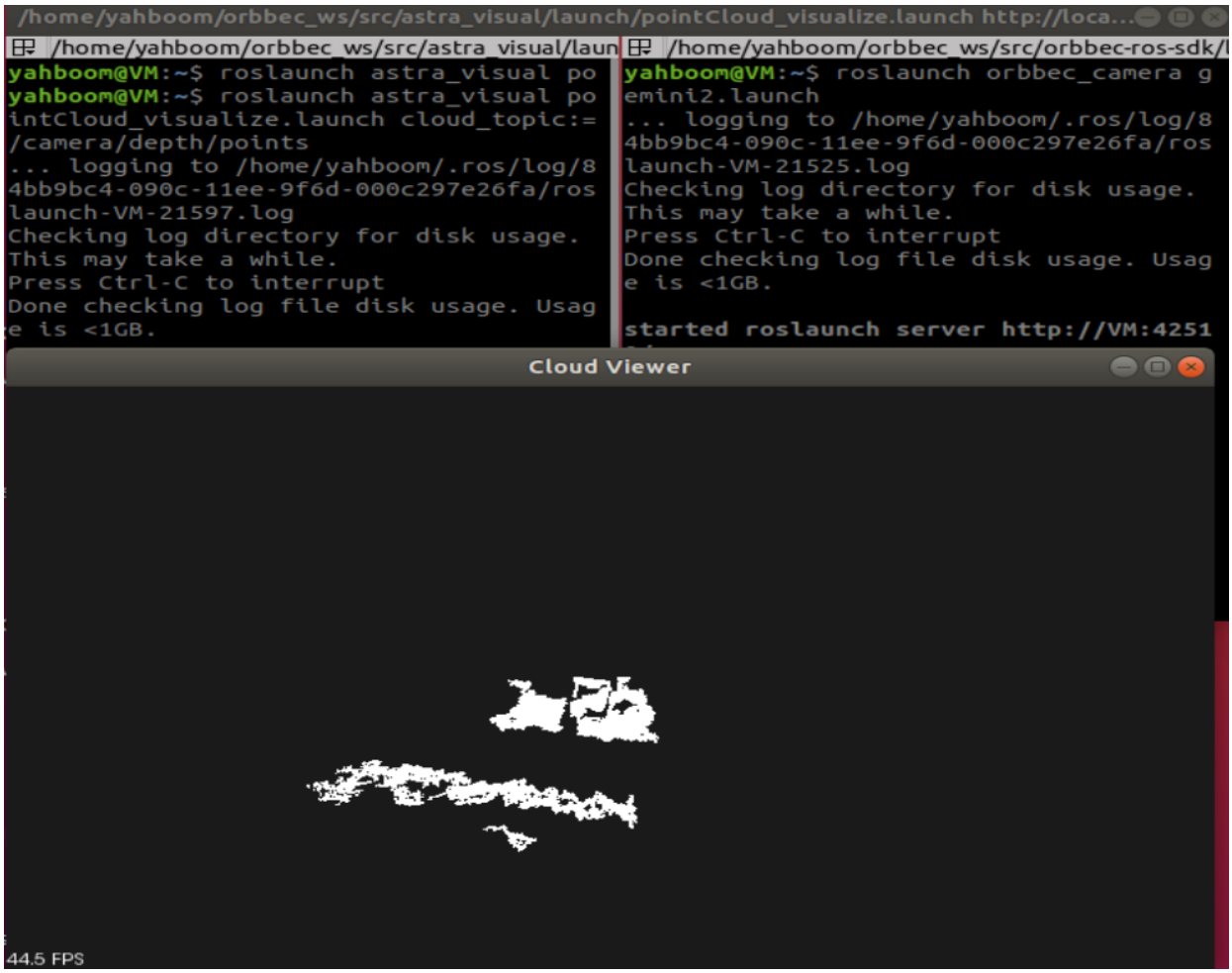
# 5、Data conversion and point cloud



## 5.1、ROS and PCD

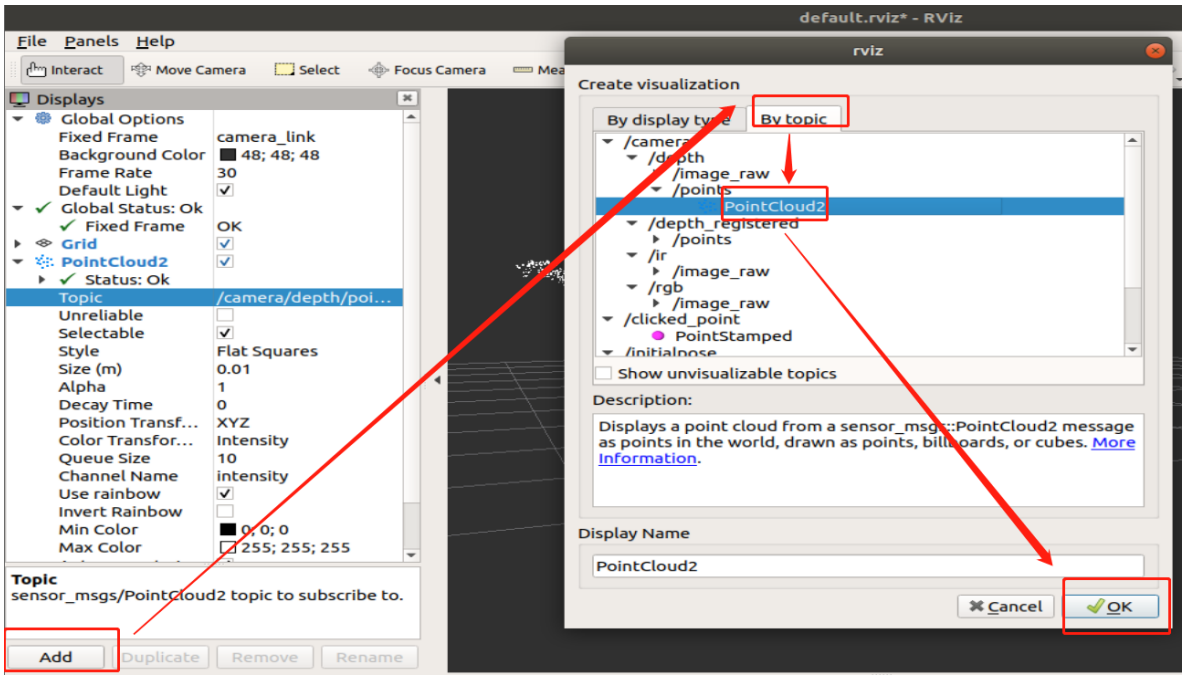
Start up  camera

```
roslaunch orbbec_camera gemini2.launch
