

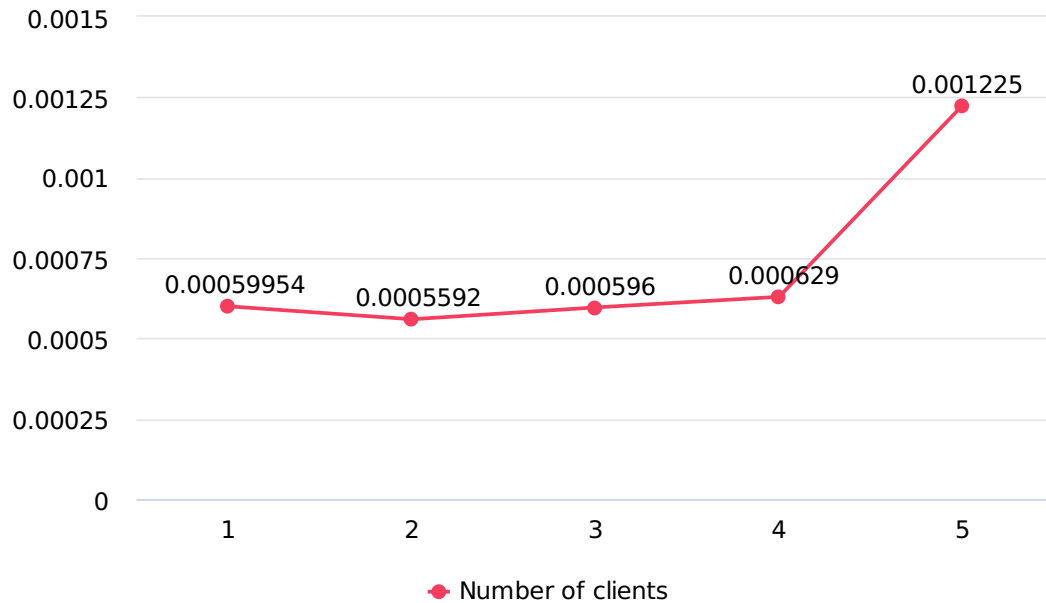
Evaluation Doc

PART 1 : Socket Connection and Handwritten Thread Pool

- **Lookup Method : For 3000 iterations, the response time is in seconds**

# Clients	1	2	3	4	5
Average Times	0.00059954	0.0005592	0.000596	0.000629	0.001225

Response Times with ThreadPool Size=2

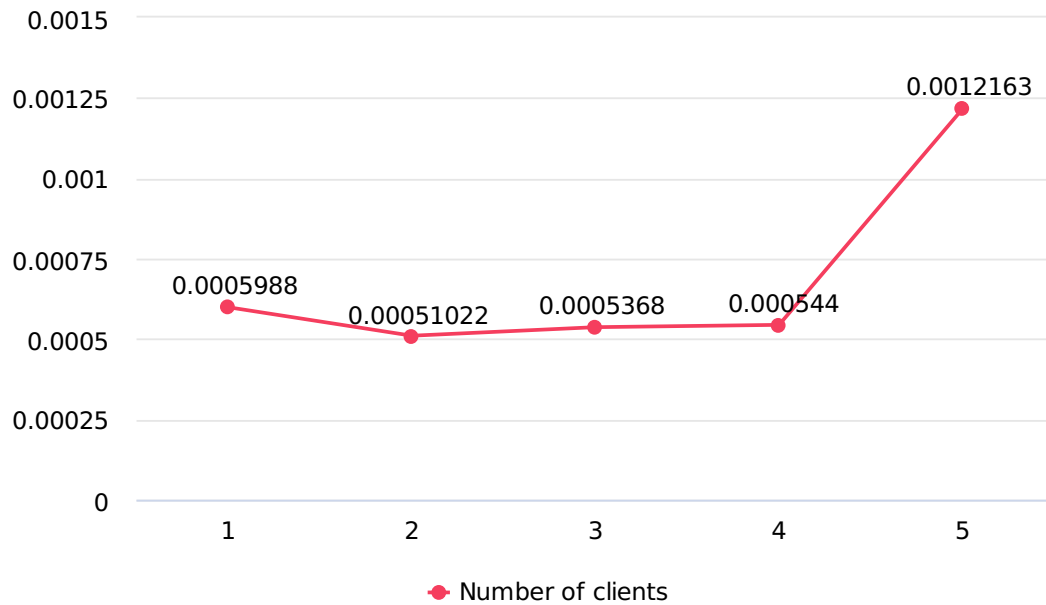


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- **Lookup Method : For 3000 iterations, the response time is in seconds**

