STATISTICS

All these simulations are ran using parameters: 1000 messages sent, 200 for average time between messages from sender's layer 5, window size 8, and a retransmission timeout set to 30.

I used a static timer set to 30, because we know that the average time for a packet to travel between links is 5 units of time

Statistics after running 30 simulations with probability of corruption and loss set to 0.0

So there will be no retransmits when there is no loss or corruption

```
Simulating with probability of corruption set to 0.0
Simulating with probability of loss set to 0.0
Number of retransmissions, average RTT, average communication times for random seed 1: 0, 10.926, 10.943
Number of retransmissions, average RTT, average communication times for random seed 2: 0, 10.713, 10.777
Number of retransmissions, average RTT, average communication times for random seed 3: 0, 11.080, 11.100
Number of retransmissions, average RTT, average communication times for random seed 4: 0, 11.104, 11.163
Number of retransmissions, average RTT, average communication times for random seed 5: 0, 11.089, 11.147
Number of retransmissions, average RTT, average communication times for random seed 5: 0, 10.970, 10.997
Number of retransmissions, average RTT, average communication times for random seed 6: 0, 10.970, 10.997
Number of retransmissions, average RTT, average communication times for random seed 7: 0, 10.970, 10.997
Number of retransmissions, average RTT, average communication times for random seed 8: 0, 10.992, 10.935
Number of retransmissions, average RTT, average communication times for random seed 9: 0, 10.793, 10.826
Number of retransmissions, average RTT, average communication times for random seed 10: 0, 10.769, 10.834
Number of retransmissions, average RTT, average communication times for random seed 10: 0, 10.769, 10.834
Number of retransmissions, average RTT, average communication times for random seed 11: 0, 10.769, 10.834
Number of retransmissions, average RTT, average communication times for random seed 13: 0, 11.085, 11.035
Number of retransmissions, average RTT, average communication times for random seed 13: 0, 11.085, 11.035
Number of retransmissions, average RTT, average communication times for random seed 16: 0, 11.111, 11.161
Number of retransmissions, average RTT, average communication times for random seed 16: 0, 11.111, 11.161
Number of retransmissions, average RTT, average communication times for random seed 17: 0, 11.040, 11.091
Number of retransmissions, average RTT, average
```

Average number of retransmission is 0 with 100% confidence Average RTT time 90% confidence interval: 10.971 ± 0.039 Average Communication time 90% confidence interval: 11.009 ± 0.039

```
Simulating with probability of corruption set to 0.1

Simulating with probability of loss set to 0.0

Number of retransmissions, average RTT, average communication times for random seed 1: 243, 10.962, 18.401

Number of retransmissions, average RTT, average communication times for random seed 2: 240, 10.792, 18.272

Number of retransmissions, average RTT, average communication times for random seed 3: 243, 11.022, 18.470

Number of retransmissions, average RTT, average communication times for random seed 4: 202, 11.034, 17.218

Number of retransmissions, average RTT, average communication times for random seed 5: 220, 10.926, 17.853

Number of retransmissions, average RTT, average communication times for random seed 6: 244, 11.053, 18.690

Number of retransmissions, average RTT, average communication times for random seed 8: 249, 10.917, 18.626

Number of retransmissions, average RTT, average communication times for random seed 8: 249, 10.917, 18.626

Number of retransmissions, average RTT, average communication times for random seed 9: 253, 10.815, 18.607

Number of retransmissions, average RTT, average communication times for random seed 10: 273, 10.911, 19.084

Number of retransmissions, average RTT, average communication times for random seed 11: 209, 10.712, 17.408

Number of retransmissions, average RTT, average communication times for random seed 11: 209, 10.728, 17.408

Number of retransmissions, average RTT, average communication times for random seed 21: 224, 10.724, 17.914

Number of retransmissions, average RTT, average communication times for random seed 12: 224, 10.724, 17.914

Number of retransmissions, average RTT, average communication times for random seed 12: 224, 10.724, 17.914

Number of retransmissions, average RTT, average communication times for random seed 12: 224, 10.724, 17.914

Number of retransmissions, average RTT, average communication times for random seed 12: 224, 10.969, 17.725

Number of retransmissions, average RTT, average communication times for random seed 13: 236, 11.094,
```

```
Number of retransmissions, average RTT, average communication times for random seed 17: 244, 11.112, 18.509
Number of retransmissions, average RTT, average communication times for random seed 18: 246, 10.921, 18.664
Number of retransmissions, average RTT, average communication times for random seed 19: 221, 11.066, 17.997
Number of retransmissions, average RTT, average communication times for random seed 20: 213, 11.063, 17.575
Number of retransmissions, average RTT, average communication times for random seed 21: 227, 10.848, 17.923
Number of retransmissions, average RTT, average communication times for random seed 22: 220, 11.155, 17.930
Number of retransmissions, average RTT, average communication times for random seed 23: 212, 10.957, 17.546
Number of retransmissions, average RTT, average communication times for random seed 23: 212, 10.957, 17.546
Number of retransmissions, average RTT, average communication times for random seed 25: 237, 11.189, 18.589
Number of retransmissions, average RTT, average communication times for random seed 25: 237, 11.189, 18.589
Number of retransmissions, average RTT, average communication times for random seed 27: 249, 11.140, 18.819
Number of retransmissions, average RTT, average communication times for random seed 27: 249, 11.140, 18.819
Number of retransmissions, average RTT, average communication times for random seed 28: 230, 10.826, 17.887
Number of retransmissions, average RTT, average communication times for random seed 29: 215, 11.166, 17.889
Number of retransmissions, average RTT, average communication times for random seed 29: 215, 11.166, 17.889
Number of retransmissions, average RTT, average communication times for random seed 29: 215, 11.166, 17.899
Number of retransmissions average RTT, average communication times for random seed 29: 215, 10.930, 17.619

Average number of retransmissions: 229.933

Average number of retransmissions of average RTT times with 30 samples: 15.829

Sample Standard Deviation of average CTT times with 30 samples: 0.464
```

