Lab 2

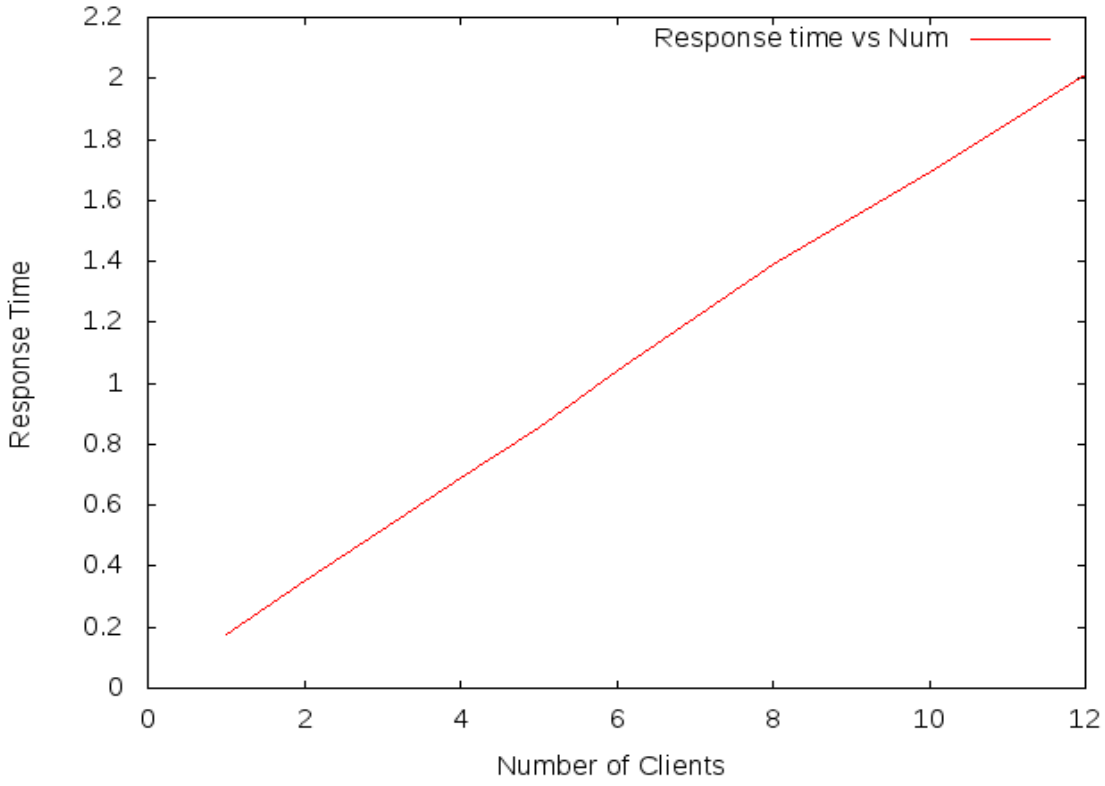
1.
Hardware Specifications:

