Eren Torlak 21010404090 CSE344 Midterm Report

Server Side:

- The server creates a server FIFO with pid
- The server waits for connection requests from clients by reading from the FIFO.
- When a connection request is received, the server checks if there is an available place for the client. If not, the client is added to a queue.
- If a slot is available, the server forks a new child process to handle the client's requests.
- The child process communicates with the client using a separate FIFO created for that client.
- The child process receives requests from the client, processes them, and sends responses back to the client.

Client Side:

- The client creates a response FIFO before sending request as lecture notes.
- The client sends a connection request to the server by writing to the server's FIFO.
- If the server accepts the connection, the client receives a response indicating that it is connected.
- The client sends requests to the server by server fifo
- The client receives responses from the server by reading from its own FIFO.

Communication Protocol:

- The server and client communicate using a structured data format, which includes fields such as the request type, client ID, and data buffers.
- The server and client use synchronization mechanisms, such as semaphores, to ensure that only one process can access a resource at a time.
- The server and client use signal handling to handle termination signals, such as SIGCHLD and SIGINT.

Request Types:

- The client can send various types of requests to the server, including:
    - CONNECT: Request to connect to the server.
    - QUIT: Request to disconnect from the server.
    - LIST: Request to list the files in the server's directory.
    - READF: Request to read a file from the server's directory.
    - WRITET: Request to write to a file in the server's directory.
    - UPLOAD: Request to upload a file to the server's directory.
    - DOWNLOAD: Request to download a file from the server's directory.
    - ARCHSERVER: Request to archive the server's directory.

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Semaphore Initialization

Three semaphores are initialized:

free_place_num: initialized with the value of maxClients, which represents the number of available place for clients.

occupied_place_num: initialized with the value of 0, which represents the number of connected clients.

connection_requested: initialized with the value of 1. It does handle connection requests safely.

Handling CONNECT and TRY_CONNECT

- **CONNECT:** The server checks for free slots. If there's a slot:
    - It connects the client immediately.
    - If not, the client is added to a queue until a slot becomes available.
    - This uses ***sem_wait()***
- **TRY_CONNECT:**
    - The client sends a request and expects an immediate response.
    - If no slots are available at the moment of request, the server rejects the connection attempt.

readF (Read File)

This operation reads content from a specified file on the server.

- **Steps**:
    1. The server constructs the full path to the file using the directory name and file path provided by the client.
    2. The server opens the file for reading.
    3. It reads chunks of the file and sends these chunks to the client until the entire file has been read.

2. writeT (Write to File)

The process begins with the client preparing a command and sending a request to the server. On receiving this request, the server initiates by creating a temporary file. It then proceeds to copy the contents of the original file—where new text is to be inserted—into this temporary file. Throughout this operation, a counter is utilized to monitor the progression through the lines of the file. Upon reaching the specified line number, the text provided by the client is inserted. Once the entire content has been successfully transferred to the temporary file, the original file is deleted. Subsequently, the temporary file is renamed to take the place of the original file. To ensure data integrity during this procedure, the file being modified is locked to prevent other processes from accessing it simultaneously.ensures client requests are handled effectively and safely.

Upload

Clients can upload files to the server, which stores them in a specified directory.

- **Steps**:
    1. The server receives the path and name of the file from the client.
    2. It creates or opens the file in write mode.
    3. File lock is initiated
    4. The server then reads chunks of data from the client requests and writes these directly to the file until the upload is complete.
    5. File unlocked
    6. After finishing the file write, the server confirms the successful upload to the client.

```
lock_file(uploadFile);
if (fwrite(reqClient.buffer, sizeof(char),
           strlen(reqClient.buffer),
           uploadFile) != strlen(reqClient.buffer)) {
    fprintf(log_fp, "Error writing to the file.\n");
    break;
}
unlock_file(uploadFile);
```

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- **Steps**:
    1. The server constructs the path to the target file.
    2. It opens the file for reading.
    3. The server sends responses about if reading is done or not .
    4. The process continues until the entire file has been sent.

archServer

it does create directory.

Calls execvp with arguments

Renames it .

May not be working well.

