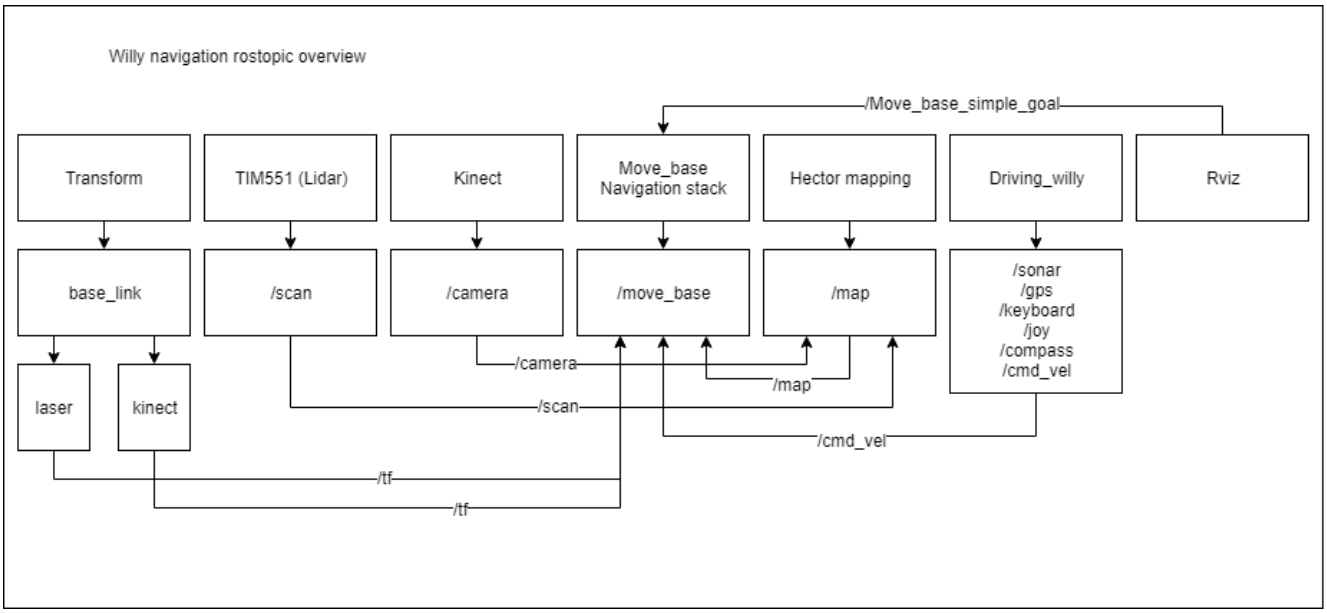
Unresolved directive in Autonomous.adoc - include::../Header.adoc[] === Autonomous driving

Preface

The following definition list is to clear up confusion about certain terms used in this document.

Term	*Definition*
PointCloud2	This is a ros message type mostly used by the Xbox 360 kinect. Its an array of points readed by the kinect including the distance to each point.
LaserScan	This is a ros message type mostly used by lidar systems. Its a 2D, 360 or 270 degrees laserscan with all the distances from the scan to the base frame of the robot.
Mappinng	The technique of visualization a space using sensor data.
ROS	Robot Operating System, the framework Willy has been built on.

Rostopic overview



For the Autonomous driving of our robot are we using ROS. ROS is a platform to help a mobile platform to navigate and communicate with different programs and devices. There is a schematic view of our rostopics in the image above.

Let's explain it a little bit. Our mobile base consist of 7 rosnodes. These rosnodes provide the neccesairly data for the move_base topic to navigate inside.

1. **tf or transform topic.** This node determinate the transformations and rotations of the different devices from the rotation point of the mobile base.
2. **TIM551 Lidar topic.** This node provides 'LaserScan' information from the sick_tim 551 lidar and published this data on the /scan topic.

3. **Kinect topic.** This node provides 'PointCloud2' information from the kinect and publish these information on the /camera topic and /camera subtopics.
4. **Move base topic.** This node is provided by the ros navigation stack. It request all information from the /tf and /map topic and provides movement commands from goals send by rviz which can be send to the /cmd_vel topic provided by our driving_willy package.
5. **Hector mapping.** This topic request information from the /scan and /camera topic and creates a map from this data to navigate in. This map is requested by the move_base.
6. **Driving willy.** This topic is provided by our own driving_willy package. It provides a /cmd_vel topic to control the motors of our mobile base. Also the GPS, compass, sonars, keyboard and joystick are controlled with this node.
7. **Rviz.** Rviz is a ros visualization tool to view sensor data. Rviz can view the generated map and the user can send navigation goals in rviz. Rviz then views the planned route and also the obstacles.

Bibliography

The current document contains no sources.