Lab: Load Testing

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CS 744 Programming Assignment 4

My System Configuration :

CPU Cores : 4
Number of threads threads per core : 2
Total Processors : 8

Frequency of Processor 0 : 1800.000 Mhz
Frequency of Processor 1 : 1800.000 Mhz
Frequency of Processor 2 : 1800.000 Mhz
Frequency of Processor 3 : 1800.000 Mhz
Frequency of Processor 4 : 1800.000 Mhz
Frequency of Processor 5 : 1800.000 Mhz
Frequency of Processor 6 : 800.016 Mhz
Frequency of Processor 7 : 800.020 Mhz

Architecture of the CPU : x86_64
CPU op-mode : 32 bits, 64 bits
Byte Order : Little Endian
Address Size : 39 bits physical, 48 bits virtual

Total Memory : 8023152 kB

Load Testing Results :

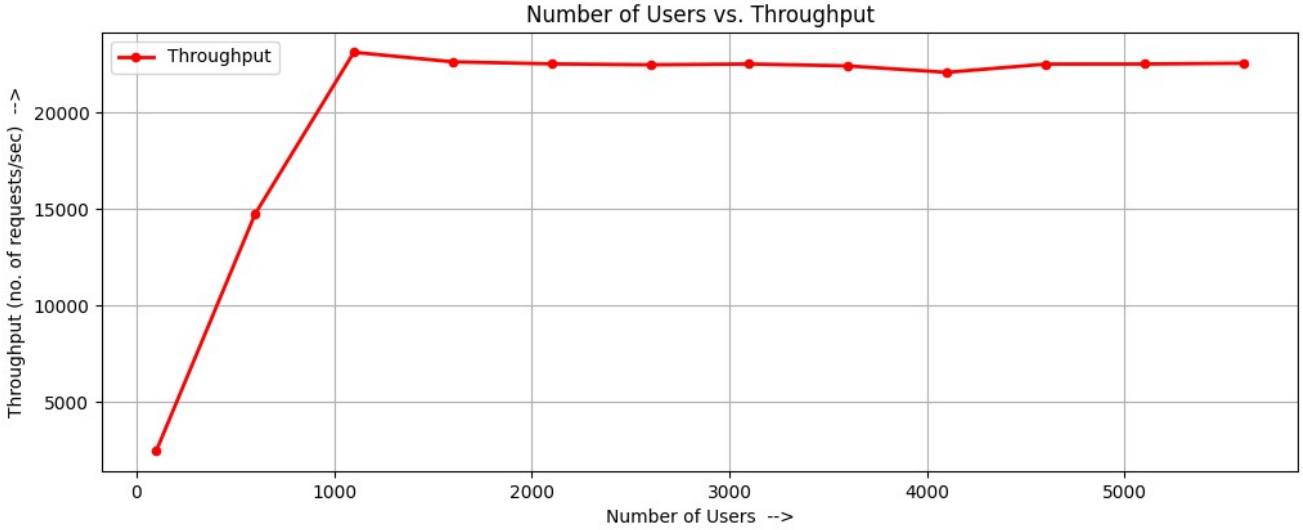
Server is running on core 0.