Average number of retransmissions 90% confidence interval: 229.933 ± 4.8 Average RTT time 90% confidence interval: 10.974 ± 0.042

Average Communication time 90% confidence interval: 18.106 ± 0.14

Statistics after running 30 simulations with probability of corruption set to 0.2

```
Simulating with probability of corruption set to 0.2

Simulating with probability of loss set to 0.0

Number of retransmissions, average RTT, average communication times for random seed 1: 590, 11.101, 29.335

Number of retransmissions, average RTT, average communication times for random seed 2: 554, 10.711, 27.878

Number of retransmissions, average RTT, average communication times for random seed 3: 569, 11.071, 28.927

Number of retransmissions, average RTT, average communication times for random seed 3: 569, 11.071, 27.061

Number of retransmissions, average RTT, average communication times for random seed 5: 569, 11.054, 28.860

Number of retransmissions, average RTT, average communication times for random seed 5: 569, 10.054, 28.860

Number of retransmissions, average RTT, average communication times for random seed 5: 569, 10.896, 26.856

Number of retransmissions, average RTT, average communication times for random seed 8: 619, 10.890, 29.912

Number of retransmissions, average RTT, average communication times for random seed 9: 567, 10.841, 28.881

Number of retransmissions, average RTT, average communication times for random seed 10: 589, 10.865, 29.163

Number of retransmissions, average RTT, average communication times for random seed 10: 589, 10.865, 29.163

Number of retransmissions, average RTT, average communication times for random seed 12: 549, 10.865, 29.163

Number of retransmissions, average RTT, average communication times for random seed 12: 549, 10.846, 27.899

Number of retransmissions, average RTT, average communication times for random seed 12: 549, 10.846, 27.899

Number of retransmissions, average RTT, average communication times for random seed 17: 567, 11.157, 28.431

Number of retransmissions, average RTT, average communication times for random seed 17: 567, 11.157, 28.105

Number of retransmissions, average RTT, average communication times for random seed 17: 567, 11.157, 28.431

Number of retransmissions, average RTT, average communication times for random seed 21: 550, 10.893,
```

Average number of retransmissions 90% confidence interval: 551.5 ± 8.9 Average RTT time 90% confidence interval: 10.969 ± 0.043

Average Communication time 90% confidence interval: 28.071 ± 0.28

```
Simulating with probability of corruption set to 0.3 Simulating with probability of loss set to 0.0 Number of retransmissions, average RTT, average communication times for random seed 1: 1050, 10.984, 43.583 Number of retransmissions, average RTT, average communication times for random seed 2: 955, 10.842, 40.452 Number of retransmissions, average RTT, average communication times for random seed 3: 992, 11.018, 41.970 Number of retransmissions, average RTT, average communication times for random seed 4: 871, 11.228, 37.971 Number of retransmissions, average RTT, average communication times for random seed 5: 984, 11.157, 41.469 Number of retransmissions, average RTT, average communication times for random seed 6: 989, 11.360, 42.053
```

```
Number of retransmissions, average RTT, average communication times for random seed 7: 1005, 10.867, 41.984
Number of retransmissions, average RTT, average communication times for random seed 8: 1038, 11.012, 43.730
Number of retransmissions, average RTT, average communication times for random seed 9: 1013, 10.925, 42.652
Number of retransmissions, average RTT, average communication times for random seed 10: 1030, 10.772, 43.071
Number of retransmissions, average RTT, average communication times for random seed 11: 953, 10.671, 40.611
Number of retransmissions, average RTT, average communication times for random seed 12: 977, 11.125, 41.421
Number of retransmissions, average RTT, average communication times for random seed 12: 977, 11.125, 41.421
Number of retransmissions, average RTT, average communication times for random seed 13: 955, 11.051, 40.920
Number of retransmissions, average RTT, average communication times for random seed 16: 982, 11.188, 41.760
Number of retransmissions, average RTT, average communication times for random seed 16: 982, 11.188, 41.760
Number of retransmissions, average RTT, average communication times for random seed 17: 951, 11.187, 40.477
Number of retransmissions, average RTT, average communication times for random seed 17: 951, 11.187, 40.477
Number of retransmissions, average RTT, average communication times for random seed 18: 984, 10.722, 41.839
Number of retransmissions, average RTT, average communication times for random seed 19: 951, 10.992, 40.808
Number of retransmissions, average RTT, average communication times for random seed 21: 922, 11.171, 39.840
Number of retransmissions, average RTT, average communication times for random seed 22: 1049, 11.126, 43.516
Number of retransmissions, average RTT, average communication times for random seed 22: 91, 11.141, 41.810
Number of retransmissions, average RTT, average communication times for random seed 22: 91, 11.141, 41.810
Number of retransmissions, average RTT, average communication times for random seed 22: 91, 10.905, 41
```

