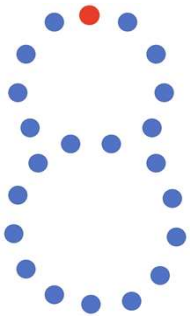
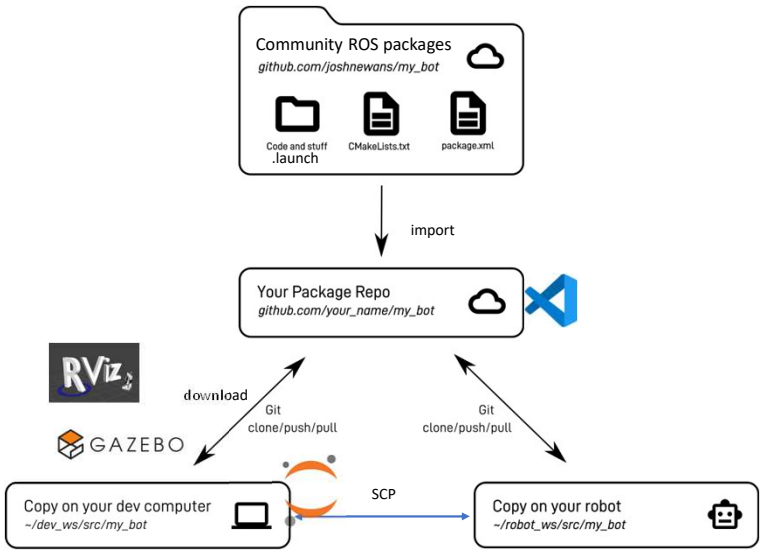
SEMTRON

