CSE-344 MIDTERM REPORT

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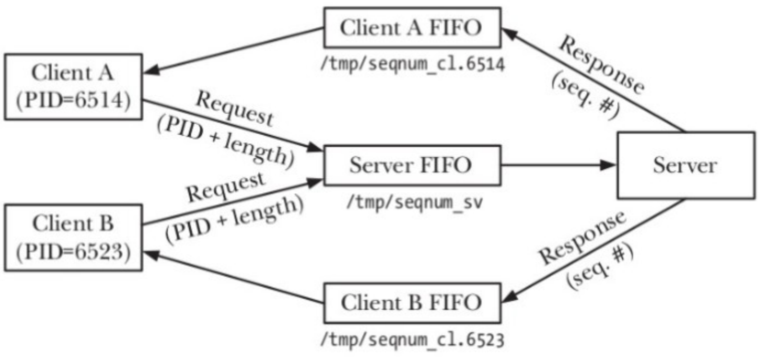
Problem Defination

Our task is to design and implement a file server that enables multiple clients to connect, access and modify the contents of files in a specific directory. The client–server model is a distributed application structure that partitions tasks between the providers of a resource or service, called servers, and service requesters, called clients.

Plan & Design

*Firstly each client creates a unique FIFO that the server uses for delivering the response for that client, and the server needs to know how to find each client's FIFO; either with a pre-agreed name template or by sending the fifo name as part of the request message.



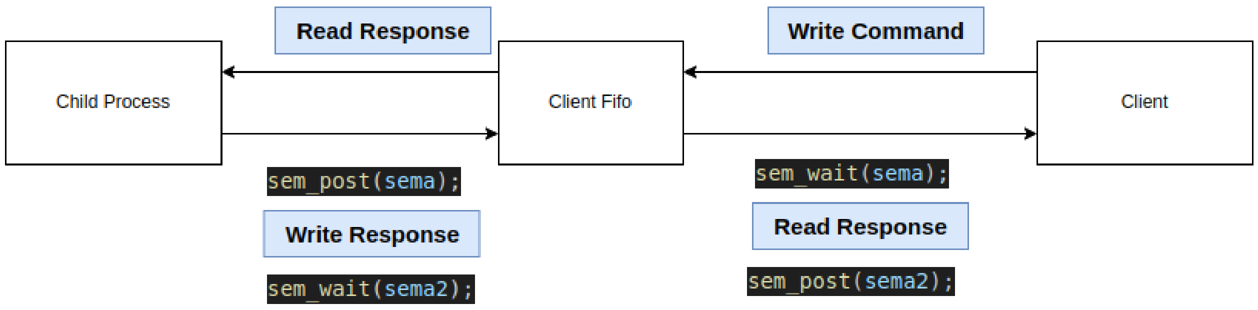
For instance the names of the client fifos can consist of the pids of the clients, thus easily ensuring uniqueness.

* After the connection is established, a process is created for each client's operations.

* If the connection is established, the client receives a "connected" message and can enter client commands.

*The communication between the client and the server's created processes will be carried out via a FIFO named "clientPid".

* I used two semaphores to prevent race conditions while performing read and write operations on the FIFO.



