

## Publishers and subscribers: TurtleBot

In the previous assignment we have succeeded to move the TurtleBot around using keyboard teleoperation; however, our ultimate goal to make the TurtleBot be able to navigate autonomously. In this assignment we will make an introduction on how you can move the robot *without* teleoperation.

### Publishing through the CCS

The simplest way to make the turtleBot move on its own is to publish a simple message through the CCS. But on which topic should you publish the message?

We have already moved the TurtleBot before using our keyboard, so we can look up to which topic the `/turtlebot_teleop_keyboard` node publishes.

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### Question 1

1 point possible (ungraded)

To which of the following topics does the `/turtlebot_teleop_keyboard` node publish?

☐ `/cmd_vel_mux/input/navi`

☐ `/cmd_vel_mux/input/teleop`

☐ `/odom`

Submit

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Now let's move the TurtleBot in a simple straight line. Try the following command by replacing '<ANS\_Q1>' by the correct name of the topic you found in the previous question.

Notice that this will only work if you have first killed the node `/turtlebot_teleop_keyboard`.

```
$ rostopic pub <ANS_Q1> \geometry_msgs/Twist '{linear: {x: 0.5, y: 0, z: 0}, angular: {x: 0, y: 0, z: 0}}'
```

Notice how the TurtleBot moves for a while in a straight line then comes to a stop. To make the TurtleBot move again you can press `ctrl+c` then try the same command again.

Another option is publish the topic with a specific rate. The following command will publish the command with a rate of 10 Hz and will make the TurtleBot move in circles.

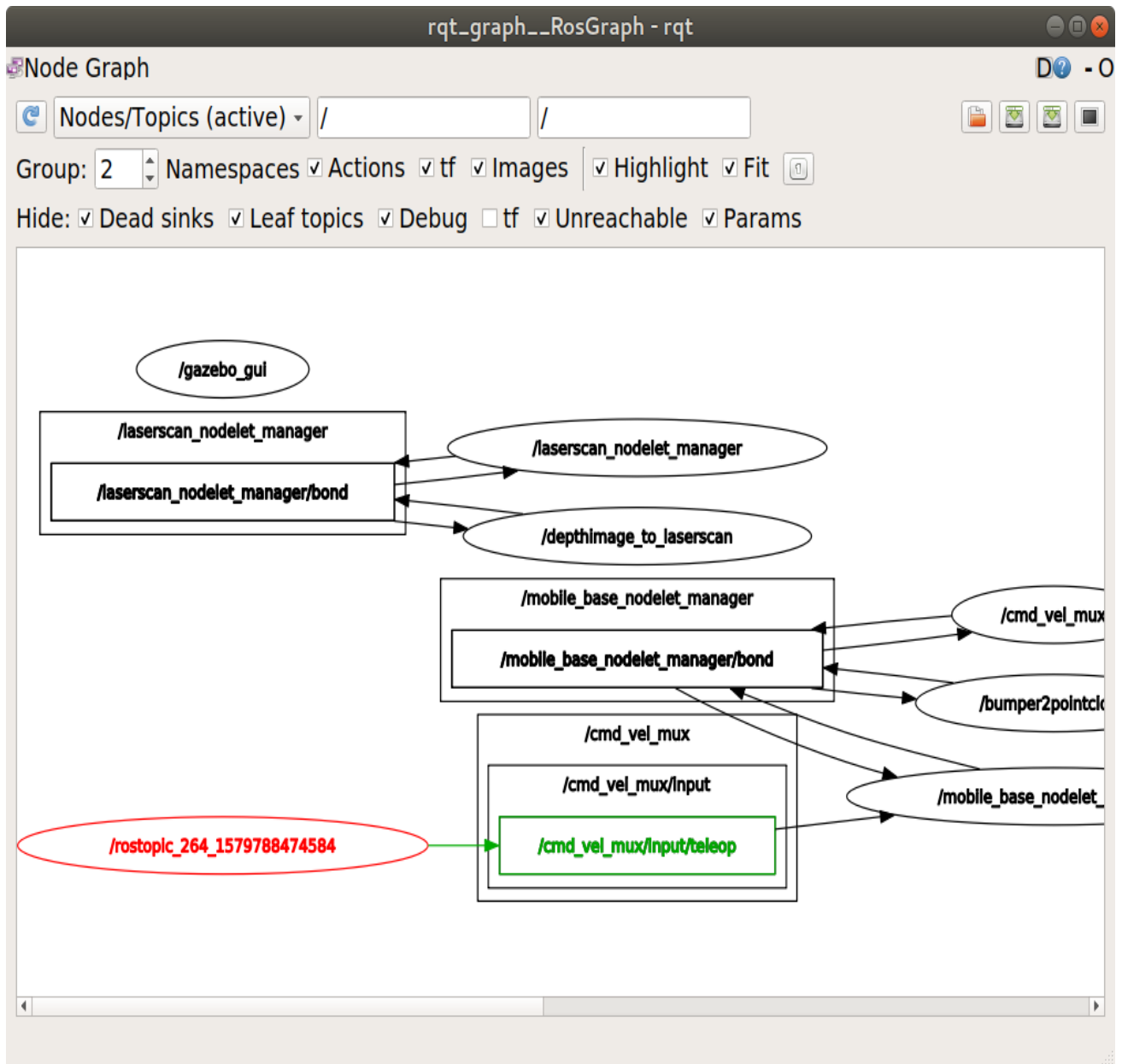
```
$ rostopic pub -r 10 <ANS_Q1> \geometry_msgs/Twist '{linear: {x: 0.1, y: 0, z: 0}, angular: {x: 0, y: 0, z: -0.6}}'
```

To notice the `-r 10` argument in this command. Now let's open up our `rqt_graph`. You can do this using the following command:

```
$ rosrun rqt_graph rqt_graph
```

Make sure you select "Nodes/Topics (active)" from the select drop bar on the top left of the window.

You should see the node publishing to the `/cmd_vel_mux/input/teleop`. They are highlighted on red and green in the following figure.



Note: The node it's called `/rostopic_XXX_XXXXXXX` however, this is **not** a ROS topic. It's a ROS node. That's is why it's an ellipse. The name is generated automatically since we are publishing via our CCS.

Now that you have successfully controlled the turtlebot from a CCS, we can basically do the same thing but with a simple python script.