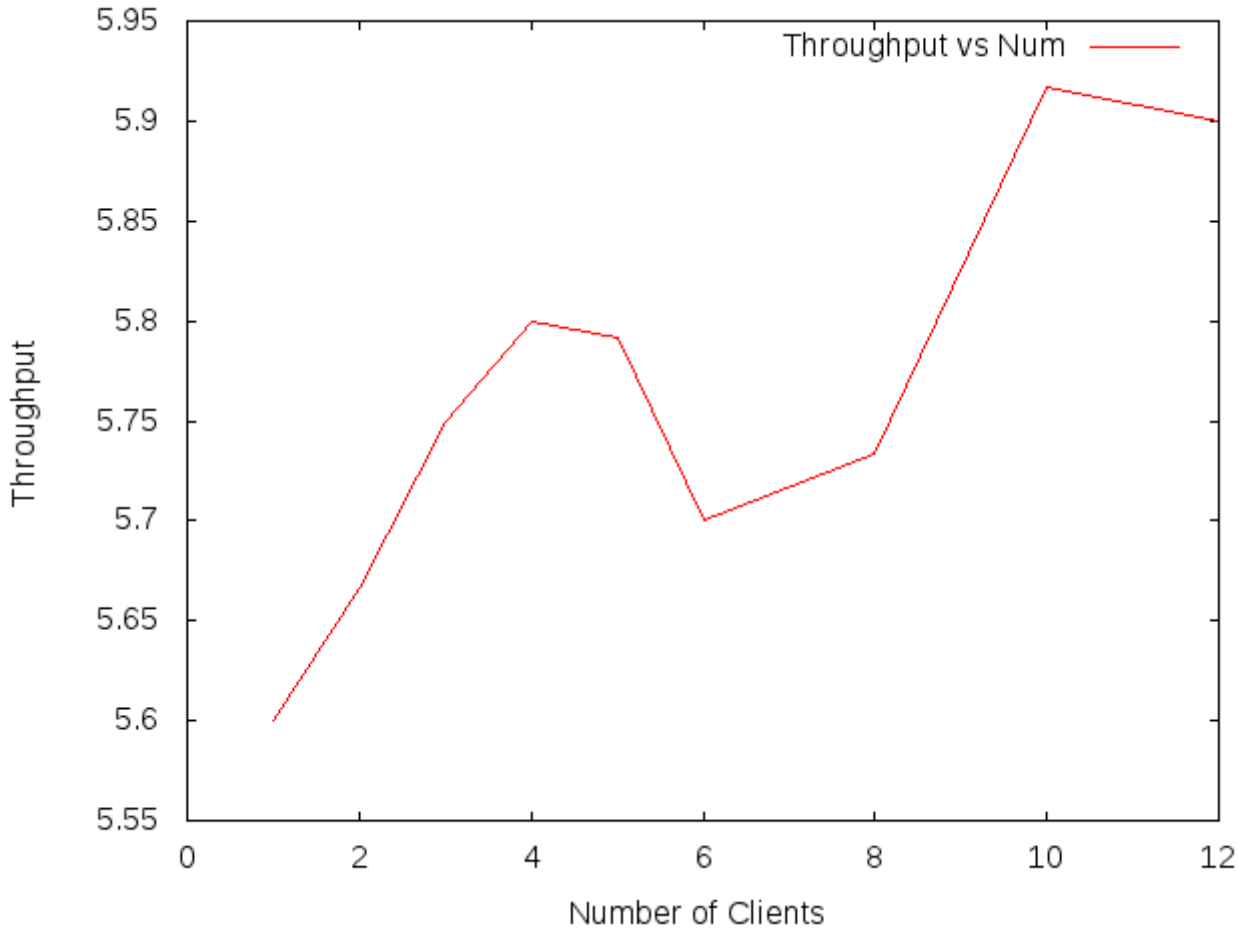
Server:
Number of cores = 2
Total Memory = 3611412 kB
MemFree = 181992 kB

Client:
Number of cores = 2
Total Memory = 3950328 kB
MemFree= 139696 kB

Maximum read bandwidth of the disk on the server in MB/s = 57.52 MBps = 28 files per second
Maximum network bandwidth you can get between your client and server machines using iperf = 95 Mbps = 5.9 files per second

