

به نام خدا



درس آزمایشگاه شبکه‌های کامپیوتری

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## تمرین پنجم

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## ب-۱) تست اتصال بین کلاینت و سرورهای TCP و UDP

پاسخ ۲: حال مقدار goodput و loss را به ازای rate های خواسته شده به دست می آوریم.

```
77.8s - received: 5157/ sent: 5157 pkts (loss 0.000%), 999.5 kbit/s
78.8s - received: 5282/ sent: 5282 pkts (loss 0.000%), 999.8 kbit/s
79.8s - received: 5408/ sent: 5408 pkts (loss 0.000%), 999.7 kbit/s
80.8s - received: 5534/ sent: 5534 pkts (loss 0.000%), 1006.0 kbit/s
81.8s - received: 5659/ sent: 5659 pkts (loss 0.000%), 999.6 kbit/s
82.8s - received: 5784/ sent: 5784 pkts (loss 0.000%), 999.4 kbit/s
83.8s - received: 5909/ sent: 5909 pkts (loss 0.000%), 992.9 kbit/s
84.8s - received: 6036/ sent: 6036 pkts (loss 0.000%), 1007.0 kbit/s
85.8s - received: 6162/ sent: 6162 pkts (loss 0.000%), 1000.9 kbit/s
86.8s - received: 6288/ sent: 6288 pkts (loss 0.000%), 999.4 kbit/s
87.8s - received: 6413/ sent: 6413 pkts (loss 0.000%), 999.8 kbit/s
88.8s - received: 6539/ sent: 6539 pkts (loss 0.000%), 998.4 kbit/s
89.8s - received: 6665/ sent: 6665 pkts (loss 0.000%), 1003.2 kbit/s
90.8s - received: 6790/ sent: 6790 pkts (loss 0.000%), 988.8 kbit/s
91.8s - received: 6917/ sent: 6917 pkts (loss 0.000%), 1011.9 kbit/s
92.8s - received: 7042/ sent: 7042 pkts (loss 0.000%), 999.0 kbit/s
93.8s - received: 7168/ sent: 7168 pkts (loss 0.000%), 1001.2 kbit/s
94.8s - received: 7293/ sent: 7293 pkts (loss 0.000%), 996.1 kbit/s
95.8s - received: 7419/ sent: 7419 pkts (loss 0.000%), 1004.5 kbit/s
96.8s - received: 7542/ sent: 7542 pkts (loss 0.000%), 982.4 kbit/s
97.8s - received: 7670/ sent: 7670 pkts (loss 0.000%), 1013.9 kbit/s
packet received = 7781 / 7781 sent: 0.000% loss
```

Figure 1:  $rate = 1 \frac{Mb}{s}$

```
15.4s - received: 1660/ sent: 1660 pkts (loss 0.000%), 1358.0 kbit/s
16.4s - received: 1828/ sent: 1828 pkts (loss 0.000%), 1343.5 kbit/s
17.4s - received: 2005/ sent: 2005 pkts (loss 0.000%), 1406.7 kbit/s
18.4s - received: 2187/ sent: 2187 pkts (loss 0.000%), 1455.3 kbit/s
19.4s - received: 2365/ sent: 2365 pkts (loss 0.000%), 1419.0 kbit/s
20.4s - received: 2545/ sent: 2545 pkts (loss 0.000%), 1439.4 kbit/s
21.4s - received: 2706/ sent: 3851 pkts (loss 29.73%), 1280.8 kbit/s
22.4s - received: 2885/ sent: 6768 pkts (loss 57.37%), 1418.6 kbit/s
23.5s - received: 3063/ sent: 8343 pkts (loss 63.28%), 1418.6 kbit/s
24.5s - received: 3241/ sent: 9918 pkts (loss 67.32%), 1420.7 kbit/s
25.5s - received: 3993/ sent: 28902 pkts (loss 86.18%), 6013.0 kbit/s
26.5s - received: 5006/ sent: 30068 pkts (loss 83.35%), 8055.5 kbit/s
27.5s - received: 5511/ sent: 31377 pkts (loss 82.43%), 4001.6 kbit/s
28.5s - received: 6041/ sent: 32629 pkts (loss 81.48%), 4238.6 kbit/s
29.5s - received: 6697/ sent: 33891 pkts (loss 80.24%), 5235.8 kbit/s
30.5s - received: 7085/ sent: 35126 pkts (loss 79.83%), 2933.6 kbit/s
31.5s - received: 7486/ sent: 36427 pkts (loss 79.44%), 3206.5 kbit/s
32.5s - received: 7797/ sent: 37625 pkts (loss 79.27%), 2394.7 kbit/s
33.8s - received: 8338/ sent: 38994 pkts (loss 78.61%), 4319.7 kbit/s
34.8s - received: 8982/ sent: 40270 pkts (loss 77.70%), 5143.1 kbit/s
35.8s - received: 9551/ sent: 41531 pkts (loss 77.00%), 4549.8 kbit/s
packet received = 9807 / 41997 sent: 76.648% loss
```