Average number of retransmissions 90% confidence interval: 979.167 \pm 12 Average RTT time 90% confidence interval: 11.014 \pm 0.055 Average Communication time 90% confidence interval: 41.501 \pm 0.4

Statistics after running 30 simulations with probability of corruption set to 0.4

```
Simulating with probability of loss set to 0.0

Number of retransmissions, average RTT, average communication times for random seed 1: 1744, 10.557, 64.937

Number of retransmissions, average RTT, average communication times for random seed 3: 1490, 10.840, 57.085

Number of retransmissions, average RTT, average communication times for random seed 3: 1508, 11.105, 58.001

Number of retransmissions, average RTT, average communication times for random seed 3: 1623, 11.217, 61.532

Number of retransmissions, average RTT, average communication times for random seed 5: 1674, 11.079, 60.580

Number of retransmissions, average RTT, average communication times for random seed 5: 1620, 11.095, 61.531

Number of retransmissions, average RTT, average communication times for random seed 6: 1620, 11.095, 61.531

Number of retransmissions, average RTT, average communication times for random seed 7: 1718, 11.104, 65.099

Number of retransmissions, average RTT, average communication times for random seed 8: 1679, 11.029, 63.603

Number of retransmissions, average RTT, average communication times for random seed 9: 1679, 11.029, 63.603

Number of retransmissions, average RTT, average communication times for random seed 11: 1555, 11.077, 60.030

Number of retransmissions, average RTT, average communication times for random seed 12: 1567, 11.016, 60.238

Number of retransmissions, average RTT, average communication times for random seed 12: 1567, 11.016, 60.238

Number of retransmissions, average RTT, average communication times for random seed 13: 1526, 11.164, 58.900

Number of retransmissions, average RTT, average communication times for random seed 13: 1526, 11.164, 58.900

Number of retransmissions, average RTT, average communication times for random seed 15: 1567, 11.089, 65.325

Number of retransmissions, average RTT, average communication times for random seed 17: 1538, 11.209, 59.267

Number of retransmissions, average RTT, average communication times for random seed 18: 1603, 11.016, 60.248

Number of retransmissions, a
```

Average number of retransmissions 90% confidence interval: 1598.133 ± 22 Average RTT time 90% confidence interval: 11.033 ± 0.053

Average Communication time 90% confidence interval: 61.05 ± 0.67

```
Simulating with probability of corruption set to 0.5 Simulating with probability of loss set to 0.0 Number of retransmissions, average RTT, average communication times for random seed 1: 2672, 11.051, 95.126
```

```
Number of retransmissions, average RTT, average communication times for random seed 2: 2370, 11.045, 85.760 Number of retransmissions, average RTT, average communication times for random seed 3: 2456, 11.107, 88.829 Number of retransmissions, average RTT, average communication times for random seed 4: 2648, 11.203, 93.653 Number of retransmissions, average RTT, average communication times for random seed 5: 2511, 11.001, 90.016 Number of retransmissions, average RTT, average communication times for random seed 6: 2528, 11.003, 90.698 Number of retransmissions, average RTT, average communication times for random seed 7: 2696, 10.929, 95.499 Number of retransmissions, average RTT, average communication times for random seed 7: 2696, 10.929, 95.499 Number of retransmissions, average RTT, average communication times for random seed 10: 2628, 11.021, 93.745 Number of retransmissions, average RTT, average communication times for random seed 11: 2525, 10.862, 90.441 Number of retransmissions, average RTT, average communication times for random seed 11: 2525, 10.862, 90.441 Number of retransmissions, average RTT, average communication times for random seed 12: 2453, 10.956, 88.050 Number of retransmissions, average RTT, average communication times for random seed 12: 2453, 10.956, 88.050 Number of retransmissions, average RTT, average communication times for random seed 13: 2607, 11.209, 87.436 Number of retransmissions, average RTT, average communication times for random seed 14: 2694, 11.124, 96.045 Number of retransmissions, average RTT, average communication times for random seed 17: 269, 11.311, 89.163 Number of retransmissions, average RTT, average communication times for random seed 18: 2511, 10.926, 99.848 Number of retransmissions, average RTT, average communication times for random seed 19: 2449, 11.137, 88.614 Number of retransmissions, average RTT, average communication times for random seed 21: 2513, 11.209, 89.500 Number of retransmissions, average RTT, average communication times for random seed 22: 2513
```

Average number of retransmissions 90% confidence interval: 2537.2 ± 27 Average RTT time 90% confidence interval: 11.058 ± 0.068 Average Communication time 90% confidence interval: 90.998 ± 0.83