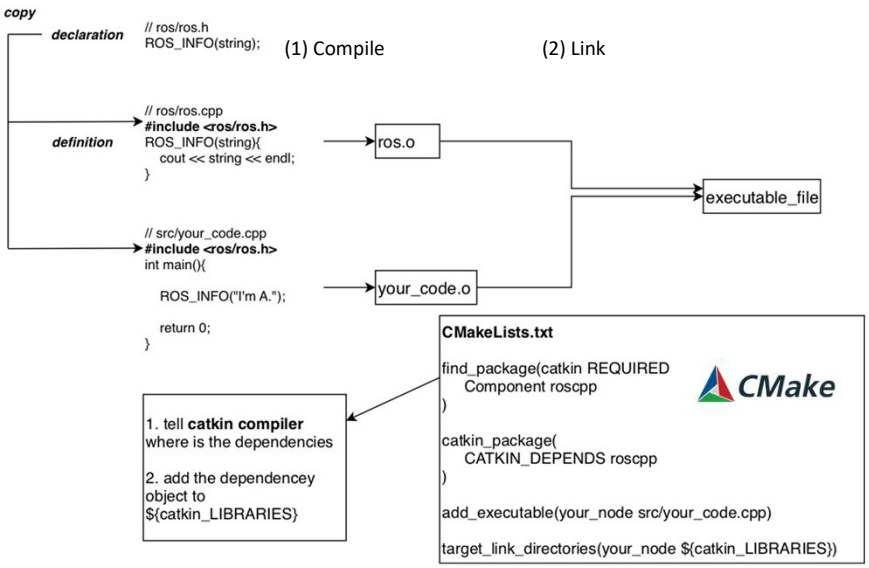
EIGHT

Robot Bringup



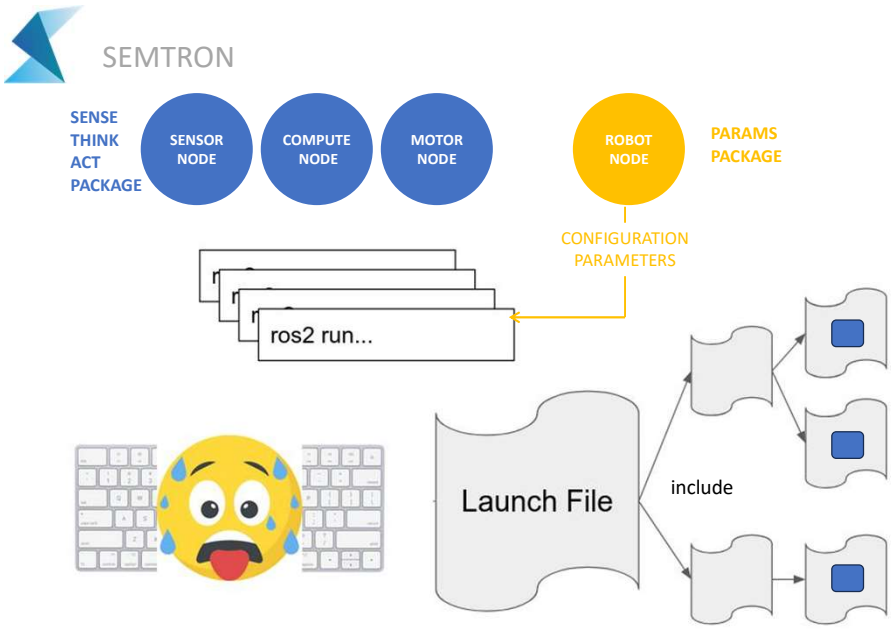


Robot bringup workflow



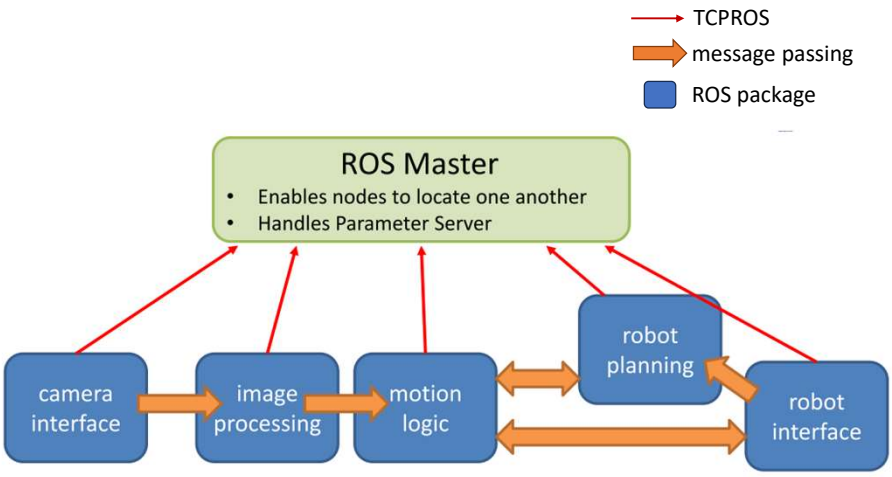
Robot bringup workflow

3



Robot bringup workflow

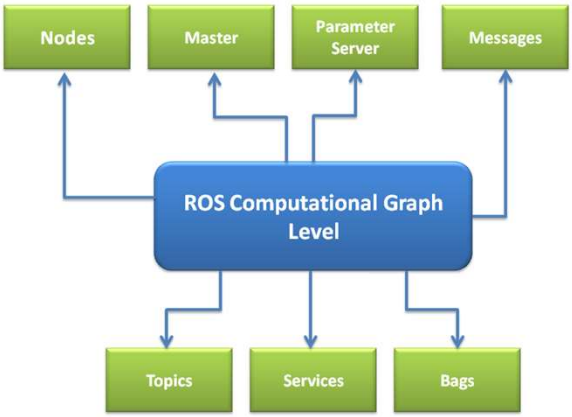
4



Robot bringup workflow

5

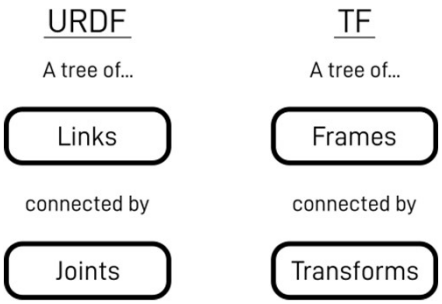
ROS launch creates a network where all ROS processes are connected. ROS Computational Graph shows the peer-to-peer network of the processes that are processing data together.