rviz    #open rviz
roslaunch astra_visual pointCloud_visualize.launch cloud_topic:=/camera/depth/points
 #Turn on the pcl tool display
```

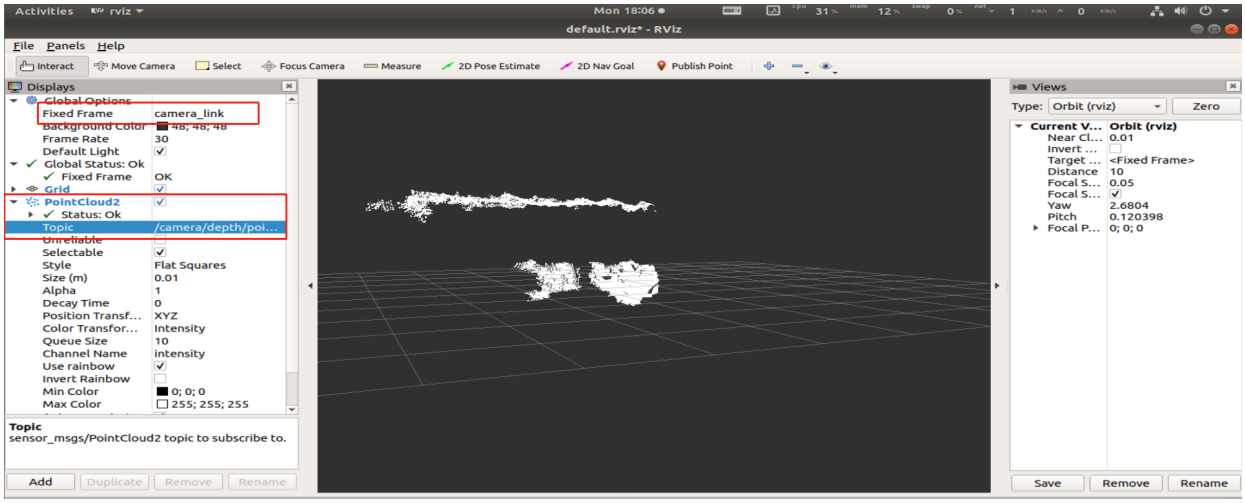



rviz point cloud display:

- Modify **[Fixed Frame]** to **[camera_link]**
- As shown in the figure below, select the topic to display

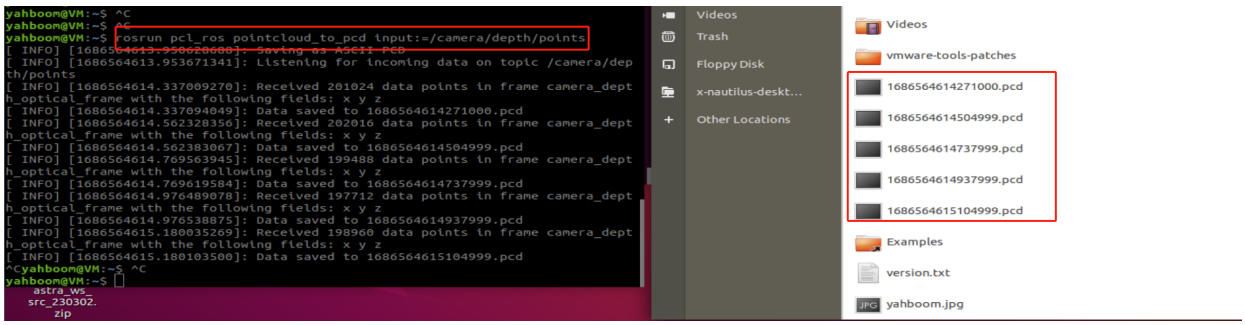



Finally rviz shows,




## (1) pointcloud_to_pcd

```
rosrun pcl_ros pointcloud_to_pcd input:=/camera/depth/points
```



Save the ROS point cloud information in the specified PCD file, usually in the directory of the current terminal.

### (2) convert_pcd_to_image

```
rosrun pcl_ros convert_pcd_to_image <cloud.pcd>
```

Loads a PCD file and publishes it as a ROS image message five times per second.

Subscribe to a ROS point cloud topic and publish it with image information.

### (3) bag_to_pcd

rosbag recording

命令：rosbag record topic1 [topic2 topic3 ...]

```
rosbag record /camera/depth/points
```

bag_to_pcd

```
rosrun pcl_ros bag_to_pcd <input_file.bag> <topic> <output_directory>
#For example:
rosrun pcl_ros bag_to_pcd 2021-09-09-11-41-56.bag /camera/depth/points my_pcd
```

Read a package file and save the ROS point cloud information in the specified PCD file. This requires a bag file.

### (4) pcd_to_pointcloud

```
rosrun pcl_ros pcd_to_pointcloud <file.pcd> [ <interval> ]
```

Load a PCD file and publish it one or more times as a ROS point cloud message.

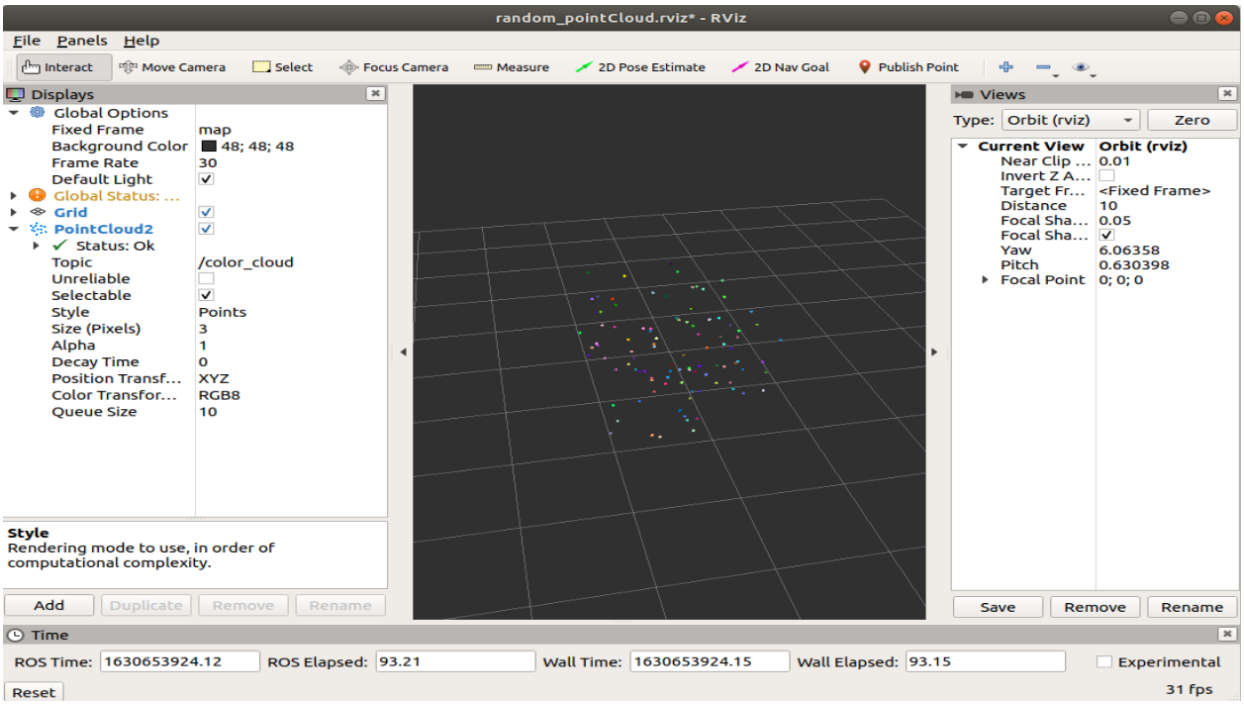
- file.pcd：The (required) filename to read.
- interval：(Optional) Number of seconds to sleep between messages. If the parameter [interval] is zero or not specified, the message is published once.