Figure 2:  $rate = 10 \frac{Mb}{s}$

```
0.0s - received: 4122/ sent: 40399 pkts (loss 93.300%), 6536.1 kbit/s
7.8s - received: 5030/ sent: 74806 pkts (loss 93.192%), 7784.0 kbit/s
8.8s - received: 5518/ sent: 86762 pkts (loss 93.640%), 3397.7 kbit/s
9.8s - received: 6338/ sent: 98597 pkts (loss 93.572%), 6553.4 kbit/s
10.8s - received: 6941/ sent: 112257 pkts (loss 93.817%), 4823.8 kbit/s
11.8s - received: 7511/ sent: 124360 pkts (loss 93.960%), 4511.1 kbit/s
12.8s - received: 8295/ sent: 137123 pkts (loss 93.951%), 6269.9 kbit/s
packet received = 8806 / 143296 sent: 93.855% loss
```

Figure 3:  $rate = 100 \frac{Mb}{s}$

```
0.0s - received: 1/ sent: 445 pkts (loss 99.775%), 2.5 kbit/s
3.2s - received: 1161/ sent: 121086 pkts (loss 99.041%), 9278.9 kbit/s
4.3s - received: 2309/ sent: 242655 pkts (loss 99.048%), 9176.2 kbit/s
5.3s - received: 3022/ sent: 364818 pkts (loss 99.172%), 5701.4 kbit/s
6.3s - received: 3751/ sent: 491170 pkts (loss 99.236%), 5831.9 kbit/s
7.3s - received: 4857/ sent: 614833 pkts (loss 99.210%), 8847.9 kbit/s
packet received = 5594 / 691811 sent: 99.191% loss
```

Figure 4:  $rate = 1 \frac{Gb}{s}$

	losss(%)	goodput (Kbps)
1 Mbps	0	1013
10 Mbps	76.648	4549
100 Mbps	93.855	6269
1 Gbps	99.21	8847

همانطور که مشاهده می شود به ازای نرخ بیشتر از 10 Mbps مقدار loss از ۱ بیشتر می شود. این موضوع به دلیل وجود خط `link_r1sw2.intf1.config(bw = 10)` در برنامه است که میزان

ظرفیت لینک برابر با 10 Mbps تنظیم شده است.  
**پاسخ ۳:** همانطور که در شکل زیر نیز مشاهده می‌شود، این مقدار برابر با 8312.6 Kbps می‌باشد.

23.6:	8250.6kbps	avg	( 9041.7[inst], 8023.0[mov.avg])	cwnd 16	rtt 17.6ms
23.7:	8250.6kbps	avg	( 9041.7[inst], 8023.0[mov.avg])	cwnd 19	rtt 21.7ms
23.8:	8250.6kbps	avg	( 9041.7[inst], 8023.0[mov.avg])	cwnd 21	rtt 24.7ms
24.0:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 16	rtt 22.0ms
24.1:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 17	rtt 20.1ms
24.2:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 20	rtt 22.4ms
24.3:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 22	rtt 25.9ms
24.4:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 17	rtt 22.3ms
24.5:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 19	rtt 21.4ms
24.6:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 21	rtt 24.8ms
24.8:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 16	rtt 26.4ms
24.9:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 17	rtt 20.3ms
25.0:	8284.3kbps	avg	( 9011.7[inst], 8121.8[mov.avg])	cwnd 20	rtt 24.1ms
25.1:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 22	rtt 27.0ms
25.2:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 12	rtt 17.8ms
25.3:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 14	rtt 15.2ms
25.4:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 18	rtt 19.9ms
25.5:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 20	rtt 22.4ms
25.7:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 22	rtt 24.9ms
25.8:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 12	rtt 17.7ms
25.9:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 14	rtt 16.2ms
26.0:	8312.6kbps	avg	( 8922.9[inst], 8201.9[mov.avg])	cwnd 17	rtt 20.1ms

