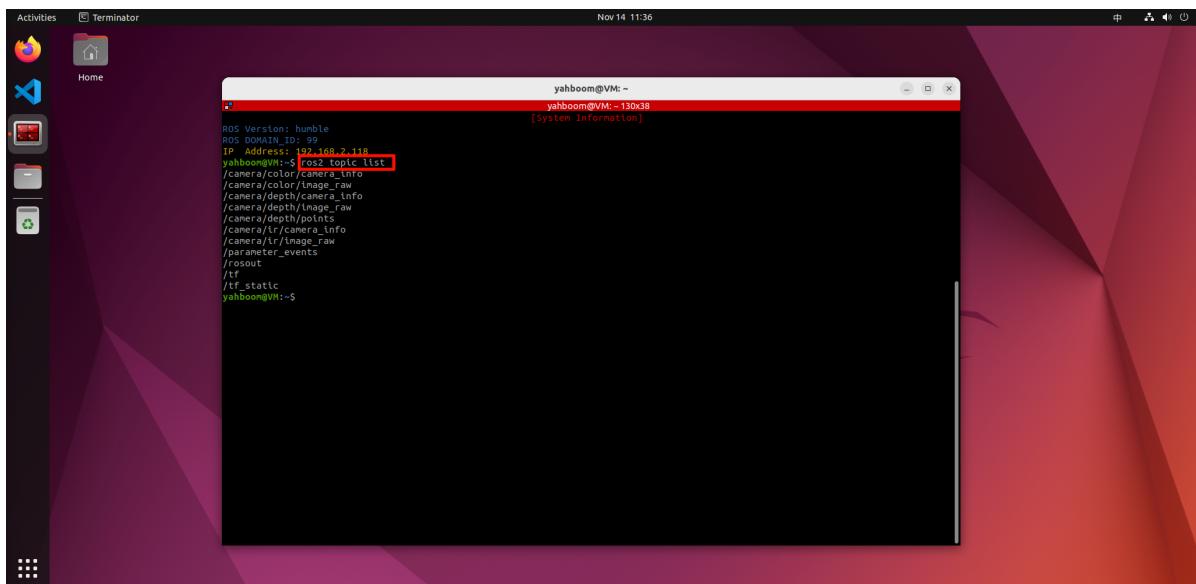
Take the launch of the Astraproplus camera as an example. After SSH connects to the car, enter in the terminal,

```
ros2 launch astra_camera astro_pro_plus.launch.xml
```

```
sunrise@ubuntu:~$ ros2 launch astra_camera astro_pro_plus.launch.xml
[INFO] [launch]: All log files can be found below /home/sunrise/.ros/log/2024-11-14-11-35-32-576626-ubuntu-57629
[INFO] [launch]: Default logging verbosity is set to INFO
[INFO] [astracamera_node-1]: process started with pid [57733]
[astracamera_node-1] Warning: class_loader.impl: SEVERE WARNING!!! A namespace collision has occurred with plugin factory for class rclcpp_components::NodeFactoryTemplate<astra_camera::OBCameraNodeFactory>. New factory will OVERWRITE existing one. This situation occurs when libraries containing plugins are directly linked against an executable (the one running right now generating this message). Please separate plug-ins out into their own library or just don't link against the library and use either class_loader::ClassLoader/MultilibraryClassLoader to open.
[astracamera_node-1] at line 253 in /opt/ros/humble/include/class_loader/class_loader_core.hpp
[astracamera_node-1] [INFO] [1731555335.048871952] [camera.camera]: init done.
[astracamera_node-1] [INFO] [1731555335.048994994] [camera.camera]: Waiting for device connection...
[astracamera_node-1] [INFO] [1731555335.049781574] [device listener]: Found 1 devices
[astracamera_node-1] [INFO] [1731555335.049857032] [camera.camera]: Trying to open device: 2bc5/0e0f@1/32
[astracamera_node-1] [INFO] [1731555335.224067337] [camera.camera]: Device connected: Astra serial number: ACRD23300GE
[astracamera_node-1] [INFO] [1731555335.224263205] [camera.camera]: starting device
[astracamera_node-1] [INFO] [1731555335.278238730] [camera.camera]: color is not enable