rqt_graph

6

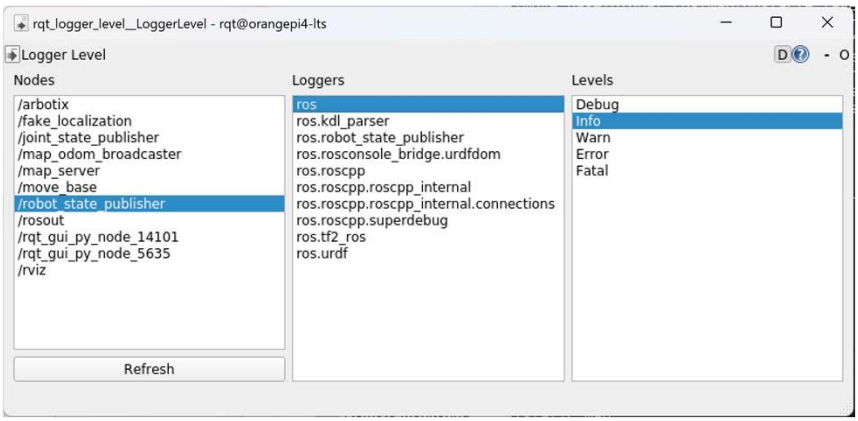
ROS node robot_state_publisher which take in a URDF file and automatically broadcast all the transforms from it to /tf and form the overall coordinate transformations



rqt_tf_tree

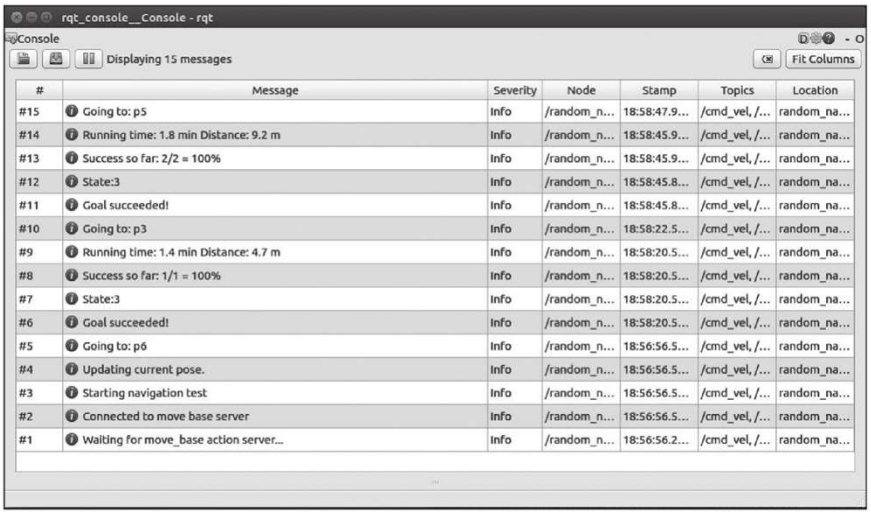
7

ROS provides tools for debugging which allows packages to send messages to /rosout and make them available on every node. The tools give access to these debugging messages and provide additional features such as filtering by level and by node.



