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ROS overview

Tutorial: ROS integration overview

To achieve ROS integration with stand-alone Gazebo, a set of ROS packages named gazebo_ros_pkgs (http://ros.org/wiki/gazebo_ros_pkgs) provides wrappers around the stand-alone Gazebo. They provide the necessary interfaces to simulate a robot in Gazebo using ROS messages, services and dynamic reconfigure Some features of gazebo_ros_pkgs:

- Supports a stand alone system dependency of Gazebo, that has no ROS bindings on its own
- Builds with catkin (http://www.ros.org/wiki/catkin)
- Treats URDF and SDF (http://gazebosim.org/sdf.html) as equally as possible
- · Reduces code duplication with Gazebo
- Improves out of the box support for controllers using ros_control
- Integrates real time controller efficiency improvements from the DARPA Robotics Challenge
- Cleans up old code from previous versions of ROS and Gazebo

An overview of the <code>gazebo_ros_pkgs</code> interface is in the following diagram:



Upgrading from simulator_gazebo (ROS groovy and earlier)

The following guidelines will help you upgrade your Gazebo-dependent packages from simulator_gazebo for use in your ROS packages:

Launch Files

Some changes are required in previously created roslaunch files for starting Gazebo. The best way to update these packages is to review the Using roslaunch files to spawn models in Gazebo (http://gazebosim.org/tutorials?tut=ros_roslaunch&cat=connect_ros) tutorial. In a nutshell:

- Within roslaunch files, pkg="gazebo" needs to be now renamed to pkg="gazebo_ros"
- gazebo_worlds package has been removed. Most of the world files were rarely used and were not maintained with changes in SDF XML formats. Thus, all worlds have been centralized within the Gazebo project itself, including empty.world.
- The best way to use Gazebo launch files is to simply inherit/include the master empty_world launch file located in the gazebo_ros package.

CMakeLists.txt

The ROS-wrapped versiong of Gazebo was removed in favor of the system install of Gazebo. This may require reconfiguration of your CMake file. The following is an example CMakeLists.txt:

package.xml

Add dependency on the new gazebo_ros package:

```
<build_depend>gazebo_ros</build_depend>
<run_depend>gazebo_ros</run_depend>
```

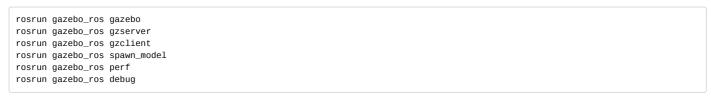
Running Gazebo

The names of the ROS nodes to launch Gazebo have changed slightly to coincide with the Gazebo executable names:

- rosrun gazebo_ros gazebo launch both the Gazebo server and GUI.
- rosrun gazebo_ros gzclient launch the Gazebo GUI.
- rosrun gazebo_ros gzserver launch the Gazebo server.

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Available nodes to run:



These nodes are better documented in the tutorial Using roslaunch files to spawn models in Gazebo (http://gazebosim.org/tutorials? tut=ros_roslaunch&cat=connect_ros).

Continue to Installing gazebo_ros Packages (http://gazebosim.org/tutorials?tut=ros_installing&cat=connect_ros).

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(https://www.youtube.com/channel/UCJyqf9XJpDoM9)