[astracamera_node-1] [INFO] [1731555335.315410141] [camera.camera]: set depth video mode Resolution :640x480@30Hz
[astracamera_node-1] [FORMAT_PIXEL_FORMAT_DEPTH_1_MM]
[astracamera_node-1] [INFO] [1731555335.321881868] [camera.camera]: set ir video mode Resolution :640x480@30Hz
[astracamera_node-1] [FORMAT_UVC]
[astracamera_node-1] [INFO] [1731555335.362312226] [camera.camera]: open uvc camera
[astracamera_node-1] [INFO] [1731555335.466129445] [camera.camera]: uvc config: vendor_id: 2bc5
[astracamera_node-1] product_id: 50f
[astracamera_node-1] width: 640
[astracamera_node-1] height: 480
[astracamera_node-1] fps: 30
[astracamera_node-1] serial_number: ACRD23300GE
[astracamera_node-1] format: mjpeg
[astracamera_node-1] frame_id: camera_color_frame
[astracamera_node-1] optical_frame_id: camera_color_optical_frame
[astracamera_node-1]
[astracamera_node-1] [INFO] [1731555335.610466938] [camera.camera]: open camera success
[astracamera_node-1] [INFO] [1731555335.622868353] [camera.camera]: set depth video mode Resolution :640x480@30Hz
[astracamera_node-1] [FORMAT_PIXEL_FORMAT_DEPTH_1_MM]
[astracamera_node-1] [WARN] [1731555335.622868644] [camera.camera]: Publishing dynamic camera transforms (/tf) at 10 Hz
[astracamera_node-1] [INFO] [1731555335.624279431] [camera.camera]: set ir video mode Resolution :640x480@30Hz
[astracamera_node-1] [FORMAT_UVC]
[astracamera_node-1] [INFO] [1731555335.644804651] [camera.camera]: depth is started
[astracamera_node-1] [INFO] [1731555335.655087823] [camera.camera]: ir is started
[astracamera_node-1] [INFO] [1731555335.655240156] [camera.camera]: Start UVC camera
[astracamera_node-1] [INFO] [1731555335.660270055] [camera.camera]: set uvc mode 640x480@30 format UVC_FRAME_FORMAT_MJPEG
[astracamera_node-1] [INFO] [1731555335.358037441] [camera.camera]: device started.
```

