data-visualization

June 5, 2018

```
In [39]: import matplotlib.pyplot as plt
         from scipy import stats
         import numpy as np
         import pandas as pd
         %matplotlib inline
```

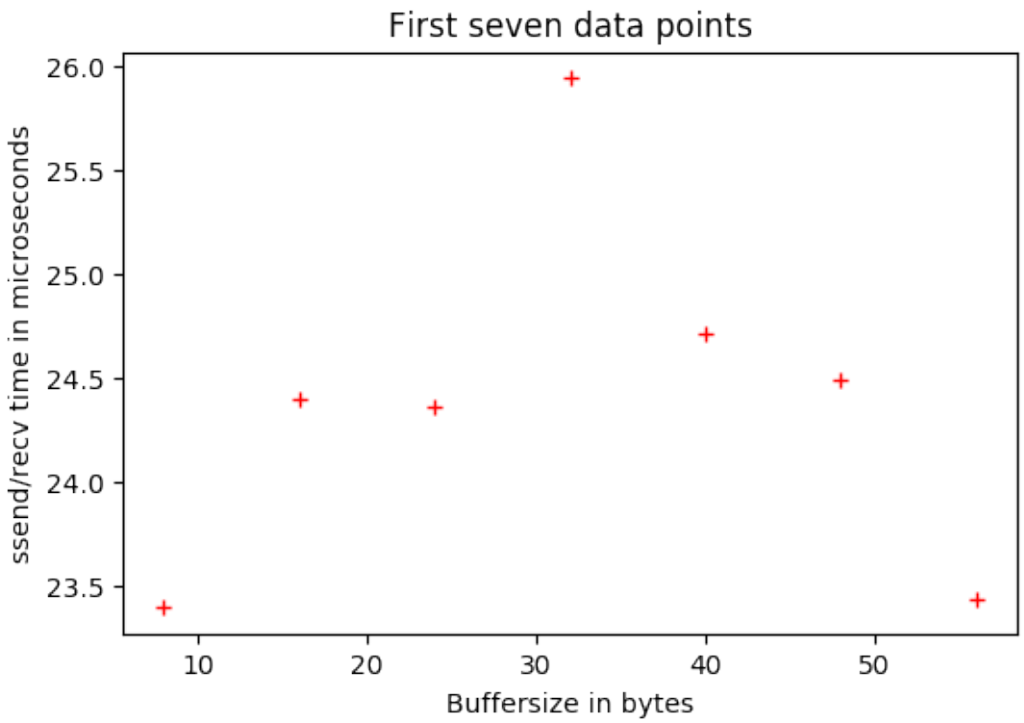
Times are measured on grid and saved in csv format. First columns is the buffersize in bytes followed by the average of ssend/recv time. Send messages specifies how many times the ssend/recv roundtrips have been measured.

```
In [81]: !head data-t40-n1000-grid.csv
```

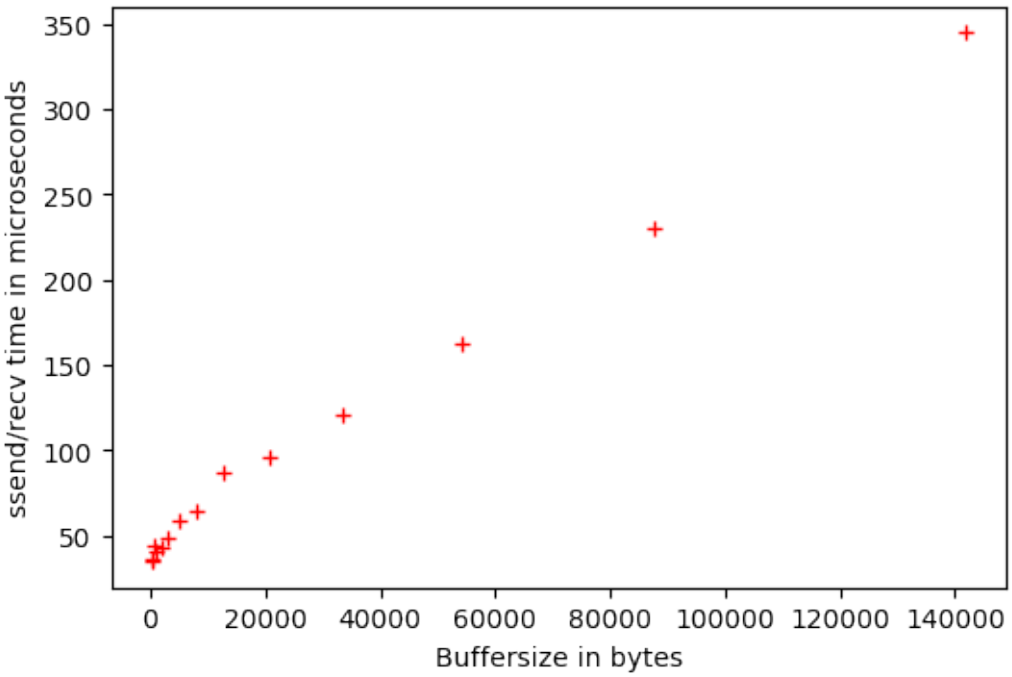
```
buffersize;t_average;send messages
8;3.68643e-06;1000
16;4.1635e-06;1000
24;2.64752e-06;1000
40;4.71246e-06;1000
64;3.13354e-06;1000
104;4.00949e-06;1000
168;3.96705e-06;1000
272;4.26745e-06;1000
440;4.34601e-06;1000
```

```
In [25]: df = pd.read_csv('data-t40-n100000-grid.csv', sep=';')
```