Statistics after running 30 simulations with probability of corruption set to 0.6

```
Simulating with probability of corruption set to 0.6
Simulating with probability of loss set to 0.0
Number of retransmissions, average RTT, average communication times for random seed 1: 3997, 11.037, 137.645
Number of retransmissions, average RTT, average communication times for random seed 2: 3782, 11.399, 130.301
Number of retransmissions, average RTT, average communication times for random seed 3: 3861, 11.001, 134.076
Number of retransmissions, average RTT, average communication times for random seed 4: 41218, 11.112, 141.939
Number of retransmissions, average RTT, average communication times for random seed 5: 3869, 10.350, 134.275
Number of retransmissions, average RTT, average communication times for random seed 5: 3869, 10.350, 134.275
Number of retransmissions, average RTT, average communication times for random seed 7: 4017, 10.450, 138.441
Number of retransmissions, average RTT, average communication times for random seed 8: 4250, 11.189, 146.094
Number of retransmissions, average RTT, average communication times for random seed 9: 4102, 10.809, 140.298
Number of retransmissions, average RTT, average communication times for random seed 1: 4088, 10.898, 140.706
Number of retransmissions, average RTT, average communication times for random seed 1: 3866, 11.284, 133.711
Number of retransmissions, average RTT, average communication times for random seed 1: 3895, 11.140, 136.565
Number of retransmissions, average RTT, average communication times for random seed 1: 3895, 11.140, 136.565
Number of retransmissions, average RTT, average communication times for random seed 1: 3892, 10.582, 133.911
Number of retransmissions, average RTT, average communication times for random seed 1: 3892, 10.582, 133.911
Number of retransmissions, average RTT, average communication times for random seed 1: 3892, 10.582, 133.911
Number of retransmissions, average RTT, average communication times for random seed 1: 3892, 10.582, 133.911
Number of retransmissions, average RTT, average communication times for random seed 1: 3892,
```

Average number of retransmissions 90% confidence interval: 3969.367 ± 36 Average RTT time 90% confidence interval: 11.082 ± 0.11 Average Communication time 90% confidence interval: 136.833 ± 1.2

Statistics after running 30 simulations with probability of corruption set to 0.7

```
Simulating with probability of loss set to 0.0

Number of retransmissions, average RTT, average communication times for random seed 1: 6326, 11.036, 211.367

Number of retransmissions, average RTT, average communication times for random seed 2: 6269, 12.637, 207.159

Number of retransmissions, average RTT, average communication times for random seed 3: 6535, 10.507, 218.745

Number of retransmissions, average RTT, average communication times for random seed 4: 6441, 11.191, 216.861

Number of retransmissions, average RTT, average communication times for random seed 5: 6523, 10.282, 215.397

Number of retransmissions, average RTT, average communication times for random seed 6: 6566, 10.364, 217.778

Number of retransmissions, average RTT, average communication times for random seed 7: 6603, 11.302, 220.932

Number of retransmissions, average RTT, average communication times for random seed 8: 6725, 11.395, 223.702

Number of retransmissions, average RTT, average communication times for random seed 9: 6317, 10.492, 211.270

Number of retransmissions, average RTT, average communication times for random seed 9: 6317, 10.492, 211.270

Number of retransmissions, average RTT, average communication times for random seed 10: 6587, 11.644, 220.071

Number of retransmissions, average RTT, average communication times for random seed 11: 6288, 11.068, 210.626

Number of retransmissions, average RTT, average communication times for random seed 12: 6217, 11.273, 210.176

Number of retransmissions, average RTT, average communication times for random seed 12: 6217, 11.273, 210.176

Number of retransmissions, average RTT, average communication times for random seed 12: 6217, 11.273, 210.176

Number of retransmissions, average RTT, average communication times for random seed 13: 6565, 11.171, 17.177

Number of retransmissions, average RTT, average communication times for random seed 13: 6506, 11.171, 17.177

Number of retransmissions, average RTT, average communication times for random seed 13: 6506, 11.171, 12.17.177

Number of
```

Average number of retransmissions 90% confidence interval: 6477.867 ± 46 Average RTT time 90% confidence interval: 11.162 ± 0.18 Average Communication time 90% confidence interval: 215.67 ± 1.5

Statistics after running 30 simulations with probability of corruption set to 0.8

Buffer overflows when corruption rate is set to 0.8!

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.1

Number of retransmissions, average RTT, average communication times for random seed 1: 239, 10.986, 18.276 Number of retransmissions, average RTT, average communication times for random seed 2: 239, 10.727, 18.215 Number of retransmissions, average RTT, average communication times for random seed 4: 257, 10.980, 18.436 Number of retransmissions, average RTT, average communication times for random seed 4: 257, 10.980, 18.4361 Number of retransmissions, average RTT, average communication times for random seed 5: 239, 10.931, 18.549 Number of retransmissions, average RTT, average communication times for random seed 5: 239, 10.931, 17.175 Number of retransmissions, average RTT, average communication times for random seed 6: 200, 11.049, 17.175 Number of retransmissions, average RTT, average communication times for random seed 8: 251, 11.003, 18.657 Number of retransmissions, average RTT, average communication times for random seed 9: 227, 10.771, 17.956 Number of retransmissions, average RTT, average communication times for random seed 9: 227, 10.771, 17.955 Number of retransmissions, average RTT, average communication times for random seed 11: 248, 10.744, 18.515 Number of retransmissions, average RTT, average communication times for random seed 11: 248, 10.744, 18.515 Number of retransmissions, average RTT, average communication times for random seed 12: 271, 10.989, 19.442 Number of retransmissions, average RTT, average communication times for random seed 13: 212, 11.032, 17.553 Number of retransmissions, average RTT, average communication times for random seed 13: 212, 11.032, 17.553 Number of retransmissions, average RTT, average communication times for random seed 15: 238, 10.879, 18.369 Number of retransmissions, average RTT, average communication times for random seed 16: 223, 11.141, 17.978 Number of retransmissions, average RTT, average communication times for random seed 26: 224, 11.051, 18.573 Number of
```

```
Number of retransmissions, average RTT, average communication times for random seed 27: 241, 11.025, 18.207
Number of retransmissions, average RTT, average communication times for random seed 28: 213, 10.904, 17.451
Number of retransmissions, average RTT, average communication times for random seed 29: 244, 11.195, 18.830
Number of retransmissions, average RTT, average communication times for random seed 30: 224, 10.939, 17.882