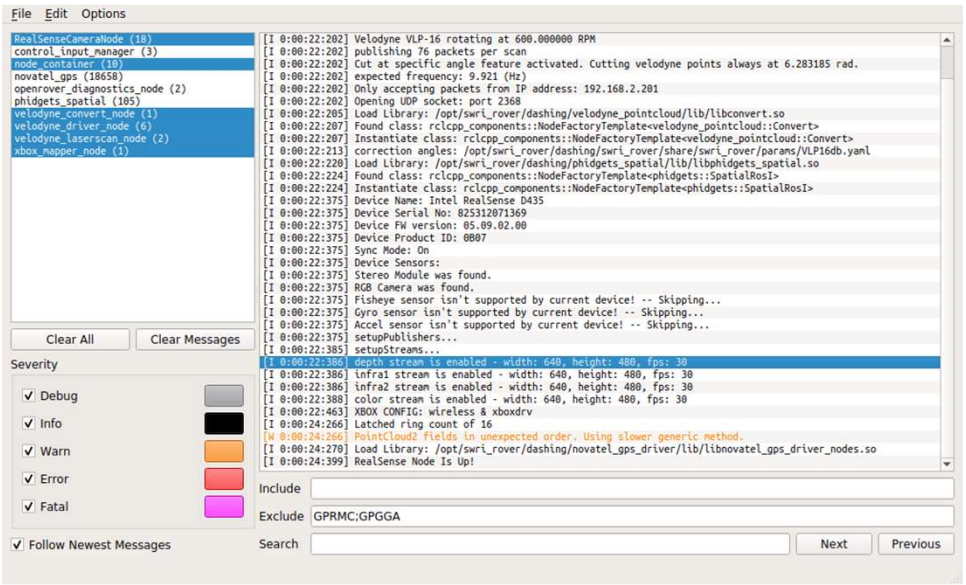
rqt_logger_level

8



rqt_console

9



swri_console

10

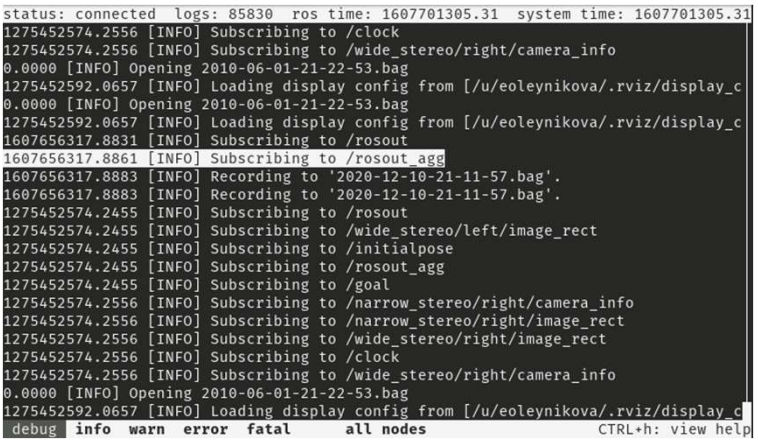
There are four potential places a log message may end up depending on the verbosity level

Output	Log Level				
	Debug	**Info**	**Warn**	**Error**	**Fatal**
stdout		X			
stderr			X	X	X
log file	X	X	X	X	X
/rosout	o	X	X	X	X

