

旭日x3派环境配置

1.安装Noetic, 这一步可以自行搜索百度

2.配置YDLIDAR-X3雷达sdk环境

2.1 直接到这个地址去下载sdk文件 [GitHub - YDLIDAR/YDLidar-SDK: Driver for receiving YD LiDAR data and more...](#),也可以使用git命令下载 `git clone https://github.com/YDLIDAR/YDLidar-SDK.git`

2.2 安装cmake

```
sudo apt install cmake pkg-config
```

2.3编译和安装

进入YDLidar-SDK文件夹后如果没有build文件夹可以先创建一个build文件夹然后利用下面的命令编译安装!

```
mkdir build #创建build文件夹, 如果原本就有的可以不用创建, 把build文件夹里的文件删除就可以了
cd build
cmake ..
make
sudo make install #这个条命令也会自动安装python库
```

3.下载编译YDLIDAR-X3雷达官方提供的ROS包

3.1官方提供的ros包可以直接在这里下载: [GitHub - YDLIDAR/ydlidar_ros_driver: ydlidar driver package under ros](#),也可以用Git命令下载 `git clone https://github.com/YDLIDAR/ydlidar_ros_driver.git`

3.2创建ros工作空间并编译

```
mkdir -p ~/ros_test/src #这个~/ros_test/src表示会在当前用户的主目录下创建一个ros_test的文件夹, 还会在这个文件夹里创建一个src的文件夹
```

文件夹创建好, 把上面下载的ydlidar_ros_driver文件夹复制到src文件夹下

然后在ros_test文件夹下打开终端输入 `catkin_make` 然后按回车就会开始编译了

如果提示下面这个错误就是上面的sdk没有安装好, 需要重新安装sdk

```
CMake Error at ydlidar_ros_driver/CMakeLists.txt:9 (find_package):
  By not providing "Findydlidar_sdk.cmake" in CMAKE_MODULE_PATH this project
  has asked CMake to find a package configuration file provided by
  "ydlidar_sdk", but CMake did not find one.

  Could not find a package configuration file provided by "ydlidar_sdk" with
  any of the following names:

    ydlidar_sdkConfig.cmake
    ydlidar_sdk-config.cmake

  Add the installation prefix of "ydlidar_sdk" to CMAKE_PREFIX_PATH or set
  "ydlidar_sdk_DIR" to a directory containing one of the above files.  If
  "ydlidar_sdk" provides a separate development package or SDK, be sure it
  has been installed.

-- Configuring incomplete, errors occurred!
See also "/home/tony/ydlidar_ws/build/CMakeFiles/CMakeOutput.log".
See also "/home/tony/ydlidar_ws/build/CMakeFiles/CMakeError.log".
Makefile:2112: recipe for target 'cmake_check_build_system' failed
make: *** [cmake_check_build_system] Error 1
Invoking "make cmake_check_build_system" failed
tony@ubuntu:~/ydlidar_ws$
```

编译成功后重新加载一下包的环境设置!

```
source ./devel/setup.sh
#当然也可以直接写进当前用户下的.bashrc文件中, 这样就不用每次都需要手动加载环境了具体的方式为
$echo "source ~/ros_test/devel/setup.bash" >> ~/.bashrc
$source ~/.bashrc
```

3.3绑定端口

```
chmod 0777 ~/ros_test/src/ydlidar_ros_driver/startup/*
sudo sh ~/ros_test/src/ydlidar_ros_driver/startup/initenv.sh
```

端口绑定完成后重新插入激光雷达, 然后启动雷达测试一下

```
cd ~/ros_test/
source ./devel/setup.bash #重新加载环境变量
#启动雷达测试
roslaunch ydlidar_ros_driver x2.launch
```

