

Retro ROS 2 Launch

Remember XML files?

October 19, 2023

Tyler Weaver
Staff Software Engineer
tyler@picknik.ai

Tyler Weaver



- Racing Kart Driver
- Movelt Maintainer
- Rust Evangelist
- Docker Skeptic



```
<launch>
  <arg name="pipeline" default="ompl" />
  <arg name="capabilities" default="" />

  <node name="move_group" pkg="moveit_ros_move_group" type="move_group"
    output="screen">
    <param name="default_planning_pipeline" value="$(arg pipeline)" />
    <param name="capabilities" value="$(arg capabilities)" />
  </node>
</launch>
```

The launch we have at home



```
import os
from launch import LaunchDescription
from launch.actions import DeclareLaunchArgument, OpaqueFunction
from launch.substitutions import LaunchConfiguration, PathJoinSubstitution
from launch.conditions import IfCondition, UnlessCondition
from launch_ros.actions import Node
from launch_ros.substitutions import FindPackageShare
from launch.actions import ExecuteProcess
from ament_index_python.packages import get_package_share_directory
from moveit_configs_utils import MoveItConfigsBuilder

def generate_launch_description():
    declared_arguments = []
    declared_arguments.append(
        DeclareLaunchArgument("rviz_config",
                               default_value="kinova_moveit_config_demo.rviz",
                               description="RViz configuration file",
        )
    )
    return LaunchDescription(declared_arguments + [OpaqueFunction(function=launch_setup)])

def launch_setup(context, *args, **kwargs):
    launch_arguments = {
        "robot_ip": "xxx.yyy.zzz.www",
        "use_fake_hardware": "true",
        "gripper": "robotiq_2f_85",
        "dof": "7",
    }

    moveit_config = (
        MoveItConfigsBuilder("gen3", package_name="kinova_gen3_7dof_robotiq_2f_85_moveit_config")
        .robot_description(mappings=launch_arguments)
        .trajectory_execution(file_path="config/moveit_controllers.yaml")
        .planning_scene_monitor(publish_robot_description=True, publish_robot_description_semantic=True)
        .planning_pipelines(pipelines=["ompl", "stomp", "pilz_industrial_motion_planner"])
        .to_moveit_configs()
    )
```

Start the actual move_group node/action server

```
run_move_group_node = Node(
    package="moveit_ros_move_group",
    executable="move_group",
    output="screen",
    parameters=[moveit_config.to_dict()],
)
```

```
rviz_base = LaunchConfiguration("rviz_config")
```

```
rviz_config = PathJoinSubstitution([FindPackageShare("moveit2_tutorials"), "launch", rviz_b
```

RViz

```
rviz_node = Node(
    package="rviz2",
    executable="rviz2",
    name="rviz2",
    output="log",
    arguments=["-d", rviz_config],
    parameters=[
        moveit_config.robot_description,
        moveit_config.robot_description_semantic,
        moveit_config.robot_description_kinematics,
        moveit_config.planning_pipelines,
        moveit_config.joint_limits,
    ],
)
```

Static TF

```
static_tf = Node(
    package="tf2_ros",
    executable="static_transform_publisher",
    name="static_transform_publisher",
    output="log",
    arguments=["--frame-id", "world", "--child-frame-id", "base_link"],
)
```

Publish TF

```
robot_state_publisher = Node(
    package="robot_state_publisher",
    executable="robot_state_publisher",
    name="robot_state_publisher",
    output="both",
    parameters=[moveit_config.robot_description],
)
```

```
nodes_to_start = [
    rviz_node,
    static_tf,
    robot_state_publisher,
    run_move_group_node
]
```

```
return nodes_to_start
```

The launch she never told you about



```
<launch>
```

```
  <arg name="robot_ip" default="xxx.yyy.zzz.www" />
```

```
  <arg name="use_fake_hardware" default="true" />
```

```
  <arg name="gripper" default="robotiq_2f_85" />
```

```
  <arg name="dof" default="7" />
```

```
  <let name="robot_description" value="$(command 'xacro $(find-pkg-share kortex_description)/robots/gen3
```

```
  <let name="robot_description_semantic" value="$(command 'xacro $(find-pkg-share kinova_gen3_7dof_robot
```

```
  <!-- MoveGroup -->
```

```
  <node pkg="moveit_ros_move_group" exec="move_group" output="screen">
```

```
    <param name="robot_description" value="$(var robot_description)" type="str" />
```

```
    <param name="robot_description_semantic" value="$(var robot_description_semantic)" type="str" />
```

```
    <param from="$(find-pkg-share easy_launch_demo)/config/moveit.yaml" />
```

```
  </node>
```

```
  <!-- RViz -->
```

```
  <node pkg="rviz2" exec="rviz2" name="rviz2" output="log" args="-d $(find-pkg-share moveit2_tutorials)/
```

```
    <param name="robot_description" value="$(var robot_description)" type="str" />
```

```
    <param name="robot_description_semantic" value="$(var robot_description_semantic)" type="str" />
```

```
    <param from="$(find-pkg-share easy_launch_demo)/config/moveit.yaml" />
```

```
  </node>
```

```
  <!-- Static TF -->
```

```
  <node pkg="tf2_ros" exec="static_transform_publisher" name="static_transform_publisher" output="log"
```

```
    args="    frame id world    child frame id base link" />
```


