

README

(Team: LAMBDA)

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About the Project:

- This project is written in C++ language(using g++ compiler) and tested in Linprog.
- All the required points are covered in this project.
 - Implementation of Go-Back-N protocol to transfer messages and files(windows size fixed to 5 as stated).
 - UDP client-server programming.
 - This project handles list, exit, and get.
 - This project also handles "lost, out of sequence, and ack timed out errors."
- Also, we have implemented makefile to compile and delete executable quickly.

Instructions to compile:

To compile this project, we have implemented makefile.

- Commands to compile using the makefile
 - "make all": To compile and create executable in Client and server folder.
 - "make clean": To delete executable from the Client and server folder.
- Direct
 - Server : "g++ Server_folder/Server.cpp -o Server_folder/Server"
 - Client: "g++ Client_folder/Client.cpp -o Client_folder/Client"

Instructions to Run program:

To run this code, open and run executable present at the "Client_folder" and "Server_folder."

Steps:

1. Once the compilation is done, open two terminals (one for the Client and the other for the Server).
2. (Terminal 1) In the "Server_folder" type command `./Server 2734 1000`
 - a. Syntax is: `./<executable_file_name> <server_port_no> <Chunk_size_in_bytes>`
3. (Terminal 2) In the "Client_folder" type command `./Client 127.0.0.1 2734 1000 10`
 - a. Synta is: `./<executable_file_name> <server_ip> <server_port> <Chunk_size> <loss_error_percentage>`

Instruction to execute commands in the program.

The Client will request the Server to list(ls) files or directory where the Server is present. The Client will also request the Server to get any file from the Server and store it in "Client_folder."

Steps:

- When the client program will start.
 - Choose 1 to perform list, 2 to get (write filename when asked to), and 3 to exit Client successfully.
 - To exit the server, use "CTRL+C" to terminate it successfully.
- Based on the input provided in the command line argument. List, out of sequence, and time out errors are visible.

Output(Screenshots)

Showing the screenshots of the project, compile and run successfully in the linprog.cs.fsu

```
linprog8~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Server_folder
privet@linprog8.cs.fsu.edu:~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Server_folder$ ./Server 2734 1000
Server started successfully...
Message received list
Packet Sending
Sending Last packet
Window is full...Waiting for the acknowledgement
TIMEOUT: Starting to resend
Packet Sending 0
Sending Last packet
TIMEOUT: Starting to resend
Packet Sending 0
Sending Last packet
***** RX RECEIVED: 0
Window is full...Waiting for the acknowledgement
TIMEOUT: Starting to resend
Sending Last packet
TIMEOUT: Starting to resend
Sending Last packet
Last RX received
^C

linprog8~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Client_folder
privet@linprog8.cs.fsu.edu:~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Client_folder$ ./Client 127.0.0.1 2734 1000 10
Press 1 to use list command
Press 2 to enter file sending mode
Press 3 to exit
1
Sending list command to server
loss: SIMULATED
loss: SIMULATED
loss: SIMULATED
Received Initial packet 127.0.0.1
SENDING acknowledgement 0
loss: SIMULATED
loss: SIMULATED
loss: SIMULATED
Received Sequence No 1Received LAST packet
Sending last RX
Message received: .
.
Server
test_file.txt
test_file.txt
sample_file.txt
Server.cpp
Press 1 to use list command
Press 2 to enter file sending mode
Press 3 to exit
^C
```

The screenshot displays two terminal windows side-by-side, showing the communication between a PuTTYSSH Client and a PuTTYSSH Server during a file transfer.

Left Window: PuTTYSSH Client

```

lnprog8~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Server_folder

***** ACK RECEIVED: 0
Window is full...Waiting for the acknowledgement
TIMEOUT: Starting to resend
Sending Last packet
TIMEOUT: Starting to resend
Sending Last packet
Last ACK received
Message received get
Inside file get command
Packet Sending()
Packet Sending1
Packet Sending2
Packet Sending3
Packet Sending4
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 0
Packet Sending5
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 1
Packet Sending6
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 2
Packet Sending7
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 3
Packet Sending8
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 4
Packet Sending9
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 5
Packet Sending10
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 6
Packet Sending11
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 6
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 6
TIMEOUT: Starting to resend
Packet Sending 7
Packet Sending 8
Packet Sending 9
Packet Sending 10
Packet Sending 11
***** ACK RECEIVED: 7
Packet Sending12
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 8
Packet Sending13
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 9
Packet Sending14
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 10
Sending Last packet
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 11
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 12
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 13
Window is full...Waiting for the acknowledgement
***** ACK RECEIVED: 14
Window is full...Waiting for the acknowledgement
TIMEOUT: Starting to resend
Sending Last packet
Last ACK received

```

Right Window: PuTTYSSH Server

```

lnprog8~/Desktop/DCN_group_project_final/Go-BACK-N-UDP/Client_folder

srivastallprog8.cs.fau.edu:DCN_group_project_final/Go-BACK-N-UDP/Client_folder> ./Client 127.0.0.1 2734 1000 10
Press 1 to use list command
Press 2 to enter file sending mode
Press 3 to exit
1
Sending list command to server
Joest: SIMULATED
Joest: SIMULATED
Joest: SIMULATED
Received Initial packet 127.0.0.1
SENDING acknowledgement 0
Joest: SIMULATED
Joest: SIMULATED
Received: Sequence No 0Received LAST packet
Sending last ACK
Message received .
0
Server
text_file.txt
test_file.txt
sample_file.txt
Server.cpp
Press 1 to use list command
Press 2 to enter file sending mode
Press 3 to exit
2
Sending get command to server
Enter the file name you want(get) from the server:
test_file.txt
Received Initial packet 127.0.0.1
SENDING acknowledgement 0
Received: Sequence No 1 SENDING acknowledgement 1
Received: Sequence No 2 SENDING acknowledgement 2
Received: Sequence No 3 SENDING acknowledgement 3
Received: Sequence No 4 SENDING acknowledgement 4
Received: Sequence No 5 SENDING acknowledgement 5
Received: Sequence No 6 SENDING acknowledgement 6
Joest: SIMULATED
OUT OF SEQ: Packet received 8
SENDING acknowledgement 6
Joest: SIMULATED
OUT OF SEQ: Packet received 10
SENDING acknowledgement 6
OUT OF SEQ: Packet received 11
SENDING acknowledgement 6
Received: Sequence No 7 SENDING acknowledgement 7
Received: Sequence No 8 SENDING acknowledgement 8
Received: Sequence No 9 SENDING acknowledgement 9
Received: Sequence No 10 SENDING acknowledgement 10
Received: Sequence No 11 SENDING acknowledgement 11
Received: Sequence No 12 SENDING acknowledgement 12
Received: Sequence No 13 SENDING acknowledgement 13
Received: Sequence No 14 SENDING acknowledgement 14
Joest: SIMULATED
Received: Sequence No 15Received LAST packet
Sending last ACK
File Received: Check your folder file is stored at Client_folder location
Press 1 to use list command
Press 2 to enter file sending mode
Press 3 to exit
3
srivastallprog8.cs.fau.edu:DCN_group_project_final/Go-BACK-N-UDP/Client_folder>

```

Note: The files used for the testing 15Kb, etc., are deleted since the data present in those files was from “Wikipedia” and can result in an unnecessary plagiarism issue.