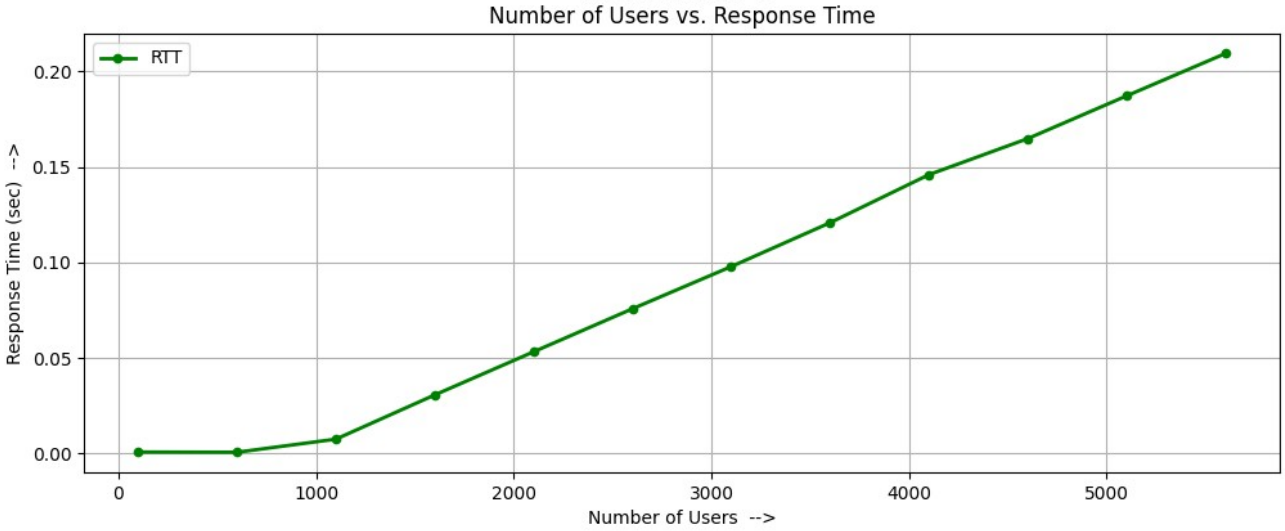
Load Generator is running on core 1,2,3.

Below are the graphs snapshots :

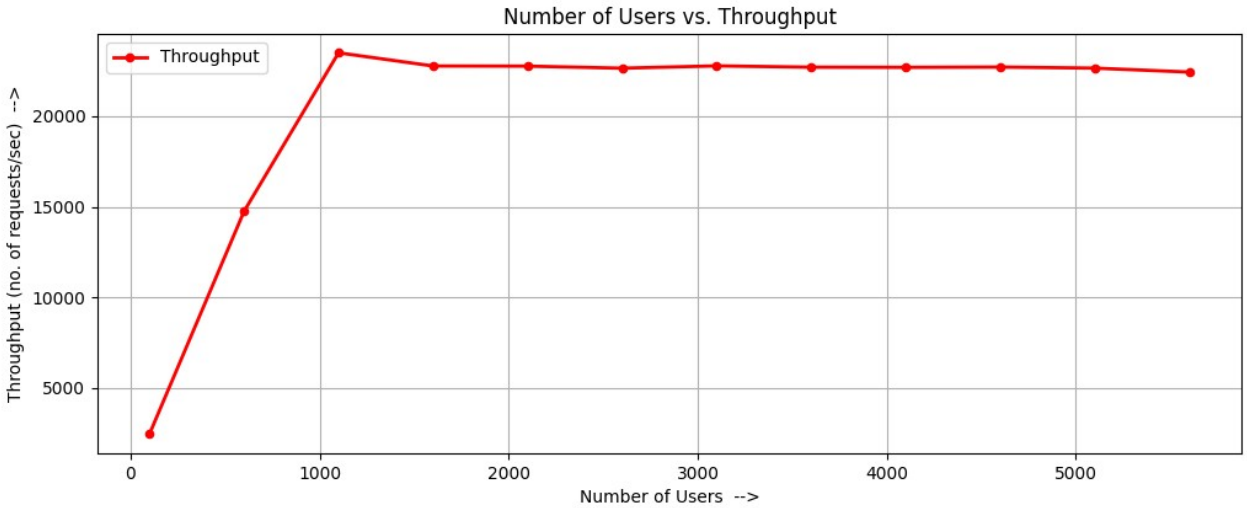
1. Think time : 0.04 sec , Test Duration : 60 sec

