

Linux Systems and Open Source Software

Robot Operating System (ROS)

Chia-Heng Tu
Dept. of Computer Science and Information Engineering
National Cheng Kung University
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Lab (ROS)

- Core ROS Tutorials (Beginner Level)
  - Installing and Configuring Your ROS Environment
  - Creating a ROS Package
  - Building a ROS Package
  - Writing a Simple Publisher and Subscriber (Python)
  - Examining the Simple Publisher and Subscriber
  - rqt_graph



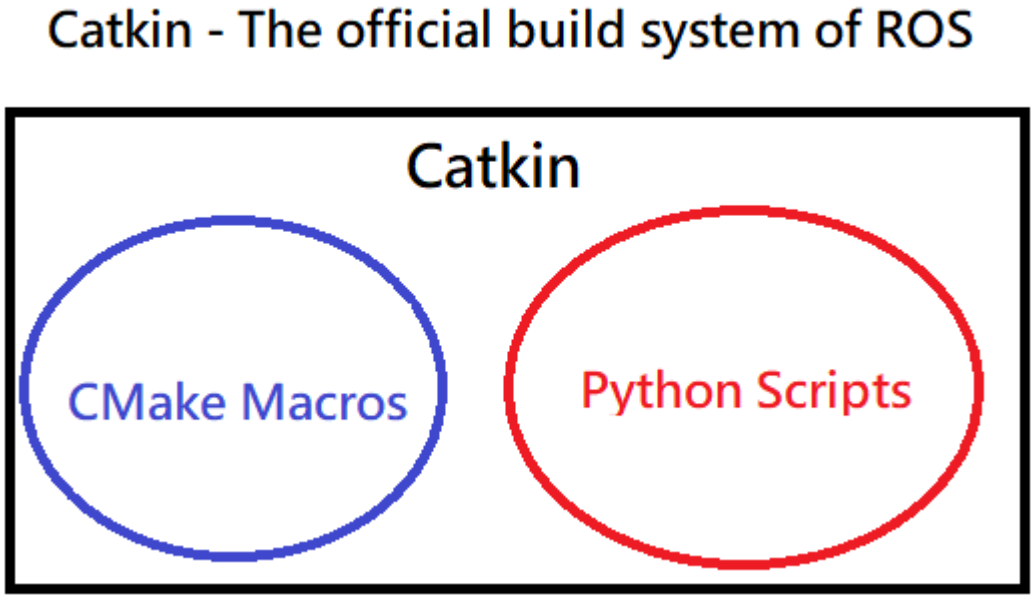
Lab (ROS2)

- Please follow the steps in the links below. (Do not follow page 4~11.)
  - Writing a simple publisher and subscriber (Python)
  - rqt_graph
- Then upload the similar screenshot on page 12 to moodle.
  - 1 terminal talker.
  - 1 terminal listener.
  - rqt_graph



Catkin

- http://wiki.ros.org/catkin/conceptual_overview





Create a ROS Workspace

```
$ mkdir -p ~/catkin_ws/src

$ cd ~/catkin_ws/

$ catkin_make
```



Creating a catkin Package

$ cd ~/catkin_ws/src

$ catkin_create_pkg beginner_tutorials std_msgs rospy roscpp



Building a catkin workspace and sourcing the setup file

```
$ cd ~/catkin_ws

$ catkin_make

$ . ~/catkin_ws/devel/setup.bash
```



package dependencies

$ roscd beginner_tutorials

$ cat package.xml



Download the code from github

$ roscd beginner_tutorials

$ mkdir scripts

$ cd scripts/

$ wget https://raw.github.com/ros/ros_tutorials/kinetic-devel/rospy_tutorials/001_talker_listener/talker.py

$ wget https://raw.github.com/ros/ros_tutorials/kinetic-devel/rospy_tutorials/001_talker_listener/listener.py

$ chmod +x *.py



Building your nodes

$ cd ~/catkin_ws

$ catkin_make



Examining the Simple Publisher and Subscriber in four terminals

```
$ roscore
```

```
$ rosparam set enable_statistics true
```

```
$ cd ~/catkin_ws
$ source ./devel/setup.bash
$ rosrun beginner_tutorials talker.py
```

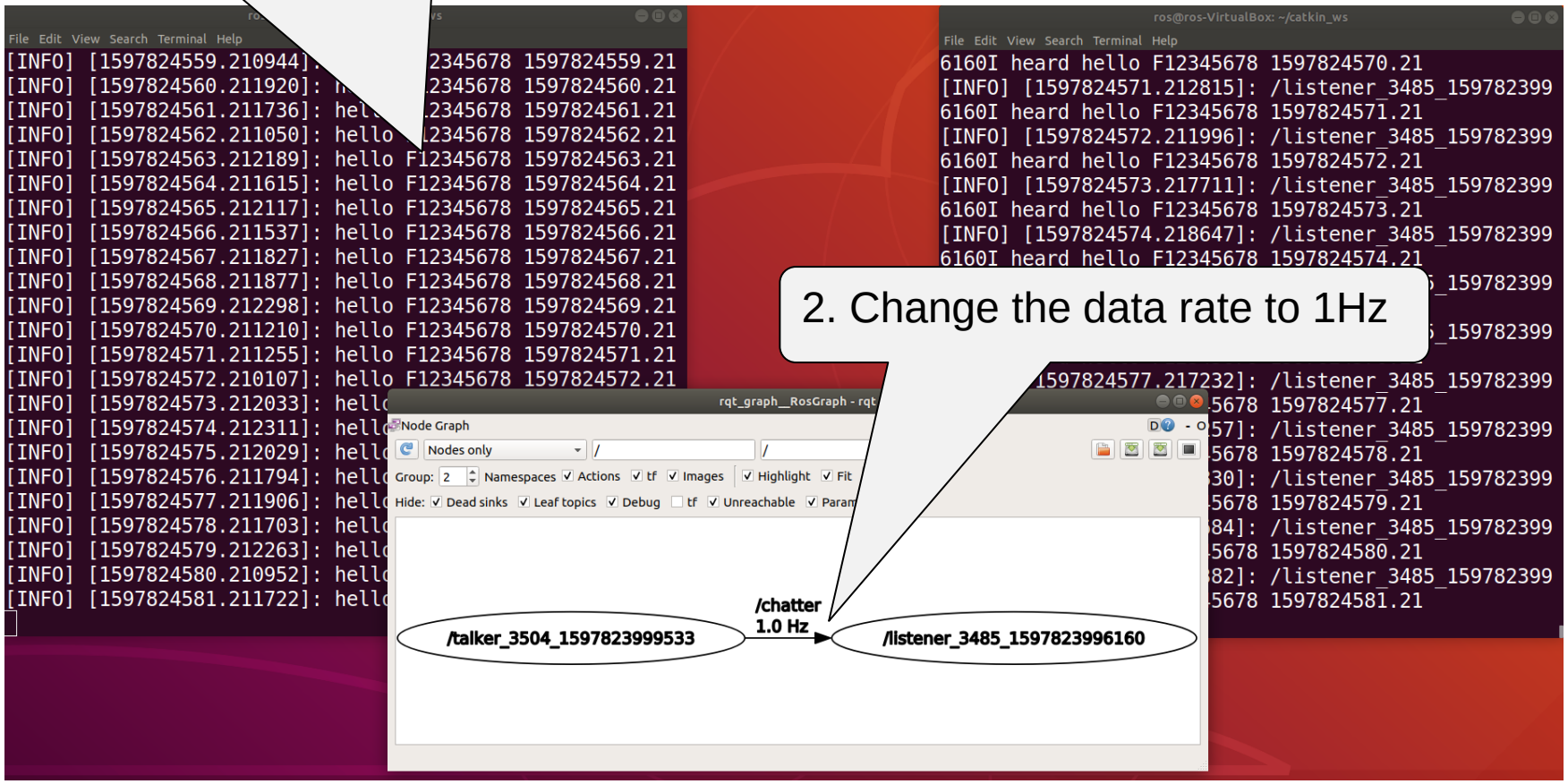
```
$ cd ~/catkin_ws
$ source ./devel/setup.bash
$ rosrun beginner_tutorials listener.py
```

```
$ rqt_graph
```

Show the runtime result & Upload to Moodle

1. Put your Student ID as the message

2. Change the data rate to 1Hz





Hint: Modify “talker.py”

```python
import rospy
from std_msgs.msg import String

def talker():
    pub = rospy.Publisher('chatter', String, queue_size=10)
    rospy.init_node('talker', anonymous=True)
    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()

if __name__ == '__main__':
    try:
        talker()
    except rospy.ROSInterruptException:
        pass
```



QUESTIONS