

Demo video1: <https://youtu.be/gcZrGyAOW-A>

Server on another **Linux** computer

Client on the **Ubuntu App** on the **Windows** system.

Demo video2: <https://youtu.be/i-ja7CGFJbY>

Server on another **Linux** computer

Client on the **VM Ubuntu** system.

1. After typing the test commands in the server and client respectively:

Data transfer:

`./server -r 9100`

`./client -n 15000 -p 15 -w 500 -b 100 -h 192.168.1.140 -r 9100`

File transfer:

`./client -h 192.168.1.140 -r 9100 -f handout.pdf -w 50`

`diff BIMDC/handout.pdf received/handout.pdf`

The results are as follows:

Client side(Ubuntu App on windows):

```
chaoyang@LAPTOP-NSGA51L0: /mnt/c/Users/zhuch/Desktop/myPA6/PA5$ ./client -n 15000 -p 15 -w 500 -b 100 -h 192.168.1.140 -r 9100
Patient threads finished
Event polling thread finished
Histogram threads are done. All client threads are now done
Took 46 seconds and 672327 micro seconds

-----
[-2.00,-1.60):  0   77   10   0   77   0   4   0  409   0 1979   0   4   75 3971
[-1.60,-1.20):  0  824  213   9  178   0  71   5  253   0  380   0  128  460  962
[-1.20,-0.80): 164 1527  827  14 1063  38  546 351 1701   0  925  395 1248  512  859
[-0.80,-0.40): 6395 5188 3236 1918 5611 7698 4908 431 5090 5431 3116 4444 4326 5543  917
[-0.40,-0.00): 6565 4629 10358 12869 5779 6534 9266 13375 4577 8598 2144 8924 8426 7195 1246
[-0.00, 0.40): 948 2072  347  190 1457  710  205  833 1675  549 2026 1233  524  486 1196
[ 0.40, 0.80): 723  613   9   0  468  20   0   5  439  391 1363   4  107  523 1068
[ 0.80, 1.20): 193   70   0   0  320   0   0   0  289  24 1670   0   78  200  592
[ 1.20, 1.60): 12   0   0   0   47   0   0   0  279   7  804   0   60   6  450
[ 1.60, 2.00):  0   0   0   0   0   0   0   0  288   0  593   0   99   0 3739
-----
[-2.00, 2.00): 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000
All Done!!!
chaoyang@LAPTOP-NSGA51L0:/mnt/c/Users/zhuch/Desktop/myPA6/PA5$ ./client -h 192.168.1.140 -r 9100 -f handout.pdf -w 50
Event polling thread finished
Took 0 seconds and 205311 micro seconds
All Done!!!
chaoyang@LAPTOP-NSGA51L0:/mnt/c/Users/zhuch/Desktop/myPA6/PA5$ diff BIMDC/handout.pdf received/handout.pdf
chaoyang@LAPTOP-NSGA51L0:/mnt/c/Users/zhuch/Desktop/myPA6/PA5$
```

Client side(Ubuntu on VM):

```
osboxes@osboxes: ~/Desktop/PA6
osboxes@osboxes:~/Desktop/PA6$ ./client -n 15000 -p 15 -w 500 -b 100 -h 192.168.1.140 -r 9100
Patient threads finished
Event polling thread finished
Histogram threads are done. All client threads are now done
Took 42 seconds and 509966 micro seconds

-----
[-2.00,-1.60):    0    77    10    0    77    0    4    0    409    0    1979    0    4    75    3971
[-1.60,-1.20):    0   824   213    9   178    0   71    5   253    0   380    0   128   460   962
[-1.20,-0.80):   164  1527   827   14  1063   38   546   351  1701    0   925   395  1248   512   859
[-0.80,-0.40):  6395  5188   3236  1918  5611  7698  4908  431  5090  5431  3116  4444  4326  5543   917
[-0.40,-0.00):  6565  4629  10358 12869  5779  6534  9266 13375  4577  8598  2144  8924  8426  7195  1246
[-0.00, 0.40):   948  2072   347   190  1457   710   205   833  1675   549  2026  1233   524   486  1196
[ 0.40, 0.80):   723   613    9    0   468   20    0    5   439   391  1363    4   107   523  1068
[ 0.80, 1.20):   193    70    0    0   320    0    0    0   289   24  1670    0    78   200   592
[ 1.20, 1.60):    12    0    0    0    47    0    0    0   279    7   804    0    60    6    450
[Visual Studio Code):    0    0    0    0    0    0    0    0   288    0   593    0    99    0   3739
-----

[-2.00, 2.00): 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000 15000
All Done!!!
osboxes@osboxes:~/Desktop/PA6$ ./client -h 192.168.1.140 -r 9100 -f handout.pdf
Event polling thread finished
Took 0 seconds and 294397 micro seconds
All Done!!!
osboxes@osboxes:~/Desktop/PA6$ diff BIMDC/handout.pdf received/handout.pdf
osboxes@osboxes:~/Desktop/PA6$
```

Server side(Linux):

```
zhuchaoyang@ubuntu:~/PA6/myPA6/PA5$ ifconfig
enp0s25: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 68:f7:28:88:1d:6a txqueuelen 1000 (以太网)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
    device interrupt 20 memory 0xf1300000-f1320000

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (本地环回)
    RX packets 466 bytes 41360 (41.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 466 bytes 41360 (41.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp4s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.140 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fd62:bafa:9c62:0:bd6d:4260:ef51:fcde prefixlen 64 scopeid 0x0<global>
    inet6 fe80::6504:7e95:bb6f:8cf0 prefixlen 64 scopeid 0x20<link>
    inet6 fd62:bafa:9c62:0:813d:4a22:aa16:f10c prefixlen 64 scopeid 0x0<global>
    ether d0:7e:35:b6:62:28 txqueuelen 1000 (以太网)
    RX packets 660185 bytes 296435186 (296.4 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 489192 bytes 47002564 (47.0 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

zhuchaoyang@ubuntu:~/PA6/myPA6/PA5$ ./server -r 9100
Server is ready to accept connections in port 9100
```

2. Compare PA6 with PA5 with varying w

PA5:

./client -n 10000 -p 10 -w X -b 100

Replace X with 100, 200, 300, 400, 500 in PA5 respectively.

PA6:

./client -n 10000 -p 10 -w X -b 100 -h 192.168.1.140 -r 9100

Replace X with 100, 200, 300, 400, 500 in PA6 respectively.

Compare the results of PA6 with PA5 (seconds):

w	PA6	PA5
100	18.455482	3.358795
200	20.009395	5.302650
300	20.477193	5.685996
400	19.149339	5.990825
500	20.928610	6.341012