看到以下提示表示雷达启动成功

```
process[master]: started with pid [4151]
ROS_MASTER_URI=http://localhost:11311

setting /run_id to 22dbb772-fe9f-11ec-8034-0011225ad20c
process[rosout-1]: started with pid [4166]
started core service [/rosout]
process[ydlidar_lidar_publisher-2]: started with pid [4169]
process[base_link_to_laser4-3]: started with pid [4170]
[ INFO] [1657272000.976910264]: YDLIDAR ROS Driver Version: 1.0.
YDLidar SDK initializing
YDLidar SDK has been initialized
[YDLIDAR]:SDK Version: 1.0.6
LiDAR successfully connected
[YDLIDAR]:Lidar running correctly ! The health status: good
LiDAR init success, Elapsed time 623 ms
[CYdLidar] Succeeded to start scan mode, Elapsed time 1062 ms
[YDLIDAR] Calc Sample Rate: 3K
[YDLIDAR] Fixed Size: 720
[YDLIDAR] Sample Rate: 3K
[YDLIDAR] Calc Sample Rate: 3K
[YDLIDAR] Fixed Size: 720
[YDLIDAR] Sample Rate: 3K
[YDLIDAR]:Single Fixed Size: 270
[YDLIDAR]:Sample Rate: 3K
[YDLIDAR INFO] Single Channel Current Sampling Rate: 3K
[YDLIDAR INFO] Now YDLIDAR is scanning .....
[YDLIDAR] Connection established in [/dev/ydlidar][115200]:
Firmware version: 2.1
Hardware version: 0
Model: F2
Serial: 2019020100002056
█
```

用 `rostopic list` 可以查看到 `/scan` `/point_cloud` `/tf` 这三个话题

```
sunrise@ubuntu:~$ rostopic list
/point_cloud
/rosout
/rosout_agg
/scan
/tf
sunrise@ubuntu:~$ █
```

然后通过 `rostopic echo /scan` 命令查看扫描数据

```

sunrise@ubuntu:~$ rostopic echo /scan
header:
  seq: 10670
  stamp:
    secs: 1657309107
    nsecs: 952948000
  frame_id: "laser frame"
angle_min: -3.1415927410125732
angle_max: 3.1415927410125732
angle_increment: 0.024259403347969055
time_increment: 0.00033193075796589255
scan_time: 0.08630199730396271
range_min: 0.10000000149011612
range_max: 12.0
ranges: [0.0, 0.0, 0.0, 0.0, 0.0, 0.1704999953508377, 0.13199999928474426, 0.129
0.125, 0.125, 0.12399999797344208, 0.12399999797344208, 0.12399999797344208, 0.
0607967377, 0.12575000524520874, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.1350000053
767487, 0.1469999998807907, 0.15000000596046448, 0.15299999713897705, 0.0, 0.156
5000631809235, 0.1850000023841858, 0.0, 0.1899999976158142, 0.19599999487400055,
29, 0.25999999046325684, 0.2707499861717224, 0.0, 0.0, 0.5509999990463257, 0.559
0591278076, 1.9500000476837158, 1.9390000104904175, 1.9299999475479126, 1.927749
0000247955322, 1.9290000200271606, 1.934000015258789, 1.9420000314712524, 1.9520
2666, 2.052000045776367, 2.062999963760376, 2.0899999141693115, 2.10800004005432
20000036239624, 1.562999963760376, 1.562000036239624, 1.565000057220459, 1.562000
3, 1.2400000095367432, 1.22475004196167, 1.312000036239624, 1.3300000429153442,
89859, 0.36000001430511475, 0.3487499952316284, 0.304749995470047, 0.29100000858
4, 0.0, 0.3227500021457672, 0.34299999475479126, 0.3449999988079071, 0.344000011
8601, 0.0, 0.0, 0.0, 0.0, 0.0, 0.1574999988079071, 0.14675000309944153, 0.0, 0.0
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
intensities: [0.0, 0.0, 0.0, 0.0, 0.0, 1016.0, 1008.0, 1008.0, 1008.0, 1008.0, 1
1008.0, 1020.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 1008.0, 1008.0, 1008.0, 1008
1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1020.0, 1020.0, 0.0, 1020.0, 1008.0, 102
20.0, 0.0, 0.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0,
, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1016.0, 1008.0, 1008.0, 1008.0
1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 1008.0, 0.0, 1020.0, 1008.0, 10
.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0,
0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.
, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0]