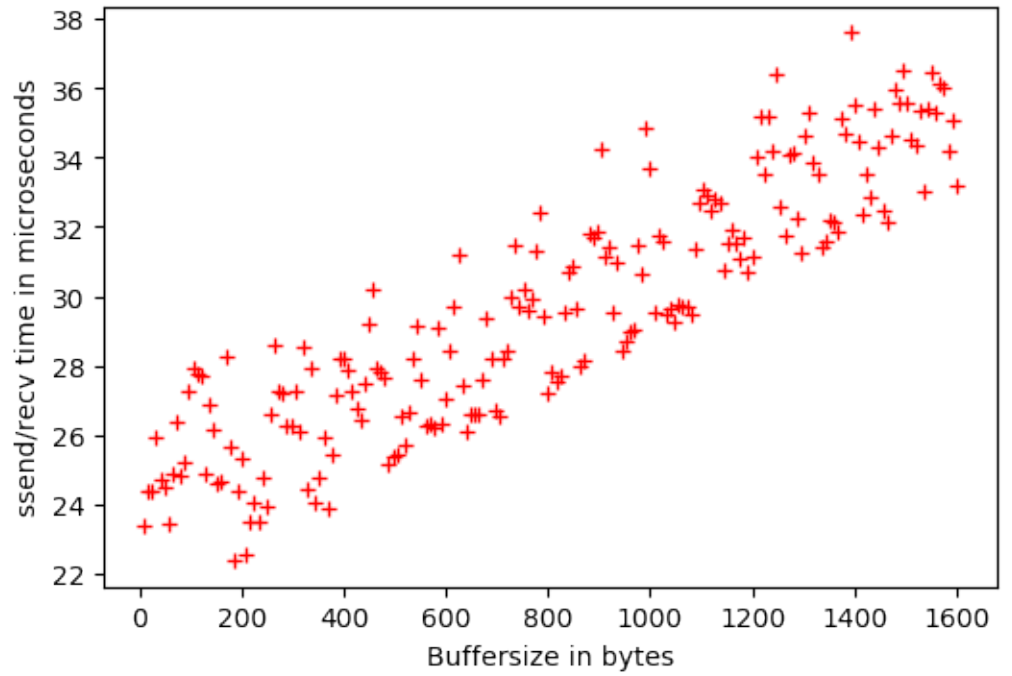
```
In [36]: data_head = df[:7]
         plt.figure(dpi=100)
         plt.title('First seven data points')
         plt.xlabel('Buffersize in bytes')
         plt.ylabel('ssend/recv time in microseconds')
         plt.plot(data_head.buffersize, [x * 10e6 for x in data_head.t_average], 'r+');
```



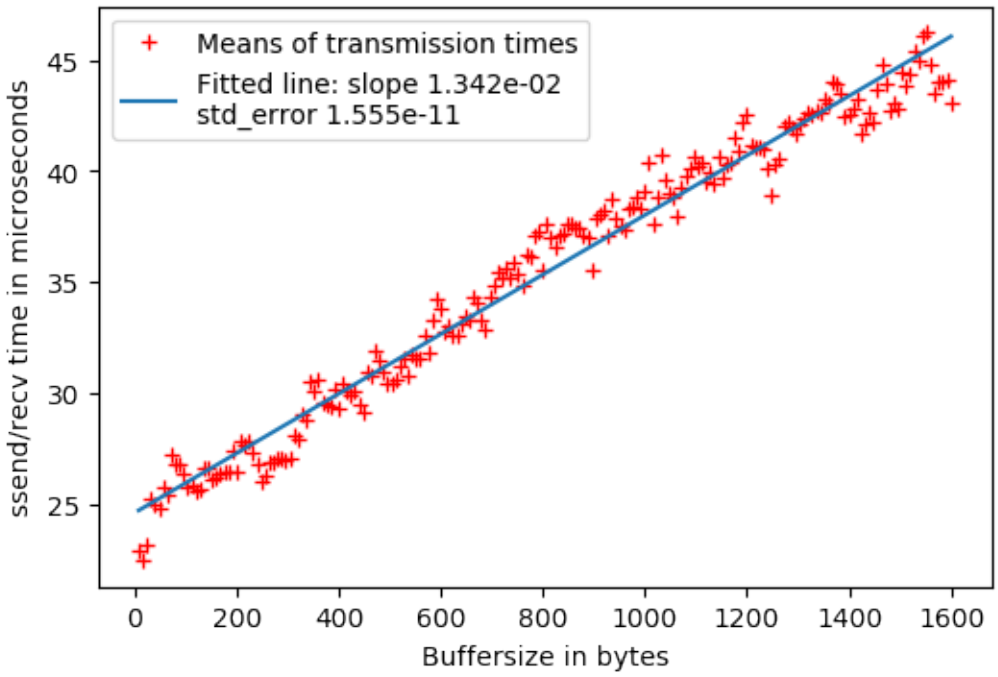

```
In [31]: data_head = df[7:]
         plt.figure(dpi=100)
         plt.xlabel('Buffersize in bytes')
         plt.ylabel('ssend/recv time in microseconds')
         plt.plot(data_head.buffersize, [x * 10e6 for x in data_head.t_average], 'r+');
```