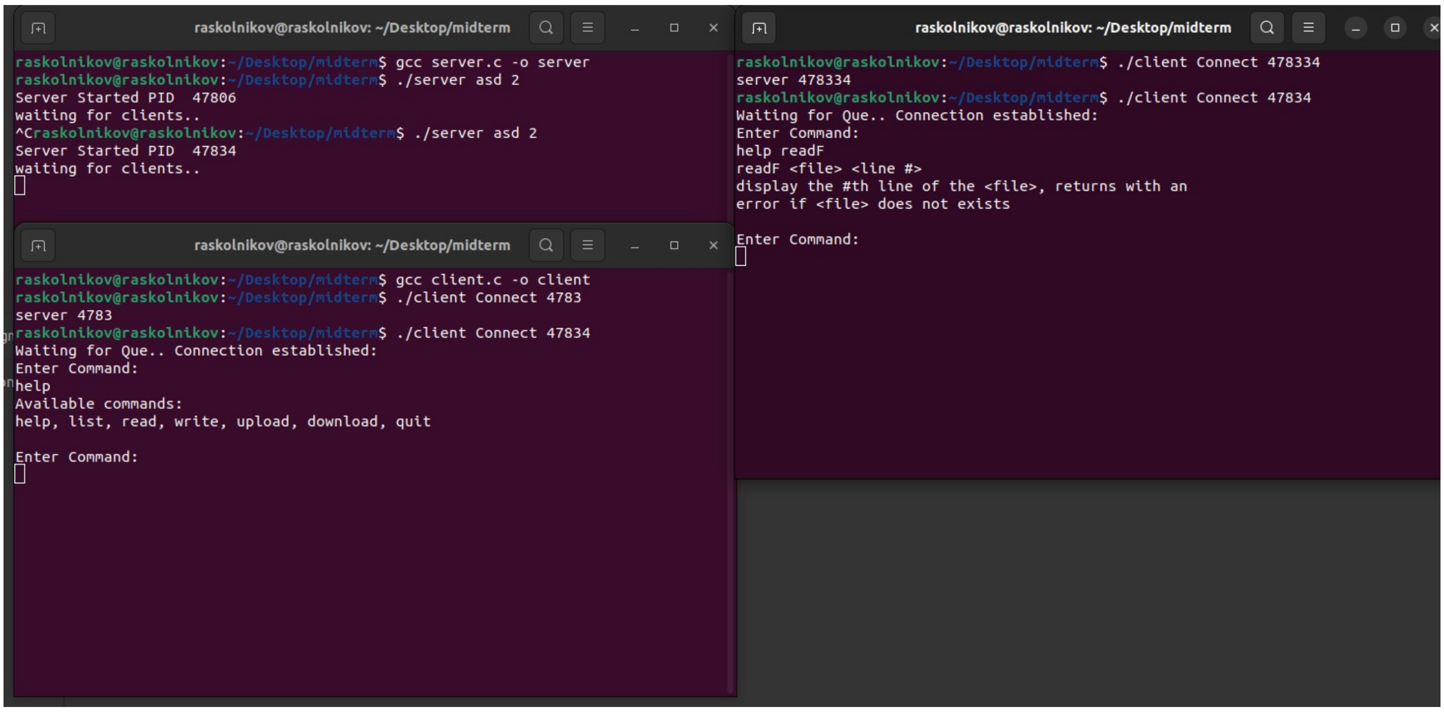
* In this process, the client sends a command, and the server process reads it. Then, the server process sends the response back to the client. These operations continue in this manner. Only one FIFO is used in these processes.

* When a Ctrl+C signal is sent to the server, it will close the child processes, disconnect the clients, and shut down the server.

*I have used semaphores to prevent race conditions in accessing the LOG FILE. Additionally, I have applied locking when writing to the file to ensure exclusive access.

TEST CASE

Multiple Client Connected


raskolnikov@raskolnikov: ~/Desktop/midterm
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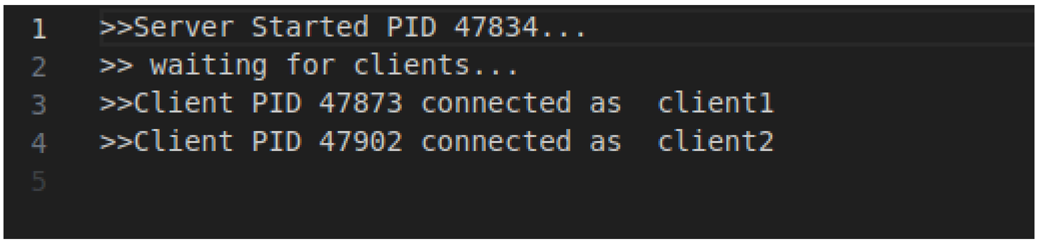
```
raskolnikov@raskolnikov:~/Desktop/midterm$ gcc server.c -o server
raskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  47806
waiting for clients..
^Craskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  47834
waiting for clients..
```

```
raskolnikov@raskolnikov:~/Desktop/midterm$ gcc client.c -o client
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 4783
server 4783
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 47834
Waiting for Que.. Connection established:
Enter Command:
help
Available commands:
help, list, read, write, upload, download, quit

Enter Command:
```