```

如果需要用rviz显示结果的话，可以利用多机通信！设置旭日x3派为主机，安装有Noetic的ubuntu20.04的虚拟机为从机

我这里查询到虚拟机的ip地址为;192.168.2.89

旭日x3派的ip地址为：192.168.2.205

```

#在虚拟机上的操作
#编辑.bashrc文件
sudo vim ~/.bashrc
#把下面这两段文字加入.bashrc文件末尾
export ROS_HOSTNAME=192.168.2.89 #本机地址
export ROS_MASTER_URI=http://192.168.2.205:11311 #ros主机地址
#更改保存后重新加载.bashrc文件
source ~/.bashrc

#在旭日x3派上的操作
#编辑.bashrc文件
sudo vim ~/.bashrc
#把下面这两段文字加入.bashrc文件末尾
export ROS_HOSTNAME=192.168.2.205 #本机地址
export ROS_MASTER_URI=http://192.168.2.205:11311 #ros主机地址
#更改保存后重新加载.bashrc文件
source ~/.bashrc

```

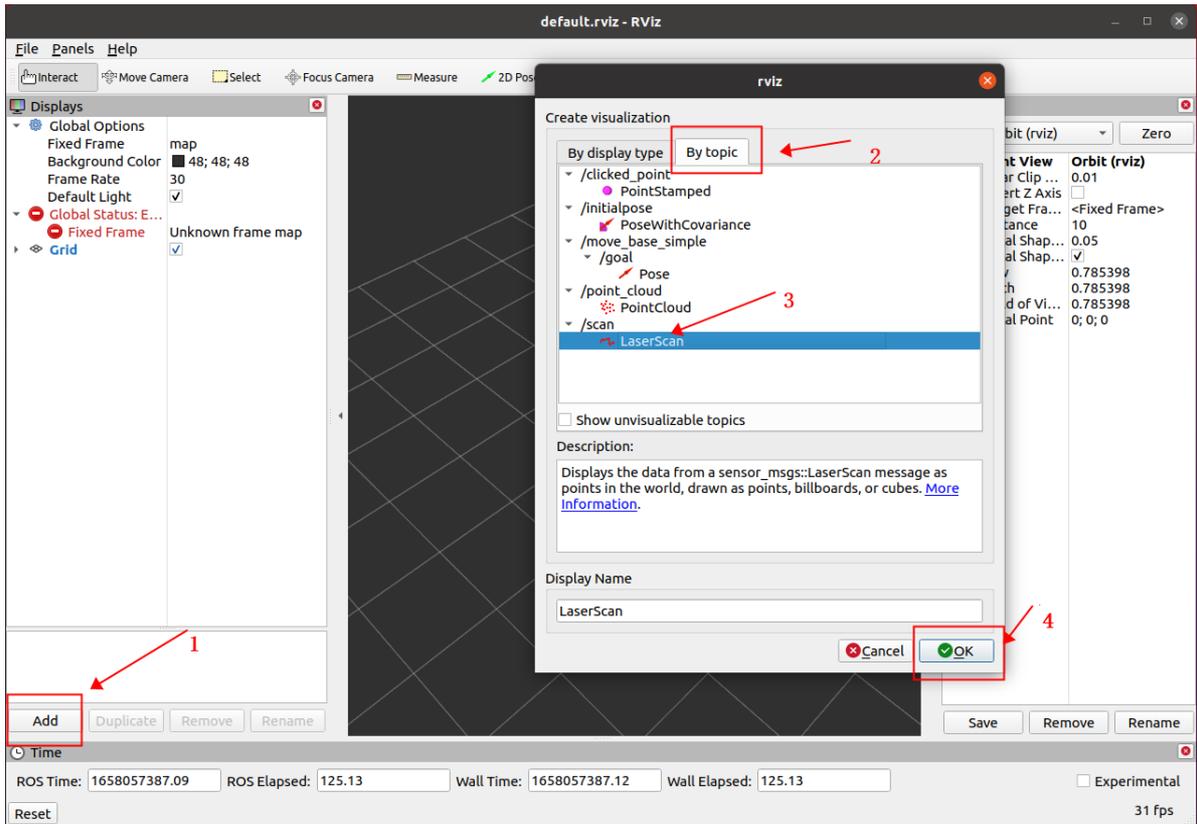
设置成功后重新启动雷达

```
cd ~/ros_test/  
source ./devel/setup.bash #重新加载环境变量  
#启动雷达  
roslaunch ydlidar_ros_driver x2.launch
```

