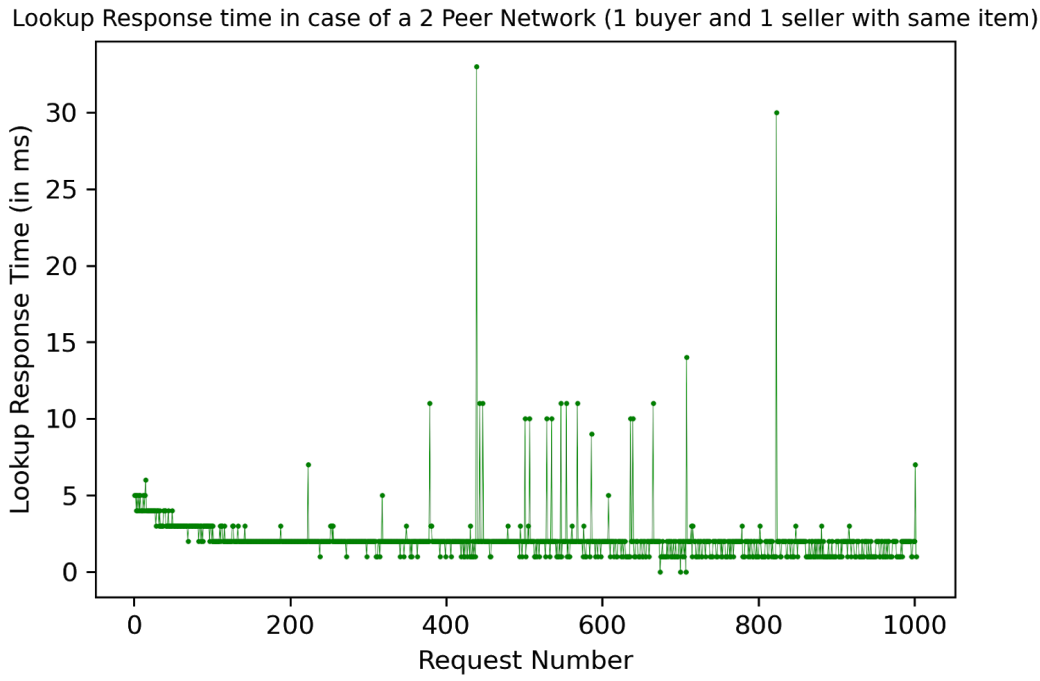
ANALYZING THE RESULTS OF OUR NETWORK

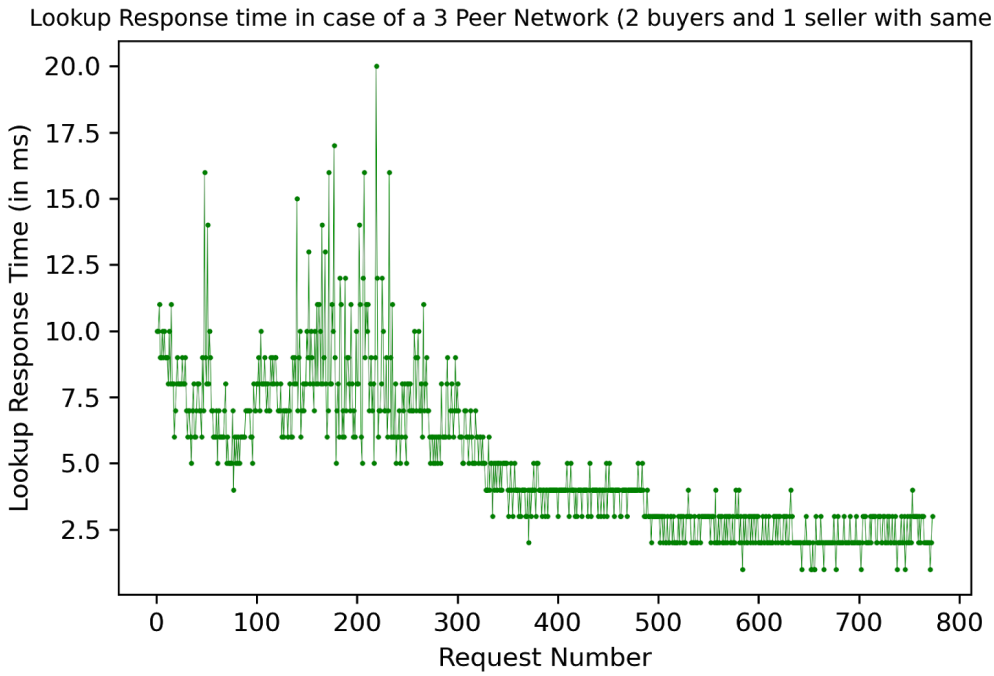
We set up different variations of our network to evaluate and analyze the performance metrics of the network when peers communicate with each other. To measure the time taken by buyer lookup requests we measure the variation of time taken with an increase in the number of buyers looking for an item to buy and spreading the buyers and the seller across servers.

