

Performance Testing

Test Setup

Testing configurations include:

- Hardware: AMD Ryzen 3 with 4 cores, 60%.
- Load Testing: Locust was used to simulate multiple user requests and measure system performance.

Performance Metrics

Process Time Comparison

- Message Brokers: Average process time for handling a request 1.333926 s.
- Pipes and Filters: Average process time for handling a request 1.834446 s.

Resource Utilization

Message Brokers:

- Maximum RAM consumption: 40% of the system's available memory.
- Message Size Limit: 10MB.

Pipes and Filters:

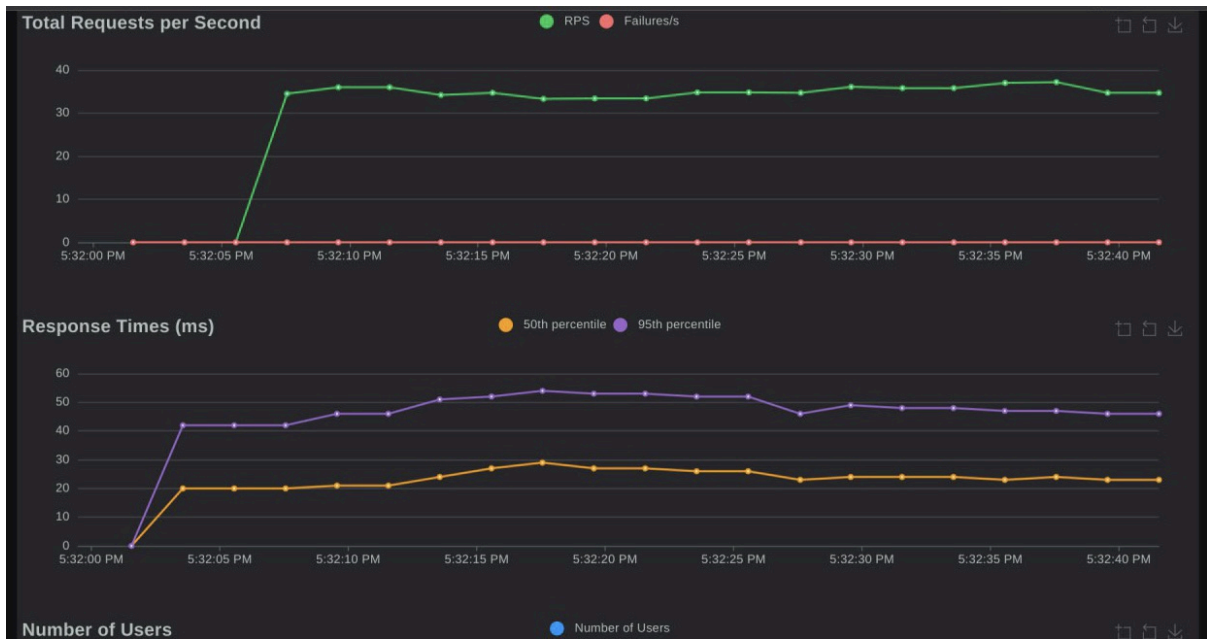
- Maximum RAM consumption: Similar to Message Brokers system, but due to smaller message sizes (1MB), this architecture potentially uses less memory.
- Message Size Limit: 1MB.

CPU Usage

- Both architectures used 4 cores at maximum 60% during testing on the AMD Ryzen 3 processor

Graphical Results of Performance Testing

Message Broker



Pipes and Filters



Performance Conclusion

Message Brokers showed better performance when handling large messages due to higher volume handling capabilities. Pipes and Filters performed better with smaller messages (1MB), but throughput decreased as the message size increased, mainly due to the limitation of message size and increased overhead in process communications.