**ب-۲) محدودسازی پهنای باند روتر**

**پاسخ ۴:** همانطور که در شکل زیر نیز مشاهده می‌شود، اندازه بسته‌ها ۱۰۴۲ بایت می‌باشد.

No.	Time	Source	Destination	Protocol	Length	Info
26734	8.619134927	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26735	8.623083419	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26736	8.624673451	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26737	8.634138864	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26738	8.634142636	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26739	8.644239261	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26740	8.644244725	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26741	8.646707394	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26742	8.648476389	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26743	8.651192132	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26744	8.654208811	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26745	8.659075204	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26746	8.659812726	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26747	8.664477379	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26748	8.666078752	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26749	8.668044319	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26750	8.671929825	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26751	8.673365291	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26752	8.677201587	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26753	8.679940819	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26754	8.681954355	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26755	8.687872400	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26756	8.687876190	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26757	8.689992958	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26758	8.694491150	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26759	8.696340951	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26760	8.698443497	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26761	8.701338125	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26762	8.707195086	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26763	8.707201206	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26764	8.736152602	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26765	8.736159157	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000
26766	8.737009140	10.10.0.1	10.10.1.3	UDP	1042	49693 → 10000 Len=1000

**پاسخ ۵:**

$$BW * \frac{1000}{1042} = 3000 * \frac{1000}{1042} = 2879.08 \frac{Kb}{s}$$

پاسخ ۶: مقدار loss برابر با صفر و 100 Kbps goodput می باشد.

```
22.2s - received: 183/ sent: 183 pkts (loss 0.000%), 100.0 kbit/s
23.2s - received: 196/ sent: 196 pkts (loss 0.000%), 100.0 kbit/s
24.2s - received: 209/ sent: 209 pkts (loss 0.000%), 100.0 kbit/s
25.3s - received: 222/ sent: 222 pkts (loss 0.000%), 100.0 kbit/s
26.3s - received: 235/ sent: 235 pkts (loss 0.000%), 100.0 kbit/s
27.4s - received: 248/ sent: 248 pkts (loss 0.000%), 100.1 kbit/s
28.4s - received: 261/ sent: 261 pkts (loss 0.000%), 100.0 kbit/s
29.4s - received: 274/ sent: 274 pkts (loss 0.000%), 100.0 kbit/s
30.5s - received: 287/ sent: 287 pkts (loss 0.000%), 100.0 kbit/s
31.5s - received: 300/ sent: 300 pkts (loss 0.000%), 100.0 kbit/s
32.6s - received: 313/ sent: 313 pkts (loss 0.000%), 100.0 kbit/s
33.6s - received: 326/ sent: 326 pkts (loss 0.000%), 100.0 kbit/s
34.6s - received: 339/ sent: 339 pkts (loss 0.000%), 100.0 kbit/s
35.7s - received: 352/ sent: 352 pkts (loss 0.000%), 99.9 kbit/s
36.7s - received: 365/ sent: 365 pkts (loss 0.000%), 100.1 kbit/s
37.8s - received: 378/ sent: 378 pkts (loss 0.000%), 99.8 kbit/s
38.8s - received: 391/ sent: 391 pkts (loss 0.000%), 100.2 kbit/s
39.8s - received: 404/ sent: 404 pkts (loss 0.000%), 100.0 kbit/s
40.9s - received: 417/ sent: 417 pkts (loss 0.000%), 99.9 kbit/s
41.9s - received: 430/ sent: 430 pkts (loss 0.000%), 100.1 kbit/s
43.0s - received: 443/ sent: 443 pkts (loss 0.000%), 99.8 kbit/s
44.0s - received: 456/ sent: 456 pkts (loss 0.000%), 100.2 kbit/s
45.0s - received: 469/ sent: 469 pkts (loss 0.000%), 100.1 kbit/s
46.1s - received: 482/ sent: 482 pkts (loss 0.000%), 99.9 kbit/s
```

