ROS1 Use Cases

Aurora is a newly developed sensor for integrated positioning and mapping created by SLAMTEC that integrates laser, vision, inertial navigation and deep learning technologies. The sensor does not require external dependencies and can provide six-degree-of-freedom positioning capabilities for indoor and outdoor three-dimensional high-precision mapping machines as soon as it is turned on.

1. Development environment requirements

Based on the Ubuntu 20.04 operating system, with ROS1 software package and compiler Gcc9.

2. Download radar SDK

Download link:SLAMTEC Product Documents Download and Technical Support

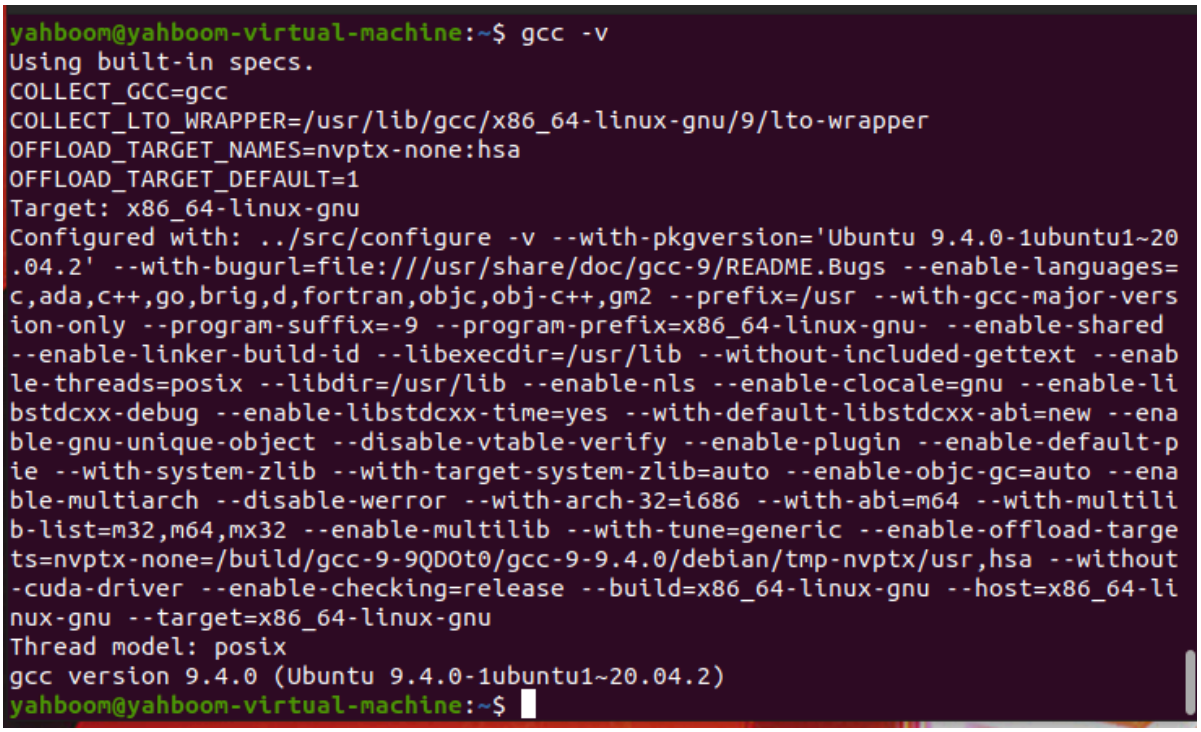
Two versions of the SDK have been placed in the attachment. Use the corresponding version according to the gcc version of your environment.

Aurora ROS1 SDK contains resources and codes that you may use during development. Its directory structure is organized as follows:

Directory	Description
docs	Reference Documents
src	Source Code
--slamware_ros_sdk	ROS SDK Source Code Package
--slamware_sdk	SDK Related Header Files and Library Files
--aurora_remote_public	Aurora Related Header Files and Library Files

Terminal input, the following content can be used to view the gcc version

```
gcc -v
```



3. Hardware requirements

To use ROS1 SDK, you need an Auraro-based spatial mapping device, turn it on and configure the appropriate IP address, and the virtual machine needs to connect to the hotspot of the aurora radar. The slamware_ros_sdk_server_node node will try to connect to the device after it is started.

