

Introduction to Robotic Operating System (ROS)

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Creating ROS a Package

- robot@vm:~\$ **cd catkin_ws**
- robot@vm:~\$ /catkin_ws\$ **cd src**
- robot@vm:~\$ /catkin_ws/src\$
catkin_create_pkg tutorial rospy
- robot@vm:~\$ /catkin_ws/src \$ **cd ..**
- robot@vm:~\$ /catkin_ws\$ **catkin_make**

Creating a ROS Publisher

- In the tutorial/src directory, create an empty document and name it “**helloworld**”. Then, write:

```
#!/usr/bin/env python
import rospy
from std_msgs.msg import String

if __name__ == '__main__':
    rospy.init_node('talker', anonymous=True)
    pub = rospy.Publisher('chat', String, queue_size=10)
    rate = rospy.Rate(10) # 10hz
    while not rospy.is_shutdown():
        hello_str = "hello world %s" % rospy.get_time()
        rospy.loginfo(hello_str)
        pub.publish(hello_str)
        rate.sleep()
```

Creating a ROS Publisher

- `robot@vm:~$ /catkin_ws$ cd`
- `robot@vm:~$ chmod +x
/home/robot/catkin_ws/src/tutorial/src/helloworld`
- `robot@vm:~$ rosrun tutorial helloworld`
- `robot@vm:~$ rqt_graph`
- `robot@vm:~$ rostopic info /chat`

Explanation

- Create a document “myadd.py” and type:

```
1 #!/usr/bin/env python  
2 import rospy  
3  
4 def add(a,b):  
5     return a+b  
6  
7 print(add(10,16))
```

- `chmod +x /home/robot/myadd.py`
- `/home/robot/myadd.py`
- The output is 26

Creating a ROS Subscriber

- In the tutorial/src directory, create an empty document and name it “**helloworld_listener**”. Then, write:

```
#!/usr/bin/env python
import rospy
from std_msgs.msg import String

def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)

if __name__ == '__main__':
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chat", String, callback)
    rospy.spin()
```

Creating a ROS Subscriber

- `robot@vm:~$ chmod +x /home/robot/catkin_ws/src/tutorial/src/helloworld_listener`
- `robot@vm:~$ rosruncatkin tutorial helloworld_listener`

Creating a ROS Launch File

- In the tutorial/src directory, create an empty folder and name it “launch”. Inside the directory, create an empty document and then name it “mylaunch.launch”. Then, write the following code and save the file.
- `<launch>`
- `<node pkg=“tutorial” name=“talker” type=“helloworld” />`
- `<node pkg=“tutorial” name=“listener” type=“helloworld_listener” />`
- `</launch>`
- `robot@vm:~$ roslaunch tutorial mylaunch.launch`
- `robot@vm:~$ rostopic info /chat`
- `robot@vm:~$ rostopic echo /chat`

More example:

- `<launch>`
- `<node pkg="tutorial" name="talker"
type="helloworld" />`
- `<node pkg="tutorial" name="listener"
type="helloworld_listener" output="screen"/>`
- `</launch>`

If syntax error occur, retype the quotation mark