

Simulation and Modelling

Lab 5: Pub1 AND Pub2 AND Pub3 => SUB

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20BRS1193

Instructions:

Already we have tried publisher subscriber in python script and multiple sub/pub also we have tried. Today you can do an experiment that does the following.

1. A packet publisher publishes the name of the packet (string format)
2. A security publisher (string) converts the above packet into encrypted packet (usually the ceaser cipher, VITCC is equivalent to YLWFF).
3. A third publisher is a Int32 publisher, publishes an integer number with number of packets.
4. There is only one subscriber, that tells the "Number of packets encrypted" after all the publishers publishes.

i.e P1 AND P2 AND P3 => Subscriber

Publisher 1:

publisher2_1.py

```
#!/usr/bin/env python3
# licence removed for brevity
import rospy
from std_msgs.msg import String

def talker():
    pub = rospy.Publisher('topic1', String, queue_size = 10)
    rospy.init_node('talker1', anonymous=True)
    rate = rospy.Rate(10)
    while not rospy.is_shutdown():
        hello_str = "Name: " + str(rospy.get_name())
        rospy.loginfo(hello_str)
```

```

        pub.publish(hello_str)
        rate.sleep()
if __name__ == '__main__':
    try:
        talker()
    except rospy.ROSInterruptException:
        pass

```

Publisher 2:

publisher2_2.py

```

#!/usr/bin/env python3
# licence removed for brevity
import rospy
from std_msgs.msg import String

def encrypt(text, s):
    result = ""
    for i in range(len(text)):
        char = text[i]
        if(char.isupper()):
            result += chr((ord(char) + s-65) % 26 + 65)
        else:
            result += chr((ord(char) + s-97) % 26 + 97)
    return result

def talker():
    pub = rospy.Publisher('topic1', String, queue_size = 10)
    rospy.init_node('talker1', anonymous=True)
    rate = rospy.Rate(10)
    while not rospy.is_shutdown():
        hello_str = "VITCC"
        hello_str = encrypt(hello_str, 3)
        rospy.loginfo(hello_str)
        pub.publish(hello_str)
        rate.sleep()

if __name__ == '__main__':
    try:

```

```
    talker()
except rospy.ROSInterruptException:
    pass
```

Publisher 3:

publisher2_3.py

```
#!/usr/bin/env python3
# licence removed for brevity
import rospy
import random
from std_msgs.msg import String

def talker():
    pub = rospy.Publisher('topic1', String, queue_size = 10)
    rospy.init_node('talker1', anonymous=True)
    rate = rospy.Rate(10)
    while not rospy.is_shutdown():
        n = random.randint(1, 100)
        rospy.loginfo(str(n))
        pub.publish(str(n))
        rate.sleep()
if __name__ == '__main__':
    try:
        talker()
    except rospy.ROSInterruptException:
        pass
```

Subscriber:

subscriber2.py

```
#!/usr/bin/env python3
import rospy
from std_msgs.msg import String

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

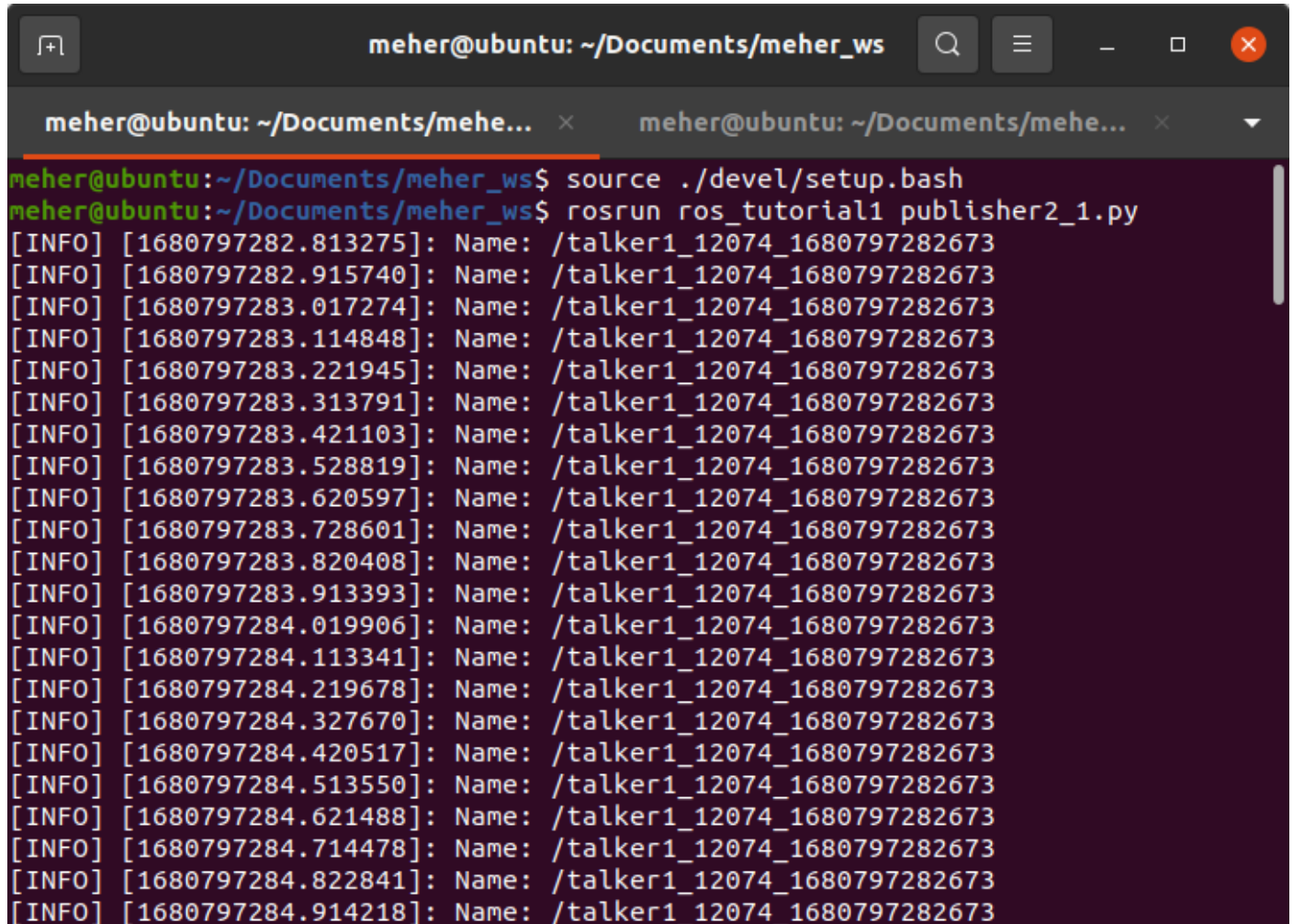
def listener():
    rospy.init_node('listener1', anonymous=True)
    rospy.Subscriber('topic1', String, callback)
```

```
rospy.spin()

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

Output:

Publisher1 and Subscriber

A terminal window titled 'meher@ubuntu: ~/Documents/meher_ws' with two tabs. The active tab shows the command 'source ./devel/setup.bash' followed by 'roslaunch ros_tutorial1 publisher2_1.py'. The output consists of 20 lines of '[INFO] [timestamp]: Name: /talker1_12074_1680797282673', where the timestamp increases by approximately 0.0001 seconds per line. The terminal has a dark background with light-colored text. The window includes standard Ubuntu window controls (minimize, maximize, close) and a search icon.