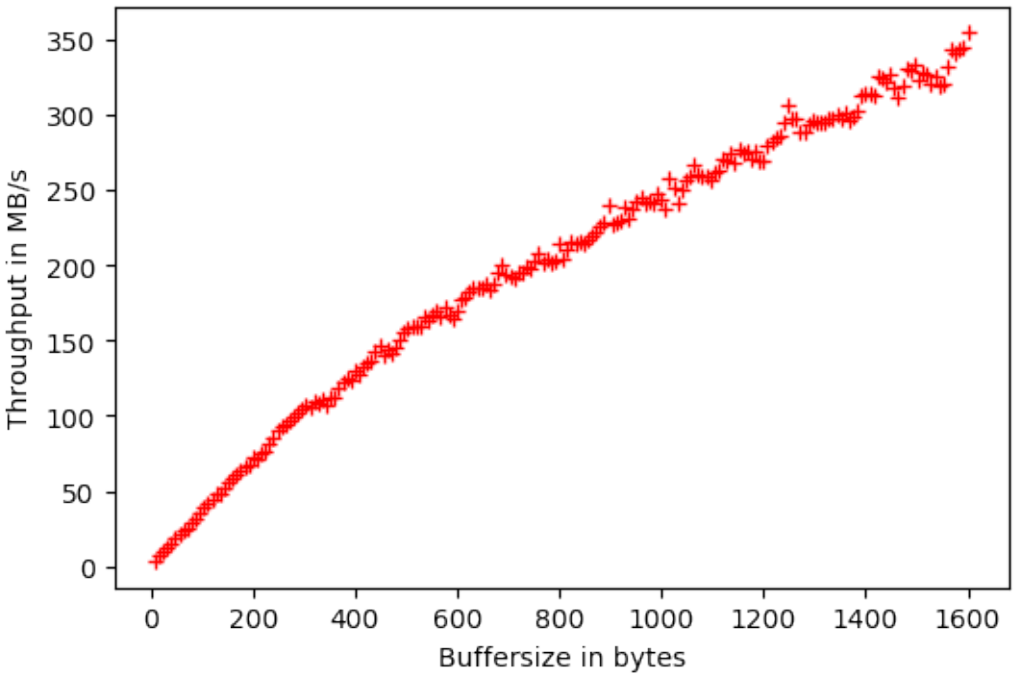
In [33]:
```
df = pd.read_csv('data-lin-t200-n100000.csv', sep=';')
plt.figure(dpi=100)
plt.xlabel('Buffersize in bytes')
plt.ylabel('ssend/recv time in microseconds')
plt.plot(df.buffersize, [x * 10e6 for x in df.t_average], 'r+');
```



In [82]:
```
df = pd.read_csv('data-lin-t200-n1000000.csv', sep=';')
slope, intercept, r_value, p_value, std_err = stats.linregress(df.buffersize, df.t_aver
plt.figure(dpi=100)
plt.xlabel('Buffersize in bytes')
plt.ylabel('ssend/recv time in microseconds')
plt.plot(df.buffersize, [x * 10e6 for x in df.t_average], 'r+', label="Means of transmi
plt.plot(df.buffersize, (intercept+slope*df.buffersize)*10e6,
         label="Fitted line: slope {:0.3e}\nstd_error {:0.3e}".format(slope*10e6, std_e
plt.legend();
```



In [83]:
```
throughput = (df.buffersize / 1024**2) / df.t_average
plt.figure(dpi=100)
plt.xlabel('Buffersize in bytes')
plt.ylabel('Throughput in MB/s')
plt.plot(df.buffersize, throughput, 'r+');
```


Throughput in MB/s
0
50
100
150
200
250
300
350
0
200
400
600
800
1000
1200
1400
1600
Buffersize in bytes