Average number of retransmissions: 232.000
Average RTT time: 10.971
Average communication time: 18.151

Sample Standard Deviation of number of retransmissions with 30 samples: 16.120
Sample Standard Deviation of average RTT times with 30 samples: 0.133

Sample Standard Deviation of average communication times with 30 samples: 0.497
```

Average number of retransmissions 90% confidence interval: 232 ± 4.8 Average RTT time 90% confidence interval: 10.971 ± 0.04 Average Communication time 90% confidence interval: 18.151 ± 0.15

Statistics after running 30 simulations with probability of loss set to 0.2

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.2 Number of retransmissions, average RTT, average communication times for random seed 1: 572, 10.851, 28.684 Number of retransmissions, average RTT, average communication times for random seed 2: 548, 10.730, 27.658 Number of retransmissions, average RTT, average communication times for random seed 3: 580, 11.010, 29.290 Number of retransmissions, average RTT, average communication times for random seed 4: 548, 10.889, 28.116 Number of retransmissions, average RTT, average communication times for random seed 5: 554, 10.980, 28.237 Number of retransmissions, average RTT, average communication times for random seed 5: 554, 10.980, 28.231 Number of retransmissions, average RTT, average communication times for random seed 7: 564, 10.895, 28.291 Number of retransmissions, average RTT, average communication times for random seed 7: 564, 10.985, 28.291 Number of retransmissions, average RTT, average communication times for random seed 9: 518, 10.657, 26.859 Number of retransmissions, average RTT, average communication times for random seed 9: 518, 10.657, 26.859 Number of retransmissions, average RTT, average communication times for random seed 19: 589, 10.770, 28.848 Number of retransmissions, average RTT, average communication times for random seed 12: 585, 10.910, 29.141 Number of retransmissions, average RTT, average communication times for random seed 12: 585, 10.910, 29.141 Number of retransmissions, average RTT, average communication times for random seed 12: 585, 10.910, 29.141 Number of retransmissions, average RTT, average communication times for random seed 14: 545, 10.912, 27.784 Number of retransmissions, average RTT, average communication times for random seed 18: 551, 10.957, 27.932 Number of retransmissions, average RTT, average communication times for random seed 19: 542, 11.118, 29.076 Number of retransmissions, average RTT, average communication times for random seed 29: 542, 11.1182, 27.992 Number of r
```

Average number of retransmissions 90% confidence interval: 550.33 ± 8.5 Average RTT time 90% confidence interval: 10.96 ± 0.04 Average Communication time 90% confidence interval: 28.014 ± 0.26

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.3 Simulating with probability of loss set to 0.3 Simulating with probability of loss set to 0.3 Number of retransmissions, average RTT, average communication times for random seed 1: 990, 11.003, 41.791 Number of retransmissions, average RTT, average communication times for random seed 2: 989, 11.033, 41.791 Number of retransmissions, average RTT, average communication times for random seed 3: 1018, 11.088, 42.774 Number of retransmissions, average RTT, average communication times for random seed 4: 957, 11.260, 40.425 Number of retransmissions, average RTT, average communication times for random seed 5: 979, 10.830, 41.362 Number of retransmissions, average RTT, average communication times for random seed 6: 861, 10.626, 38.026 Number of retransmissions, average RTT, average communication times for random seed 8: 993, 10.840, 41.875 Number of retransmissions, average RTT, average communication times for random seed 9: 984, 10.707, 41.092 Number of retransmissions, average RTT, average communication times for random seed 10: 1065, 10.671, 43.854 Number of retransmissions, average RTT, average communication times for random seed 11: 1020, 10.862, 42.235 Number of retransmissions, average RTT, average communication times for random seed 12: 1022, 11.174, 43.069 Number of retransmissions, average RTT, average communication times for random seed 14: 974, 11.103, 40.914 Number of retransmissions, average RTT, average communication times for random seed 15: 954, 10.941, 40.690 Number of retransmissions, average RTT, average communication times for random seed 16: 1024, 11.103, 40.914 Number of retransmissions, average RTT, average communication times for random seed 17: 927, 10.999, 39.697 Number of retransmissions, average RTT, average communication times for random seed 17: 927, 10.999, 39.697 Number of retransmissions, average RTT, average communication times for random seed 19: 943, 11.125, 40.661
```