You can use the following command to view the topic. Enter in the virtual machine 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 depth image data
/camera/depth/points	Depth depth point cloud data
/camera/ir/image_raw	IR infrared image data

## 1.4, Image visualization

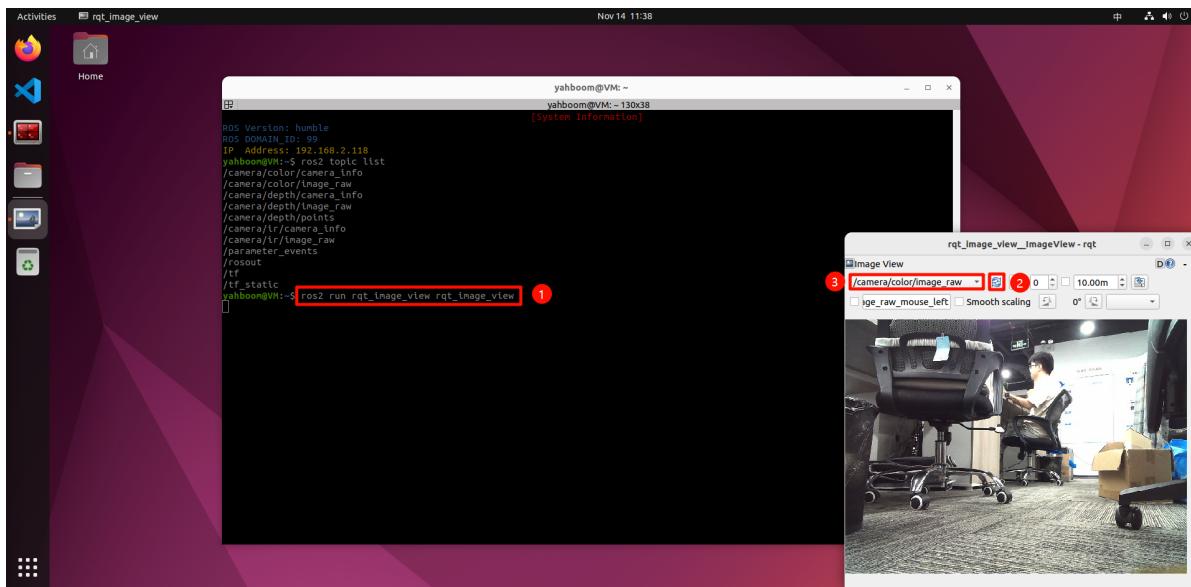
After the camera is started, the topic image can be displayed in the following ways.