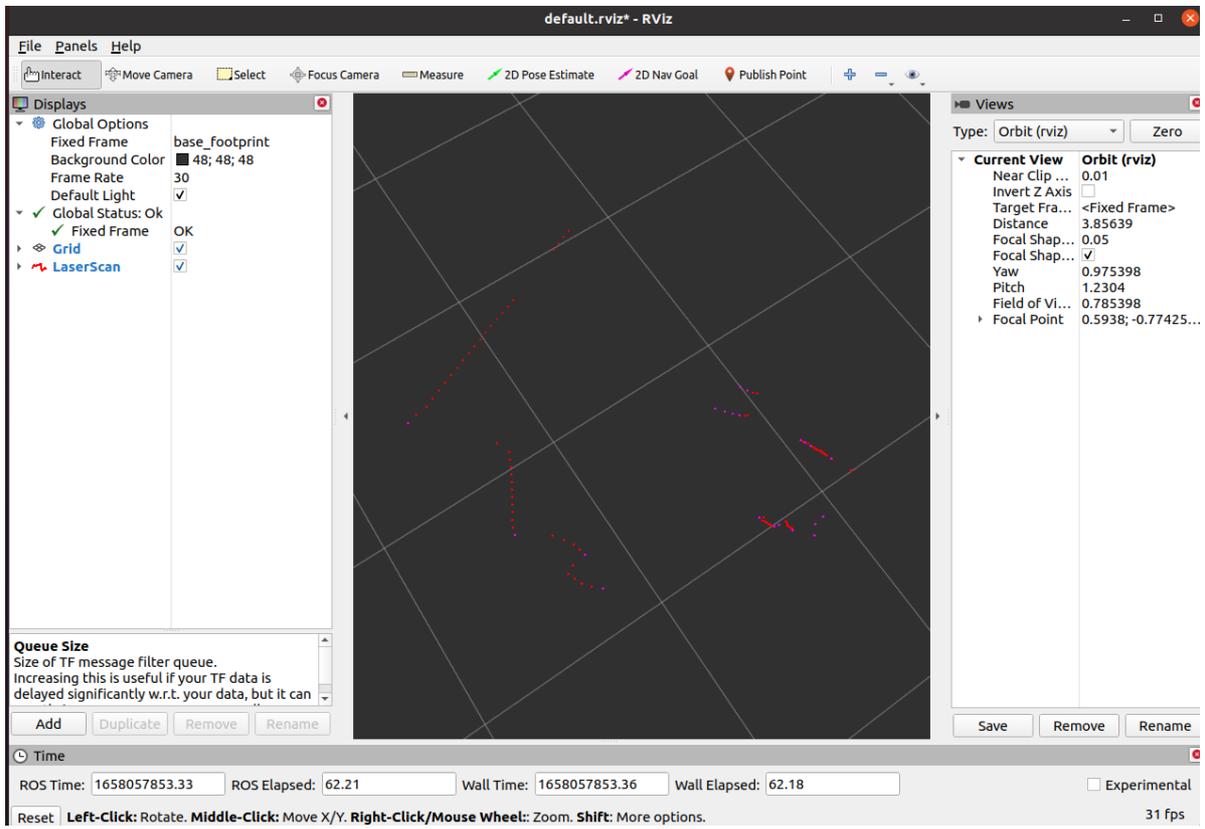
然后在虚拟机端启动rviz

```
#直接使用rviz命令启动  
rviz
```

启动成功后可以看到这个界面，然后点击add，在弹出的窗口中选择“By topic” -----> "LaserScan"----->"ok"



最后再选项“Fixed Frame”为“base_footprint”然后就可以看到雷达扫描的结果了



测试成功后可以使用ctrl+c结束运行