```
Number of retransmissions, average RTT, average communication times for random seed 20: 961, 10.985, 40.908
Number of retransmissions, average RTT, average communication times for random seed 21: 940, 10.796, 40.010
Number of retransmissions, average RTT, average communication times for random seed 22: 977, 11.186, 41.521
Number of retransmissions, average RTT, average communication times for random seed 23: 929, 11.213, 39.631
Number of retransmissions, average RTT, average communication times for random seed 24: 1006, 10.763, 42.257
Number of retransmissions, average RTT, average communication times for random seed 25: 1002, 11.175, 42.053
Number of retransmissions, average RTT, average communication times for random seed 26: 936, 11.048, 39.820
Number of retransmissions, average RTT, average communication times for random seed 28: 974, 10.847, 40.637
Number of retransmissions, average RTT, average communication times for random seed 28: 974, 10.847, 40.637
Number of retransmissions, average RTT, average communication times for random seed 29: 1025, 11.061, 42.793
Number of retransmissions, average RTT, average communication times for random seed 30: 958, 11.021, 40.670
Average number of retransmissions: 977.100
Average communication time: 41.289
Sample Standard Deviation of number of retransmissions with 30 samples: 39.350
Sample Standard Deviation of average RTT times with 30 samples: 0.189
Sample Standard Deviation of average communication times with 30 samples: 1.217
```

Average number of retransmissions 90% confidence interval: 977.1 \pm 12 Average RTT time 90% confidence interval: 10.981 \pm 0.057 Average Communication time 90% confidence interval: 41.289 \pm 0.37

Statistics after running 30 simulations with probability of loss set to 0.4

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.4

Number of retransmissions, average RTT, average communication times for random seed 1: 1623, 11.086, 61.436 Number of retransmissions, average RTT, average communication times for random seed 2: 1664, 10.833, 62.741 Number of retransmissions, average RTT, average communication times for random seed 3: 1726, 10.841, 65.121 Number of retransmissions, average RTT, average communication times for random seed 4: 1494, 11.140, 57.542 Number of retransmissions, average RTT, average communication times for random seed 5: 1519, 10.911, 58.424 Number of retransmissions, average RTT, average communication times for random seed 5: 1519, 10.911, 58.424 Number of retransmissions, average RTT, average communication times for random seed 7: 1634, 11.031, 61.765 Number of retransmissions, average RTT, average communication times for random seed 7: 1634, 11.031, 61.765 Number of retransmissions, average RTT, average communication times for random seed 8: 1589, 10.849, 60.751 Number of retransmissions, average RTT, average communication times for random seed 10: 1687, 10.399, 63.385 Number of retransmissions, average RTT, average communication times for random seed 10: 1687, 10.399, 63.385 Number of retransmissions, average RTT, average communication times for random seed 11: 1669, 10.652, 62.866 Number of retransmissions, average RTT, average communication times for random seed 12: 1633, 11.201, 62.162 Number of retransmissions, average RTT, average communication times for random seed 13: 1567, 11.077, 60.123 Number of retransmissions, average RTT, average communication times for random seed 13: 1567, 11.077, 60.123 Number of retransmissions, average RTT, average communication times for random seed 13: 1567, 11.074, 60.136 Number of retransmissions, average RTT, average communication times for random seed 13: 1576, 11.044, 60.316 Number of retransmissions, average RTT, average communication times for random seed 13: 1576, 10.844,
```

Average number of retransmissions 90% confidence interval: 1597.667 \pm 19 Average RTT time 90% confidence interval: 10.914 \pm 0.053 Average Communication time 90% confidence interval: 60.816 \pm 0.58

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.5 Simulating with probability of retransmissions, average RTT, average communication times for random seed 2: 2524, 11.503, 90.334 Number of retransmissions, average RTT, average communication times for random seed 4: 2362, 11.020, 85.074 Number of retransmissions, average RTT, average communication times for random seed 5: 2457, 11.375, 88.243 Number of retransmissions, average RTT, average communication times for random seed 6: 2609, 11.153, 92.326 Number of retransmissions, average RTT, average communication times for random seed 8: 2517, 11.395, 90.232 Number of retransmissions, average RTT, average communication times for random seed 10: 2647, 11.139, 91.735 Number of retransmissions, average RTT, average communication times for random seed 10: 2647, 11.139, 91.735 Number of retransmissions, average RTT, average communication times for random seed 11: 2560, 10.989, 91.225 Number of retransmissions, average RTT, average communication times for random seed 12: 2581, 11.064, 92.319 Number of retransmissions, average RTT, average communication times for random seed 12: 2581, 11.064, 92.319 Number of retransmissions, average RTT, average communication times for random seed 13: 2488, 10.892, 89.686 Number of retransmissions, average RTT, average communication times for random seed 13: 2488, 10.892, 89.686 Number of retransmissions, average RTT, average communication times for random seed 14: 2520, 11.100, 89.364
```

```
Number of retransmissions, average RTT, average communication times for random seed 15: 2454, 11.114, 87.591
Number of retransmissions, average RTT, average communication times for random seed 16: 2739, 11.227, 96.844
Number of retransmissions, average RTT, average communication times for random seed 17: 2412, 10.976, 86.769
Number of retransmissions, average RTT, average communication times for random seed 18: 2615, 11.257, 92.772
Number of retransmissions, average RTT, average communication times for random seed 19: 2477, 11.316, 88.866
Number of retransmissions, average RTT, average communication times for random seed 21: 2449, 11.246, 87.580
Number of retransmissions, average RTT, average communication times for random seed 22: 2459, 11.246, 87.580
Number of retransmissions, average RTT, average communication times for random seed 22: 2454, 10.943, 88.128
Number of retransmissions, average RTT, average communication times for random seed 23: 2581, 10.625, 9183
Number of retransmissions, average RTT, average communication times for random seed 24: 2512, 10.543, 89.817
Number of retransmissions, average RTT, average communication times for random seed 26: 2462, 10.792, 88.991
Number of retransmissions, average RTT, average communication times for random seed 26: 2462, 10.792, 88.991
Number of retransmissions, average RTT, average communication times for random seed 27: 2594, 10.936, 92.207
Number of retransmissions, average RTT, average communication times for random seed 28: 2500, 10.652, 88.802
Number of retransmissions, average RTT, average communication times for random seed 29: 2448, 10.736, 87.723
Number of retransmissions, average RTT, average communication times for random seed 29: 2448, 10.736, 87.723
Number of retransmissions, average RTT, average communication times for random seed 29: 2468, 10.796, 87.7142