### 1.4.1, rqt\_image\_view

Use rqt\_image\_view tool to view 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, we take the display of RGB image as an example.



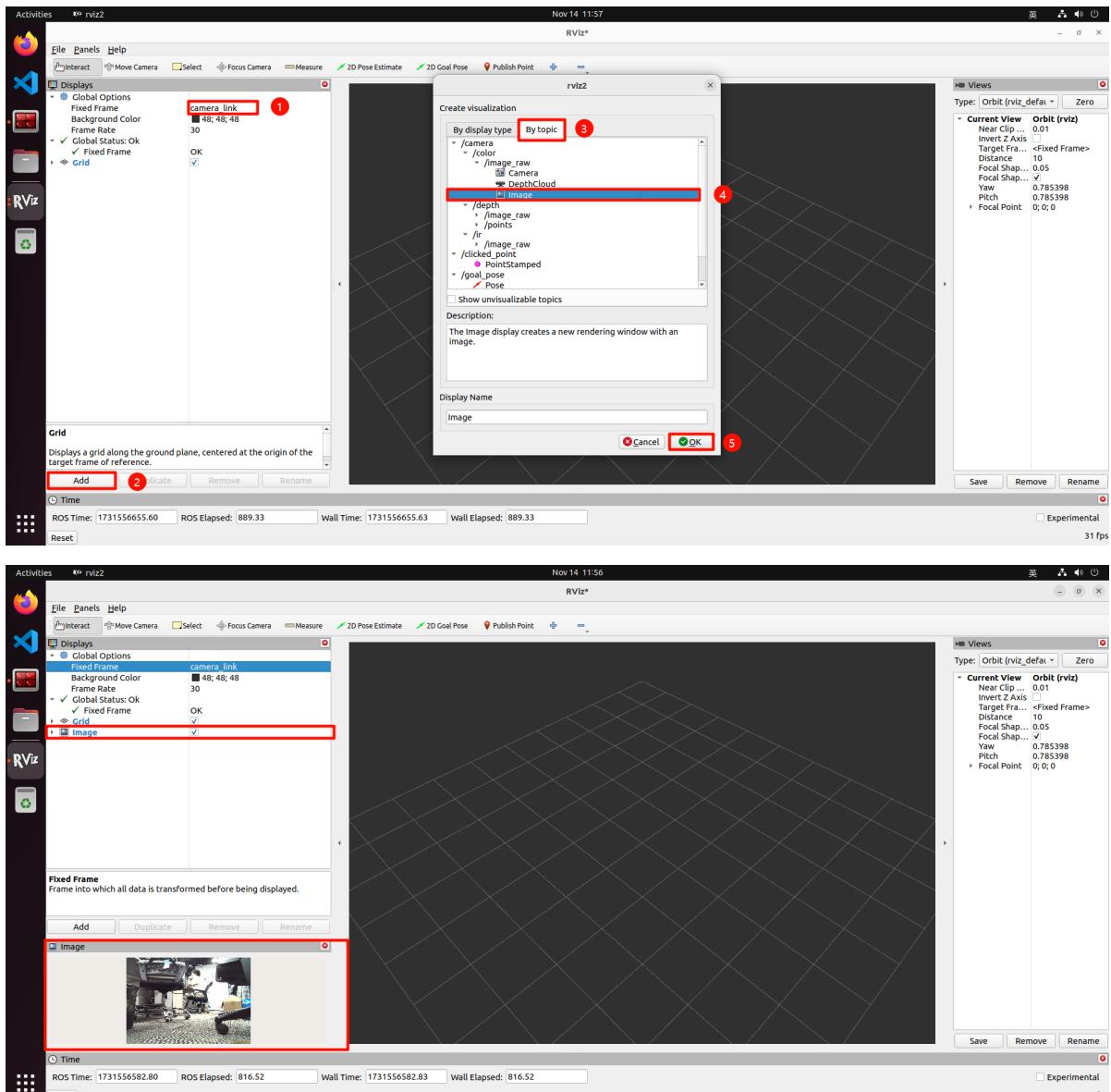
### 1.4.2, rviz2

Use rviz2 to display image or depth point cloud, enter in the virtual machine terminal,