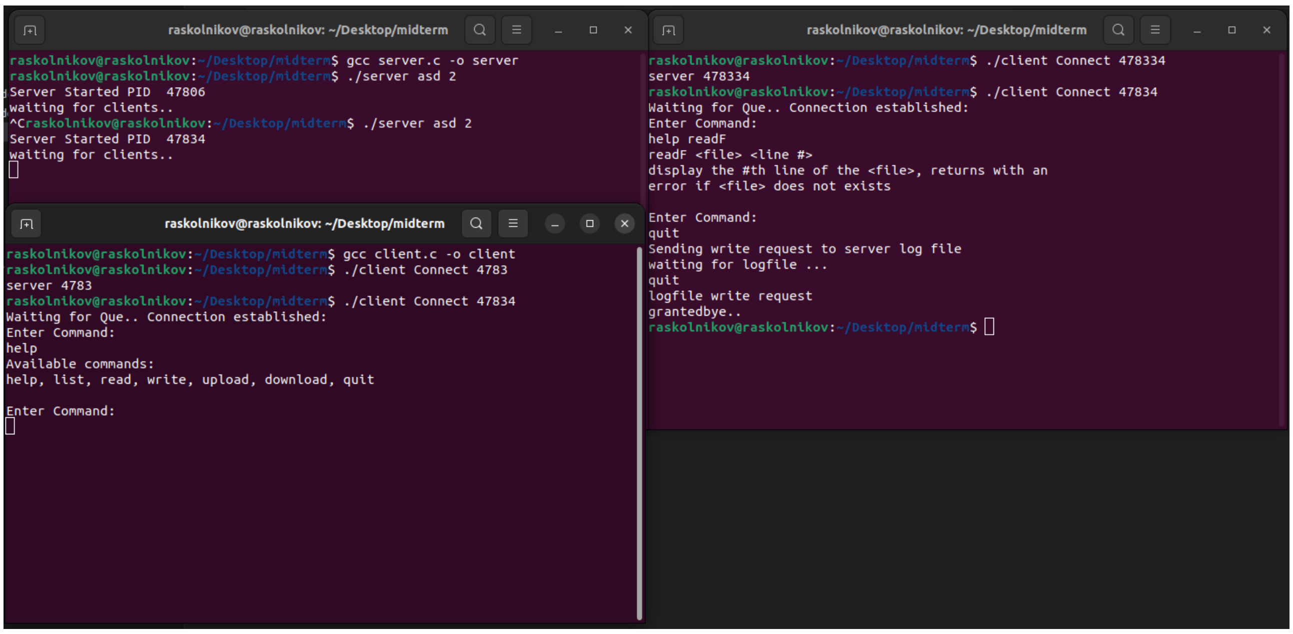
```
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 478334
server 478334
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 47834
Waiting for Que.. Connection established:
Enter Command:
help readF
readF <file> <line #>
display the #th line of the <file>, returns with an
error if <file> does not exists

Enter Command:
```

Multiple Client Connected log file



```
>>Server Started PID 47834...
>> waiting for clients...
>>Client PID 47873 connected as  client1
>>Client PID 47902 connected as  client2
```

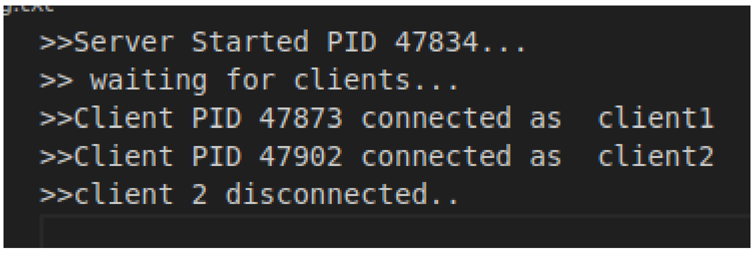
CLIENT QUIT



```
raskolnikov@raskolnikov:~/Desktop/midterm$ gcc server.c -o server
raskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  47806
waiting for clients..
^Craskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  47834
waiting for clients..
```

```
raskolnikov@raskolnikov:~/Desktop/midterm$ gcc client.c -o client
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 4783
server 4783
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 47834
Waiting for Que.. Connection established:
Enter Command:
help
Available commands:
help, list, read, write, upload, download, quit

Enter Command:
```