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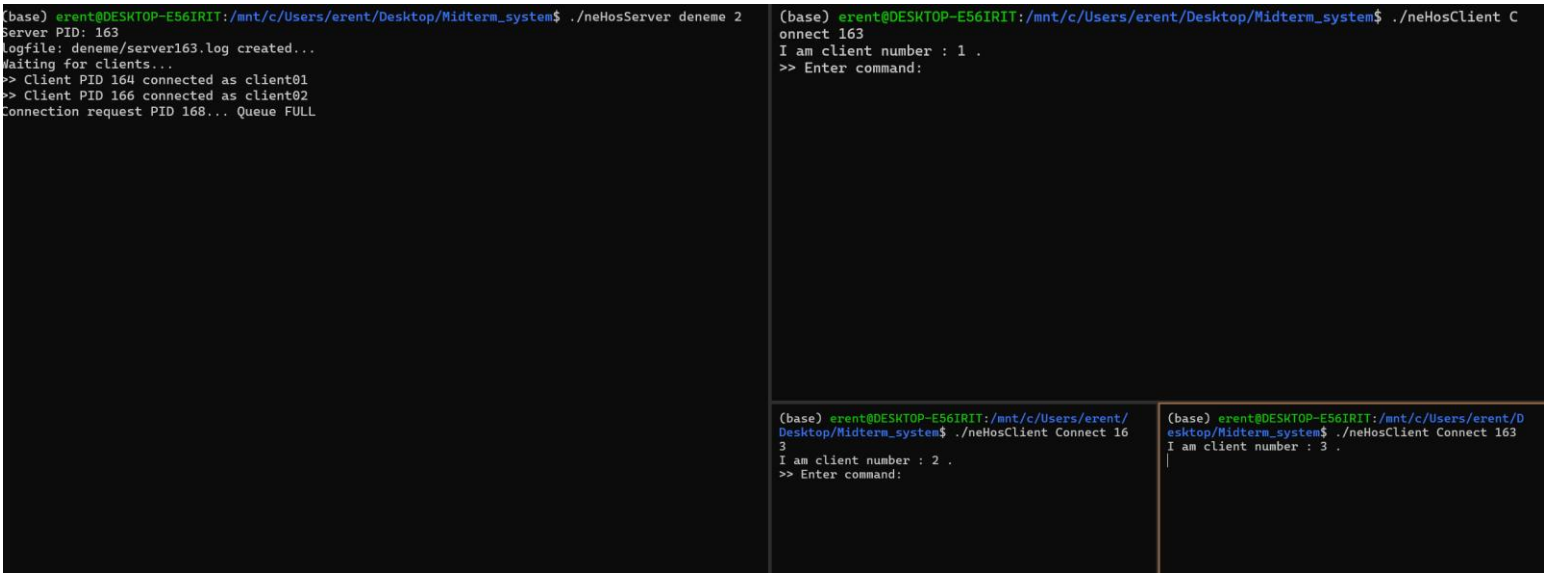
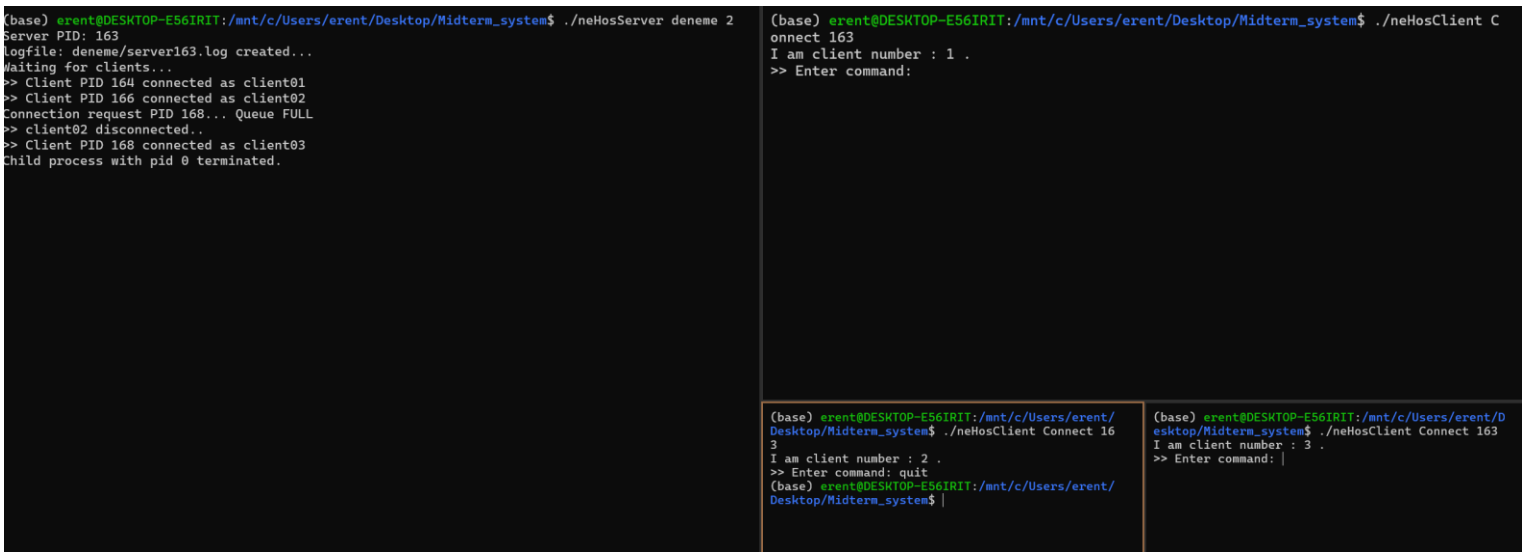
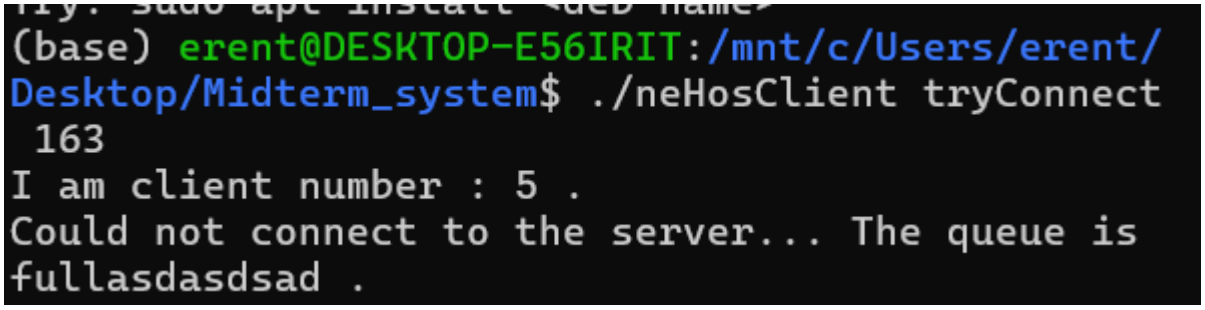
Queue full case:



One client quited , the one in the queue joined.



trtConnect



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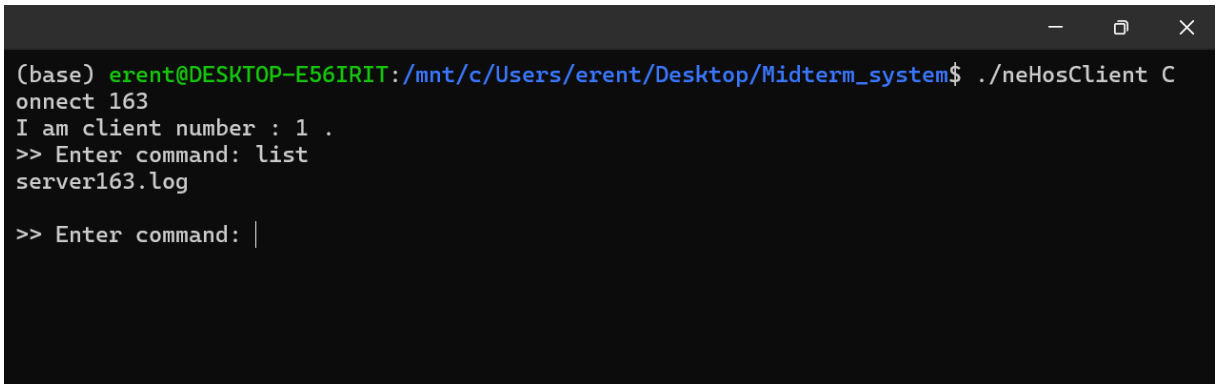

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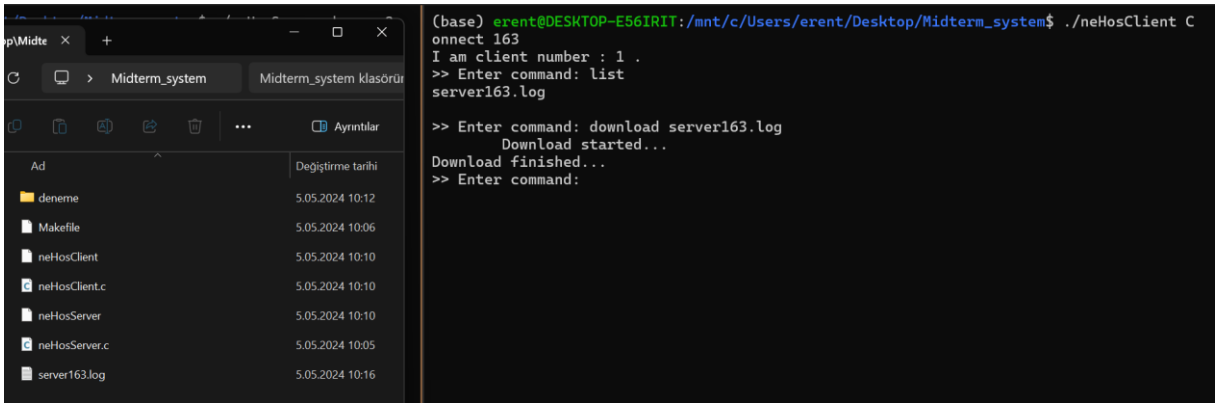