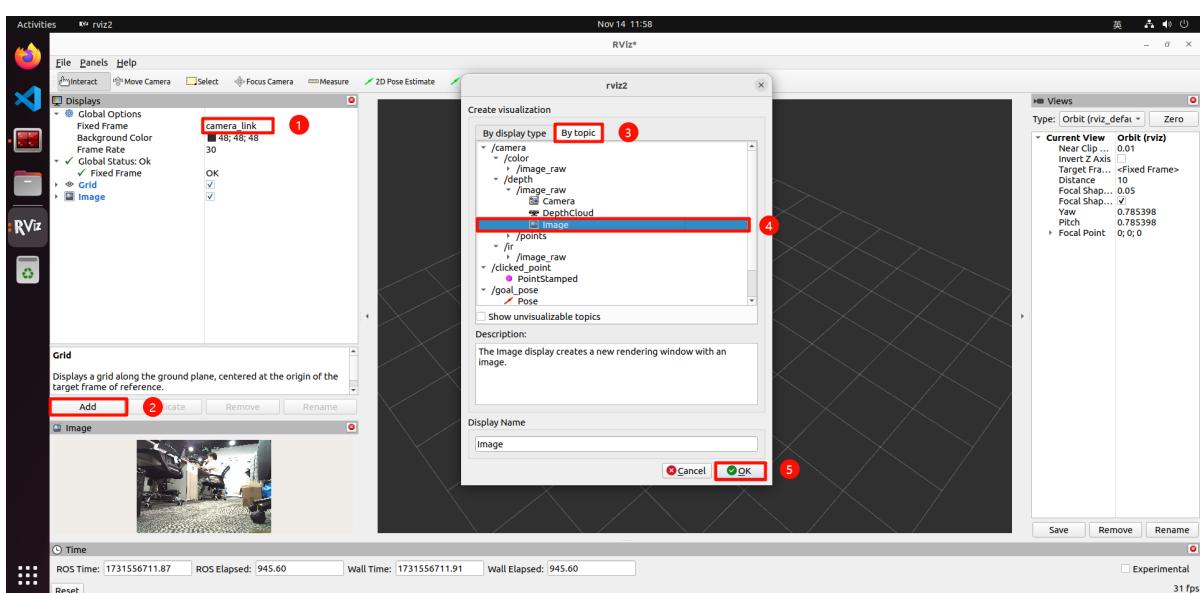
```
rviz2
```

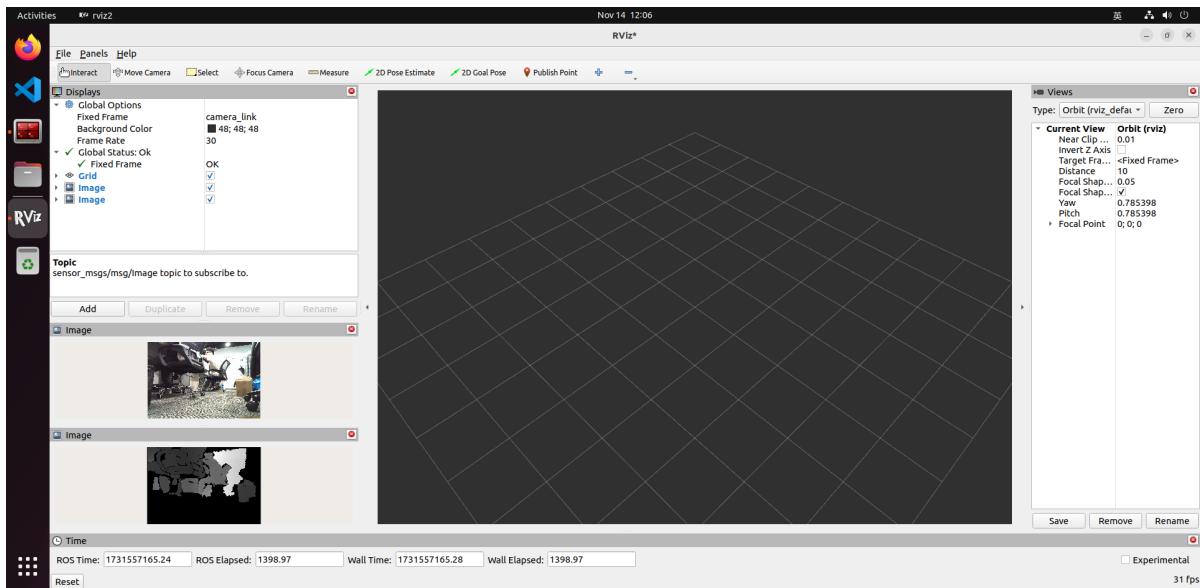
It is necessary to change **Fixed Frame** to **camera\_link**

