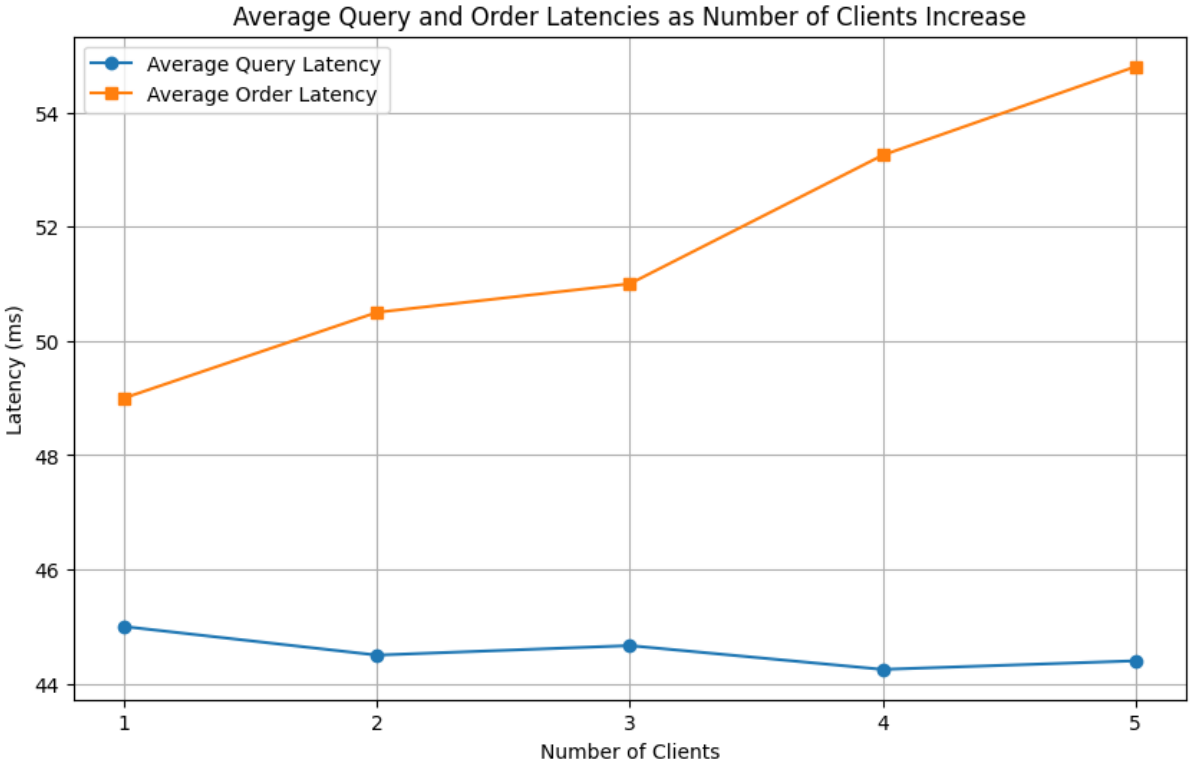
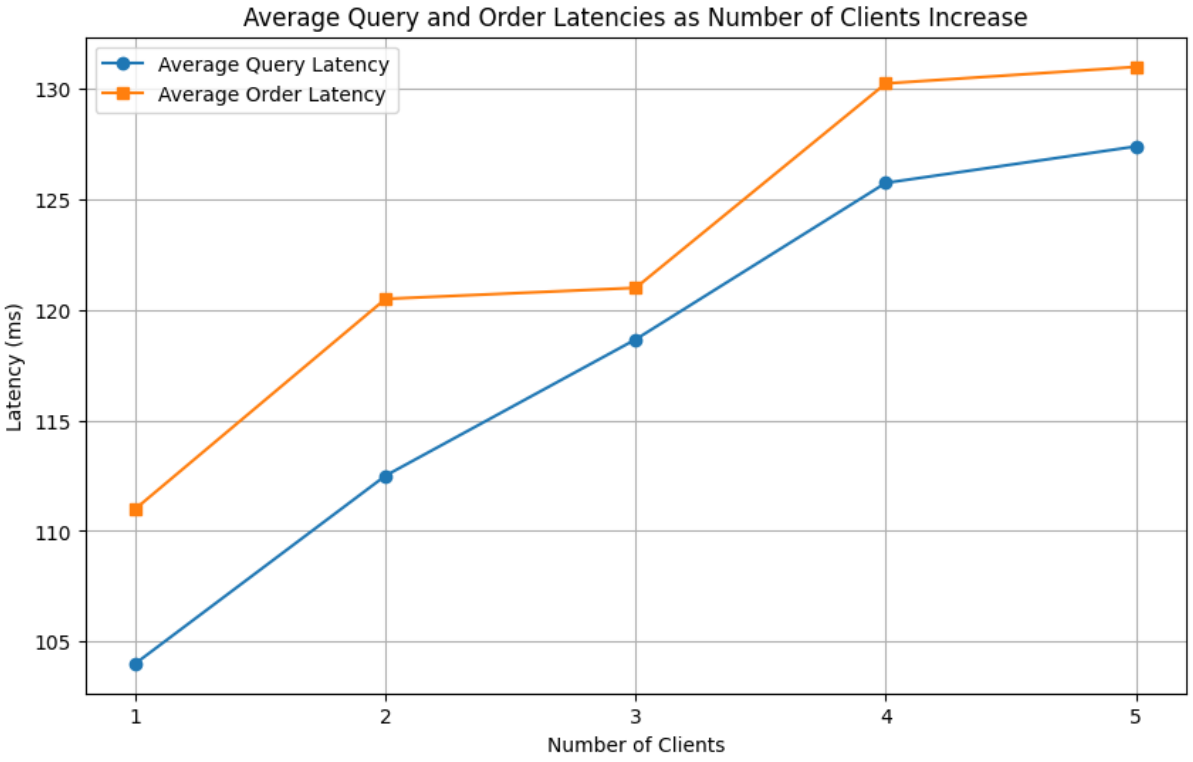
Evaluation Doc



The above image for microservices running as docker containers.



The above image is for microservices running independently on Edlab servers.

1. **Impact of Docker Containers on Latency:**

   Contrary to typical expectations where virtualization might introduce overhead, the observed lower latency with Docker containers suggests efficient container management and network configurations. Docker can indeed offer performance close to bare-metal if the containers are well-optimized and the host system is properly configured. This scenario indicates that Docker's lightweight virtualization mechanism does not significantly hinder performance and, in some cases, might even lead to better resource utilization and lower latency due to the consistent, isolated environments it provides for each microservice.

2. **Query vs. Buy Requests Latency:**

   The observation that query requests have lower latency than buy requests remains consistent and logical due to the complexity and the number of microservices involved in handling buy requests. The additional processing steps required for buy requests, including interfacing with more microservices, contribute to their higher latency. The efficiency of Docker in managing these microservices might minimize the latency difference, but

the inherent complexity of buy requests still leads to higher latency compared to query requests.

3. **Latency Changes with Client Load:**

   The finding that latency increases with the number of clients, but less so for Docker-contained applications, speaks to Docker's effective load management and resource allocation. Docker's network performance and the ability to limit resources per container can help manage the load more efficiently, leading to a less pronounced increase in latency as client numbers rise. This efficient handling of network traffic and resource allocation can mitigate the impact of increased load, maintaining lower latency across different types of requests.

This analysis underscores the benefits of containerization with Docker, particularly in maintaining or even reducing latency in a microservice architecture. It highlights the importance of container and network optimization to achieve performance improvements or to minimize the overhead typically associated with virtualization technologies.