CS744 - PA4
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System:
Cores: 8, Processors 16
I have used core number 0 for single core server and 0-1 for multicore server and 5 to 15 for the load generator.

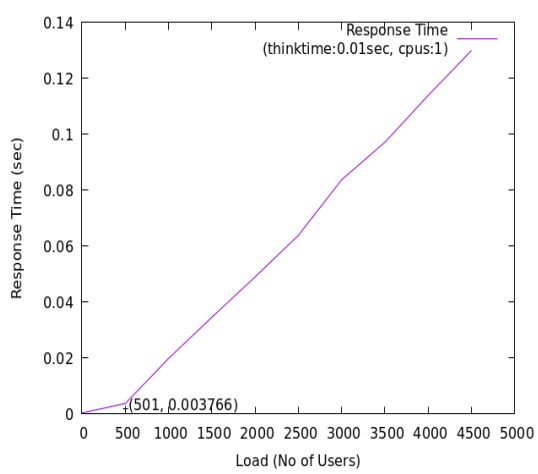
On server side:
I have kept threads = 50,
Listen Queue = 20000
Queue size = 20000

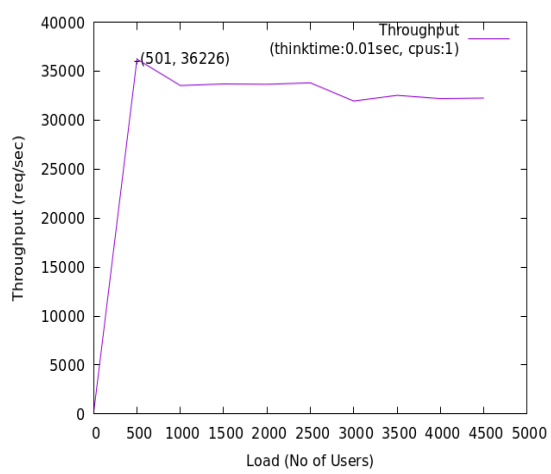
Load generator:
I have plotted for few cases as mentioned below,

Case 1:
Think time = 0.01
Test Duration = 60
Users = 5000

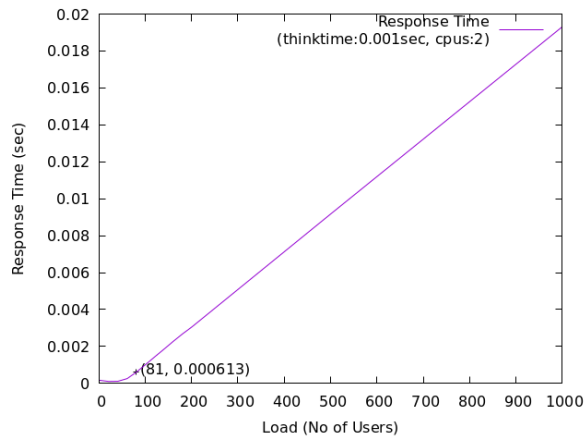
Case 2:
Think time = 0.001
Test Duration = 60
Users = 500

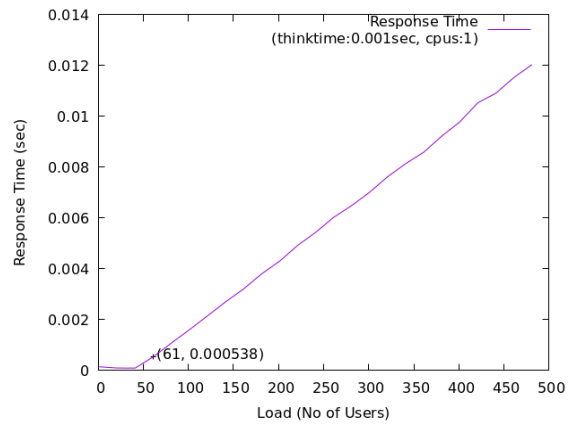
Here are my plots:



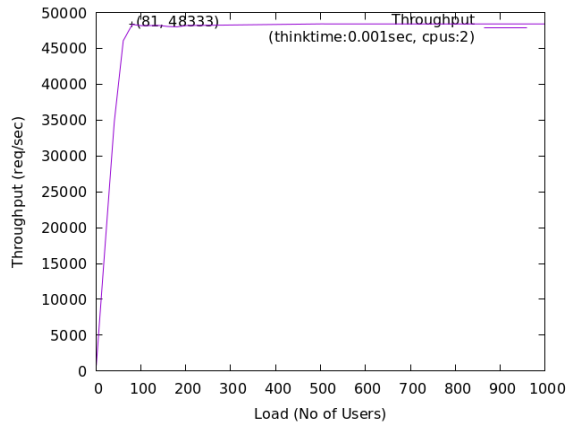


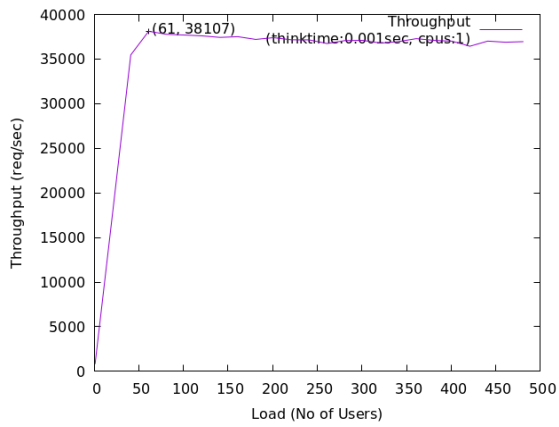
Response time and throughput for Case 1 respectively.





Response time plot for 2 processors and 1 processor respectively. For Case 2.





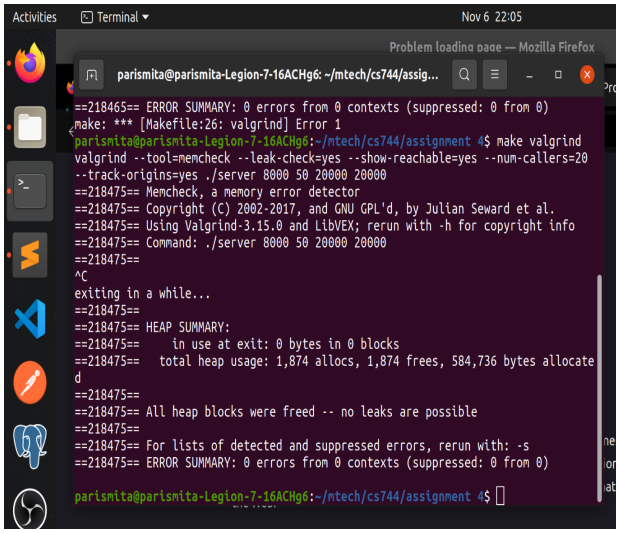
Throughput for double and single processor respectively for Case 2.

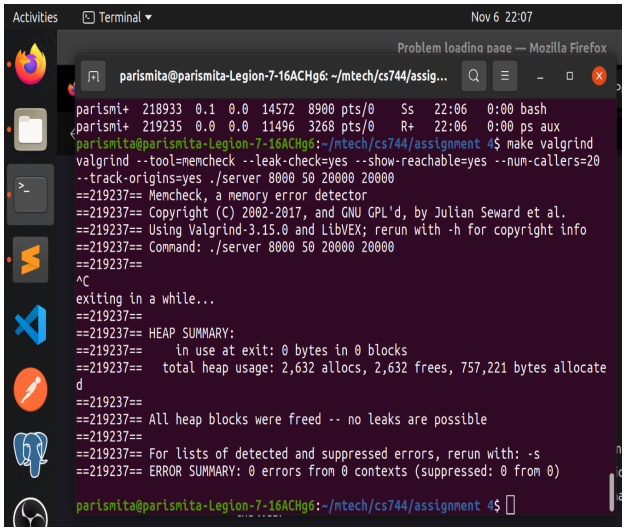
Observation: Closed loop testing.
For a single core, the throughput is going to be around 38000 req/sec. And response time is 0.538 msec when I have my think time as 0.001 sec and the saturation point is 61 users. Hence my system capacity for single core is 38000 req/sec and service demand of bottleneck which is the CPU in this case, as CPU is 100% utilized, is 26 microsec. The turnaround time is coming to be 1.538 msec. The optional user value is around 57 users and my plot shows it as 61 users which is nearby as I load in units of 20 req/sec. Hence proves that my results are accurate.

Similarly for 2 cores, throughput is saturating at 48,000 req/sec. Hence capacity is 48000 req/sec and response time at that point is 0.613msec for 81 users. The CPU was utilized 100% hence its the bottleneck. The TAT is around 1.6msec as think-time is 0.001sec. The optimal values for users come around 72 users which is similar to my results.

The bottleneck is the CPU for all the above cases, I have checked it using top.

Here’s my report on valgrind memory leak.





To avoid possible leaks on crtl+c, I have used a signal handler which sets a flag to exit the thread and the server is closed after all threads are exited.

Additional Code to server:

1) Introduction to flag
2) Signal handler
3) Closing socket fd where it was not closed
4) Freeing heap variables in http_server.cpp