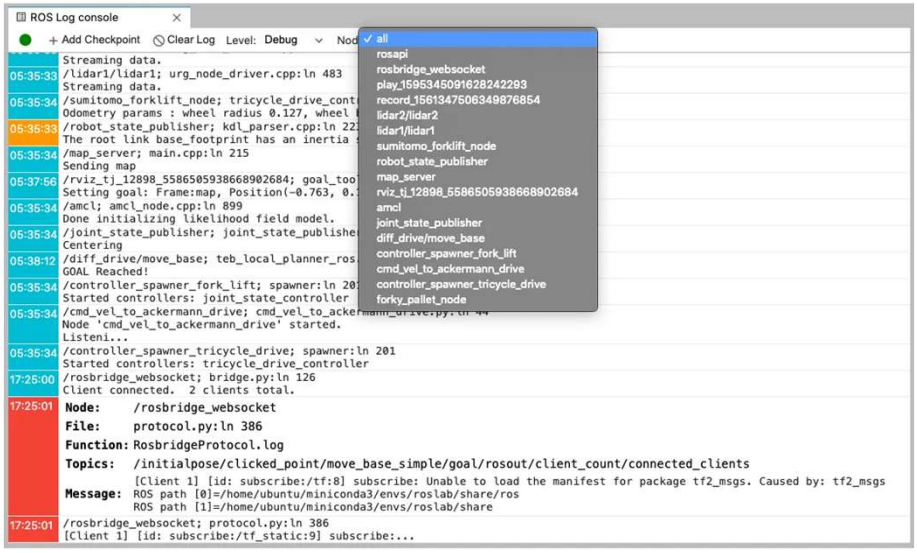
loginfo will be sent to screen if the value of the roslaunch/XML/node output parameter 'screen' is set. The default is 'log', the stdout/stderr output will be sent to a log file in $ROS_HOME/log, and stderr will continue to be sent to the screen.

ROS logging

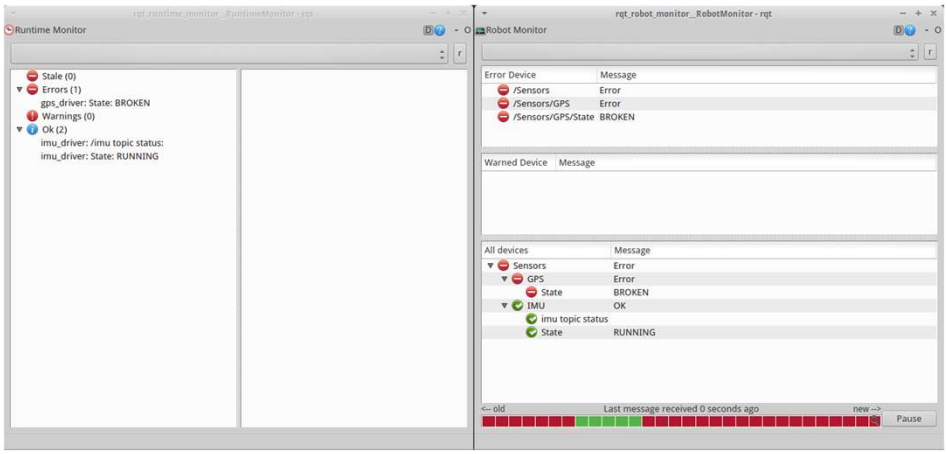
11



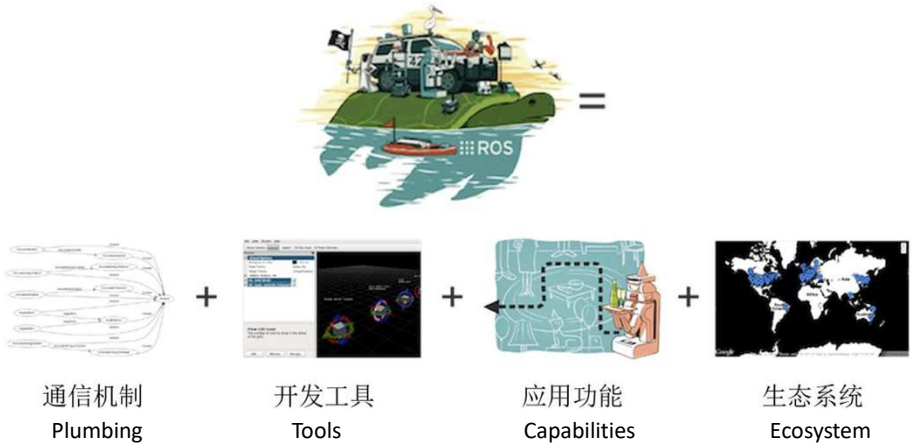
12



The diagnostics stack contains tools for collecting, publishing, analyzing and viewing diagnostics data from hardware drivers and robot hardware.

