

University of Memphis

Major in Computer Science

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Instruction of Alternating Bits Implementation

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1. Objective: The objective of this walkthrough is to show the readers how to run the client-server program using terminal window in Linux environment.

2. Introduction:

The client-server Selective Repeat program is a program that run on application layer, uses the UDP protocol, and implement Selective Repeat protocol to transfer text file between host reliably. The UDP protocol is a protocol in transport layer that allow for fast delivery of data from one host to another; however, it does not guarantee reliable data transfer. For that reason, the Selective Repeat protocol is implemented in the application layer on top of the UDP protocol to guarantee that the receiving side receive the data in its entirety. Moreover, Selective Repeat gives better performance than Alternating Bit, because Alternating Bit is stop and wait protocol where the packet is sent to the receiver and wait. The next packet can only be transferred when the acknowledgement of the previous packet has been received. On other hand, Selective Repeat allows sender to send many packets without necessarily having to wait for the previous packet's ACK number. The sender can fill the send window and avoid the channel utilization problem as in Alternating Bit protocol.

3. Tools:

- Terminal window in Linux, Command Prompt in Window
- Bash (Unix Shell) in Window – Optional
- Python 2.7
- Code Editors (to view and alter code) such as Sublime Text, Notepad++, or Visual Studio

4. Program's File Structure:

Selective_Repeat

client

client_SelectRepeat.py

clientText.txt

server

sever_SelectRepeat.py

serverText.txt

5. How to Run Program?

After downloading the “Selective_Repeat” folder/directory, save “Selective_Repeat” folder/directory into a designated destination chosen by user. The user can open 2 terminal window/command prompts. Use “cd” to locate to “server” folder of one terminal and “client” of other terminal. In server terminal window, type “ifconfig” for Linux system or “ipconfig” for window to look for the IP address of the device. After that, using code editor to open the clienAlterBit.py file and modify the value variable “serverName” to the IP address.

Type “python sever_SelectRepeat.py” in the server terminal and “python client_SelectRepeat.py” in the client terminal. A prompt will appear to ask for specific file client wants to request. Type text.txt and hit enter.

The clientText.txt file in the client folder is empty before the code is run, and the serverText.txt in server folder contain the story of “Alice in the Wonderland”. After the program is run, the copy of the story will be transmitted to the clientText.txt file in the client side.

The user can choose to test the program on two different computers on different networks.

6. Screen Shots of Running Program

Server side is waiting for message

```
dungle@DELL: /mnt/c/Users/owner/Documents/University of Memphis/Networking_Information_Assurance/Project/PartB/Selective_Repeat/server$ python server_SelectRepeat.py
Server is ready to receive...
```

Client side starts to send request

```
dungle@DELL: /mnt/c/Users/owner/Documents/University of Memphis/Networking_Information_Assurance/Project/PartB/Selective_Repeat/client$ python client_SelectRepeat.py
Enter file name: serverText.txt
```

After the program finished running...

Client Side:

```
Total of 152136 bytes received . Number of packets were received: 149
Successful received data!
Connection closed...
dungle@DELL: /mnt/c/Users/owner/Documents/University of Memphis/Networking_Information_Assurance/Project/PartB/Selective_Repeat/client$
```

Server Side:

```
Seq = 148
ACK = 147
send_base = 148
len_window = 6
True
Server is ready to receive...
```

Text.txt file after receiving data:

ALICE'S ADVENTURES IN WONDERLAND

Lewis Carroll

THE MILLENNIUM FULCRUM EDITION 3.0

CHAPTER I

Down the Rabbit-Hole

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a white Rabbit with pink eyes ran close by her.

There was nothing so VERY remarkable in that; nor did Alice think it so VERY much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have