4. Environment setup

4.1. Create a workspace first

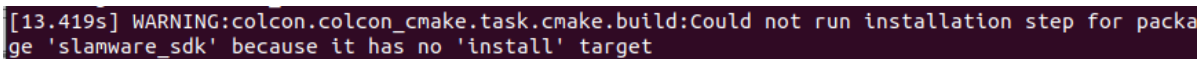
```
mkdir -p ~/ros_ws/src
cd ~/ros_ws/src
```

Put the sdk source code you just downloaded in the src working directory where the source code is stored,

4.2 Compile

```
cd ..
catkin_make
```

It is normal to have warnings when compiling slamware_sdk,



4.3 Configure the workspace system environment

```
source devel/setup.bash
```

In order to automatically load the environment every time the terminal is started: add the following command to ~/.bashrc

```
echo "source ~/ros_ws/devel/setup.bash" >> ~/.bashrc
```

4.4 Configure the system environment for dynamic libraries for image building

Since aurora_remote_public_lib is a dynamic library, you need to add the platform path to LD_LIBRARY_PATH. For example, if you place slamware_ros1_sdk_linux-x86_64-gcc9 in the ~/ros_ws/sec folder, you need to add the following command to ~/.bashrc

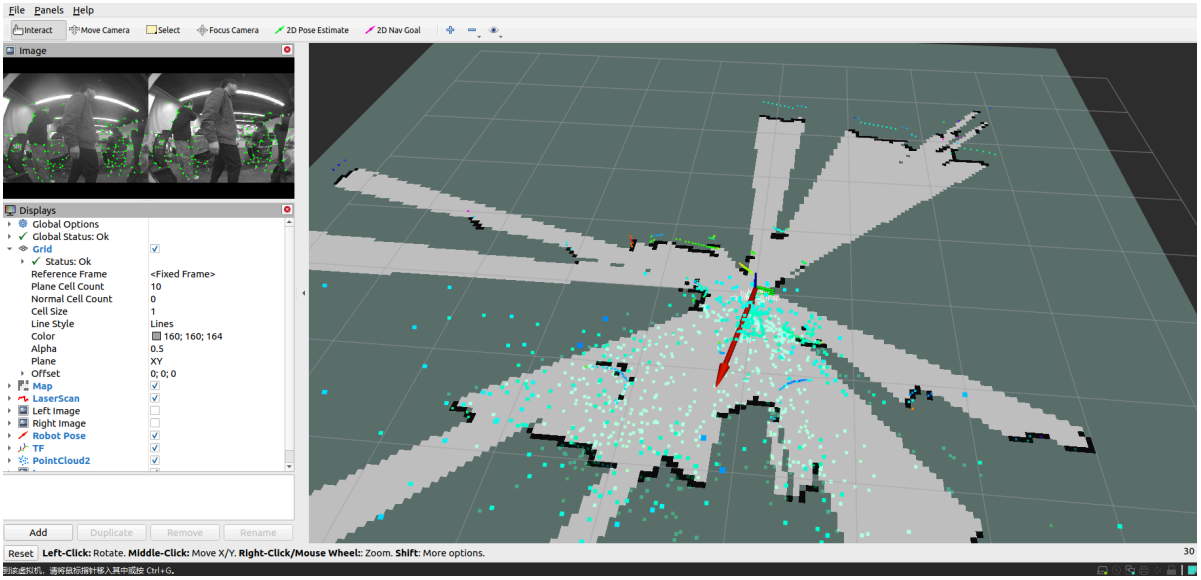
Note: If you download the SDK for the aarch64 environment, the corresponding name should be changed to slamware_ros1_sdk_linux-aarch64-gcc9.

```
export
LD_LIBRARY_PATH=~/ros_ws/src/aurora_ros1_sdk_linux_x86_gcc9/src/aurora_remote_pub
lic/lib/linux_x86_64:$LD_LIBRARY_PATH
```

4.5 Start the graph building node

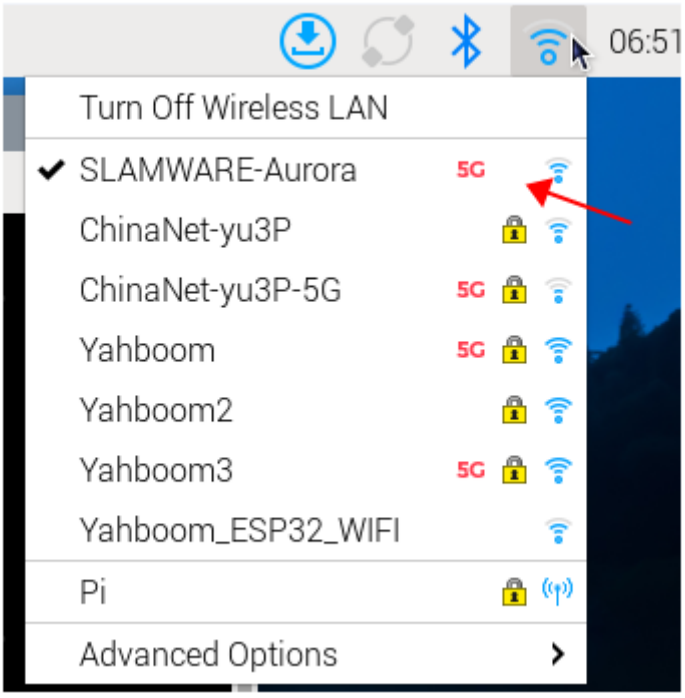
If the Aurora device is in AP mode, connect to the Aurora WIFI and start the node

```
roslaunch slamware_ros_sdk slamware_ros_sdk_server_and_view.launch
ip_address:=192.168.11.1
```

