5.2.1

TF Reference Frames: How and Where?

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How are reference frames created?

- ROS Package: Robot state publisher (robot_state_publisher)
  - joint state information - /joint_states topic
  - robot_description parameter - URDF/XACRO (hrwros.xacro)
- Fixed frame of reference: "world"

hrwros_gazebo/launch/hrwros_environment.launch

```
<!-- Combine joint state information from two robots. -->
<node name="joint_state_publisher"
pkg="joint_state_publisher" type="joint_state_publisher">
<rosparam="/source_list">[/robot1/joint_states,
/robot2/joint_states]</rosparam>
</node>
```

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Note!

In your files, the joint states of the two
robot arms are in a different topic:
combined_joint_states

The joint states of the Turtlebot remain in the
joint_states topic

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```
<!-- Load the URDF on to the ROS parameter server. -->
<include file="$(find
hrwros_support)/launch/load_hrwros.launch"/>
```
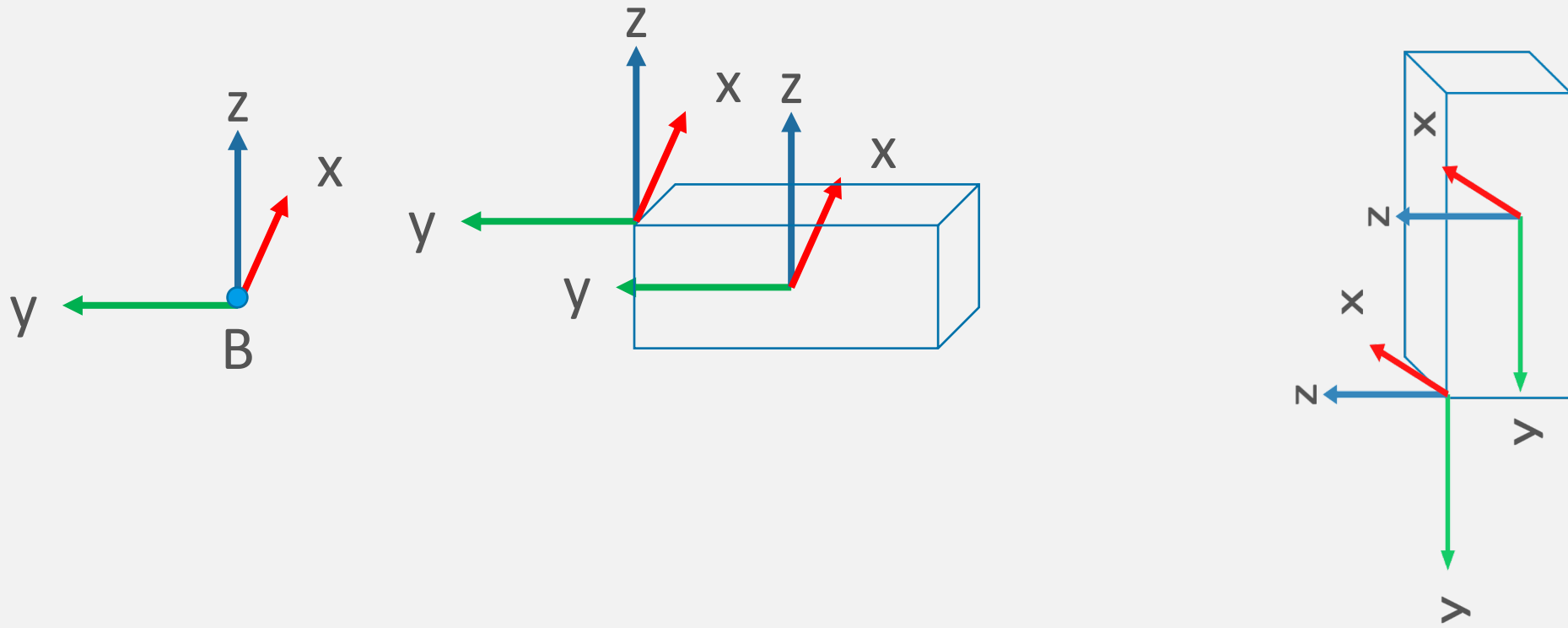
```
<launch>
<param name="robot_description" command="$(find
xacro)/xacro --inorder '$(find
hrwros_support/urdf/hrwros.xacro)'"/>
</launch>
```

Where are reference frames located?

Reference frames: Joints in xacro

```
<!-- Reference frame for robot2_pedestal_joint -->
<joint name="robot2_pedestal_joint" type="fixed">
  <parent link="world"/>
  <child link="robot2_pedestal_link"/>
  <origin xyz="-7.8 -1.5 0"/>
</joint>
```