ROS tutorial

navigation/tf

ROBOT OPERATING SYSTEM LAB SESSION 5

03/04/2018

tips

rosbag record :   record data from a running ROS system into .bag file

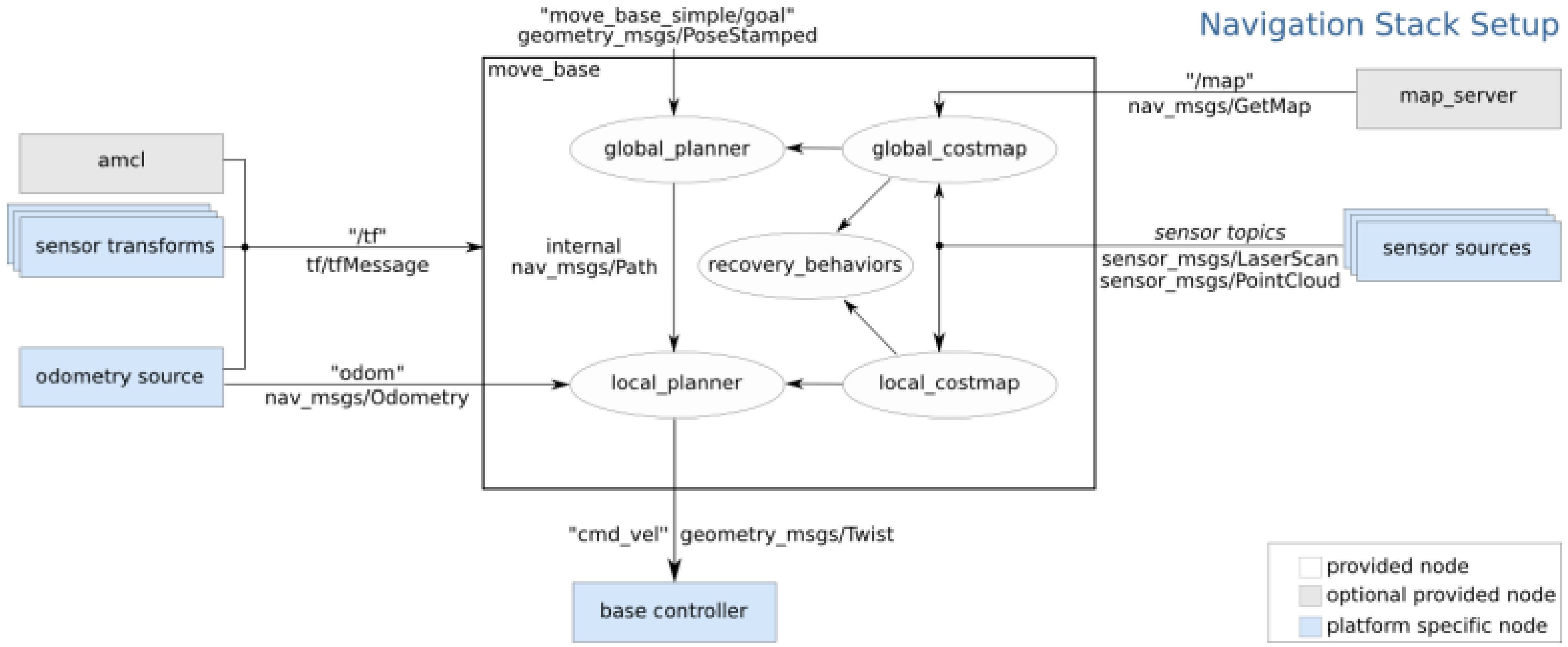
rosbag play   :   play back the data to produce similar behavior in a running system

rosbag record –O name /topic :   The -O argument tells rosbag record to log to a file named

rosbag play –r num :   allows you to change the rate of publishing by a specified factor

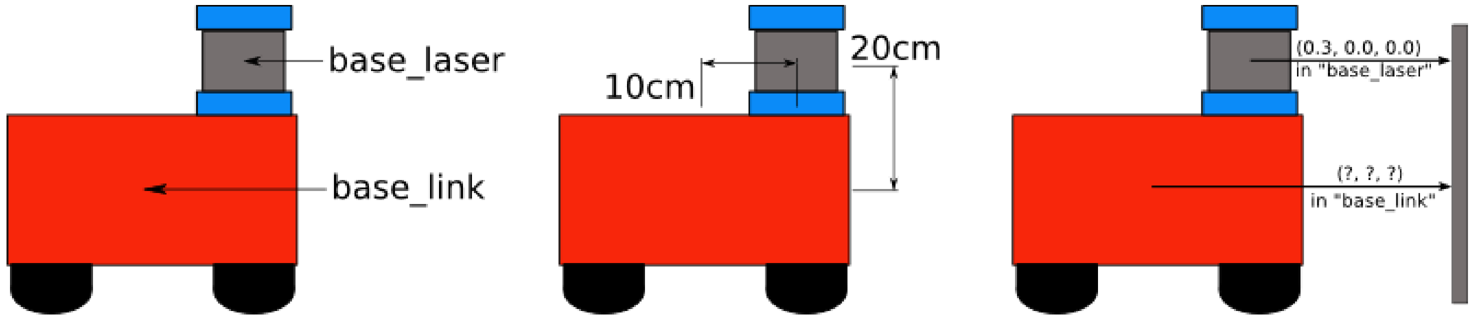
roswtf: examines your system to try and find problems

navigation



Navigation Stack Setup
"move_base_simple/goal"
geometry_msgs/PoseStamped
move_base
global_planner
global_costmap
recovery_behaviors
local_planner
local_costmap
internal
nav_msgs/Path
"/map"
nav_msgs/GetMap
map_server
amcl
sensor transforms
odometry source
"/tf"
tf/tfMessage
"odom"
nav_msgs/Odometry
sensor topics
sensor_msgs/LaserScan
sensor_msgs/PointCloud
sensor sources
"cmd_vel"
geometry_msgs/Twist
base controller
provided node
optional provided node
platform specific node

transform


base_laser
base_link
10cm
20cm
(0.3, 0.0, 0.0)
in "base_laser"
(?, ?, ?)
in "base_link"

Broadcasting a Transform

```
broadcaster.sendTransform(
  tf::StampedTransform(
    tf::Transform(tf::Quaternion(0, 0, 0, 1), tf::Vector3(0.1, 0.0, 0.2)),ros::Time::now(),"base_link", "base_laser"));
```

Using a Transform

```
try{
  geometry_msgs::PointStamped base_point;
  listener.transformPoint("base_link", laser_point, base_point);
  ROS_INFO("base_laser: (%.2f, %.2f. %.2f) -----> base_link: (%.2f, %.2f, %.2f) at time %.2f",
  laser_point.point.x, laser_point.point.y, laser_point.point.z,
  base_point.point.x, base_point.point.y, base_point.point.z, base_point.header.stamp.toSec());
}
```

transformPoint() with three arguments: the name of the frame we want to transform the point to ("base_link" in our case), the point we're transforming, and storage for the transformed point.

Building the Code

```
add_executable(tf_broadcaster src/tf_broadcaster.cpp)

add_executable(tf_listener src/tf_listener.cpp)

target_link_libraries(tf_broadcaster ${catkin_LIBRARIES})

target_link_libraries(tf_listener ${catkin_LIBRARIES})
```

Running the Code

```
roscore

rosrun  robot_setup_tf  tf_broadcaster

rosrun robot_setup_tf  tf_listener
```

test

Understand the tf http://wiki.ros.org/navigation/Tutorials/RobotSetup/TF

http://wiki.ros.org/tf/Tutorials

Finish another transform