Connecting to turtlebots - UBUNTU 22 with ARO singularity

Everything needs to be done on the local wifi

```
name: e210bot
pass: j6UsAC8a
```

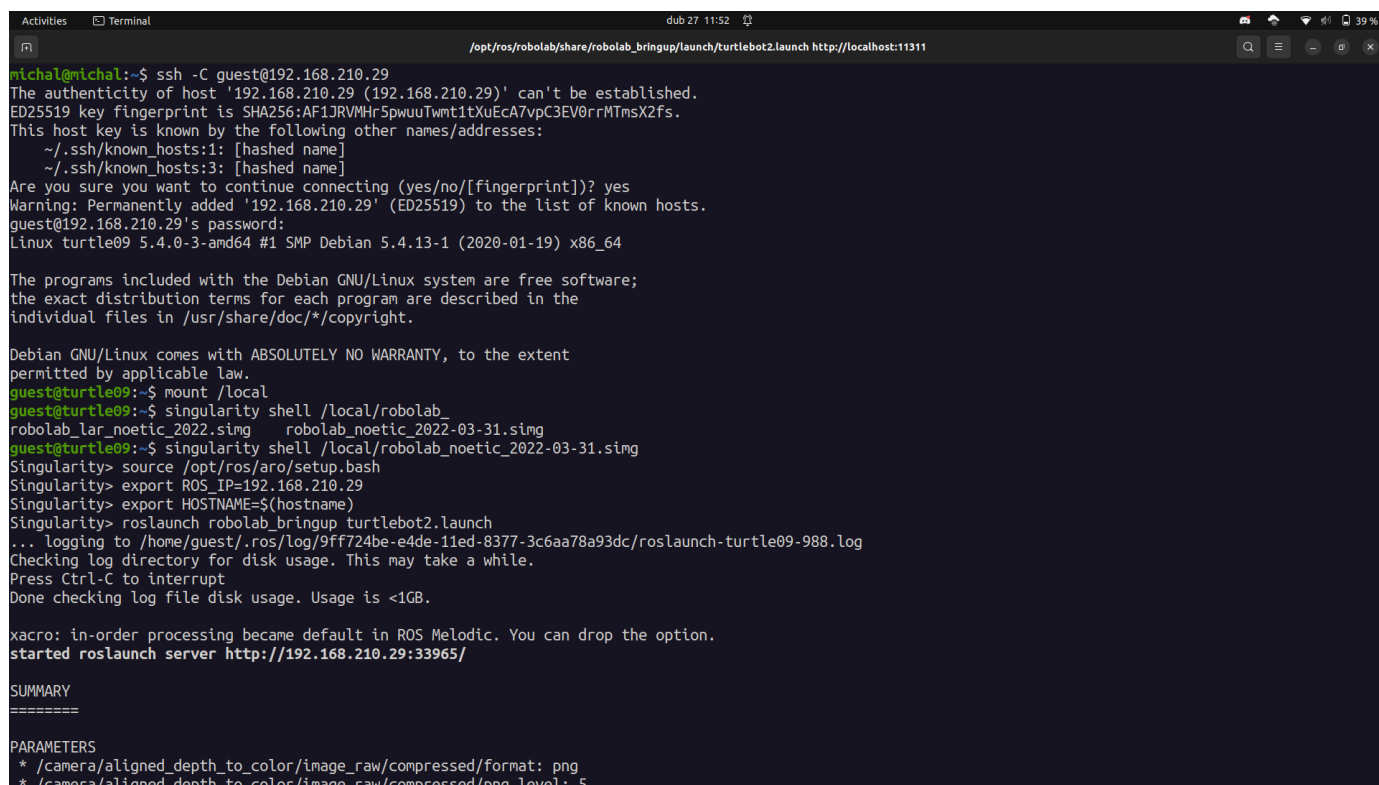## Remote connection to the robot

```
ssh -C guest@192.168.210.29 # pass = xxx
mount /local
singularity shell /local/robolab_noetic_2022-03-31.simg
source /opt/ros/aro/setup.bash
export ROS_IP=192.168.210.29
export HOSTNAME=$(hostname)
roslaunch robolab_bringup turtlebot2.launch  # Or launch tmux, see note under
```

