

TCP/UDP tuning

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TCP/UDP tuning

- Why do we need to tune?
 - answer lies in the bandwidth
 - tuning differ with the network

TCP/UDP tuning

TCP

Connection oriented transmission

What to tune in TCP?

- TCP window size

- Maximum segment size

- buffer length

TCP/UDP tuning

TCP window size

how many packet are transfer
before receiving any acknowledgement

Theoretical optimum window size:

:BDP (bandwidth delay product)

=bottle bandwidth*RTT

TCP/UDP tuning

- MSS(maximum segment size)
how much data to send in each
packet

$$\text{MSS} = \text{MTU} - 40$$

Ethernet MTU is 1500 and MSS is 1460

TCP/UDP tuning

- Buffer length

how much memory to allocate to send and receive traffic flow buffers.

Default Testing

```
C:\>iperf -s
```

```
-----  
Server listening on TCP port 5001  
TCP window size: 8.00 KByte (default)  
-----
```

```
[1880] local 192.168.0.207 port 5001 connected with 192.168.96.1 port 1100  
[ ID] Interval      Transfer    Bandwidth  
[1880]  0.0-10.0 sec  2.00 MBytes  1.67 Mbits/sec
```

```
C:\>iperf -c 192.168.0.207
```

```
-----  
Client connecting to 192.168.0.207, TCP port 5001  
TCP window size: 8.00 KByte (default)  
-----
```

```
[884] local 192.168.96.1 port 1100 connected with 192.168.0.207 port 5001  
[ ID] Interval      Transfer    Bandwidth  
[884]  0.0-10.0 sec  2.00 MBytes  1.67 Mbits/sec
```

Testing with different TCP window Value

```
C:\>iperf -c 192.168.0.207 -w 1k
WARNING: TCP window size set to 1024 bytes. A small window size
will give poor performance. See the Iperf documentation.
-----
Client connecting to 192.168.0.207, TCP port 5001
TCP window size: 1.00 KByte
-----
[884] local 192.168.96.1 port 1103 connected with 192.168.0.207 port 5001
[ ID] Interval      Transfer      Bandwidth
[884]  0.0-10.5 sec  1.24 MBytes   995 Kbits/sec
-----
C:\>iperf -c 192.168.0.207 -w 4k
WARNING: TCP window size set to 1024 bytes. A small window size
will give poor performance. See the Iperf documentation.
-----
Client connecting to 192.168.0.207, TCP port 5001
TCP window size: 1.00 KByte
-----
[884] local 192.168.96.1 port 1104 connected with 192.168.0.207 port 5001
[ ID] Interval      Transfer      Bandwidth
[884]  0.0-10.0 sec  1.78 MBytes   1.49 Mbits/sec
-----
C:\>iperf -c 192.168.0.207 -w 8k
WARNING: TCP window size set to 1024 bytes. A small window size
will give poor performance. See the Iperf documentation.
-----
Client connecting to 192.168.0.207, TCP port 5001
TCP window size: 1.00 KByte
-----
[884] local 192.168.96.1 port 1105 connected with 192.168.0.207 port 5001
[ ID] Interval      Transfer      Bandwidth
[884]  0.0-10.1 sec  2.27 MBytes   1.90 Mbits/sec
-----
```

Window Size

	1k	4k	8k	16k	32k
<u>Test</u>					
test 1	995	1410	841	1670	1670
test 2	490	990	1390	1500	1560
test 3	1980	1450	1420	711	628
Average	1155	1283.333	1217	1293.667	1286

UDP Testing

Packet Size						
	1k			4k		
	throughput	delay	loss(%)	throughput	delay	loss(%)
Test 1	1050	6.126	0	1050	8.365	0
Test 2	676	9.95	16	850	19.336	0
Test 3	1050	5.761	0	1170	17.216	0
Average	800.6667	8.675333	10.66667	916.6667	15.679	0

Packet Size						
	16k			32k		
	throughput	delay	loss(%)	throughput	delay	loss(%)
Test 1	1050	33.298	2.5	1010	39.013	20
Test 2	906	53.141	7.4	1060	45.99	0
Test 3	771	771	25	503	99.95	54
Average	954	46.52667	5.766667	1043.333	43.66433	6.666667

Thank you