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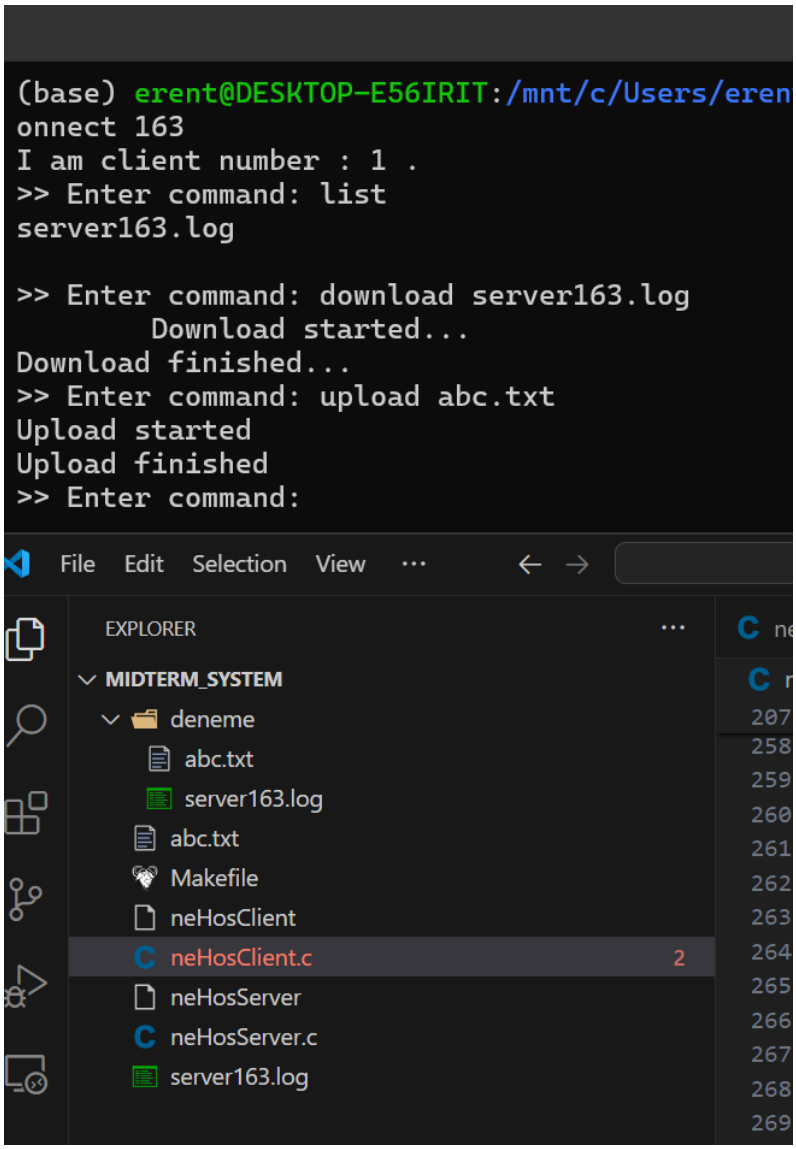
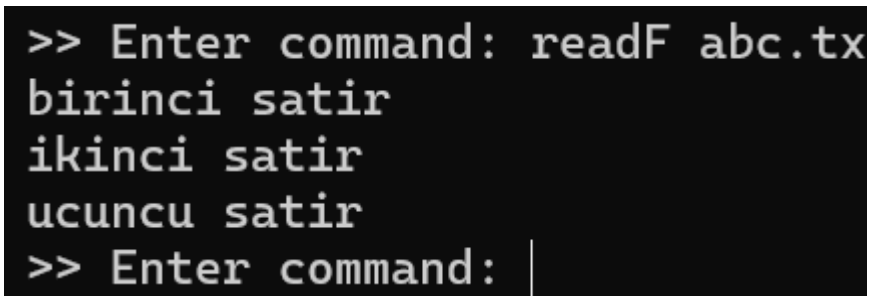
Upload



