PCD HW1

Both client and server are written in python(3.9)

Server options:

The server can be run with 2 options: TCP and UDP:

- `py .\server.py -p UDP`
- `py .\server.py -p TCP`

Client options:

For the client we can specify the protocol with the option `-p` (TCP/UDP), the chunk size with `-s`, if stop and wait is enabled with option `-w` (0/1) and the file we want to send to the server with `-f`

- `py .\client.py -p UDP -s 1024 -w 1 -f dummy_text_file.txt`

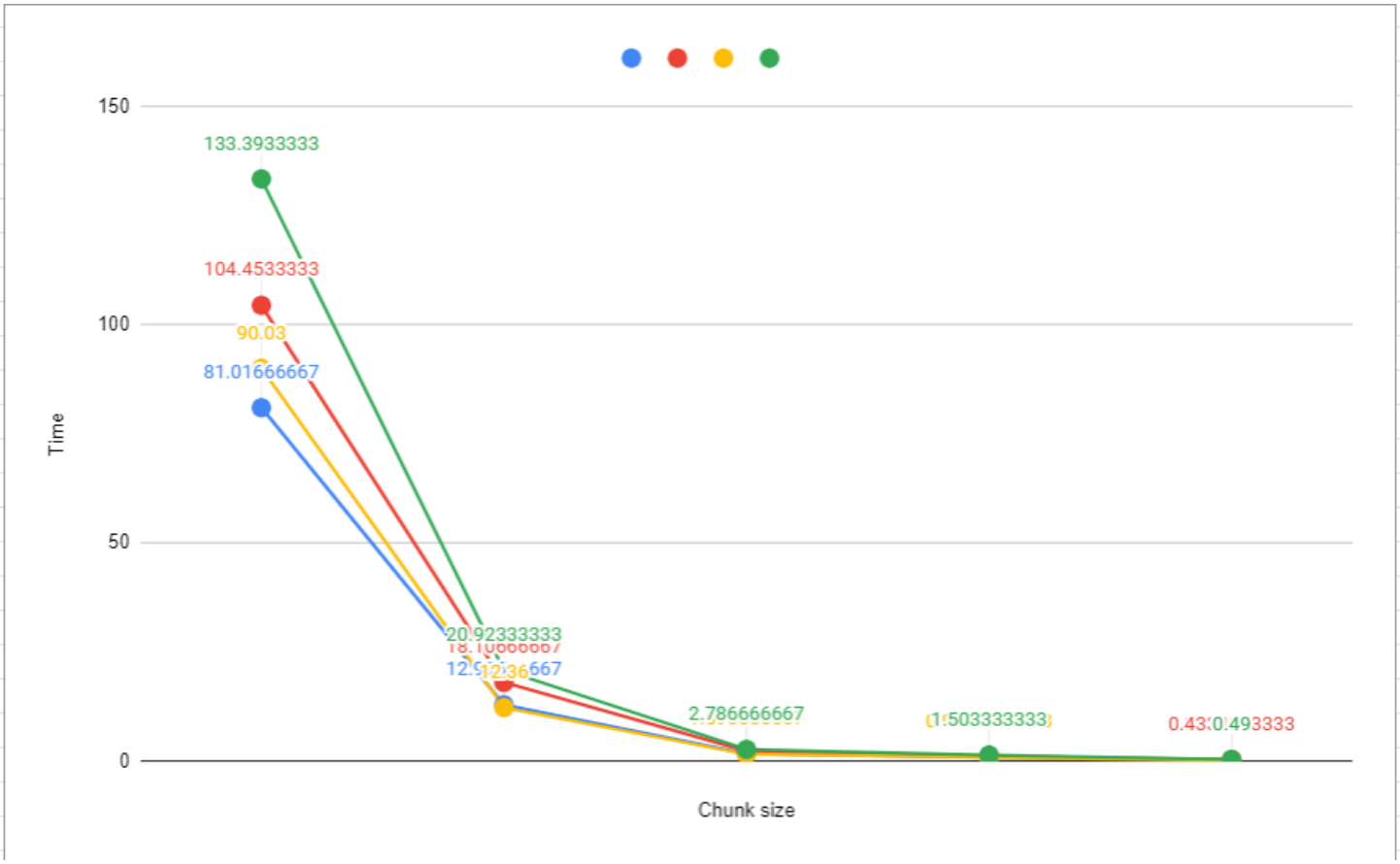
Stats:

	Streaming					Stop and wait				
100MB	TCP1	TCP2	TCP3	TCP streaming	Rata success	TCP1	TCP2	TCP3	TCP stop and w	Rata success
128bytes	81.28	78.57	83.2	81.01666667	100%	115.17	100.03	98.16	104.4533333	100%
1024bytes	12.82	13.42	12.75	12.99666667	100%	18.18	17.97	18.17	18.10666667	100%
8,192bytes	1.85	1.76	1.85	1.82	100%	2.3	2.51	2.46	2.423333333	100%
16,348bytes	0.91	0.94	0.92	0.9233333333	100%	1.25	1.29	1.23	1.256666667	100%
60,000bytes	0.35	0.32	0.31	0.3266666667	100%	0.42	0.42	0.46	0.4333333333	100%

	Streaming					Stop and wait				
100MB	UDP1	UDP2	UDP3	UDP streaming	Rata success	UDP1	UDP2	UDP3	UDP stop and w	Rata success
128bytes	90.9	89.41	89.78	90.03	100%	134.45	133.66	132.07	133.3933333	100%
1024bytes	12.34	12.39	12.35	12.36	100%	20.78	20.99	21	20.92333333	100%
8,192bytes	1.68	1.72	1.69	1.696666667	100%	2.77	2.81	2.78	2.786666667	100%
16,348bytes	0.91	0.92	0.91	0.9133333333	100%	1.46	1.49	1.56	1.503333333	100%
60,000bytes	0.3	0.28	0.29	0.29	100%	0.51	0.48	0.48	0.49	100%

I tested the option presented above on my local machine and centralized the results here. The time comparison can be seen below.

Green - UDP stop and wait
Red - TCP stop and wait
Yellow - UDP streaming
Blue - TCP streaming



On my local machine the data was always 100% received for both TCP and UDP and there were no big differences between transmission time. UDP became faster than TCP for larger chunks.

I also run my server on a Azure Virtual Machine.

Remote server					
			Streaming		
100MB	TCP1		Chunks sent	Chunks received	Rata success
8,192bytes	83.74		13026	29173	100%
16,348bytes	80.1		6528	16344	100%
60,000bytes	79.91		1779	13394	100%
			Streaming		
100MB	UDP1		Chunks sent	Chunks received	Rata success
8,192bytes	3.54		13026	103	1%
16,348bytes	3.05		6528	21	32%
60,000bytes	2.48		1179	0	0%

We can see here the real time difference between TCP and UDP and also the reliability of each one.