```
meher@ubuntu: ~/Documents/meher_ws$ source ./devel/setup.bash
meher@ubuntu: ~/Documents/meher_ws$ roslaunch ros_tutorial1 publisher2_1.py
[INFO] [1680797282.813275]: Name: /talker1_12074_1680797282673
[INFO] [1680797282.915740]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.017274]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.114848]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.221945]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.313791]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.421103]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.528819]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.620597]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.728601]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.820408]: Name: /talker1_12074_1680797282673
[INFO] [1680797283.913393]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.019906]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.113341]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.219678]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.327670]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.420517]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.513550]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.621488]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.714478]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.822841]: Name: /talker1_12074_1680797282673
[INFO] [1680797284.914218]: Name: /talker1_12074_1680797282673
```

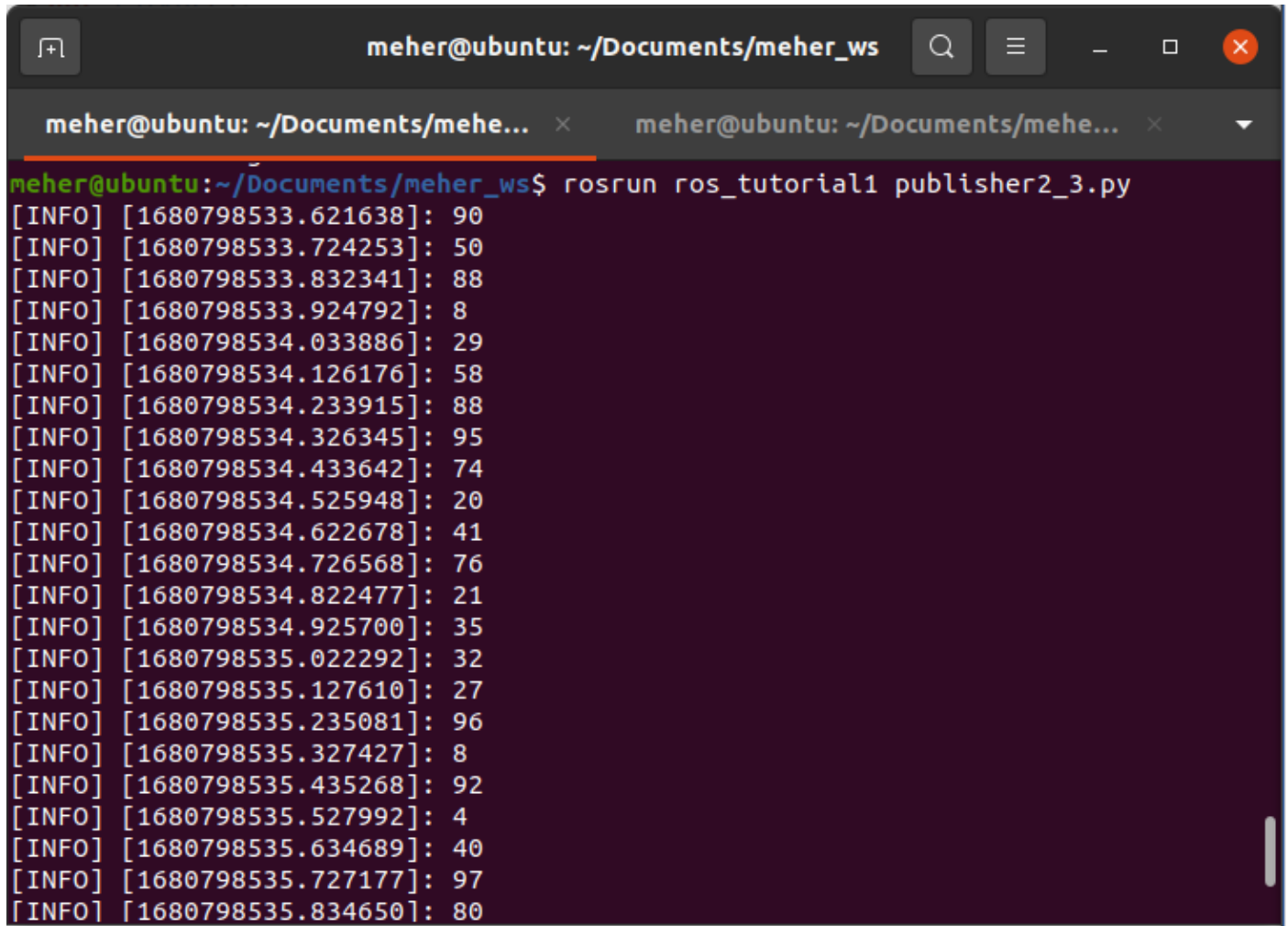
```
meher@ubuntu: ~/Documents/meher_ws
meher@ubuntu: ~/Documents/mehe... x meher@ubuntu: ~/Documents/mehe... x
meher@ubuntu:~/Documents/meher_ws$ source ./devel/setup.bash
meher@ubuntu:~/Documents/meher_ws$ rosrn ros_tutorial1 subscriber2.py
^Cmeher@ubuntu:~/Documents/meher_ws$ rosrn ros_tutorial1 subscriber2.py
[INFO] [1680797285.827151]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797285.919711]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.027377]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.120073]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.229296]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.321801]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.430319]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.522472]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.615597]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.726177]: /listener1_12092_1680797285628 Packet: Name: /talk
er1_12074_1680797282673
[INFO] [1680797286.816463]: /listener1_12092_1680797285628 Packet: Name: /talk
```

Publisher2 and Subscriber