readF



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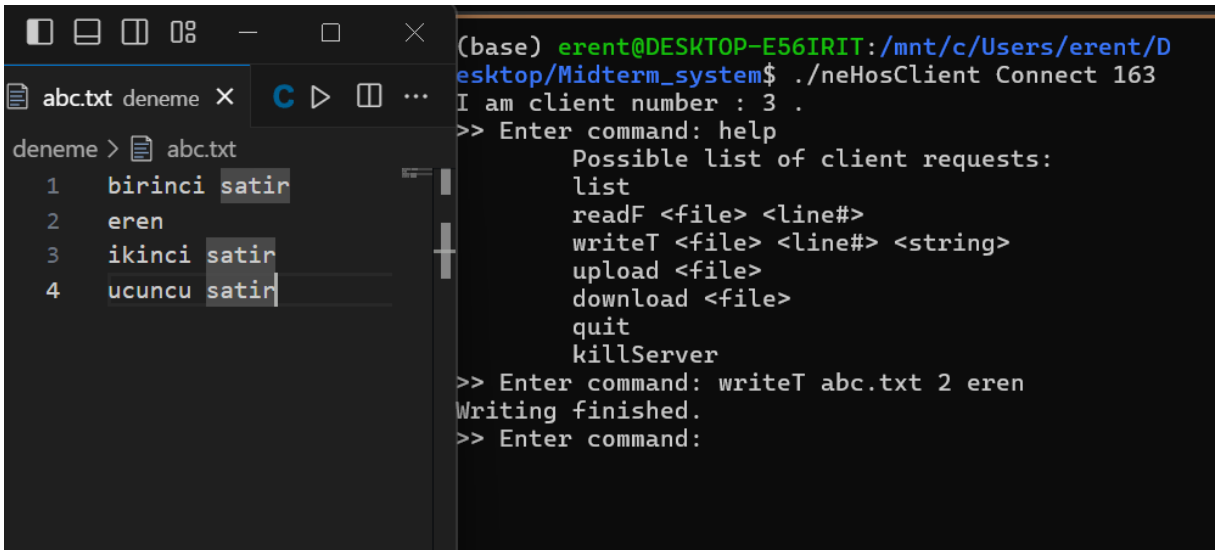
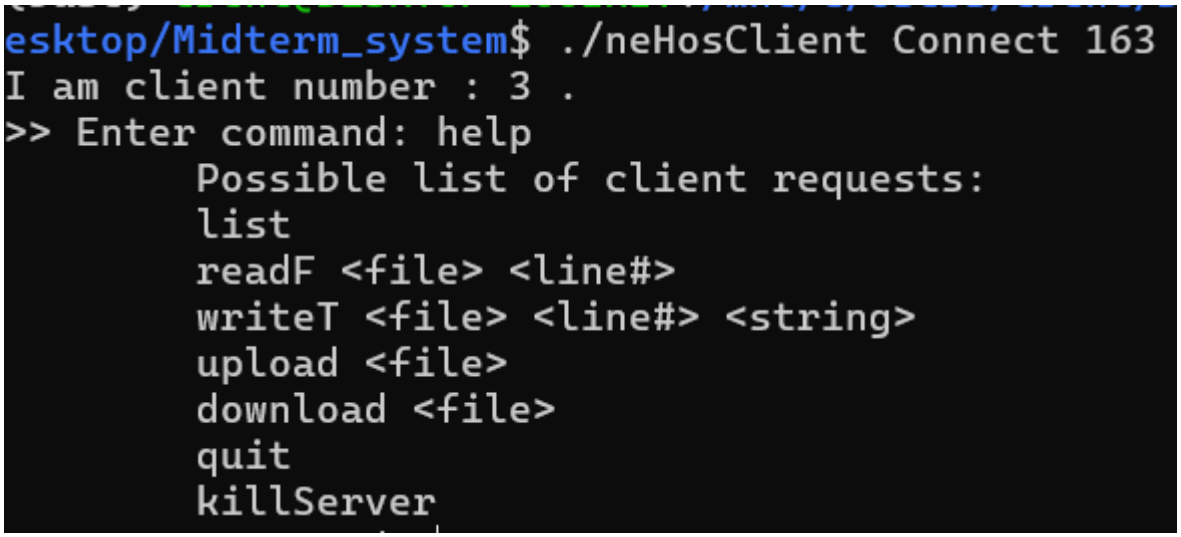
writeT



help



arcServer

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killServer