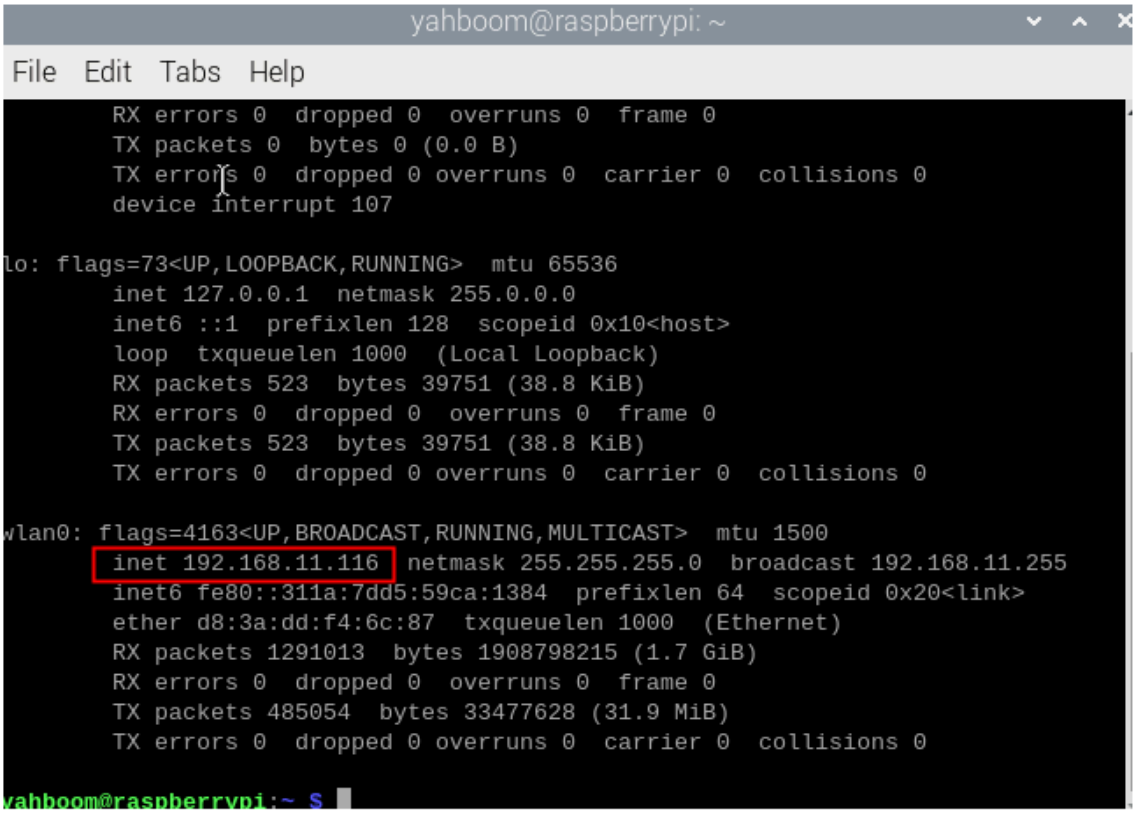


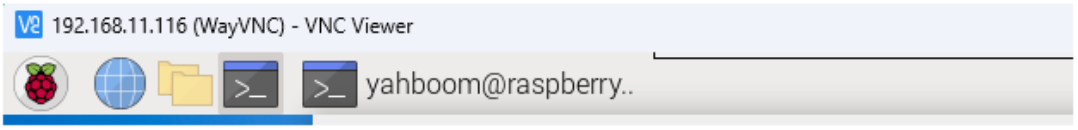
Raspberry Pi 5, X5, Jetson nano version:

If it is the Raspberry Pi desktop version and Jetson nano, x5 desktop version, after successfully booting up, connect the external monitor to the hotspot of Aurora radar to the motherboard, as shown below,



Then enter ifconfig in the terminal to view the ip address under the current hotspot, and then use this address for vnc remote desktop connection, **(the premise is that the computer must also be connected to the hotspot emitted by Aurora radar)**





Enter docker in advance and enter in the terminal

```
sh ros1_noetic.sh
```

If the following interface appears, it means that you have successfully entered docker.

```
access control disabled, clients can connect from any host
WARNING: Published ports are discarded when using host network mode
root@raspberrypi:/#
```

Then enter in the docker terminal,

```
ros2 launch slamware_ros_sdk slamware_ros_sdk_server_and_view.launch
ip_address:=192.168.11.1
```

If successful, you can view the map building screen.