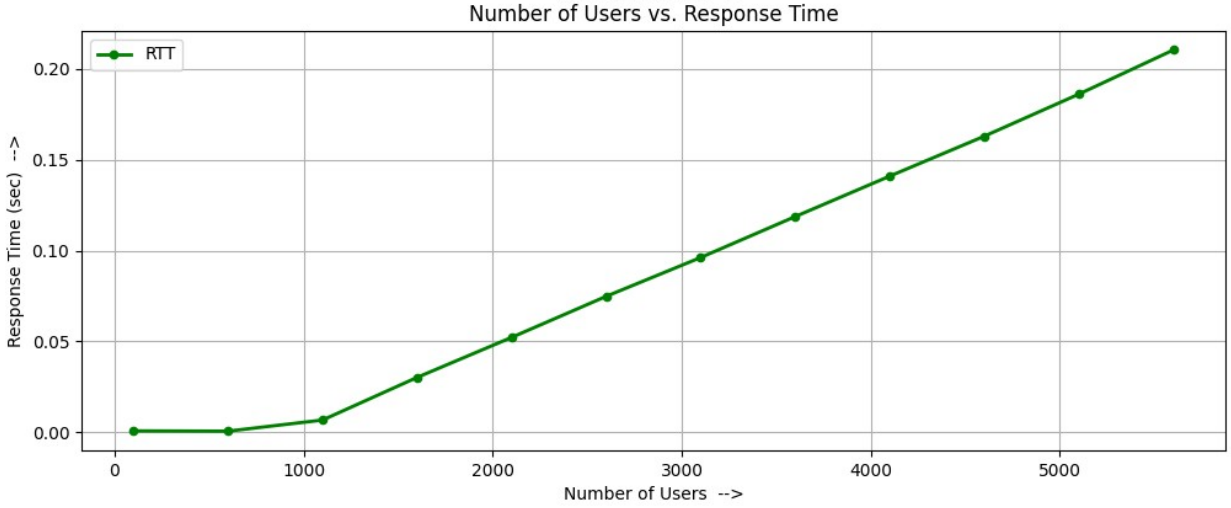
Snapshot 1 :

