IERG4180 Network Software Design and Programming
Project 3 Report

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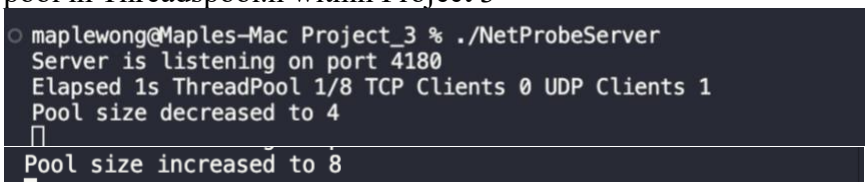
GitHub Repository: https://github.com/Catalpa1maple/IERG4180-Project

Requirement: **C++11** and **ws2_32.lib** (for windows)

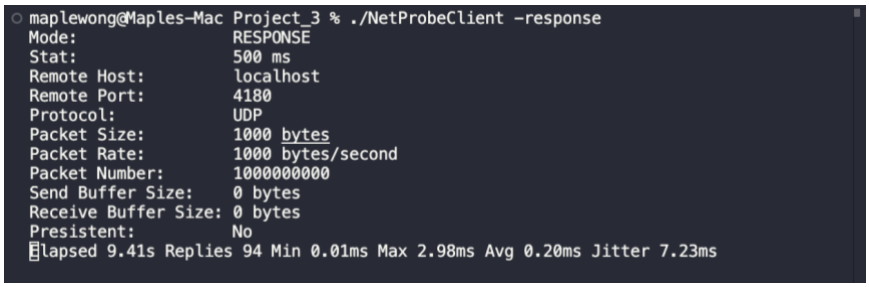
Feature:

(a) Constructed a class Threadpool to handle monitoring, growing and shrinking the pool in Threadspool.h within Project 3



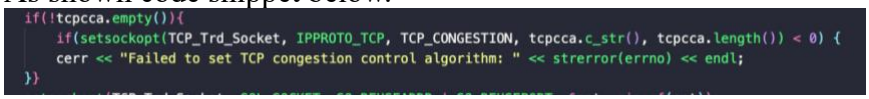
(b) As below

(c)



The detail of (b) and (c) feature will be discussed later in exp part.

(d) Implement a pre-socket TCP congestion control with <netinet/tcp.h> library
As shown code snippet below.



Experiment

(1)

	Throughput	loss	CPU
Linux	~200000Mbps	~0%(very few)	~89%
Windows	~150000Mbps	~5%	~14%

Compared with Project_2 which concurrency server without threadpool while the project 3 program is way more efficient therefore obviously the throughput increase around 20%.

(2)

\Client proto	1	2	5	10	30
TCP	~200000Mbps	~200000Mbps	~200000Mbps	~180000Mbps	~160000Mbps
UDP	~300000Mbps	~300000Mbps	~300000Mbps	~280000Mbps	~270000Mbps

(3)

	Throughput (1 Client)	20 Clients
Non-persistent	~200000Mbps	~160000Mbps
Persistent	~200000Mbps	~190000Mbps

As Non-persistent mode costs extra time on setting up connection therefore by accumulating and gradually Persistent one will handle more requests.

(4)

Cubic: Has higher throughput and performs better under low-loss network

BBR: Recovers faster from packet loss event and maintains higher throughput in lossy network

In conclude TCP BBR is better in lossy network (random packet loss rate > 0) as it recovers soon and sustainability.