پاسخ ۷:

```
303.1s - received: 22688/ sent: 23630 pkts (loss 4.071%), 2877.3 kbit/s
304.1s - received: 23028/ sent: 24005 pkts (loss 4.070%), 2876.5 kbit/s
305.1s - received: 23383/ sent: 24375 pkts (loss 4.070%), 2838.8 kbit/s
306.1s - received: 23744/ sent: 24756 pkts (loss 4.088%), 2881.4 kbit/s
307.1s - received: 24104/ sent: 25132 pkts (loss 4.090%), 2875.7 kbit/s
308.1s - received: 24464/ sent: 25507 pkts (loss 4.089%), 2879.5 kbit/s
309.1s - received: 24824/ sent: 25882 pkts (loss 4.088%), 2874.7 kbit/s
310.1s - received: 25184/ sent: 26258 pkts (loss 4.090%), 2874.8 kbit/s
311.1s - received: 25544/ sent: 26634 pkts (loss 4.093%), 2872.4 kbit/s
312.1s - received: 25905/ sent: 27011 pkts (loss 4.095%), 2881.3 kbit/s
313.1s - received: 26264/ sent: 27385 pkts (loss 4.093%), 2871.2 kbit/s
314.1s - received: 26624/ sent: 27760 pkts (loss 4.092%), 2877.7 kbit/s
315.2s - received: 26984/ sent: 28136 pkts (loss 4.094%), 2874.0 kbit/s
316.2s - received: 27344/ sent: 28512 pkts (loss 4.097%), 2876.3 kbit/s
317.2s - received: 27704/ sent: 28887 pkts (loss 4.095%), 2875.3 kbit/s
318.2s - received: 28064/ sent: 29263 pkts (loss 4.097%), 2877.3 kbit/s
319.2s - received: 28424/ sent: 29639 pkts (loss 4.099%), 2875.7 kbit/s
320.2s - received: 28784/ sent: 30014 pkts (loss 4.098%), 2877.0 kbit/s
321.2s - received: 29144/ sent: 30389 pkts (loss 4.097%), 2875.0 kbit/s
322.2s - received: 29504/ sent: 30765 pkts (loss 4.099%), 2874.2 kbit/s
323.2s - received: 29864/ sent: 31141 pkts (loss 4.101%), 2879.1 kbit/s
324.2s - received: 30224/ sent: 31516 pkts (loss 4.100%), 2877.1 kbit/s
```

```
139.5s - received: 47978/ sent:169174 pkts (loss 71.640%), 2879.2 kbit/s
140.5s - received: 48338/ sent:170425 pkts (loss 71.637%), 2879.0 kbit/s
141.5s - received: 48698/ sent:171675 pkts (loss 71.634%), 2879.3 kbit/s
142.5s - received: 49058/ sent:172926 pkts (loss 71.631%), 2879.2 kbit/s
143.5s - received: 49417/ sent:174179 pkts (loss 71.629%), 2865.3 kbit/s
144.5s - received: 49772/ sent:175430 pkts (loss 71.629%), 2837.2 kbit/s
145.5s - received: 50128/ sent:176683 pkts (loss 71.629%), 2843.4 kbit/s
146.5s - received: 50488/ sent:177933 pkts (loss 71.625%), 2879.2 kbit/s
147.5s - received: 50843/ sent:179187 pkts (loss 71.625%), 2832.5 kbit/s
148.5s - received: 51203/ sent:180437 pkts (loss 71.623%), 2879.1 kbit/s
149.5s - received: 51563/ sent:181688 pkts (loss 71.620%), 2879.1 kbit/s
150.5s - received: 51919/ sent:182941 pkts (loss 71.620%), 2842.1 kbit/s
151.5s - received: 52279/ sent:184192 pkts (loss 71.617%), 2876.7 kbit/s
152.5s - received: 52635/ sent:185443 pkts (loss 71.617%), 2845.4 kbit/s
153.5s - received: 52995/ sent:186694 pkts (loss 71.614%), 2879.5 kbit/s
154.5s - received: 53350/ sent:187945 pkts (loss 71.614%), 2839.0 kbit/s
155.5s - received: 53708/ sent:189197 pkts (loss 71.613%), 2860.0 kbit/s
156.5s - received: 54062/ sent:190449 pkts (loss 71.613%), 2827.4 kbit/s
157.5s - received: 54422/ sent:191699 pkts (loss 71.611%), 2878.6 kbit/s
158.5s - received: 54782/ sent:192950 pkts (loss 71.608%), 2879.5 kbit/s
159.5s - received: 55142/ sent:194201 pkts (loss 71.606%), 2879.1 kbit/s
160.5s - received: 55502/ sent:195451 pkts (loss 71.603%), 2879.2 kbit/s
```