# Clients	1	2	3	4	5
Average Times	0.0005988	0.00051022	0.0005368	0.000544	0.0012163

Response Times with ThreadPool Size=6

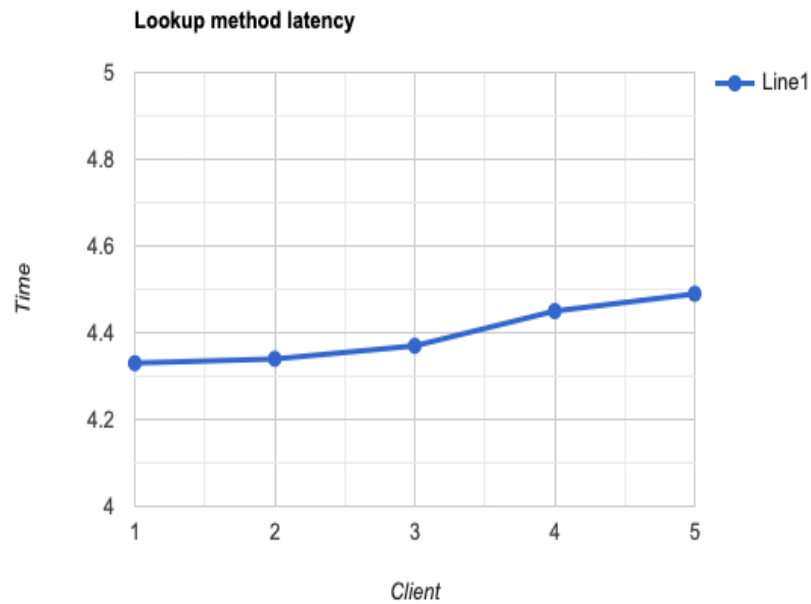


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PART 2 : GRPC

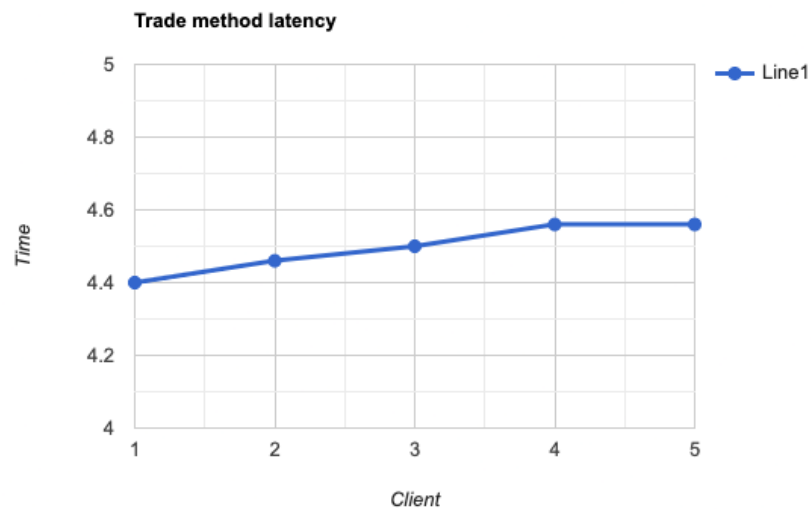
- **Lookup Method : For 3000 iterations, the response time is in milliseconds**
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# Clients	1	2	3	4	5
Average Times	4.33	4.34	4.37	4.45	4.49



- **Trade Method :** For 3000 iterations, the response time is in milliseconds
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#Clients	1	2	3	4	5
Average Time	4.40	4.46	4.55	4.56	4.56



Q1. How does the latency of Lookup compare across part 1 and part 2? Is one more efficient than the other?

Ans. The lookup response time is less in the case of Part1 than Part2. This is because Part1 uses socket connection which is faster whereas Part2 uses gRPC. Also, gRPC operates over HTTP so there is an additional overhead for it.

Q2. How does latency change as the number of clients(load) is varied? Does a load increase impact response time ?

Ans. Some change in latency is observed as the number of clients is varied. Although observed change is not significant, increasing concurrent connections(clients) to the server adds some latency, as the increased threads handling client calls incur some overheads. In Part1, as the number of client increases, the response times increase. This is because more number of client processes results in more waiting time. Thus, the latency increases.

Q3.How does the latency of lookup compare to trade? You can measure latency of each by having clients only issue lookup requests and only issue trade requests and measure the latency of each separately. Does synchronization play a role in your design and impact performance of each?

Ans. The latency of lookup is lower as compared to trade. This is due to the presence of synchronization such as locks used in trade method for update operation on shared variable of traded volume of stocks. Locks are essential to ensure that when one thread/process is updating a shared variable, another thread/process cannot alter that variable. This is done to maintain consistency.

Q4.In part 1, what happens when the number of clients is larger the size of the static thread pool? Does the response time increase due to request waiting?

Ans. In the first graph of Part 1, the number of clients is 5 while the size of the static thread pool is 2 while in the second graph of Part 1, the number of clients is 5 while the size of the static thread pool is 6. In some cases, the response time of thread pool size 2 is more which can be because there are limited number of threads thus waiting time is more. The response time increases in case of smaller pool size because of increased waiting time of the threads.