> **UBUNTU 22 NOTE**
>
> Running the robot controller (keyboard control) locally seems not to work under this setup, but running it on the robot works:

```
tmux # Create two terminals inside tmux
# Window 0
source /opt/ros/aro/setup.bash
roslaunch robolab_bringup/turtlebot2.launch
# Window 1
source /opt/ros/aro/setup.bash
rosrun teleop_twist_keyboard teleop_twist_keyboard.py cmd_vel:=/cmd_vel_mux/safety_controller
_repeat_rate:=10.0 _key_timeout:=1.0 _speed:=0.25 _turn:=0.5
```

Output

Local session (RVIZ)

Start singularity on laptop, set ROS_MASTER_URI (since we want to connect to a remote ROS session) and run RVIZ to see outputs

```
source /opt/ros/aro/setup.bash
```

> **UBUNTU 22 NOTE**
>
> source /opt/ros/aro/setup.bash overrides LD_LIBRARY_PATH variable and RVIZ won't start due to library conflicts.
> If ~/.bashrc is modified accordingly to ARO Forum, this issue can be resolved by invoking bash shell inside the singularity container again

```
bash
export ROS_MASTER_URI=http://192.168.210.29:11311
rviz
```

Output

First call of rviz fails due to the ROS_MASTER_URI not being set.

```
Singularity> source /opt/ros/aro/setup.bash
Singularity> rviz
QStandardPaths: XDG_RUNTIME_DIR points to non-existing path '/run/user/1000', please create it with 0700 permissions.

(rviz:35423): dbind-WARNING **: 11:34:41.958: Couldn't connect to accessibility bus: Failed to connect to socket /run/user/1000/at-spi/bus_1: No such file or directory
QStandardPaths: XDG_RUNTIME_DIR points to non-existing path '/run/user/1000', please create it with 0700 permissions.
Qt: Session management error: None of the authentication protocols specified are supported
[ INFO] [1682588082.015693640]: rviz version 1.14.19
[ INFO] [1682588082.015721941]: compiled against Qt version 5.12.8
[ INFO] [1682588082.015727824]: compiled against OGRE version 1.9.0 (Ghadamon)
Singularity> export ROS_MASTER_URI=http://192.168.210.29:11311
Singularity> rviz
QStandardPaths: XDG_RUNTIME_DIR points to non-existing path '/run/user/1000', please create it with 0700 permissions.

(rviz:35515): dbind-WARNING **: 11:35:41.667: Couldn't connect to accessibility bus: Failed to connect to socket /run/user/1000/at-spi/bus_1: No such file or directory
QStandardPaths: XDG_RUNTIME_DIR points to non-existing path '/run/user/1000', please create it with 0700 permissions.
Qt: Session management error: None of the authentication protocols specified are supported
[ INFO] [1682588141.683781516]: rviz version 1.14.19
[ INFO] [1682588141.683801289]: compiled against Qt version 5.12.8
[ INFO] [1682588141.683805961]: compiled against OGRE version 1.9.0 (Ghadamon)
[ INFO] [1682588141.764906041]: Forcing OpenGl version 0.
[ INFO] [1682588141.963278644]: Stereo is NOT SUPPORTED
[ INFO] [1682588141.963325089]: OpenGL device: Mesa Intel(R) Xe Graphics (TGL GT2)
[ INFO] [1682588141.963339454]: OpenGl version: 4.6 (GLSL 4.6) limited to GLSL 1.4 on Mesa system.
```

To see data from camera, we need to

- Add topic by Add -> Camera -> ... (select **compressed**)
- Set frame `Global Options` -> `Fixed Frame` -> `camera_color_frame`