11210EECS302002 Introduction to Computer Networks Lab3

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一、 server.c

主要的功能在於 sendFile()此 function，當 server 收到 client 的 request 後，就會執行此 sendFile()。

1. 用一個變數 current 紀錄現在讀到 file 的幾個 byte 了，所以 while loop 的判斷是就是用 current 有沒有讀超過檔案大小。
2. 接著用 fseek(fd, current, SEEK_SET)將 fd 移至第 current 個 byte，然後用 fread()讀進要傳送的 packet.data 中。如果是最後一個封包的話要在 packet struct 裡面設定好，然後送出 packet。
3. 等待 Ack。這邊是用 poll()來做 Time out，當 poll()回傳 0，代表在一段時間內 sockfd 沒有收到東西，那我們就重傳檔案。
4. 送出成功，current+=1024，seq++。

二、client.c

1. 接收檔案

(i) 用變數 seq 紀錄現在收到哪個封包了，用 current 紀錄現在寫到記憶體的哪裡。
(ii) 收封包，其實我們都會成功收到，但可以利用 isLoss()來假裝沒收到。
(iii) 成功收到後，如果 seq == 收到的封包的 seq，回傳 Ack。
(iv) 利用 current 和收到的封包的 size 使用 memcpy()寫入資料。
(v) 更新 current 和 seq，且如果收到的 packet 是最後一個，則 break。

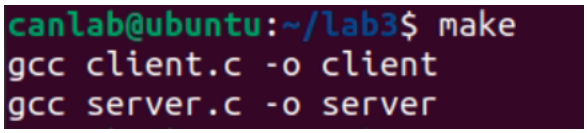
2. 寫入檔案

(i) 用”wb”的方式開檔。
(ii) 寫入資料。
(iii) 關閉檔案，將 file descriptor 設成 NULL。

三、 what I learned

Stop-and-wait 的機制其實並不難做，況且已經有個非常良好的 template。但因為我不熟悉 fseek()的使用，所以當我用 isLoss()後，寫入的檔案一直不對。經過檢查之後，發現問題來自於 sender 端，而我把 fseek()改好之後就完成了。

四、Screenshot



```
canlab@ubuntu:~/lab3$ ./server 7777
═══════ Server ═══════
Server IP is 127.0.0.1
Listening on port 7777
═══════════════════════

Server is waiting...
Processing command...
Filename is video.mp4
═══════ Sending ═══════
Send SEQ = 0
Received ACK = 0
Send SEQ = 1
Received ACK = 1
Send SEQ = 2
Timeout! Resend!
Send SEQ = 2
Received ACK = 2
Send SEQ = 3
Timeout! Resend!
Send SEQ = 3
Timeout! Resend!
Send SEQ = 3
```

```
canlab@ubuntu:~/lab3$ ./client
═══ Enter Server Info ═══
Server IP: 127.0.0.1
Server port: 7777
═══════════════════════

Please enter a command:
download video.mp4
File size is 275508 bytes
═══════ Receiving ═══════
Received SEQ = 0
Received SEQ = 1
Received SEQ = 2
Received SEQ = 3
Oops! Packet loss!
Received SEQ = 4
Received SEQ = 5
Received SEQ = 6
Oops! Packet loss!
Received SEQ = 7
Oops! Packet loss!
Received SEQ = 8
Oops! Packet loss!
Received SEQ = 9
Received SEQ = 10
Oops! Packet loss!
Received SEQ = 11
Received SEQ = 12
Received SEQ = 13
```

```
Received ACK = 262
Send SEQ = 263
Received ACK = 263
Send SEQ = 264
Received ACK = 264
Send SEQ = 265
Timeout! Resend!
Send SEQ = 265
Received ACK = 265
Send SEQ = 266
Received ACK = 266
Send SEQ = 267
Timeout! Resend!
Send SEQ = 267
Received ACK = 267
Send SEQ = 268
Received ACK = 268
Send SEQ = 269
Timeout! Resend!
Send SEQ = 269
Received ACK = 269
═══════════════════════

Server is waiting...
```

```
Oops! Packet loss!
Received SEQ = 255
Received SEQ = 256
Received SEQ = 257
Received SEQ = 258
Oops! Packet loss!
Received SEQ = 259
Received SEQ = 260
Received SEQ = 261
Received SEQ = 262
Received SEQ = 263
Received SEQ = 264
Oops! Packet loss!
Received SEQ = 265
Received SEQ = 266
Oops! Packet loss!
Received SEQ = 267
Received SEQ = 268
Oops! Packet loss!
Received SEQ = 269
Elapsed: 13 sec
═══════════════════════

Saving download_video.mp4
File has been written
═══════════════════════

Please enter a command:
```