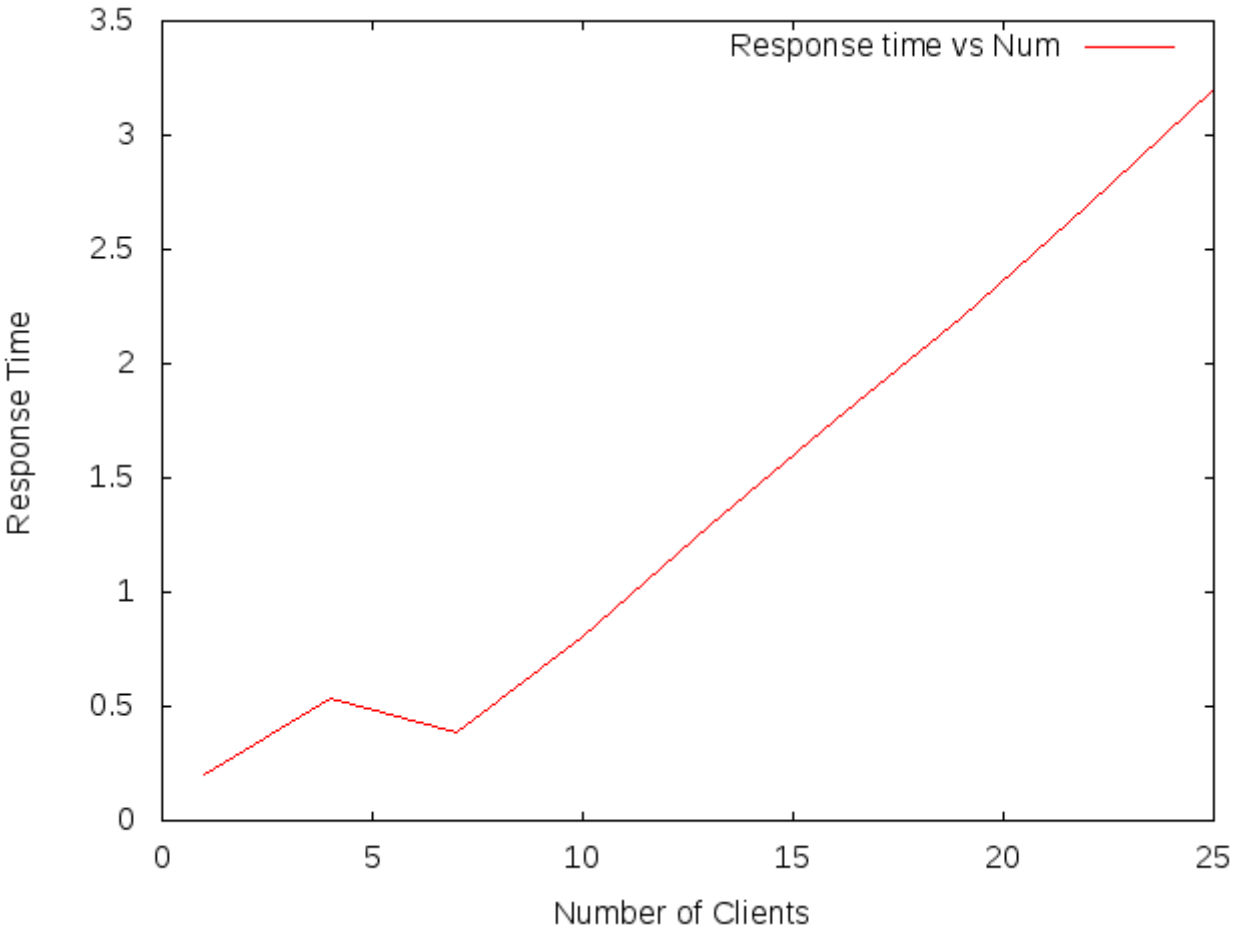
2.
(a) The optimal value of N : 1
(b) For N lower than optimal value, throughput increases and response time increases slightly. For N higher than optimal value, throughput becomes constant and response time increases more steeply.



