EE4204 Report

Varying-batch-size protocol:

Transfer time

Data Unit Size (bytes)	T1 (ms)	T2 (ms)	T3 (ms)	T average (ms)
100	36.284	36.436	35.653	36.12433
200	19.396	19.92	19.284	19.53333
300	12.228	12.82	12.492	12.51333
400	9.24	9.184	9.008	9.144
500	7.362	7.76	7.41	7.510667
600	6.026	6.06	6.59	6.225333
700	5.482	5.752	5.458	5.564
800	4.54	4.49	4.514	4.514667

Throughput

Data Unit Size (bytes)	R1 (Mbps)	R2 (Mbps)	R3 (Mbps)	R average (Mbps)
100	13.18333	13.12833	13.41666	13.24277
200	24.66199	24.01325	24.80523	24.49349
300	39.11875	37.31232	38.29203	38.24103
400	51.76883	52.0845	53.10213	52.31849
500	64.97473	61.64227	64.55385	63.72362
600	79.38002	78.93466	72.58634	76.96701
700	87.25721	83.16134	87.64089	86.01981
800	105.3621	106.5354	105.969	105.9555

Fixed-batch-size protocol:

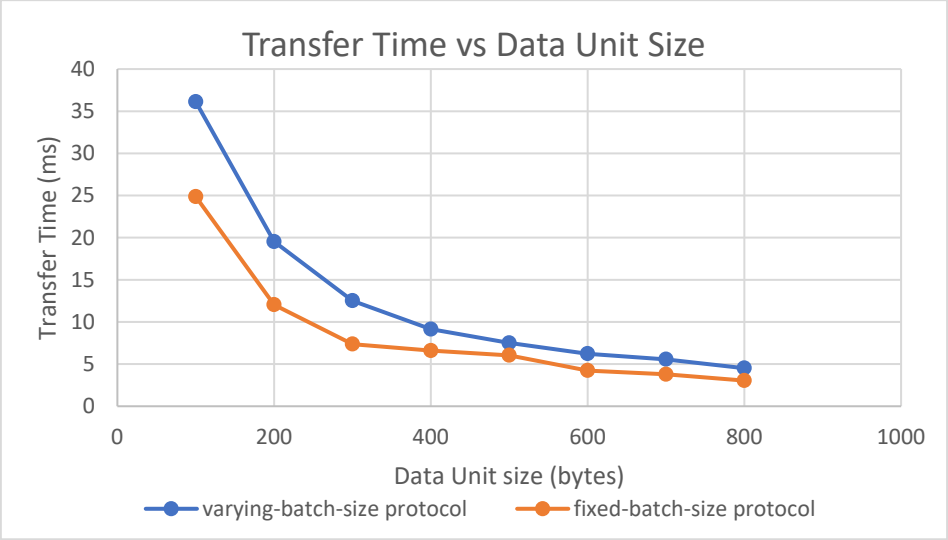
Transfer time:

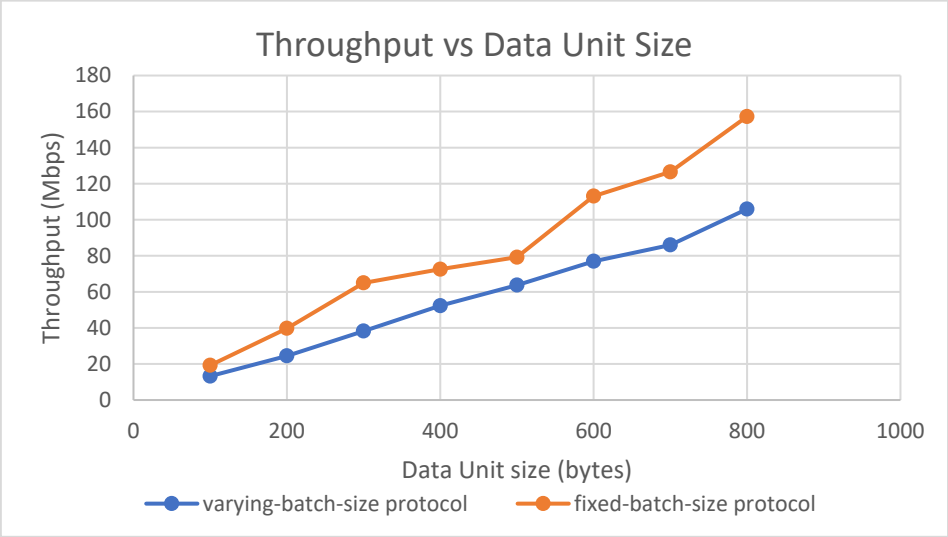
Data Unit Size (bytes)	T1 (ms)	T2 (ms)	T3 (ms)	T average (ms)
100	25.207	24.82	24.567	24.86467
200	12.08	11.987	12.041	12.036
300	7.378	7.537	7.185	7.366667
400	6.775	6.591	6.416	6.594
500	6.087	5.854	6.183	6.041333
600	4.474	4.16	4.077	4.237
700	3.722	3.648	3.986	3.785333
800	3.172	3.003	2.958	3.044333

Throughput:

Data Unit Size (bytes)	R1 (Mbps)	R2 (Mbps)	R3 (Mbps)	R average (Mbps)
100	18.97663	19.27252	19.471	19.24005
200	39.59801	39.90523	39.72627	39.74317
300	64.83383	63.4661	66.57537	64.95843
400	70.60428	72.57533	74.55487	72.57816
500	78.58452	81.71234	77.36438	79.22041
600	106.9164	114.9865	117.3274	113.0768
700	128.518	131.125	120.006	126.5497
800	150.802	159.2887	161.712	157.2676

Graphs





Evaluation

Transfer time decreased exponentially and throughput increased linearly as data unit size increases. This is because less ACKs are needed for larger DUs for the entire message.

Furthermore, in smaller data units, overhead take up significant portion of overall packet size, which increases transfer time. As the data unit size increase, overhead becomes a smaller proportion of the packet and more data can be transferred.

Fixed-batch-size protocol has a lower transfer time and higher throughput than the varying-batch-size protocol at all data unit sizes. With a fixed batch size protocol, the number of packets sent per batch is consistent, so there is less overhead involved in setting up and tearing down each batch. This can reduce the overall overhead of the transfer and lead to more efficient use of the network bandwidth.

An assumption made would be that network conditions were optimal.