## 5.2、PCL 3D point cloud

### 5.2.1、start up

Publish the point cloud, and the launch file contains the startup of rviz. So I can clearly see a point cloud flickering in the middle of rviz.

```
roslaunch astra_visual pointCloud_pub.launch
```




Another way to start, this way needs to manually start **[rviz]**, and add the component **[PointCloud2]** to select the topic **[/color_cloud].**

```
roscore
rosrun astra_visual pointCloud_pub
```

- code analysis

The source code comments are very clear, please check the source code directly.
~/astra_ws/src/astra_visual/src/pub_pointCloud.cpp

## 5.2.2、Point cloud visualization

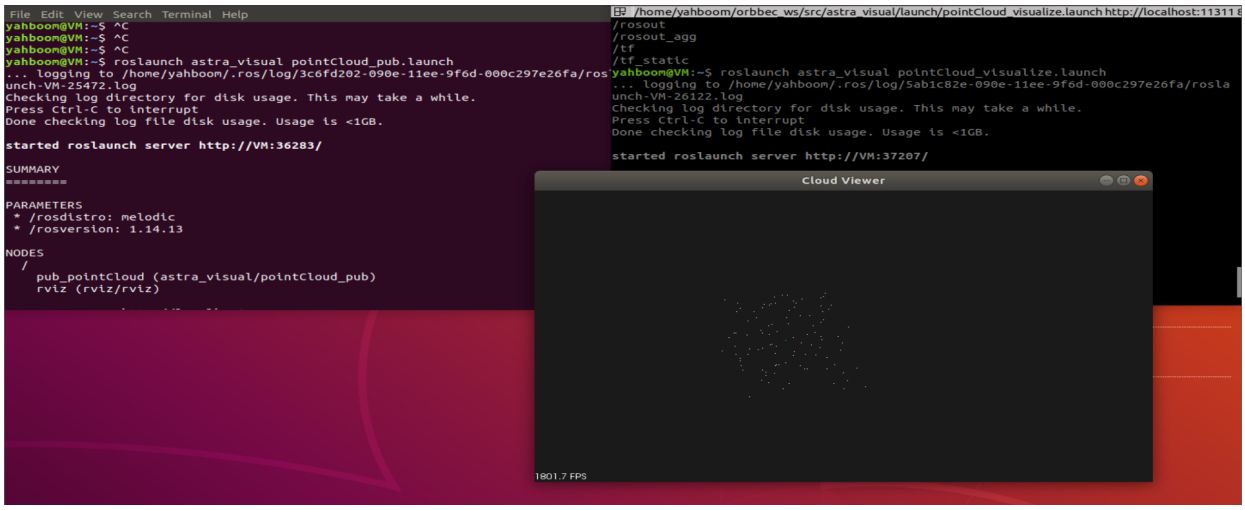
- rviz

```
rviz
```

- pcl_visualization

Start up command

```
roslaunch astra_visual pointCloud_pub.launch
roslaunch astra_visual pointCloud_visualize.launch
```




- Shortcut key

【Ctrl】+【-】

【Shift】+【+】

【Alt】+【-】

【Alt】+【+】

The mouse wheel and left and right buttons can also be controlled.