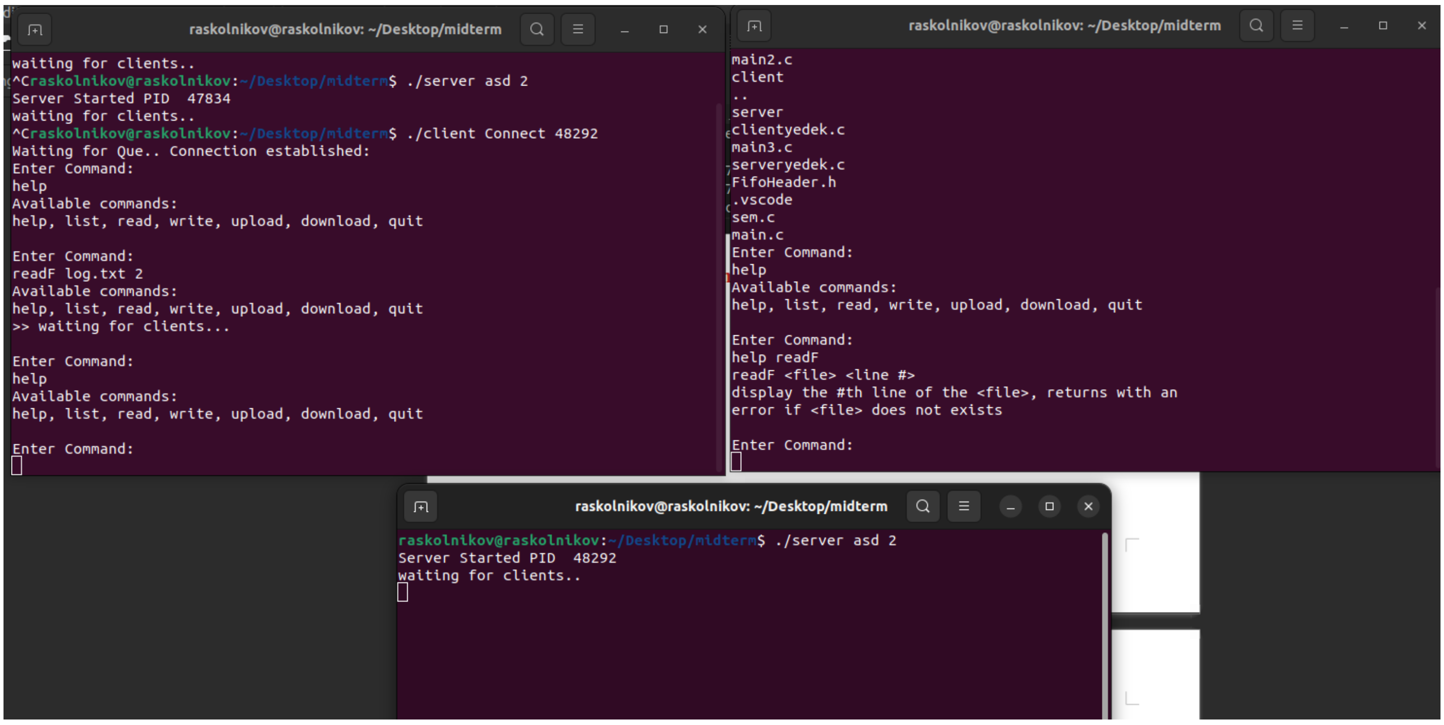
```
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 478334
server 478334
raskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 47834
Waiting for Que.. Connection established:
Enter Command:
help readF
readF <file> <line #>
display the #th line of the <file>, returns with an
error if <file> does not exists

Enter Command:
quit
Sending write request to server log file
waiting for logfile ...
quit
logfile write request
grantedbye..
raskolnikov@raskolnikov:~/Desktop/midterm$
```



```
>>Server Started PID 47834...
>> waiting for clients...
>>Client PID 47873 connected as  client1
>>Client PID 47902 connected as  client2
>>client 2 disconnected..
```

I have implemented all commands except for upload and download.

Multiple Client Multiple Command



raskolnikov@raskolnikov: ~/Desktop/midterm

```
waiting for clients..
^Craskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  47834
waiting for clients..
^Craskolnikov@raskolnikov:~/Desktop/midterm$ ./client Connect 48292
Waiting for Que.. Connection established:
Enter Command:
help
Available commands:
help, list, read, write, upload, download, quit

Enter Command:
readF log.txt 2
Available commands:
help, list, read, write, upload, download, quit
>> waiting for clients...

Enter Command:
help
Available commands:
help, list, read, write, upload, download, quit

Enter Command:
```

raskolnikov@raskolnikov: ~/Desktop/midterm

```
main2.c
client
..
server
clientyedek.c
main3.c
serveryedek.c
FifoHeader.h
.vscode
sem.c
main.c
Enter Command:
help
Available commands:
help, list, read, write, upload, download, quit

Enter Command:
help readF
readF <file> <line #>
display the #th line of the <file>, returns with an
error if <file> does not exists

Enter Command:
```

raskolnikov@raskolnikov: ~/Desktop/midterm

```
raskolnikov@raskolnikov:~/Desktop/midterm$ ./server asd 2
Server Started PID  48292
waiting for clients..
```