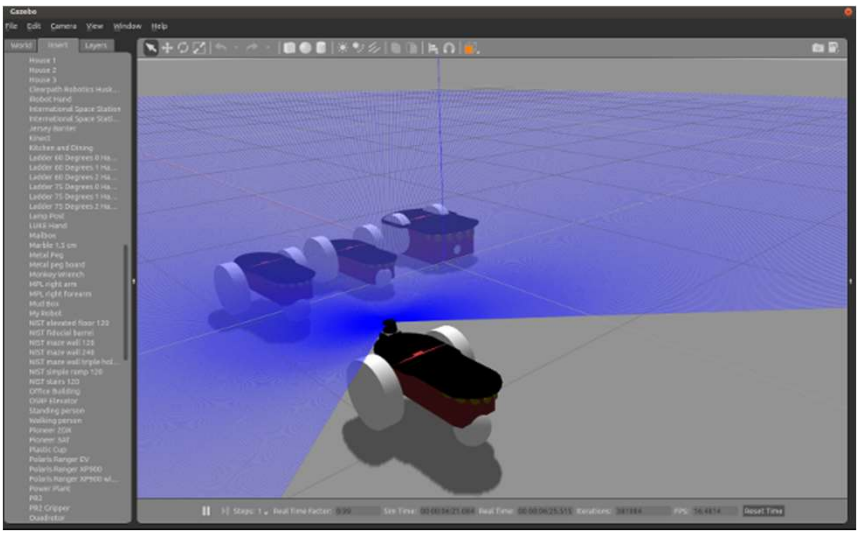


ROS diagnostic monitors



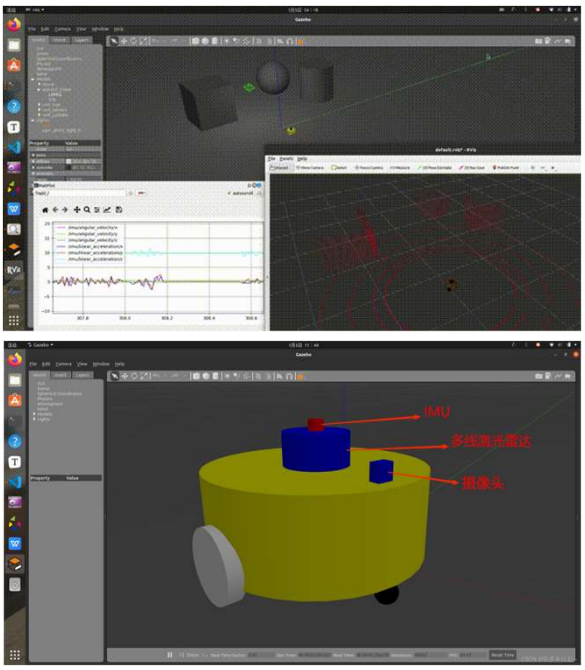
ROS community

15



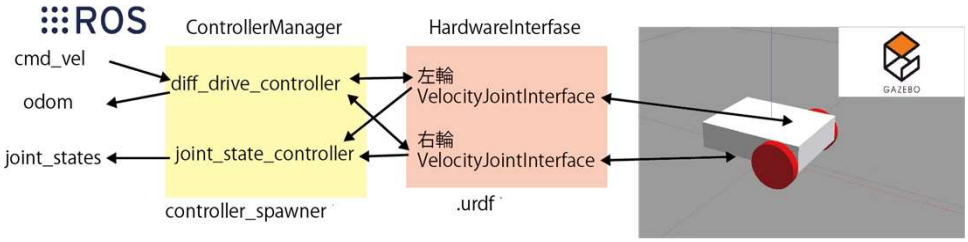
Simulation bringup - LiDAR

16



Simulation bringup - IMU

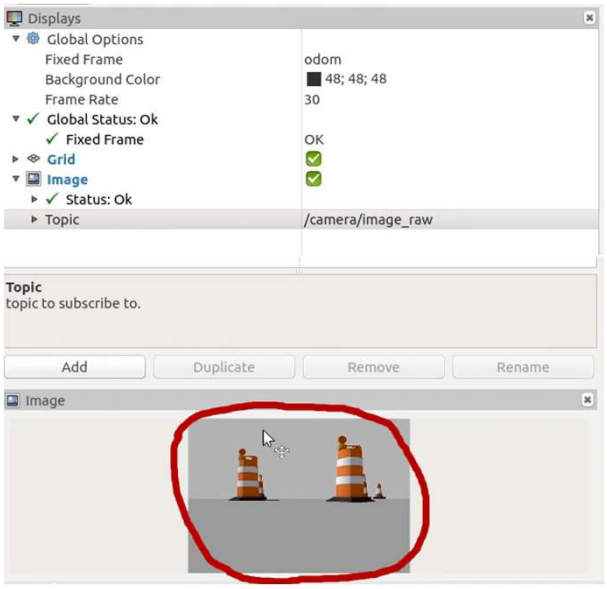
17



Simulation bringup – wheel odometry

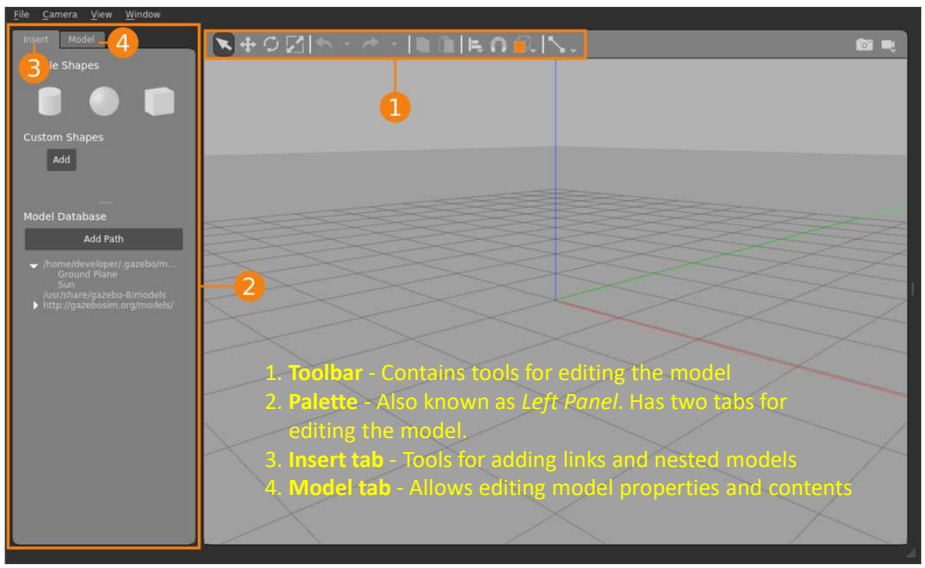
18

Simulation bringup - camera



19

Ctrl-M



