SLAM_C1_Lidar_ROS2

ROS2 website： https://docs.ros.org/

Equipment: pc *1; C1 radar

Environment: Ubuntu20.04; ROS2 (Foxy)

Create a new workspace:

```
mkdir -p rplidar_ws/src
```

When using this lidar, you need to enter the workspace every time to execute the command:

```
cd ~/rplidar_ws_ws
```

Extract the [rplidar_ws_src.zip] function package and put it into the src folder of the rplidar_ws workspace,

Input following command:

```
colcon build              #compile
source install/setup.bash  #Update environment
```

Note: Every time you modify the code in the function package, you need to re-compile and then [update environment].

Input following command to add the workspace to the .bashrc of the environment variable.

```
echo "source ~/rplidar_ws/install/setup.bash" >> ~/.bashrc
```

1. Re-map USB serial port

Input following command:

```
cd ~/rplidar_ws/src/rplidar_ros-dev-ros2/scripts
sudo chmod 777 *
sudo bash create_udev_rules.sh
```

After binding, unplug and plug the radar again.

Use the following command to view modified remapping

```
ll /dev/rplidar
```


Note: This is not necessarily ttyUSB0. As long as /dev/rplidar is displayed, the binding is successful.

2. Terminal test

1. Input following command to start lidar:

```
ros2 launch rplidar_ros rplidar_c1_launch.py
```

2. View lidar data

```
ros2 topic echo /scan
```

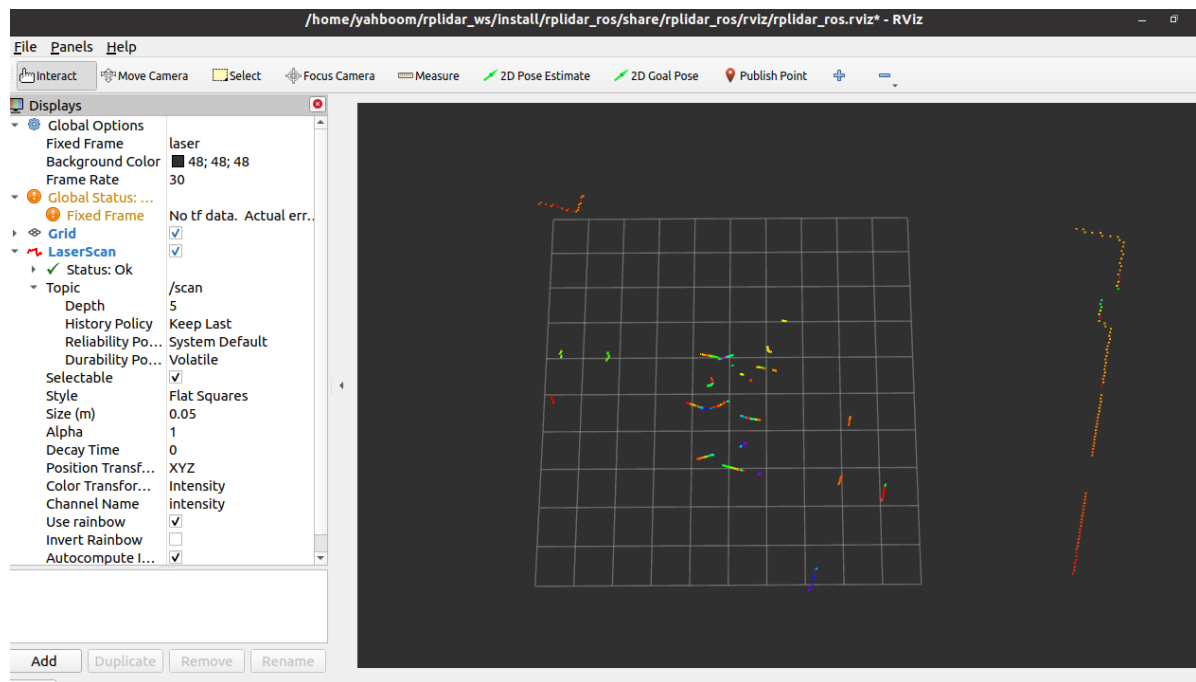You can see the scan results of rplidar in the terminal.

3. rviz2 visual test

ctrl c Close the terminal of the lidar launch file just started.

```
ros2 launch rplidar_ros view_rplidar_c1_launch.py
```

You can see the scan results of the lidar in rviz2.

Note: The topics of 【Fixed Frame】 coordinate system and 【LaserScan】 must be consistent with those published.
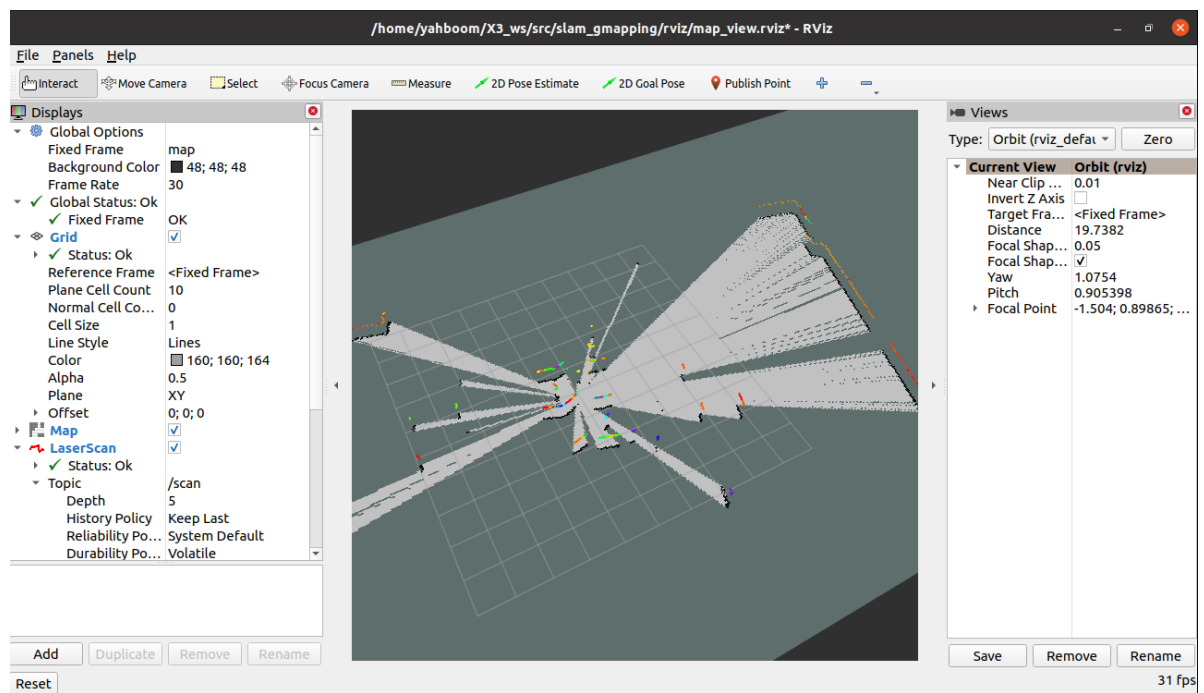
4. gmapping mapping test

1. Input following command to start lidar:

```
ros2 launch rplidar_ros rplidar_c1_launch.py
```

2. Start gmapping mapping

```
ros2 launch slam_gmapping slam_gmapping.launch.py
ros2 run slam_gmapping slam_gmapping
```

You can see the scan results of the lidar in rviz2.

Note: The 【Fixed Frame】 coordinate system, 【LaserScan】 topic, and 【map】 topic must be consistent with the published ones.