- View color image



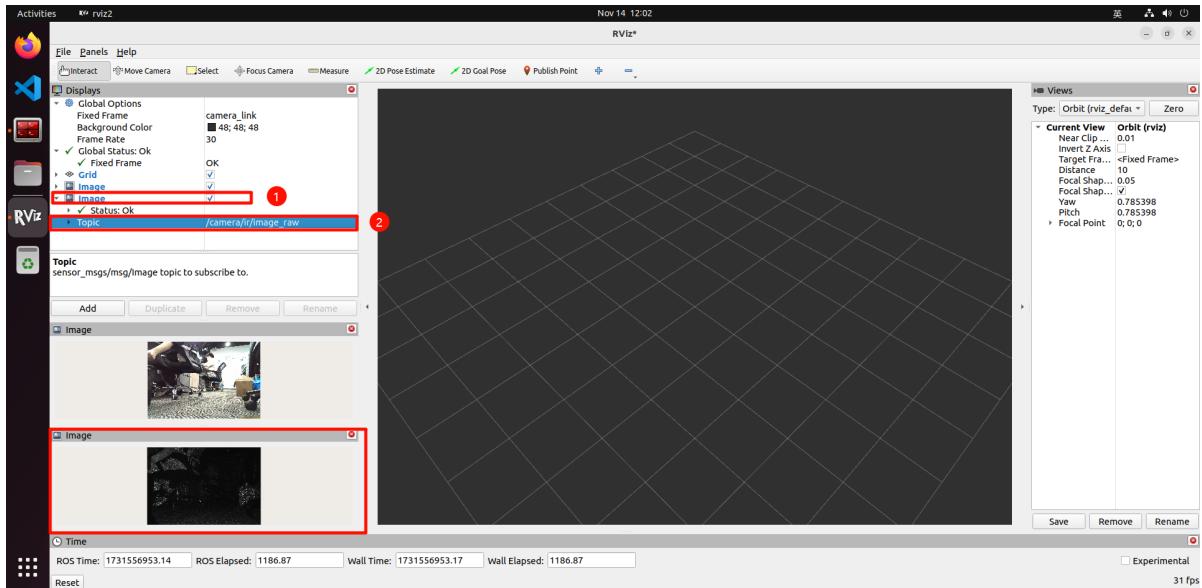
- View depth image



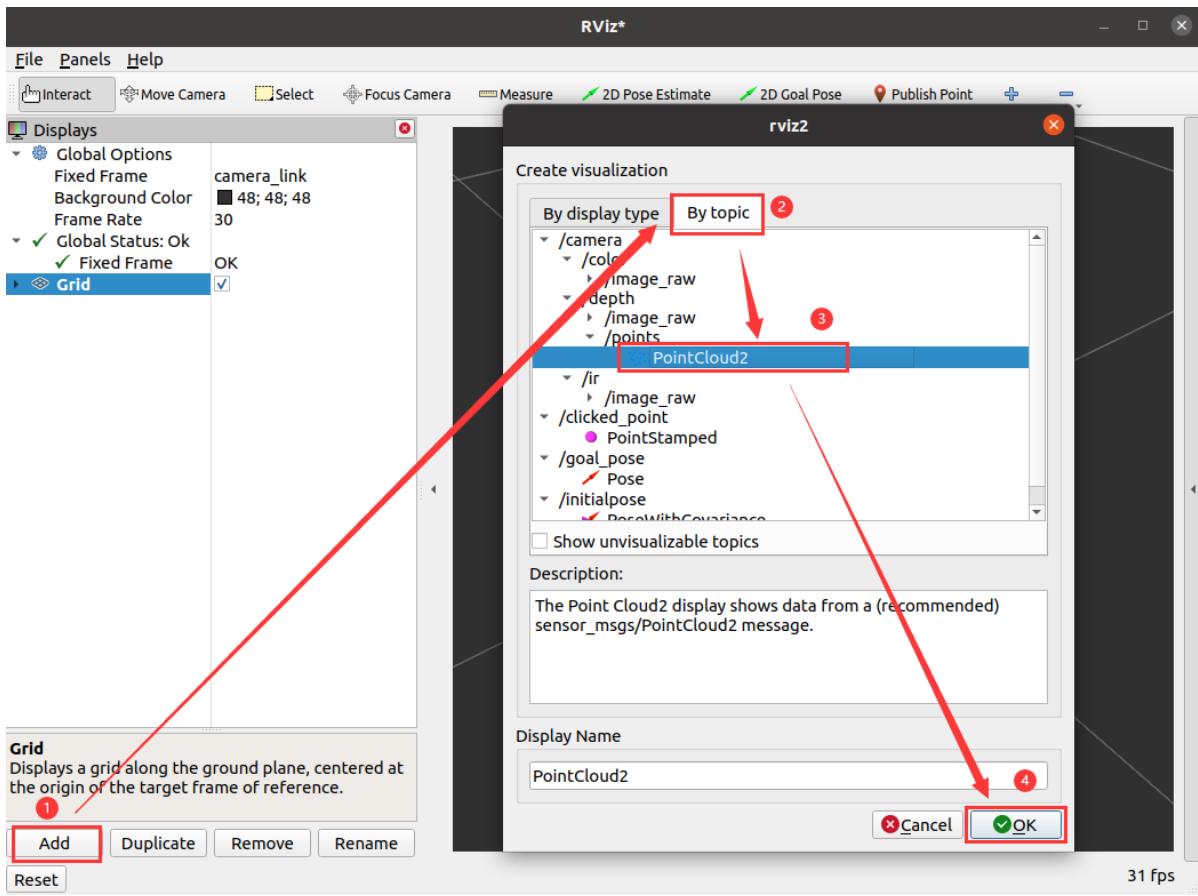


