Evaluation and Performance Measurement

Performance results:

Latency results without Docker:

Number of Clients	Lookup latency (s)	Trade latency (s)
1	0.008086	0.01299
2	0.009934	0.01496
3	0.011363	0.01435
4	0.012605	0.01496
5	0.014577	0.01574

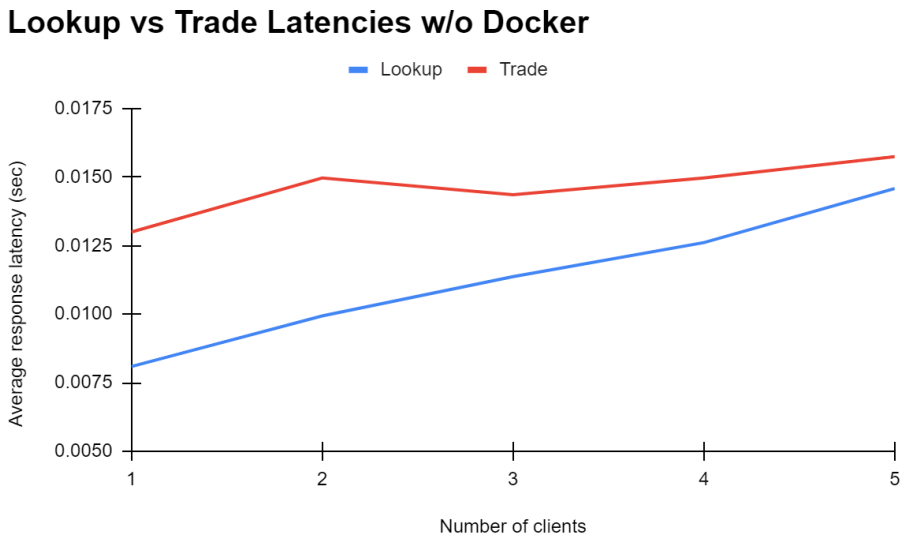
Latency results with Docker:

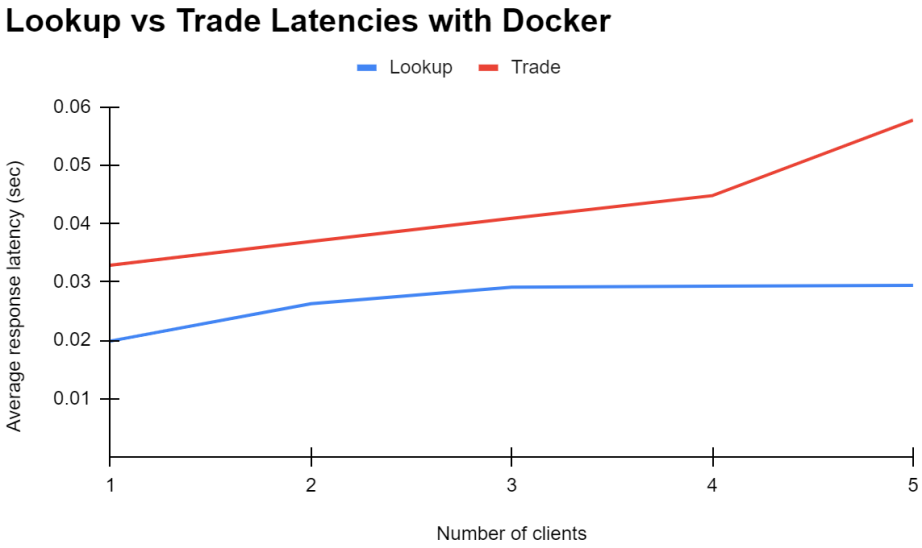
Number of Clients	Lookup latency (s) (Docker)	Trade latency (s) (Docker)
1	0.019866	0.032855
2	0.026262	0.03694
3	0.029108	0.040901
4	0.02926	0.044796
5	0.029415	0.057736

1. **Does the latency of the application change with and without Docker containers? Did virtualization add any overheads?**

Yes. The latency of the applications increased when Docker containers were used.
This is expected because Docker containers run in a virtualized environment, which adds an additional layer of abstraction between the application and the underlying hardware. This can result in increased latency, due to the additional overhead of virtualization. The same can be observed from the lookup and trade latencies from the above two tables. Latencies while using Docker are significantly higher than normal cases.

2. **How does the latency of the lookup requests compare to trade? Since trade requests involve all these microservices, while lookup requests only involve two microservices, does it impact the observed latency?**





Lookup latencies are lower than Trade latencies. This is expected because lookup functionality involves just communication from client to frontend to catalog while trade involves client to frontend to order to catalog. Since more microservices are involved in trade requests than lookup, the latency is relatively more during trade requests. The same can be observed from the above lookup vs trade graphs.

3. **How does the latency change as the number of clients change? Does it change for different types of requests?**

As the number of clients increases, the latencies are also increased. The same can be observed from the above graphs too. This is expected because, with the increase in the number of clients(load), the overall number of requests to the server increases. This can be observed in both lookup and trade requests, and in both normal and Docker cases.