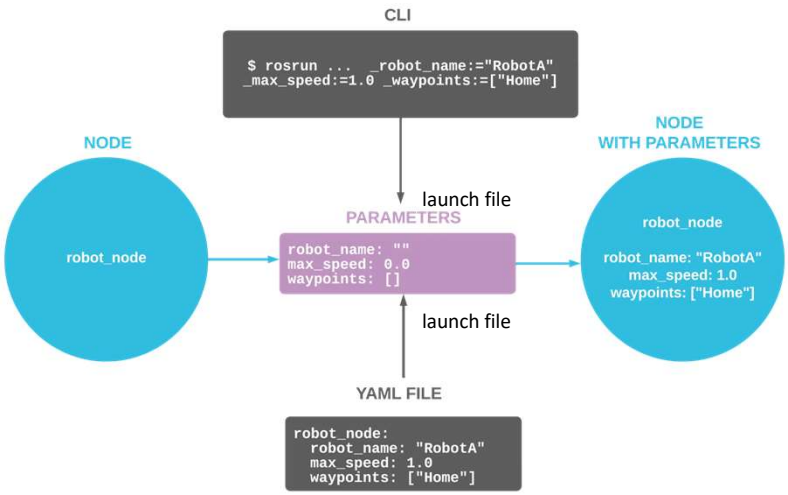
Gazebo editor

20

SEMTRON

rospy API with Notebook

21



rosrun parameters

22

Accessing and setting Parameters

Via command line

1) To list all the parameters : `rosparam list`
2) To assign a value to an already existing parameter or to set a new one : `rosparam set <parameter_name> <parameter_value>`
3) To get/read a parameter value : `rosparam get <parameter_name>`