- View infrared images

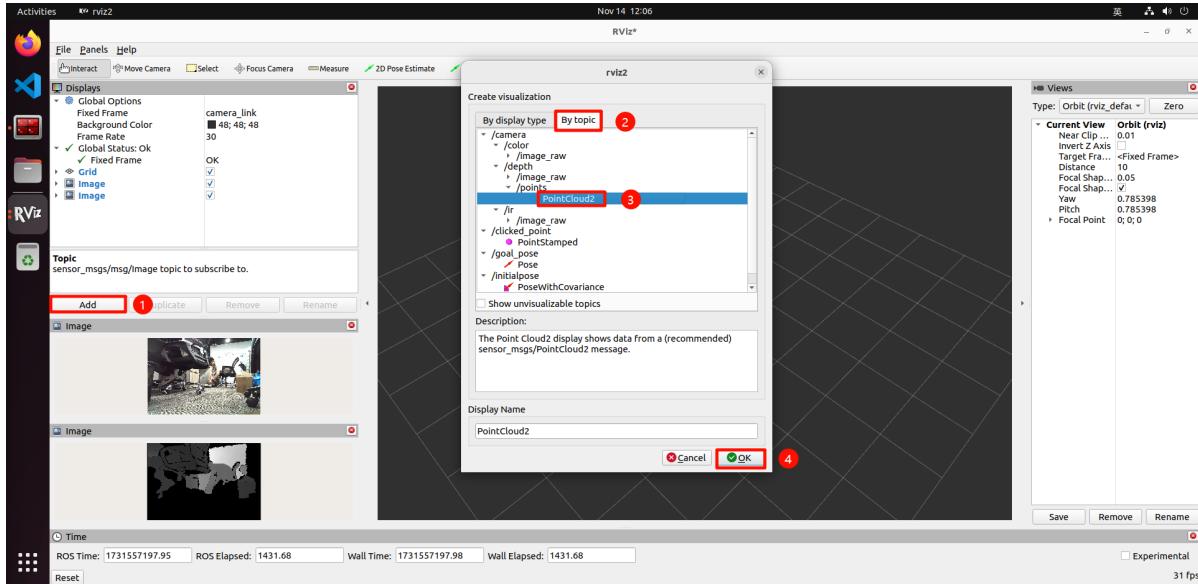
You can modify the plugin topic directly