```
meher@ubuntu: ~/Documents/meher_ws
meher@ubuntu: ~/Documents/mehe... x meher@ubuntu: ~/Documents/mehe... x
^Cmeher@ubuntu:~/Documents/meher_ws$ rosrn ros_tutorial1 publisher2_2.py
[INFO] [1680797990.565744]: YLWFF
[INFO] [1680797990.668012]: YLWFF
[INFO] [1680797990.770025]: YLWFF
[INFO] [1680797990.868078]: YLWFF
[INFO] [1680797990.976754]: YLWFF
[INFO] [1680797991.067908]: YLWFF
[INFO] [1680797991.175237]: YLWFF
[INFO] [1680797991.267808]: YLWFF
[INFO] [1680797991.375792]: YLWFF
[INFO] [1680797991.467886]: YLWFF
[INFO] [1680797991.569519]: YLWFF
[INFO] [1680797991.668066]: YLWFF
[INFO] [1680797991.776594]: YLWFF
[INFO] [1680797991.867832]: YLWFF
[INFO] [1680797991.975387]: YLWFF
[INFO] [1680797992.068645]: YLWFF
[INFO] [1680797992.167597]: YLWFF
[INFO] [1680797992.267087]: YLWFF
[INFO] [1680797992.375063]: YLWFF
[INFO] [1680797992.467529]: YLWFF
[INFO] [1680797992.566426]: YLWFF
[INFO] [1680797992.666313]: YLWFF
[INFO] [1680797992.765913]: YLWFF
```

```
meher@ubuntu: ~/Documents/meher_ws
meher@ubuntu: ~/Documents/mehe... x meher@ubuntu: ~/Documents/mehe... x
er1_12074_1680797282673
^Cmeher@ubuntu:~/Documents/meher_ws$ rosrn ros_tutorial1 subscriber2.py
[INFO] [1680797996.469072]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797996.573383]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797996.686083]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797996.773167]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797996.881206]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797996.973382]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.067868]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.172568]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.268836]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.373905]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.479150]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.572654]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.679282]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.772372]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.869421]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797997.972591]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.078342]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.172766]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.280683]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.373031]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.475645]: /listener1_12151_1680797996259 Packet: YLWFF
[INFO] [1680797998.572288]: /listener1_12151_1680797996259 Packet: YLWFF
```

Publisher3 and Subscriber

A terminal window titled 'meher@ubuntu: ~/Documents/meher_ws' with standard window controls. It shows two tabs, both labeled 'meher@ubuntu: ~/Documents/mehe...'. The active tab displays the command 'roslaunch ros_tutorial1 publisher2_3.py' and its output, which consists of 20 lines of '[INFO] [timestamp]: value' messages. The values are: 90, 50, 88, 8, 29, 58, 88, 95, 74, 20, 41, 76, 21, 35, 32, 27, 96, 8, 92, 4, 40, 97, 80.