The launch she never told you about



<launch>

<arg name="/home/tyler/code/ws_param_examples/install/moveit2_tutorials/share/moveit2_tutorials/launch/kinova_moveit_config_demo.rviz* - RViz

<arg name="File Panels Help

<arg name="Interact Move Camera Select Focus Camera Measure 2D Pose Estimate 2D Goal Pose Publish Point + -

<arg name="Displays
Global Options
Fixed Frame base_link
Background Color 48; 48; 48
Frame Rate 30

<!-- MoveGr

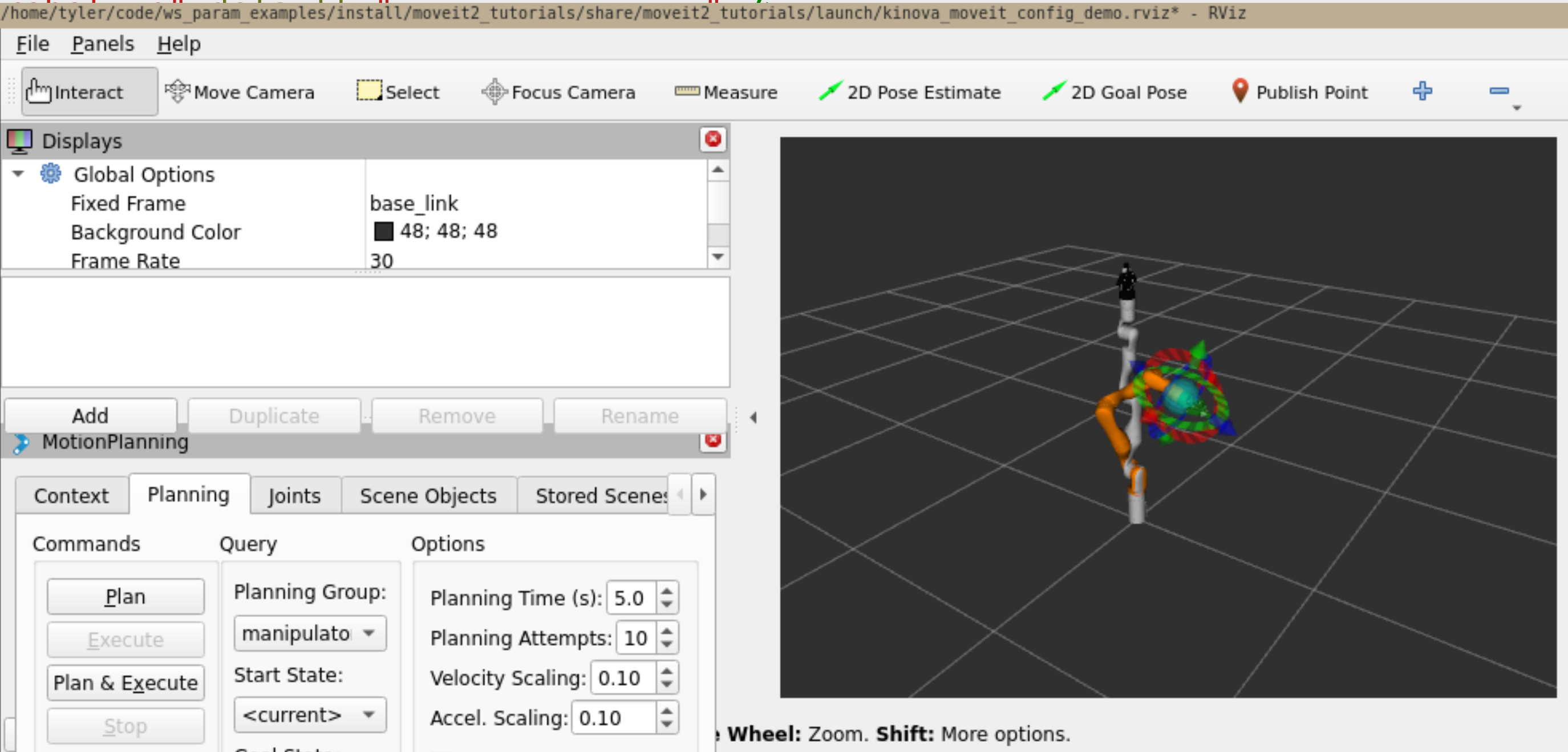
<node pkg="MotionPlanning
<param na
<param na
<param fr
</node>

<!-- RViz -

<node pkg="MotionPlanning
<param na
<param na
<param na
<param from="\$ (find-pkg-share easy_launch_demo)/config/moveit.yaml" />
</node>

<!-- Static TF -->

<node pkg="tf2_ros" exec="static_transform_publisher" name="static_transform_publisher" output="log"
args=" frame_id world child_frame_id base_link" />



on)/robots/gen3
gen3_7dof_robot

pe="str" />

it2_tutorials)/

pe="str" />

- Launch demo with 43 lines of XML vs ~1000 lines of Python
- Single [moveit.yaml](#) config for MoveIt
- Try it yourself: github.com/tylerjw/easy_ros2_launch_talk