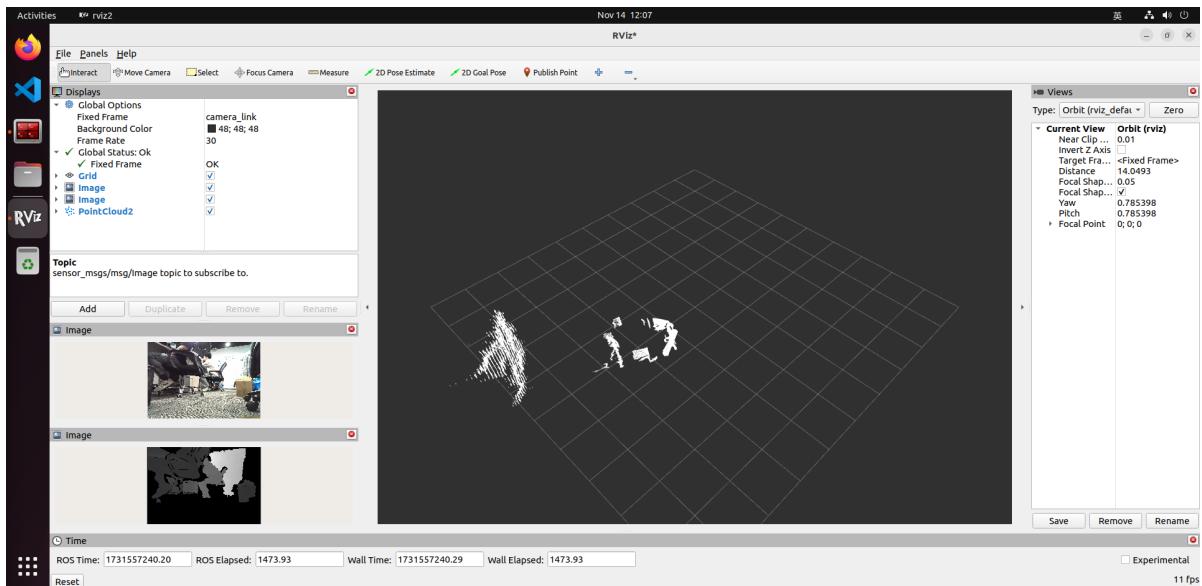


(2) Add depth point cloud information in rviz,



- View point cloud information





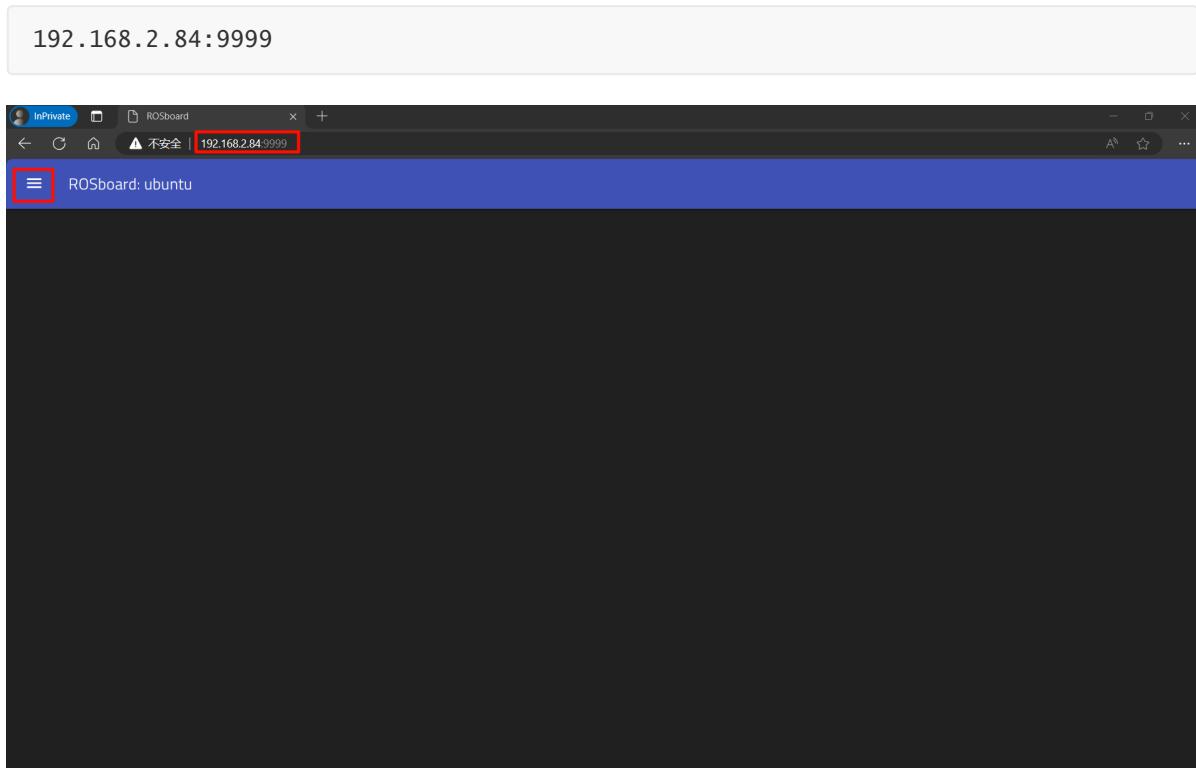
### 1.4.3, Web display

In the subsequent courses on depth camera related functions, they are all developed based on the ROSboard tool to achieve web interaction. Here, this tool is used to display images.

After SSH connects to the car, enter in the terminal,

```
ros2 run rosboard rosboard_node
```

Then open the PC browser (note that the computer and the Sunrise Network must be in the same LAN), enter the URL: car IP:9999, for example, my car IP is 192.168.2.84, enter the URL in the browser of the virtual machine to open the ROSboard web page:



Click the button in the upper left corner to display the current ROS topics. We can select one or more image topic data to display:

