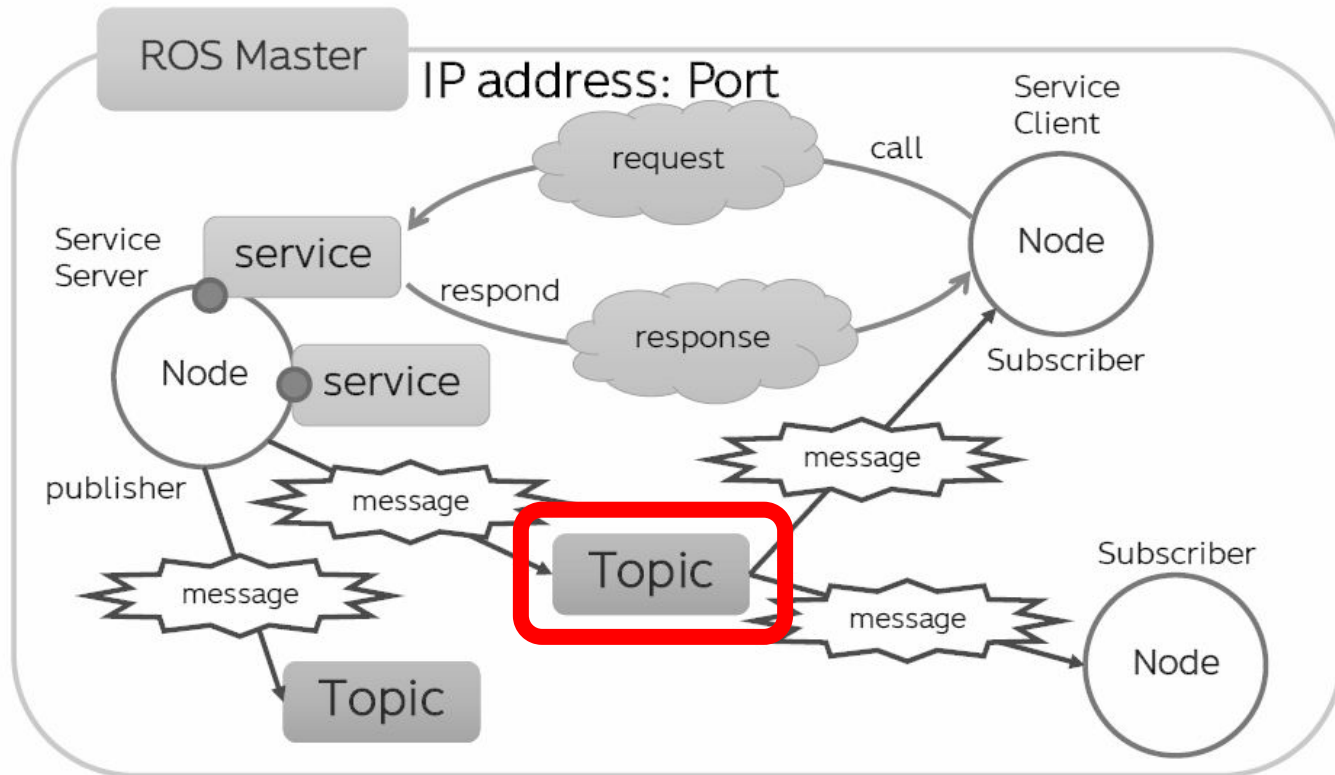


The ROS logo consists of a 3x3 grid of nine dark blue dots, arranged in three rows and three columns.

ROS





ROS topics command-line

คำสั่งบน command-line ของ ROS ที่เกี่ยวกับ ROS topics

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดง bandwidth ที่ใช้โดย */topic_name*

```
rostopic bw /topic_name
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดง delay ของ */topic_name*

โดย topic นั้นต้องมี header

```
rostopic delay /topic_name
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดง message ที่ publish ไปที่ */topic_name*

```
rostopic echo /topic_name
```


ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการค้นหา topic จาก *message_type*

```
rostopic find message_type
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดงความถี่ของการ publish ของ */topic_name*

```
rostopic hz /topic_name
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดงข้อมูลของ */topic_name*

```
rostopic echo /topic_name
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดง topics ทั้งหมดที่มีอยู่ในขณะนั้น

```
rostopic list
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการ publish ข้อมูลเข้าไปที่ */topic_name*

```
rostopic pub /topic_name message_type message
```

ROS topics command-line

- rostopic bw
- rostopic delay
- rostopic echo
- rostopic find
- rostopic hz
- rostopic info
- rostopic list
- rostopic pub
- rostopic type

ทำการแสดงชนิดของ */topic_name*

```
rostopic type /topic_name
```

Command-line Tutorial

เปิด terminal

\$ roscore

```
~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://:39823/
ros_comm version 1.15.13

SUMMARY
=====

PARAMETERS
* /rostdistro: noetic
* /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://:11311/

setting /run_id to 
process[rosout-1]: started with pid [3028]
started core service [/rosout]
```

เปิดหน้าต่างใหม่

```
rostopic pub /topic_name message_type message
```

กำหนดความถี่ในการ publish 10 Hz

```
$ rostopic pub -r 10 /test std_msgs/String hello
```

```
~# rostopic pub -r 10 /test std_msgs/String hello
```

เปิดหน้าต่างใหม่

rostopic list

```
$ rostopic list
```

```
[REDACTED]:~# rostopic list  
/rosout  
/rosout_agg  
/test
```

```
rostopic hz /topic_name
```



```
$ rostopic hz /test
```

```
~# rostopic hz /test  
subscribed to [/test]  
average rate: 9.999 ←  
min: 0.100s max: 0.100s std dev: 0.00005s window: 10  
average rate: 10.000 ←  
min: 0.100s max: 0.100s std dev: 0.00007s window: 20
```

กด ctrl+c เพื่อหยุดการทำงาน

```
rostopic bw /topic_name
```

```
$ rostopic bw /test
```

```
~# rostopic bw /test  
subscribed to [/test]  
average 92.30B/s ←  
mean: 9.00B min: 9.00B max: 9.00B window: 10  
average 91.08B/s ←  
mean: 9.00B min: 9.00B max: 9.00B window: 20
```

กด ctrl+c เพื่อหยุดการทำงาน

```
rostopic echo /topic_name
```

```
$ rostopic echo /test
```

```
data: "hello"
---
data: "hello"
---
data: "hello"
---
data: "hello"
---
data: "hello"
---
data: "hello"
---
data: "hello"
```

กด ctrl+c เพื่อหยุดการทำงาน


```
rostopic find message_type
```

```
$ rostopic find std_msgs/String
```

```
root@ubuntu:~# rostopic find std_msgs/String  
/test
```

```
rostopic info /topic_name
```

```
$ rostopic info /test
```

```
[REDACTED]:~# rostopic info /test  
Type: std_msgs/String  
  
Publishers:  
* /rostopic_19661_1642950447547 (http://[REDACTED]:33267/)  
  
Subscribers: None
```

```
rostopic type /topic_name
```

```
$ rostopic type /test
```

```
[REDACTED]:~# rostopic type /test  
std_msgs/String
```

กด ctrl+c ในทุกๆหน้าเพื่อหยุดการทำงาน

Setup your workspace

ติดตั้ง workspace ของคุณ


```
$ echo 'source ~/tutorial_ws/devel/setup.bash' >> ~/.bashrc
```

```
$ source ~/.bashrc
```

ROSPy

Tutorial

```
$ roscd your_package/src
```

```
$ gedit publisher.py
```

Publisher (publisher.py)

```
#!/usr/bin/env python3
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
```

```
$ chmod +x publisher.py
```

TEST

publisher

\$ roscore

```
~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
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setting /run_id to 
process[rosout-1]: started with pid [3028]
started core service [/rosout]
```

เปิดหน้าต่างใหม่


```
$ rostopic echo /chatter
```

```
root@ubuntu:~# rostopic echo /chatter
```

```
-
```

เปิดหน้าต่างใหม่

```
$ rosrun your_package publisher.py
```

```
~# rosrun your_package publisher.py  
[INFO] [1644186234.906372]: hello world 1644186234.9063287  
[INFO] [1644186235.006621]: hello world 1644186235.0065062  
[INFO] [1644186235.106566]: hello world 1644186235.1064792  
[INFO] [1644186235.206545]: hello world 1644186235.206486  
[INFO] [1644186235.306590]: hello world 1644186235.3065186  
[INFO] [1644186235.406559]: hello world 1644186235.4065  
[INFO] [1644186235.506596]: hello world 1644186235.506496  
[INFO] [1644186235.606629]: hello world 1644186235.6065054  
[INFO] [1644186235.706671]: hello world 1644186235.7065372
```

กลับไปหน้า rostopic echo

```
~# rostopic echo /chatter
data: "hello world 1644186234.9063287"
---
data: "hello world 1644186235.0065062"
---
data: "hello world 1644186235.1064792"
---
data: "hello world 1644186235.206486"
---
data: "hello world 1644186235.3065186"
---
data: "hello world 1644186235.4065"
---
data: "hello world 1644186235.506496"
---
data: "hello world 1644186235.6065054"
---
data: "hello world 1644186235.7065372"
```

กด ctrl+c ในทุกๆหน้าเพื่อหยุดการทำงาน

```
$ roscd your_package/src
```

```
$ gedit subscriber.py
```

Subscriber (subscriber.py)

```
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", String, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```



```
$ chmod +x subscriber.py
```

TEST

subscriber

\$ roscore

```
~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
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setting /run_id to 
process[rosout-1]: started with pid [3028]
started core service [/rosout]
```

เปิดหน้าต่างใหม่

```
$ rosrun your_package subscriber.py
```

เปิดหน้าต่างใหม่

```
$ rosrun your_package publisher.py
```

```
~# rosrun your_package publisher.py  
[INFO] [1644179280.187208]: hello world 1644179280.1871665  
[INFO] [1644179280.287463]: hello world 1644179280.28735  
[INFO] [1644179280.387472]: hello world 1644179280.3873692  
[INFO] [1644179280.487447]: hello world 1644179280.4873552  
[INFO] [1644179280.587433]: hello world 1644179280.5873199  
[INFO] [1644179280.687431]: hello world 1644179280.6873271  
[INFO] [1644179280.787477]: hello world 1644179280.787353  
[INFO] [1644179280.887431]: hello world 1644179280.8873289  
[INFO] [1644179280.987537]: hello world 1644179280.9873812  
[INFO] [1644179281.087514]: hello world 1644179281.0873728  
[INFO] [1644179281.187447]: hello world 1644179281.1873302  
[INFO] [1644179281.287420]: hello world 1644179281.2873225  
[INFO] [1644179281.387470]: hello world 1644179281.387365  
[INFO] [1644179281.487521]: hello world 1644179281.4873872  
[INFO] [1644179281.587456]: hello world 1644179281.587338  
[INFO] [1644179281.687503]: hello world 1644179281.6873484  
[INFO] [1644179281.787471]: hello world 1644179281.7873478
```

กลับไปดูหน้า subscriber


```
r [REDACTED]:~# rosrun your_package subscriber.py
```

```
[INFO] [1644179280.187906]: /listener_6586_1644179277166I heard hello world 1644179280.1871665  
[INFO] [1644179280.288673]: /listener_6586_1644179277166I heard hello world 1644179280.28735  
[INFO] [1644179280.388614]: /listener_6586_1644179277166I heard hello world 1644179280.3873692  
[INFO] [1644179280.488713]: /listener_6586_1644179277166I heard hello world 1644179280.4873552  
[INFO] [1644179280.588678]: /listener_6586_1644179277166I heard hello world 1644179280.5873199  
[INFO] [1644179280.688676]: /listener_6586_1644179277166I heard hello world 1644179280.6873271  
[INFO] [1644179280.788904]: /listener_6586_1644179277166I heard hello world 1644179280.787353  
[INFO] [1644179280.888623]: /listener_6586_1644179277166I heard hello world 1644179280.8873289  
[INFO] [1644179280.989142]: /listener_6586_1644179277166I heard hello world 1644179280.9873812  
[INFO] [1644179281.088920]: /listener_6586_1644179277166I heard hello world 1644179281.0873728  
[INFO] [1644179281.188585]: /listener_6586_1644179277166I heard hello world 1644179281.1873302  
[INFO] [1644179281.288523]: /listener_6586_1644179277166I heard hello world 1644179281.2873225  
[INFO] [1644179281.388665]: /listener_6586_1644179277166I heard hello world 1644179281.387365  
[INFO] [1644179281.488858]: /listener_6586_1644179277166I heard hello world 1644179281.4873872  
[INFO] [1644179281.588698]: /listener_6586_1644179277166I heard hello world 1644179281.587338  
[INFO] [1644179281.688766]: /listener_6586_1644179277166I heard hello world 1644179281.6873484  
[INFO] [1644179281.788856]: /listener_6586_1644179277166I heard hello world 1644179281.7873478
```

กด ctrl+c ในทุกๆหน้าเพื่อหยุดการทำงาน

http://wiki.ros.org/std_msgs

Custom messages

```
$ roscd your_package/
```

```
$ mkdir msg/
```

```
$ cd msg/
```

```
$ gedit Data.msg
```

```
string name  
int64 id
```

```
$ cd ..
```

```
$ gedit package.xml
```

```
<build_depend>message_generation</build_depend>  
<exec_depend>message_runtime</exec_depend>
```



```
$ gedit CMakeLists.txt
```

```
find_package(catkin REQUIRED COMPONENTS
  roscpp
  rospy
  std_msgs
  message_generation
)
```

```
catkin_package(  
#  INCLUDE_DIRS include  
#  LIBRARIES your_package  
#  CATKIN_DEPENDS roscpp rospy std_msgs  
#  DEPENDS system_lib  
    CATKIN_DEPENDS message_runtime  
)
```

```
✗ add_message_files(  
✗     FILES  
✗     # Message1.msg  
✗     # Message2.msg  
✗ )
```

```
add_message_files(  
    FILES  
    Data.msg  
)
```

```
✗ generate_messages(  
✗     DEPENDENCIES  
✗     std_msgs  
✗ )
```

```
generate_messages(  
    DEPENDENCIES  
    std_msgs  
)
```

```
$ cd ../..
```

```
$ catkin_make
```

```
- +++ processing catkin package: 'your_package'  
- ==> add_subdirectory(your_package)  
- Using these message generators: gencpp;geneus;genlisp;gennodejs;genpy  
- your_package: 1 messages, 0 services
```

```
$ rosmmsg show your_package/Data
```

```
~/tutorial_ws# rosmmsg show your_package/Data  
string name  
int64 id
```

Use
custom message
on ROSpy


```
$ roscd your_package/src
```

```
$ cp publisher.py your_publisher.py
```

```
$ gedit your_publisher.py
```

Publisher (your_publisher.py)

```
#!/usr/bin/env python3
import rospv
from std_msgs.msg import String
def talker():
    pub = rospv.Publisher('chatter', String, queue_size=10)
    rospv.init_node('talker', anonymous=True)
    rate = rospv.Rate(10) # 10hz
    while not rospv.is_shutdown():
        hello_str = "hello world %s" % rospv.get_time()
        rospv.loginfo(hello_str)
        pub.publish(hello_str)
        rate.sleep()
if __name__ == '__main__':
    try:
        talker()
    except rospv.ROSInterruptException:
        pass
```

Publisher (your_publisher.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
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
```

Publisher (your_publisher.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
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)
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if __name__ == '__main__':
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    pub = rospy.Publisher('chatter', Data, queue_size=10)
    rospy.init_node('talker', anonymous=True)
    rate = rospy.Rate(10) # 10hz
    while not rospy.is_shutdown():
        name = 'Test'
        id = 10
        pub_data = Data(name=name, id=id)
        rospy.loginfo(hello_str)
        pub.publish(hello_str)
        rate.sleep()
if __name__ == '__main__':
    try:
        talker()
    except rospy.ROSInterruptException:
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    while not rospy.is_shutdown():
        name = 'Test'
        id = 10
        pub_data = Data(name=name, id=id)
        rospy.loginfo(pub_data)
        pub.publish(pub_data)
        rate.sleep()
if __name__ == '__main__':
    try:
        talker()
    except rospy.ROSInterruptException:
        pass
```

```
$ cp subscriber.py your_subscriber.py
```

```
$ gedit your_subscriber.py
```

Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", String, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```

Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", String, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```

Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", String, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```

Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", Data, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```


Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + "I heard %s", data.data)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", Data, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```

Subscriber (your_subscriber.py)

```
#!/usr/bin/env python3
import rospy
from your_package.msg import Data
def callback(data):
    rospy.loginfo(rospy.get_caller_id() + " Name: %s, ID: %i", data.name, data.id)
def listener():
    rospy.init_node('listener', anonymous=True)
    rospy.Subscriber("chatter", Data, callback)
    rospy.spin()

if __name__ == '__main__':
    listener()
```

\$ roscore

```
~# roscore
... logging to /root/.ros/log/a4938efa-7c5b-11ec-b410-0242ac110002/roslaunch-c0665c07a68b-2984.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://:39823/
ros_comm version 1.15.13

SUMMARY
=====

PARAMETERS
* /rostdistro: noetic
* /rosversion: 1.15.13

NODES

auto-starting new master
process[master]: started with pid [3008]
ROS_MASTER_URI=http://:11311/

setting /run_id to 
process[rosout-1]: started with pid [3028]
started core service [/rosout]
```

เปิดหน้าต่างใหม่

```
$ rosrun your_package your_subscriber.py
```

เปิดหน้าต่างใหม่

```
$ rosrun your_package your_publisher.py
```

```
root@ubuntu:~# rosrun your_package your_publisher.py
[INFO] [1644181529.563797]: name: "Test"
id: 10
[INFO] [1644181529.664101]: name: "Test"
id: 10
[INFO] [1644181529.764052]: name: "Test"
id: 10
[INFO] [1644181529.864114]: name: "Test"
id: 10
[INFO] [1644181529.963948]: name: "Test"
id: 10
[INFO] [1644181530.064070]: name: "Test"
id: 10
[INFO] [1644181530.164097]: name: "Test"
id: 10
[INFO] [1644181530.264088]: name: "Test"
id: 10
```

กลับไปดูหน้า `your_subscriber`


```
~# rosrn your_package your_subscriber.py  
[INFO] [1644181529.564876]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181529.665546]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181529.765448]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181529.865698]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181529.965338]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181530.065574]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181530.165835]: /listener_13418_1644181496844 Name: Test, ID: 10  
[INFO] [1644181530.265754]: /listener_13418_1644181496844 Name: Test, ID: 10
```

กด ctrl+c ในทุกๆหน้าเพื่อหยุดการทำงาน

http://wiki.ros.org/nav_msgs

Q&A



me@robotcitizens.org