실습 2 – ROS 전송 속도

문제점 : 데이터 크기에 따른 전송속도는 어떻게 되는가?

준비

1) 파이썬 파일 2개, 런치 파일 1개

- sender_speed.py

```
#!/usr/bin/env python

import rospy
from std_msgs.msg import String
import time

rospy.init_node('sender_speed')
pub=rospy.Publisher('long_string', String, queue_size=10)
rate=rospy.Rate(1)

#1Mbyte
#m_data="#"*(1000000)
#5Mbyte
m_data="#"*5000000
#10Mbyte
#m_data="#"*10000000
#20Mbyte
#m_data="#"*(20000000)
#50Mbyte
#m_data="#"*50000000

while not rospy.is_shutdown():

        cur_time=rospy.Time.from_sec(time.time()).to_sec()
        st_ms=m_data[:-17]+''+str('%.6f'%cur_time)
        pub.publish(st_ms)
        rate.sleep()
```

- receiver_speed.py

```
#!/usr/bin/env python

import rospy
from std_msgs.msg import String
import time
arr_avg=[]
arr_time=[]
def callback(msg):
        s=msg.data[-17:]
        t=rospy.Time.from_sec(time.time()).to_sec()-float(s)

        rospy.loginfo(str(len(msg.data))+" byte: "+str(t)+" second ")
        rospy.loginfo("speed : "+str(len(msg.data)/t)+"byte/s")
        lenth=len(msg.data)
        arr_avg.append((lenth/10**6)//t)
        arr_time.append(t)
        #print (lenth/10**6)//t

rospy.init_node('receiver_speed')
sub=rospy.Subscriber('long_string', String, callback)

rospy.spin()

#average speed
print(str(sum(arr_avg)//len(arr_avg))+" Mbyte/s")
#average time
print(str(sum(arr_time)/len(arr_time))+" seconed")
```

2) 발행자에서 1초에 한번씩 다양한 용량의 long_string 발행(#으로 데이터 채우기)

   A. 1 Mbyte, 5Mbyte, 10Mbyte, 50Mbbyte 등 전송

3) 매번 받을 때 마다 소요시간 및 속도 출력

```
[INFO] [1609045481.129821]: speed : 330317377.813byte/s
[INFO] [1609045482.128178]: 5000000 byte: 0.0136640071869 second
[INFO] [1609045482.129061]: speed : 365924866.082byte/s
[INFO] [1609045483.125826]: 5000000 byte: 0.0111339092255 second
[INFO] [1609045483.127526]: speed : 449078566.993byte/s
[INFO] [1609045484.123888]: 5000000 byte: 0.00987696647644 second
[INFO] [1609045484.124875]: speed : 506228305.212byte/s
[INFO] [1609045485.128880]: 5000000 byte: 0.0144970417023 second
[INFO] [1609045485.130268]: speed : 344897952.471byte/s
[INFO] [1609045486.138238]: 5000000 byte: 0.0241069793701 second
[INFO] [1609045486.140039]: speed : 207408813.988byte/s
^C[receiver-3] killing on exit
[sender-2] killing on exit
493.0 Mbyte/s
0.0125599762179 seconed
```

```
[INFO] [1609045821.720361]: 10000000 byte: 0.0147778987885 second
[INFO] [1609045821.720873]: speed : 676686188.148byte/s
[INFO] [1609045822.737095]: 10000000 byte: 0.0310699939728 second
[INFO] [1609045822.737673]: speed : 321853940.775byte/s
[INFO] [1609045823.743952]: 10000000 byte: 0.0343670845032 second
[INFO] [1609045823.744633]: speed : 290976093.683byte/s
[INFO] [1609045824.723354]: 10000000 byte: 0.0170569419861 second
[INFO] [1609045824.723856]: speed : 586271560.762byte/s
[INFO] [1609045825.722477]: 10000000 byte: 0.016163110733 second
[INFO] [1609045825.723428]: speed : 618692785.391byte/s
^C[sender-2] killing on exit
[receiver-3] killing on exit
449.0 Mbyte/s
0.0248843954321 seconed
```

```
[INFO] [1609045619.851920]: speed : 355161750.311byte/s
[INFO] [1609045620.875133]: 50000000 byte: 0.164595842361 second
[INFO] [1609045620.875625]: speed : 303774380.219byte/s
[INFO] [1609045621.860648]: 50000000 byte: 0.150380134583 second
[INFO] [1609045621.861173]: speed : 332490725.18byte/s
[INFO] [1609045622.846559]: 50000000 byte: 0.135725021362 second
[INFO] [1609045622.847017]: speed : 368391911.072byte/s
[INFO] [1609045623.845539]: 50000000 byte: 0.135138988495 second
[INFO] [1609045623.846125]: speed : 369989449.802byte/s
[INFO] [1609045624.864563]: 50000000 byte: 0.153882980347 second
[INFO] [1609045624.865162]: speed : 324922222.635byte/s
^C[receiver-3] killing on exit
[sender-2] killing on exit
345.0 Mbyte/s
0.147234687805 seconed
```

다른 방법

- sender_speed.py 중

```
while not rospy.is_shutdown():
    hello_str.data = my_string + ":" + str(rospy.get_time())
    pub.publish(hello_str)
#    rospy.loginfo(str(hello_str.data).split(":")[1])
    rate.sleep()
```

- receiver_speed.py

```
#!/usr/bin/env python

import rospy
from std_msgs.msg import String

name = "receiver"
sub_topic = "long_string"

def callback(data):
    current_time = str(rospy.get_time())
    arrival_data = str(data.data).split(":")

    time_diff = float(current_time) - float(arrival_data[1])
    string_size = len(arrival_data[0])
    rospy.loginfo(str(string_size) + " byte: " + str(time_diff) +" second")
    rospy.loginfo("speed : " + str(float(string_size)/time_diff) + "byte/s")

rospy.init_node(name, anonymous=True)
rospy.loginfo("Init")
rospy.Subscriber(sub_topic, String, callback)
rospy.spin()
```