```
meher@ubuntu:~/Documents/meher_ws$ roslaunch ros_tutorial1 publisher2_3.py
[INFO] [1680798533.621638]: 90
[INFO] [1680798533.724253]: 50
[INFO] [1680798533.832341]: 88
[INFO] [1680798533.924792]: 8
[INFO] [1680798534.033886]: 29
[INFO] [1680798534.126176]: 58
[INFO] [1680798534.233915]: 88
[INFO] [1680798534.326345]: 95
[INFO] [1680798534.433642]: 74
[INFO] [1680798534.525948]: 20
[INFO] [1680798534.622678]: 41
[INFO] [1680798534.726568]: 76
[INFO] [1680798534.822477]: 21
[INFO] [1680798534.925700]: 35
[INFO] [1680798535.022292]: 32
[INFO] [1680798535.127610]: 27
[INFO] [1680798535.235081]: 96
[INFO] [1680798535.327427]: 8
[INFO] [1680798535.435268]: 92
[INFO] [1680798535.527992]: 4
[INFO] [1680798535.634689]: 40
[INFO] [1680798535.727177]: 97
[INFO] [1680798535.834650]: 80
```

```
meher@ubuntu: ~/Documents/meher_ws
meher@ubuntu: ~/Documents/mehe... x meher@ubuntu: ~/Documents/mehe... x
^Cmeher@ubuntu:~/Documents/meher_ws$ rosrund ros_tutorial1 subscriber2.py
[INFO] [1680798533.622733]: /listener1_12621_1680798530744 Packet: 90
[INFO] [1680798533.725947]: /listener1_12621_1680798530744 Packet: 50
[INFO] [1680798533.838931]: /listener1_12621_1680798530744 Packet: 88
[INFO] [1680798533.926380]: /listener1_12621_1680798530744 Packet: 8
[INFO] [1680798534.035542]: /listener1_12621_1680798530744 Packet: 29
[INFO] [1680798534.128460]: /listener1_12621_1680798530744 Packet: 58
[INFO] [1680798534.236288]: /listener1_12621_1680798530744 Packet: 88
[INFO] [1680798534.327864]: /listener1_12621_1680798530744 Packet: 95
[INFO] [1680798534.459212]: /listener1_12621_1680798530744 Packet: 74
[INFO] [1680798534.528677]: /listener1_12621_1680798530744 Packet: 20
[INFO] [1680798534.624861]: /listener1_12621_1680798530744 Packet: 41
[INFO] [1680798534.728175]: /listener1_12621_1680798530744 Packet: 76
[INFO] [1680798534.824630]: /listener1_12621_1680798530744 Packet: 21
[INFO] [1680798534.928890]: /listener1_12621_1680798530744 Packet: 35
[INFO] [1680798535.024278]: /listener1_12621_1680798530744 Packet: 32
[INFO] [1680798535.129429]: /listener1_12621_1680798530744 Packet: 27
[INFO] [1680798535.236479]: /listener1_12621_1680798530744 Packet: 96
[INFO] [1680798535.329479]: /listener1_12621_1680798530744 Packet: 8
[INFO] [1680798535.553828]: /listener1_12621_1680798530744 Packet: 92
[INFO] [1680798535.556394]: /listener1_12621_1680798530744 Packet: 4
[INFO] [1680798535.636148]: /listener1_12621_1680798530744 Packet: 40
[INFO] [1680798535.728772]: /listener1_12621_1680798530744 Packet: 97
[INFO] [1680798535.836289]: /listener1_12621_1680798530744 Packet: 80
```