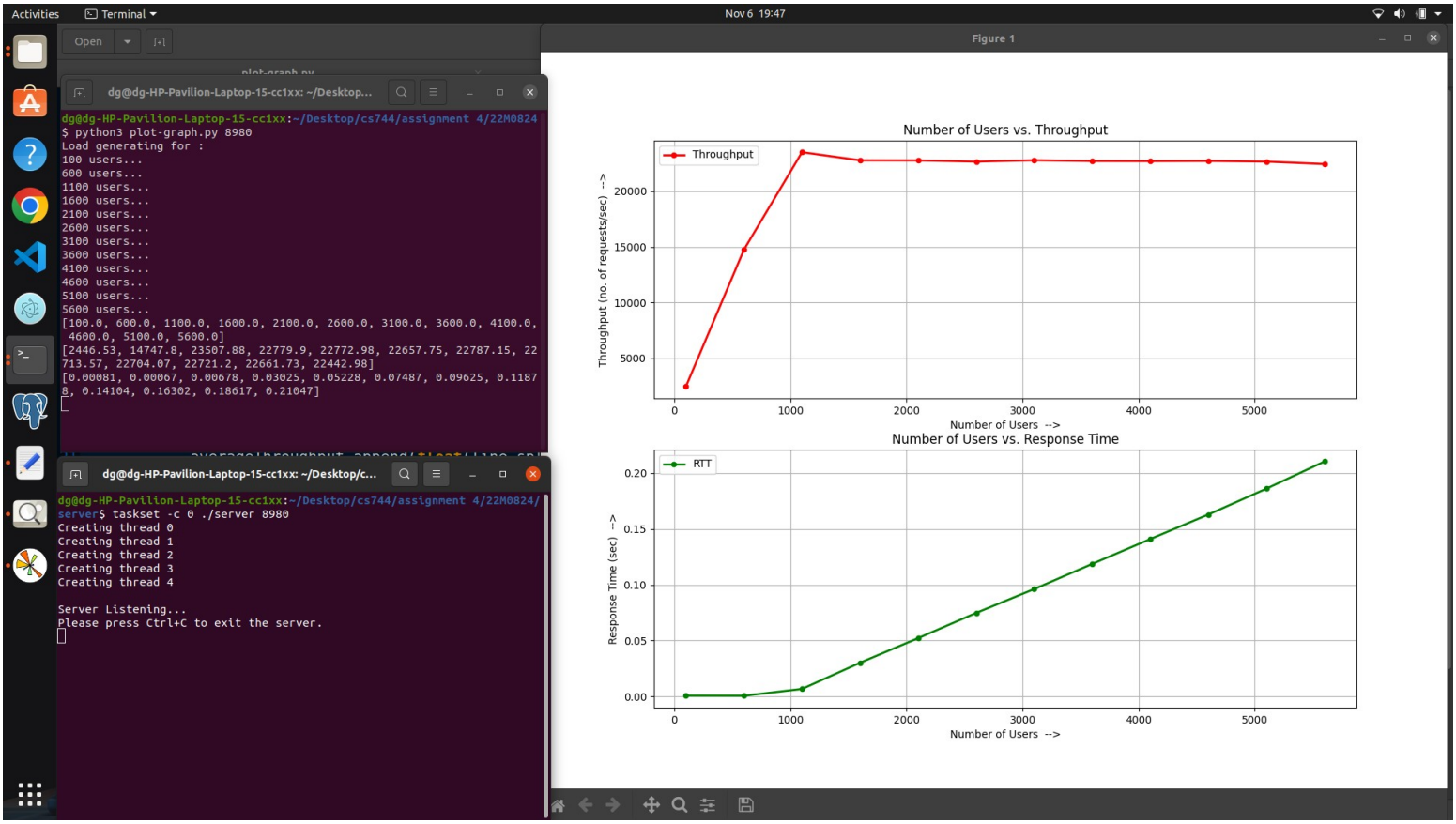




Snapshot 2 :


Number of Users vs. Throughput
Throughput
Throughput (no. of requests/sec) -->
20000
15000
10000
5000
0
1000
2000
3000
4000
5000
Number of Users -->


Number of Users vs. Response Time
RTT
Response Time (sec) -->
0.20
0.15
0.10
0.05
0.00
0
1000
2000
3000
4000
5000
Number of Users -->


Activities
Terminal
Nov 6 19:47
Open
dg@dg-HP-Pavilion-Laptop-15-cc1xx: ~/Desktop...
dg@dg-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/cs744/assignment 4/22M0824
$ python3 plot-graph.py 8980
Load generating for :
100 users...
600 users...
1100 users...
1600 users...
2100 users...
2600 users...
3100 users...
3600 users...
4100 users...
4600 users...
5100 users...
5600 users...
[100.0, 600.0, 1100.0, 1600.0, 2100.0, 2600.0, 3100.0, 3600.0, 4100.0, 4600.0, 5100.0, 5600.0]
[2446.53, 14747.8, 23507.88, 22779.9, 22772.98, 22657.75, 22787.15, 22713.57, 22704.07, 22721.2, 22661.73, 22442.98]
[0.00081, 0.00067, 0.00078, 0.03025, 0.05228, 0.07487, 0.09625, 0.11878, 0.14104, 0.16302, 0.18617, 0.21047]
dg@dg-HP-Pavilion-Laptop-15-cc1xx: ~/Desktop/c...
dg@dg-HP-Pavilion-Laptop-15-cc1xx:~/Desktop/cs744/assignment 4/22M0824/server
$ taskset -c 0 ./server 8980
Creating thread 0
Creating thread 1
Creating thread 2
Creating thread 3
Creating thread 4
Server Listening...
Please press Ctrl+C to exit the server.
Figure 1
Number of Users vs. Throughput
Throughput
Throughput (no. of requests/sec) -->
Number of Users vs. Response Time
RTT
Response Time (sec) -->
Number of Users -->

As this is Closed loop load testing, we can see that our average throughput is increasing along with the number of users and after some saturation point, it is staying nearly same/ throughput flattens (horizontal line in graph). Also, the response time is somewhat linearly increasing with increasing number of users.

Here we can see that the server saturation is happening at around 1100 users. Average throughput corresponding to 1100 users was approximately 23,507 requests/sec and Average Response time was approximately 0.00678 sec.

Also, by using htop, we are able to see that when we run our server on core 0, after a certain point, the core utilization is becoming 100% due to which the average throughput is staying nearly similar after that point and we are getting nearly a horizontal line in our graph. Because of this, we can conclude that CPU is becoming a bottleneck in this case.