

## Network Programming Assignment 2

### Files:

1. server.c
2. twoprocesses.c
3. twothreads.c
4. nonblockingio.c
5. blockingio.c
6. serverb.c (For part (e) and (f))
7. nonblockingconnect.c
8. multiplethreads.c

Compile the threads files using  
\$gcc -o exe twothreads.c -pthread

For part (e) and (f), use serverb.c file.

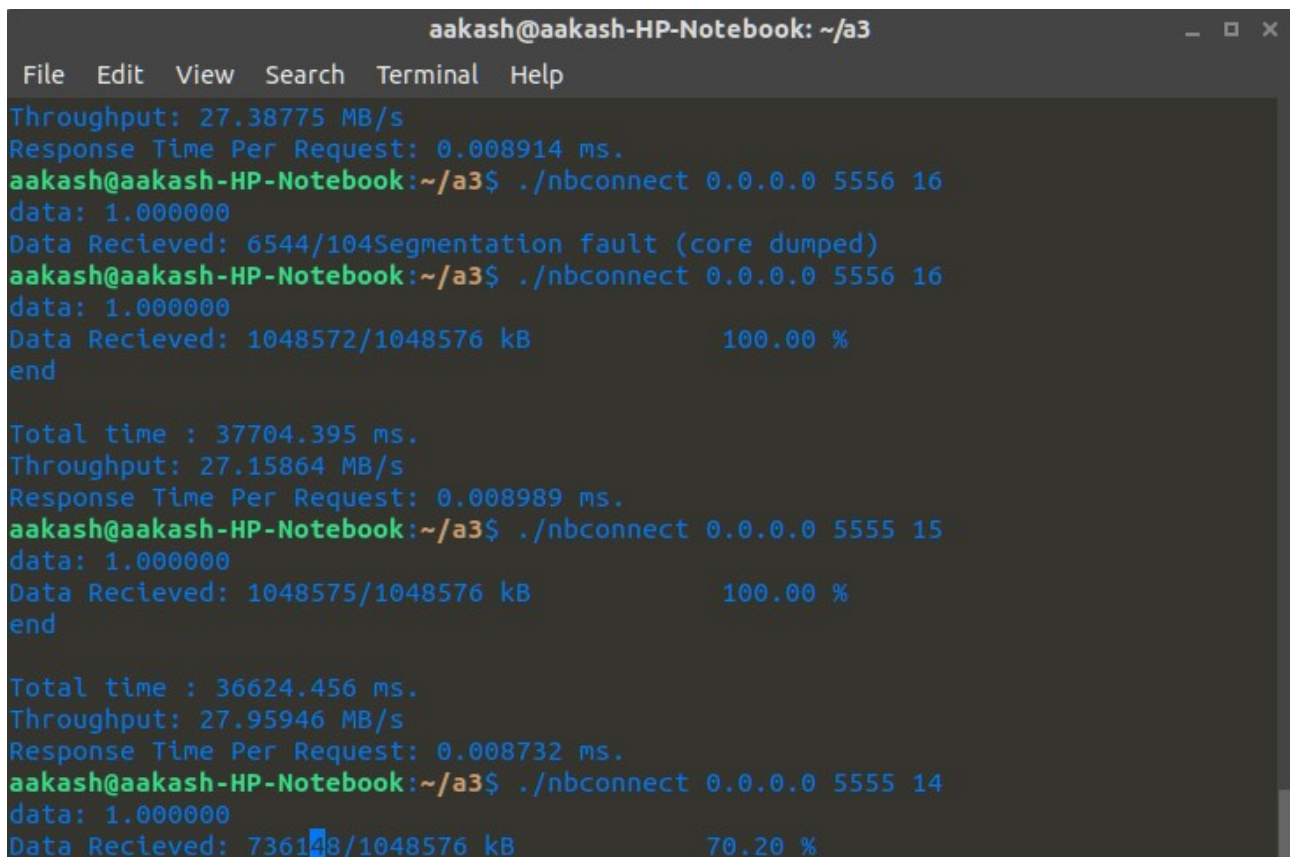
Usage: ./nonblockingconnect <server\_ip> <server\_port> <no\_connections>

Initially, no. of connections and data to be sent are exchanged, then required no. of connectons are generated from the client side.

Server then accepts all connections and starts sending data equally among all the sockets.

In each packet, server sends the offset where the given data string must be written in the output file.

On the client side, the progress is contnuosly shown as data recieved. After the recieve is complete, the client then displays: a) Total Time, b) Throughput, c) Response Time Per Request

A screenshot of a terminal window titled 'aakash@aakash-HP-Notebook: ~/a3'. The terminal shows the output of a network program. It displays throughput and response time for three different connection counts (16, 15, and 14). The first two runs show 100% data received, while the third run shows 70.20% data received. The terminal text is as follows:

```
aakash@aakash-HP-Notebook: ~/a3
File Edit View Search Terminal Help
Throughput: 27.38775 MB/s
Response Time Per Request: 0.008914 ms.
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5556 16
data: 1.000000
Data Recieved: 6544/104Segmentation fault (core dumped)
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5556 16
data: 1.000000
Data Recieved: 1048572/1048576 kB          100.00 %
end
Total time : 37704.395 ms.
Throughput: 27.15864 MB/s
Response Time Per Request: 0.008989 ms.
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5555 15
data: 1.000000
Data Recieved: 1048575/1048576 kB          100.00 %
end
Total time : 36624.456 ms.
Throughput: 27.95946 MB/s
Response Time Per Request: 0.008732 ms.
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5555 14
data: 1.000000
Data Recieved: 736148/1048576 kB          70.20 %
```

Progress Display

```
aakash@aakash-HP-Notebook: ~/a3
File Edit View Search Terminal Help

Total time : 40741.199 ms.
Throughput: 25.13426 MB/s
Response Time Per Request: 0.009713 ms.
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5556 12
data: 1.000000
Data Recieved: 793520Segmentation fault (core dumped)
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5556 12
data: 1.000000
Data Recieved: 1048555/1048576 kB          100.00 %
end

Total time : 38651.903 ms.
Throughput: 26.49287 MB/s
Response Time Per Request: 0.009215 ms.
aakash@aakash-HP-Notebook:~/a3$ ./nbconnect 0.0.0.0 5556 11
data: 1.000000
Data Recieved: 1048575/1048576 kB          100.00 %
end

Total time : 38406.664 ms.
Throughput: 26.66204 MB/s
Response Time Per Request: 0.009157 ms.
aakash@aakash-HP-Notebook:~/a3$
```

### Output Display

For part (a) to (d), user server.c file

Results:

No. Connections	Total Time (msec)	Throughput (MB/s)	Response Time Per Request (msec)
<u>Two Processes</u>	17110.238	59.84721	0.004079
<u>Two Threads</u>	16369.522	62.55528	0.003903
<u>Non Blocking IO</u>	70722.675	14.47909	0.016862
<u>Blocking IO</u>	48630.556	21.05672	0.011594