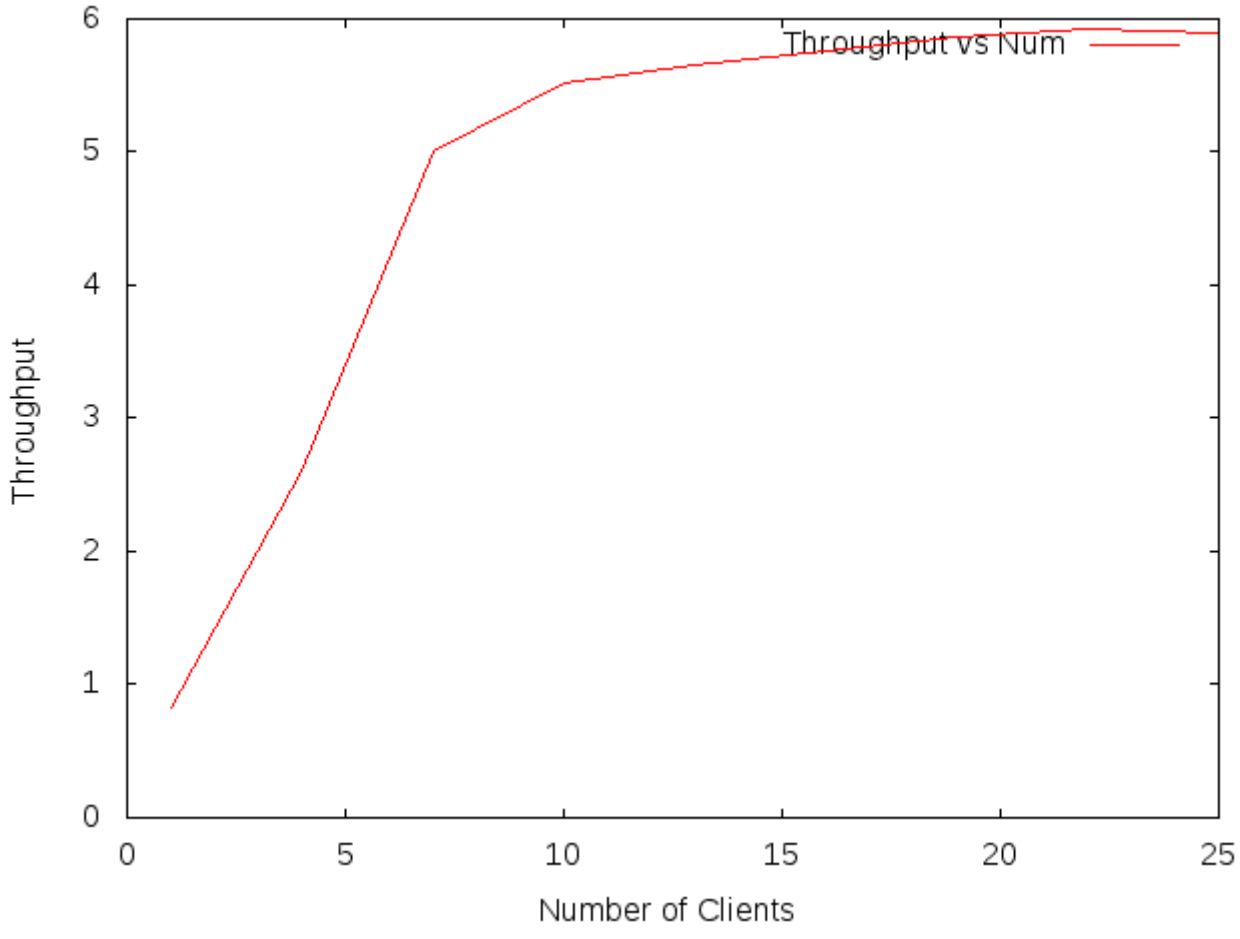


(c) The bottleneck resource is Network.
We ran iperf to find the network bandwidth, n = 95 Mbps
We also ran top and iostat while doing the experiment, and both of them showed CPU and disk utilization well below saturation.
(d)At optimal value, our throughput was, t = 5.8 files/second.
So, network utilization was 2MB*5.8*8 bits/second = 92.8 Mbps which is almost equal to the network bandwidth.

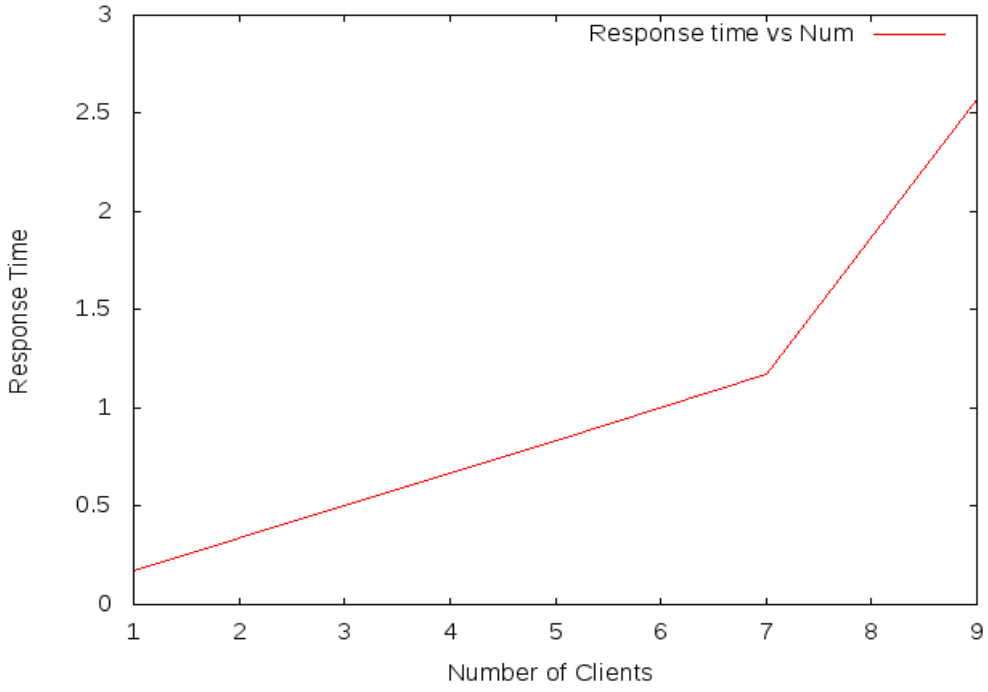
3.
(a) The optimal value of N : 10
(b) For N lower than optimal value, throughput increases almost linearly and response time increases slightly.
For N higher than optimal value, throughput becomes constant and response time increases more steeply.