Average number of retransmissions: 2522.867
Average number of retransmissions of average RTT times with 30 samples: 88.789
Sample Standard Deviation of average communication times with 30 sampl
```

Average number of retransmissions 90% confidence interval: 2522.867 ± 27 Average RTT time 90% confidence interval: 11.039 ± 0.077 Average Communication time 90% confidence interval: 90.075 ± 0.83

Statistics after running 30 simulations with probability of loss set to 0.6

```
Simulating with probability of loss set to 0.6
Simulating with probability of loss set to 0.6
Simulating with probability of loss set to 0.6
Number of retransmissions, average RTT, average communication times for random seed 1: 3967, 10.862, 134.928
Number of retransmissions, average RTT, average communication times for random seed 2: 4006, 11.376, 136.158
Number of retransmissions, average RTT, average communication times for random seed 4: 403, 10.564, 136.442
Number of retransmissions, average RTT, average communication times for random seed 4: 3782, 10.860, 130.388
Number of retransmissions, average RTT, average communication times for random seed 5: 858, 11.249, 131.812
Number of retransmissions, average RTT, average communication times for random seed 6: 4089, 11.457, 139.558
Number of retransmissions, average RTT, average communication times for random seed 7: 3924, 10.905, 134.479
Number of retransmissions, average RTT, average communication times for random seed 8: 3818, 10.742, 131.602
Number of retransmissions, average RTT, average communication times for random seed 9: 4050, 10.639, 137.714
Number of retransmissions, average RTT, average communication times for random seed 10: 4245, 11.255, 144.494
Number of retransmissions, average RTT, average communication times for random seed 11: 4095, 10.762, 139.638
Number of retransmissions, average RTT, average communication times for random seed 11: 4097, 10.762, 139.638
Number of retransmissions, average RTT, average communication times for random seed 11: 4099, 10.762, 139.638
Number of retransmissions, average RTT, average communication times for random seed 12: 3099, 11.311, 132.542
Number of retransmissions, average RTT, average communication times for random seed 13: 377, 10.921, 129.189
Number of retransmissions, average RTT, average communication times for random seed 13: 377, 10.921, 129.189
Number of retransmissions, average RTT, average communication times for random seed 15: 430, 11.126, 147.247
Number of retransmissions, average RTT, average c
```

Average number of retransmissions 90% confidence interval: 3964.233 ± 43 Average RTT time 90% confidence interval: 11.009 ± 0.11 Average Communication time 90% confidence interval: 135.579 ± 1.3

```
Simulating with probability of corruption set to 0.0 Simulating with probability of loss set to 0.7 Number of retransmissions, average RTT, average communication times for random seed 1: 6201, 10.188, 205.827 Number of retransmissions, average RTT, average communication times for random seed 2: 6484, 11.359, 214.776 Number of retransmissions, average RTT, average communication times for random seed 3: 6600, 11.114, 216.083 Number of retransmissions, average RTT, average communication times for random seed 4: 6290, 10.445, 208.397 Number of retransmissions, average RTT, average communication times for random seed 5: 6267, 10.521, 207.863 Number of retransmissions, average RTT, average communication times for random seed 6: 6851, 10.530, 220.240 Number of retransmissions, average RTT, average communication times for random seed 7: 6559, 11.824, 218.249
```

```
Number of retransmissions, average RTT, average communication times for random seed 8: 6155, 11.361, 205.114
Number of retransmissions, average RTT, average communication times for random seed 9: 6826, 11.191, 223.345
Number of retransmissions, average RTT, average communication times for random seed 10: 6768, 10.771, 222.834
Number of retransmissions, average RTT, average communication times for random seed 11: 6419, 11.476, 212.551
Number of retransmissions, average RTT, average communication times for random seed 12: 6756, 10.516, 218.657
Number of retransmissions, average RTT, average communication times for random seed 13: 5964, 11.174, 197.986
Number of retransmissions, average RTT, average communication times for random seed 14: 6325, 10.771, 208.028
Number of retransmissions, average RTT, average communication times for random seed 16: 6982, 10.300, 217.178
Number of retransmissions, average RTT, average communication times for random seed 17: 6379, 11.156, 211.577
Number of retransmissions, average RTT, average communication times for random seed 17: 6379, 11.156, 211.577
Number of retransmissions, average RTT, average communication times for random seed 18: 6421, 11.075, 213.072
Number of retransmissions, average RTT, average communication times for random seed 18: 6421, 11.075, 213.072
Number of retransmissions, average RTT, average communication times for random seed 20: 6370, 11.012, 211.170
Number of retransmissions, average RTT, average communication times for random seed 20: 6370, 11.012, 211.170
Number of retransmissions, average RTT, average communication times for random seed 22: 6365, 11.548, 209.382
Number of retransmissions, average RTT, average communication times for random seed 22: 6365, 11.548, 209.382
Number of retransmissions, average RTT, average communication times for random seed 23: 6687, 10.763, 213.092
Number of retransmissions, average RTT, average communication times for random seed 26: 6593, 10.693, 10.693
Number of retransmissions, average RTT, average communication times f
```

Average number of retransmissions 90% confidence interval: 6480.667 ± 71 Average RTT time 90% confidence interval: 10.983 ± 0.14 Average Communication time 90% confidence interval: 213.069 ± 1.9

Statistics after running 30 simulations with probability of loss set to 0.8

