

Note: all tests done use 4-byte length packets under a 10-second duration

UDP:

Building	Dist.	40 (slow)	80 (medium)	240 (fast)
ELC	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0256313439s median = 0.0255745649s min = 0.0250041484s max = 0.0276768207s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0137154s median = 0.0136654s min = 0.013000726s max = 0.01582026s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.005734939s, median = 0.005822658s, min = 0.005000829s, max = 0.01092267s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00043238162s, median = 0.0s, min = 0.0s, max = 0.003904819488s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0002787914s, median = 0.0s, min = 0.0s, max = 0.003911256s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00024704456s, median = 0.0s, min = 0.0s, max = 0.004880666s
Library	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.02566217s, median = 0.02592849s, min = 0.0250349s, max = 0.02622485s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.01388913s, median = 0.01396155s, min = 0.01300001s, max = 0.01595854s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00619895s, median = 0.00598693s, min = 0.00500011s, max = 0.01695322s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.001184085s, median = 0.00099682s, min = 0.0s, max = 0.00797104s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00130474s, median = 0.000996708s, min = 0.0s, max = 0.01396870s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.001244798s, median = 0.00099635s, min = 0.0s, max = 0.009219884s
Chapter house	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0255628053s, median = 0.02549171447s, min = 0.02500081062s, max = 0.02692294120s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0137262827s, median = 0.0139358043s, min = 0.01299977302s, max = 0.01514887s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.005692810s, median = 0.005756974s, min = 0.005000114s, max = 0.011175394s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0002223532s, median = 0.0s, min = 0.0s, max = 0.0029981136s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000302257s, median = 0.0s, min = 0.0s, max = 0.005469560s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0002667312s, median = 0.0s, min = 0.0s, max = 0.005060911s

TCP:

		40	80	240
ELC	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0659840s, median = 0.025422096s, min = 0.02501702s, max = 9.9196338s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.013662853s, median = 0.01366424s, min = 0.0130088329s, max = 0.014661550s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.005770008s, median = 0.0058295726s, min = 0.0050008296s, max = 0.011579275s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000213043s, median = 0.0s, min = 0.0s, max = 0.003905773s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000252119s, median = 0.0s, min = 0.0s, max = 0.01564717s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000233273s, median = 0.0s, min = 0.0s, max = 0.003935098s
Library	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.02598063s, median = 0.02595376s, min = 0.0250101s, max = 0.02991962s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.01386111s, median = 0.01396155s, min = 0.0130004s, max = 0.01564788s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00616615s, median = 0.005984544s, min = 0.00500202s, max = 0.011967658s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000980845s, median = 0.000954985s, min = 0.0s, max = 0.00787806s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000833983s, median = 0.000910401s, min = 0.0s, max = 0.00800180s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.001133047s, median = 0.000994920s, min = 0.0s, max = 0.01096749s
Chapter house	uniform	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.02554329s, median = 0.0254530s, min = 0.02500271s, max = 0.0271928s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.0137354s, median = 0.01391553s, min = 0.01300024s, max = 0.01496052s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00581631s, median = 0.0057907s, min = 0.00500035s, max = 0.03889703s
	burst	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000228313s, median = 0.0s, min = 0.0s, max = 0.002996921s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.00020252s, median = 0.0s, min = 0.0s, max = 0.002991676s	loss rate: 0.0% out of order rate: 0.0% RTT: mean = 0.000212453s, median = 0.0s, min = 0.0s, max = 0.00601768s

Analysis:

From these findings, we can observe that the network in the library is the slowest of the networks tested. RTT was slower using uniform and burst distributions for both UDP and TCP. The ELC and the Chapter house had similar network performances.

RTT for burst mode is seen as lower than uniform for both TCP and UDP. This may be because in my uniform distribution traffic generator code, I sleep between sending and receiving the packet back instead of sleeping after the packet was returned. This increases the RTT by the sleep time which is determined using the specified argument bandwidth. Also notice that RTT never = 0 in a uniform distribution.

For some packets in burst data transfers, RTT equals 0. This is indicative of a very fast packet transfer. Notice that minimum and median RTT does not decrease with higher bandwidths. This is because the minimum instance is already representing ideal round trip time conditions. For instance, the first packet in a burst will be able to experience a relatively low RTT.