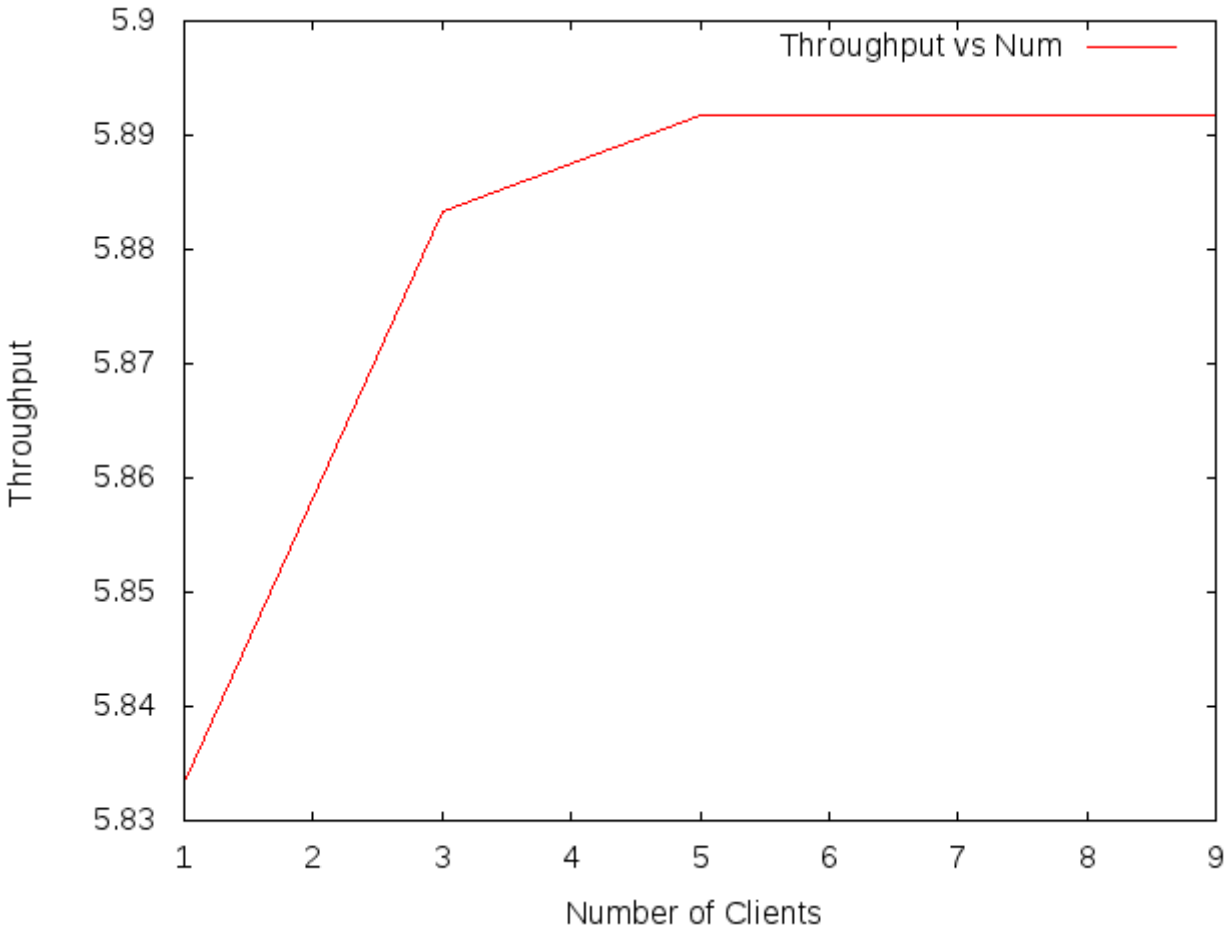


(c) The bottleneck resource is Network.



We ran iperf to find the network bandwidth, n = 95 Mbps
We also ran top and iostat while doing the experiment, and both of them showed CPU and disk utilization well below saturation.
(d)At optimal value, our throughput was, t = 5.5 files/second.
So, network utilization was 2MB*5.5*8 bits/second = 88 Mbps which is slightly less than network bandwidth. It increases very gradually after N = 10 to almost 5.9 files/sec.
4.
(a) The optimal value of N : 5 (but there was no significant increase since 1)
(b) For N lower than optimal value, throughput increases and response time increases slightly. For N higher than optimal value, throughput becomes constant and response time increases more steeply.





(c) The bottleneck resource is Network.
We ran iperf to find the network bandwidth, n = 95 Mbps
We also ran top and iostat while doing the experiment, and both of them showed CPU and disk utilization well below saturation.
(d)At optimal value, our throughput was, t = 5.89 files/second.
So, network utilization was 2MB*5.89*8 bits/second = 94.24 Mbps which is almost equal to the network bandwidth.