```
Simulating with probability of loss set to 0.8

Number of retransmissions, average RTT, average communication times for random seed 1: 12640, 11.137, 374.884

Number of retransmissions, average RTT, average communication times for random seed 2: 12288, 12.322, 365.431

Number of retransmissions, average RTT, average communication times for random seed 3: 12133, 11.067, 360.150

Number of retransmissions, average RTT, average communication times for random seed 4: 12662, 11.144, 361.594

Number of retransmissions, average RTT, average communication times for random seed 5: 12504, 11.061, 371.936

Number of retransmissions, average RTT, average communication times for random seed 5: 12504, 11.061, 371.936

Number of retransmissions, average RTT, average communication times for random seed 6: 11802, 11.147, 353.359

Number of retransmissions, average RTT, average communication times for random seed 7: 12205, 8.956, 365.615

Number of retransmissions, average RTT, average communication times for random seed 8: 11562, 11.237, 363.622

Number of retransmissions, average RTT, average communication times for random seed 9: 12711, 12.515, 381.298

Number of retransmissions, average RTT, average communication times for random seed 11810, 10.289, 378.993

Number of retransmissions, average RTT, average communication times for random seed 11810, 10.289, 378.993

Number of retransmissions, average RTT, average communication times for random seed 12: 12393, 10.450, 366.467

Number of retransmissions, average RTT, average communication times for random seed 12: 12393, 10.450, 366.467

Number of retransmissions, average RTT, average communication times for random seed 18: 12743, 10.851, 371.593

Number of retransmissions, average RTT, average communication times for random seed 18: 12743, 10.851, 371.593

Number of retransmissions, average RTT, average communication times for random seed 18: 12743, 10.851, 371.593

Number of retransmissions, average RTT, average communication times for random seed 18: 12749, 11.926, 366.920

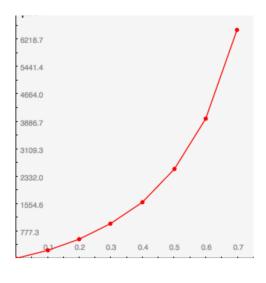
N
```

Average number of retransmissions 90% confidence interval: 12213.033 ± 140 Average RTT time 90% confidence interval: 10.837 ± 0.32 Average Communication time 90% confidence interval: 364.361 ± 3.2

Number of Retransmissions as a function of Corruption

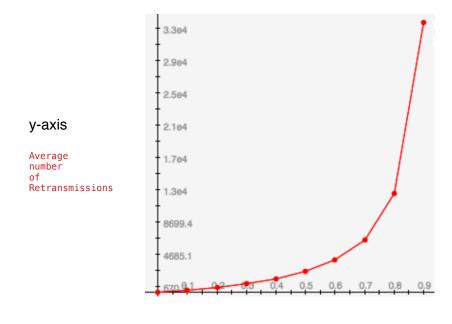
System exits from buffer overload at corruption rate 0.8





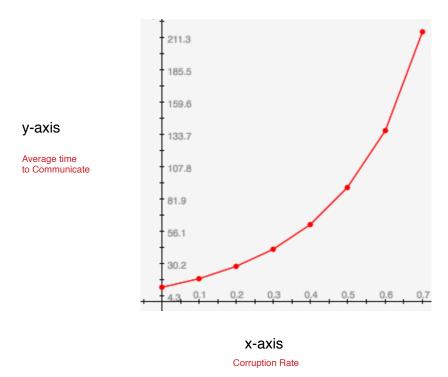
x-axis Corruption Rate

Number of Retransmissions as a function of Loss

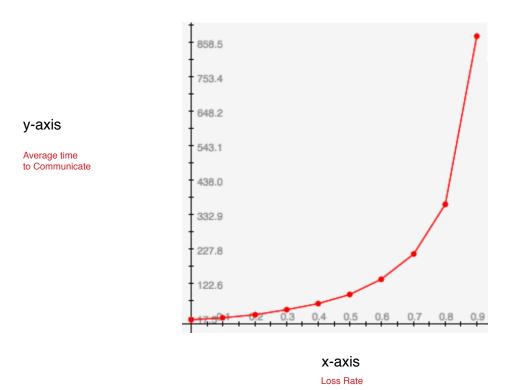


x-axis Loss Rate

Average Time to Communicate as a function of Corruption



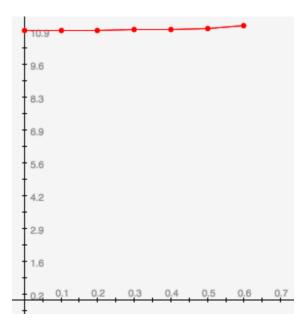
Average Time to Communicate as a function of Loss



Average RTT time as a function of Corruption

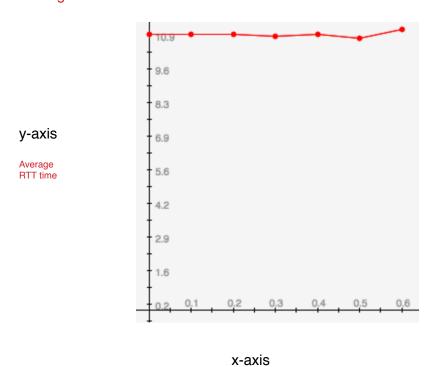


Average RTT time



x-axis
Corruption Rate

Average RTT time as a function of Loss



Loss Rate