In the following data, we make 1000 lookup calls in various scenarios and plot the time taken for each lookup call to complete. There are 4 scenarios that we are testing -
1. Local Machine 2 Peer network (1 buyer and 1 seller)
2. Local Machine 3 Peer network (2 buyers and 1 seller, all of them connected to each other)
3. Remote Server 2 Peer network (1 buyer and 1 seller, both on separate servers)
4. Remote Server 3 Peer network (2 buyers and 1 seller, all of them connected to each other, both buyers are on Machine 1 and seller is on Machine 2)
It is assumed that in all of the above cases, the item being sold and bought is the same (‘Fish’ in our case).

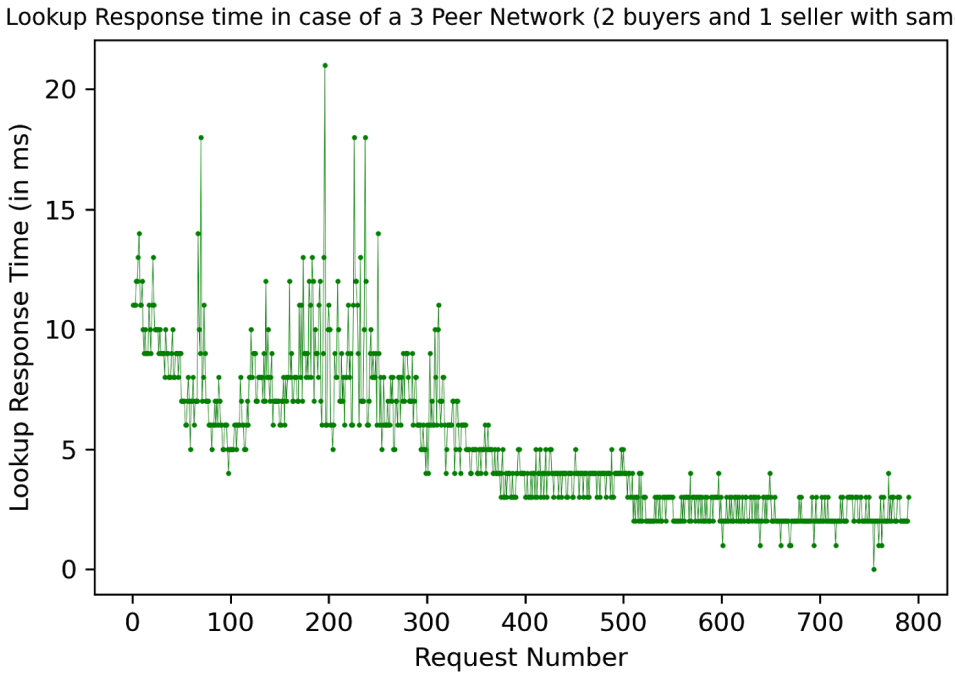
The following graphs are measurements on a local machine:



The average value for the above graph - 2.15 ms

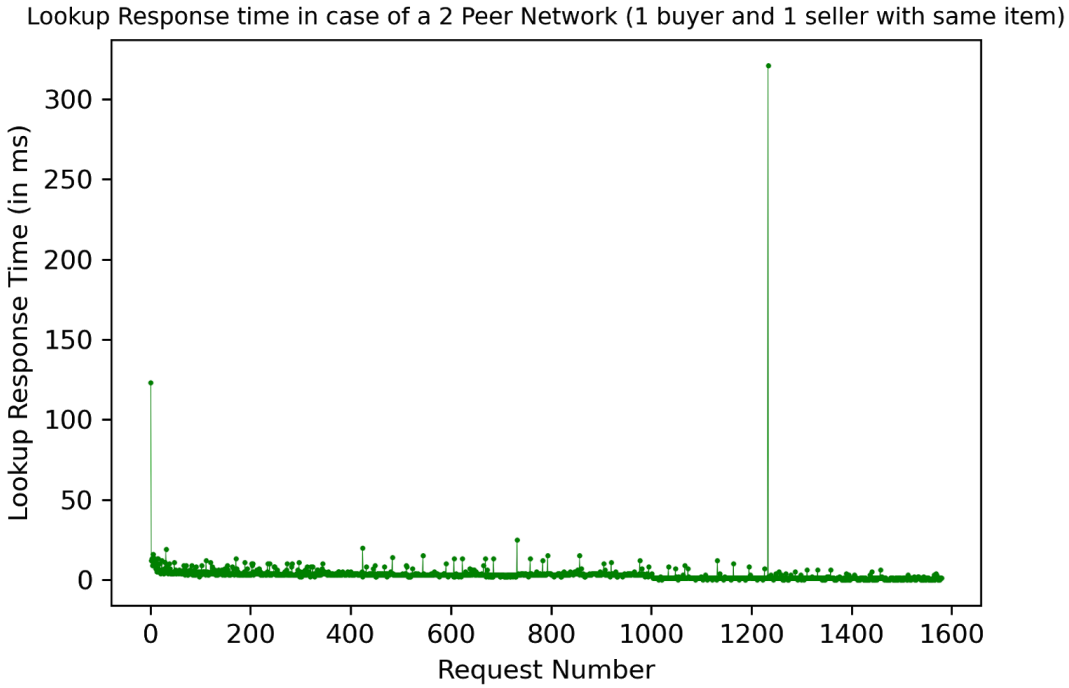


The average value for the above graph - 4.96 ms

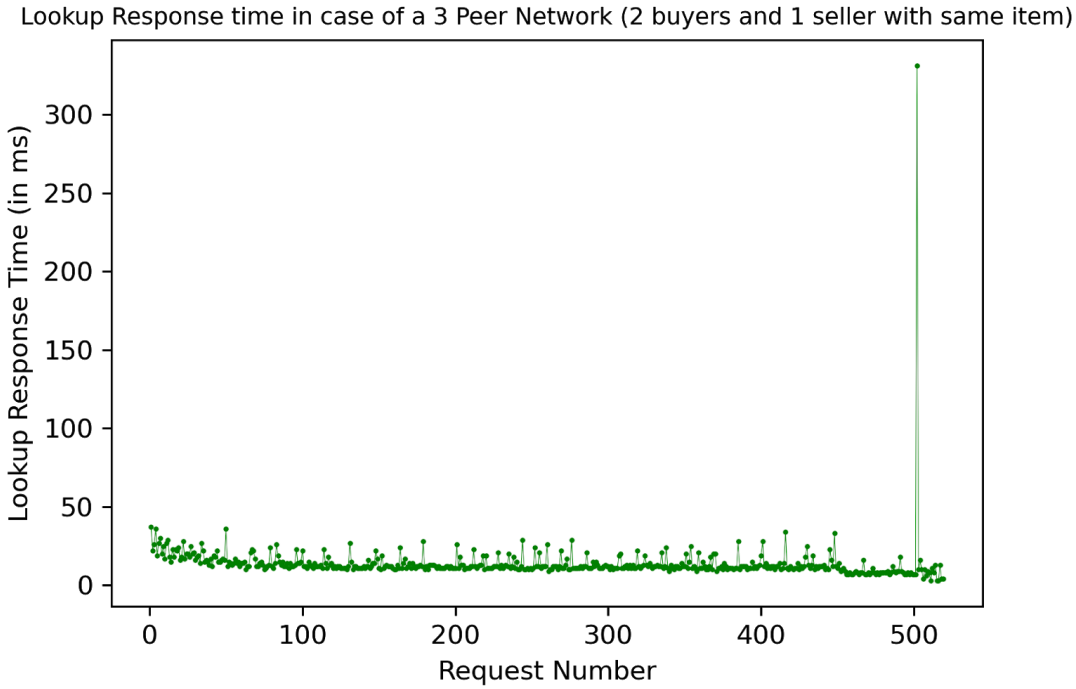


The average value for the above graph - 5.08ms

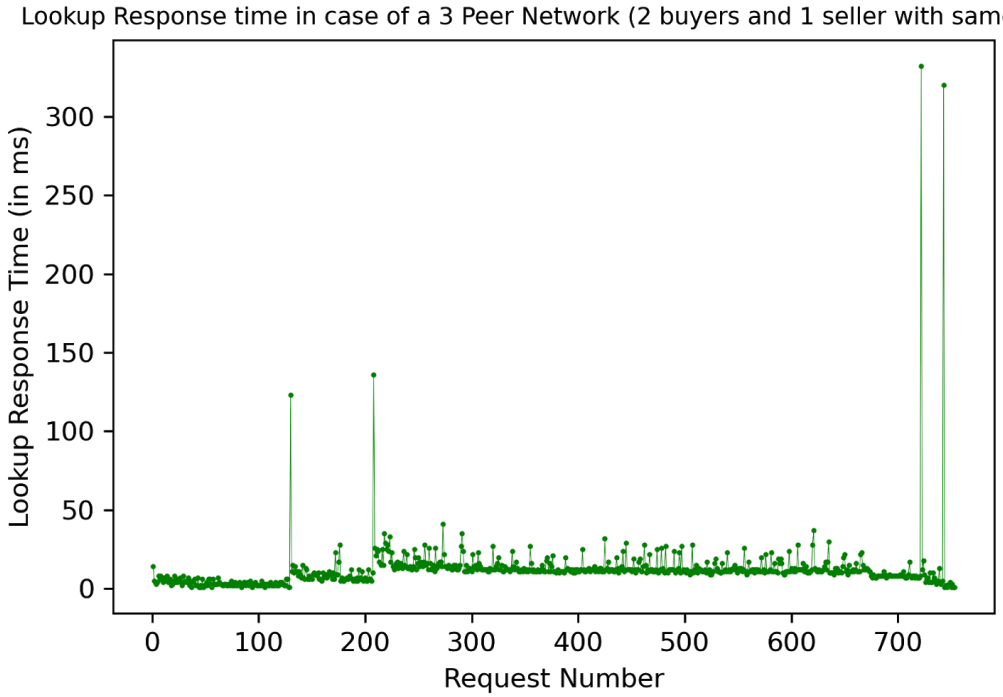
The following graphs are measurements on multiple servers:



The average value for the above graph - 3.24ms



The average value for the above graph - 13.95ms



The average value for the above graph - 12.11ms

Results of the above experiment

	1 BUYER 1 SELLER	2 BUYERS 1 SELLER	
		BUYER 1	BUYER 2
ON LOCAL MACHINE	2.15 ms	4.96 ms	5.08ms
ON SERVERS	3.24ms	13.95ms	12.11ms

Inference:

1. We observe that communication between servers takes more time on average as compared to communication between processes on a local machine. (3.24ms vs 2.15ms). This aligns with our understanding of local inter-process calls and remote inter-process.
2. We also observe that the lookup response time increases with the complexity in the network. In case of 3 peers, the lookup time observed is 13.95ms/12.11ms (depending upon the buyer peer) as compared to the case of 2 peers, when the lookup time is 3.24ms. This also aligns with our understanding that the lookup request response time will increase when the number of peers to be ‘looked up’ increases, which is correlated with the complexity of the network.