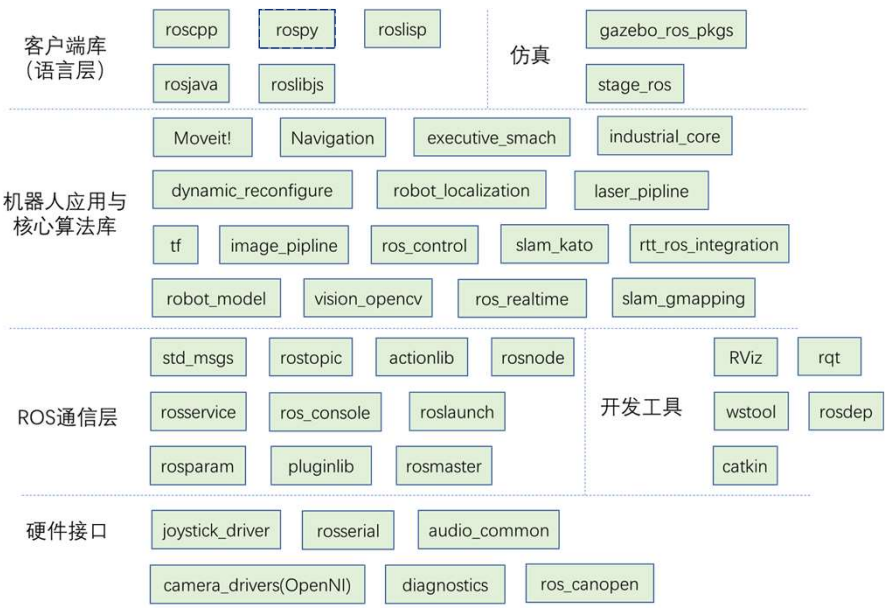
Via launch files

Parameters can be set, created and loaded into the parameter server while creating launch files.

Via the rospy API library

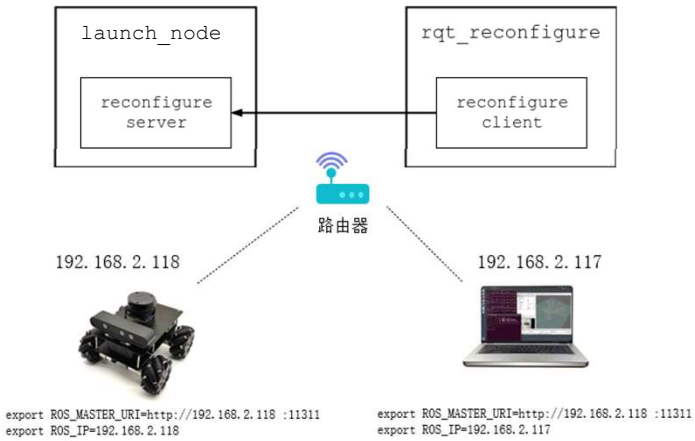
This is generally used when the parameters are to be used by a node during the runtime.

23



24

$ rosrun rqt_reconfigure rqt_reconfigure



rqt_reconfigure

25