Figure 5:  $rate = 3 \frac{Mb}{s}$

Figure 6:  $rate = 10 \frac{Mb}{s}$

rate	losss(%)	goodput (Kbps)
100 Kbps	0	100
3 Mbps	4	2875
10 Mbps	71	2875

همانطور که از جدول بالا پیداست، مقدار تئوری به دست آمده برای goodput در بخش ۵ کمی کمتر از نتایج این بخش می باشد.

**پاسخ ۸:** مشاهده می شود مطابق انتظاری که داشتیم، اندازه بسته ها ۱۵۱۴ بایت است.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	10.10.1.3	10.10.0.1	TCP	66	10001 → 42202 [ACK] Seq
2	0.000014263	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [ACK] Seq
3	0.000015250	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [PSH, AC
4	0.000084487	10.10.1.3	10.10.0.1	TCP	66	10001 → 42202 [ACK] Seq
5	0.000098859	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [ACK] Seq
6	0.000099723	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [PSH, AC
7	0.016154372	10.10.1.3	10.10.0.1	TCP	66	10001 → 42202 [ACK] Seq
8	0.016170333	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [ACK] Seq
9	0.016171277	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [PSH, AC
10	0.024197444	10.10.1.3	10.10.0.1	TCP	66	10001 → 42202 [ACK] Seq
11	0.024215915	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [ACK] Seq
12	0.024216806	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [PSH, AC
13	0.032285180	10.10.1.3	10.10.0.1	TCP	66	10001 → 42202 [ACK] Seq
14	0.032302455	10.10.0.1	10.10.1.3	TCP	1514	42202 → 10001 [ACK] Seq

**پاسخ ۹:**

$$BW * \frac{1448}{1514} = 3000 * \frac{1448}{1514} = 2869.22 \frac{Kb}{s}$$

**پاسخ ۱۰:** طبق شکل زیر، مقدار goodput تقریباً برابر با ۲۸۰۰ Kbps می باشد که از مقدار تئوری به دست آمده در بخش قبل کمتر است.

```

0.0: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 10 rtt 1.4ms
0.1: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 12 rtt 35.7ms
0.1: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 14 rtt 44.6ms
0.3: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 15 rtt 55.0ms
0.4: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 17 rtt 63.1ms
0.5: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 20 rtt 74.4ms
0.8: 0.0kbps avg ( 0.0[inst], 0.0[mov.avg]) cwnd 22 rtt 84.4ms
1.0: 2822.0kbps avg ( 2822.0[inst], 2822.0[mov.avg]) cwnd 12 rtt 81.6ms
1.3: 2822.0kbps avg ( 2822.0[inst], 2822.0[mov.avg]) cwnd 17 rtt 62.1ms
1.5: 2822.0kbps avg ( 2822.0[inst], 2822.0[mov.avg]) cwnd 20 rtt 73.4ms
1.9: 2822.0kbps avg ( 2822.0[inst], 2822.0[mov.avg]) cwnd 11 rtt 64.7ms
2.2: 2810.9kbps avg ( 2801.6[inst], 2801.6[mov.avg]) cwnd 17 rtt 60.9ms
2.6: 2810.9kbps avg ( 2801.6[inst], 2801.6[mov.avg]) cwnd 21 rtt 80.6ms
2.9: 2810.9kbps avg ( 2801.6[inst], 2801.6[mov.avg]) cwnd 13 rtt 58.8ms

```