

Computer Networks and Applications Socket Program Guide_3

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client 端程式簡介：

此程式需在 UNIX 架構下運行，以 C++ 語言撰寫。Server 端利用 linked list 資料結構儲存用戶的註冊狀況及線上名單，並且能透過 client 端傳送的要求，回覆相對應的 message，目前功能可以容許多名用戶註冊、登入，能儲存用戶餘額及顯示最新線上名單。Client 能互相通訊進行轉帳，且所有 server 和 client 或是 client 之間的訊息傳遞均透過 TLS 加密，此程式 client 能轉帳給另一指定 client，並讓 server 得知交易情況，在 server 端同步更新轉帳後的帳戶餘額。

編譯、執行程式方式如下：

需特別注意，編譯時需加入 -I/opt/local/include/ 資料夾的位置，才能正確找到標頭檔！

```
ych$ g++ -o server server_b03705018.cpp -I/opt/local/include/ -lcrypto -lssl
ych$ ./server 8888
```

1. Client 端能正常註冊、登入、顯示餘額、線上人數、及上線名單，如下圖。

```
Success Connection!
Enter your instructions!
-----
1 for Register
2 for Login
3 for Waiting for account transferring
4 for Tranfer money
5 for List
E for Exit
-----
Your instruction: 1
Enter the name you want to register: test1
Enter the initial account balance: 1000
100 OK

Enter your instructions!
-----
1 for Register
2 for Login
3 for Waiting for account transferring
4 for Tranfer money
5 for List
E for Exit
-----
Your instruction: 2
Enter your name: test1
Enter the port number (which is > 1023 ): 1111
-----
Account Balance: 1000
Number of users: 1
test1#127.0.0.1#1111

Enter the number of actions you want to take.
1 to ask for the latest list, 7 for back to homepage, 8 to Exit:
```

2. Client 端的 payee 需先在主頁面輸入 3，開啟 socket 等待 payer 連線。

```
-----
1 for Register
2 for Login
3 for Waiting for account transferring
4 for Tranfer money
5 for List
E for Exit
-----
Your instruction: 3
---Waiting for account transferring---
```

3. Client 端的 payer 在主頁面輸入 4，並輸入 payee 的名字和轉帳金額後，即可成功和 payee 進行加密通訊轉帳。

```
Enter your instructions!
-----
1 for Register
2 for Login
3 for Waiting for account transferring
4 for Tranfer money
5 for List
E for Exit
-----
Your instruction: 4
Please enter the payee's name: test1
Please enter the transfer amount: 500
successful connect to payee!!!
```

4. Payee 收到款項後，若 server 已完成餘額更新，會顯示更新完畢。

```
Your instruction: 3
---Waiting for account transferring---
A payer has connected!

-----Account updated-----
```

5. Payer 若成功匯款出去，也會收到來自 payee 回傳的成功消息。

```
Your instruction: 4
Please enter the payee's name: test1
Please enter the transfer amount: 500
successful connect to payee!!!

-----Account updated-----
```

6. 交易完畢後餘額也隨之更新。

```
Account Balance: 1500
Number of users: 2
test1#127.0.0.1#1111
test2#127.0.0.1#2222
```

(\$1,000 → \$1,500)

```
Account Balance: 4500
Number of users: 2
test1#127.0.0.1#1111
test2#127.0.0.1#2222
```

(\$5,000 → \$4,500)

7. 若 payer 輸入不能負擔的金額，會出現 error 提示。

```
-----
Your instruction: 4
Please enter the payee's name: test1
Please enter the transfer amount: 6000
You can't afford the payment. Please enter again!
Please enter the transfer amount: 500
successful connect to payee!!!

-----Account updated-----
```

8. Server 端可以觀看到每個 client 的動作。

```
REGISTER#test1#1000  
test1#1111  
REGISTER#test2#5000  
test2#2222  
FIND#test1  
TRANSFER#test1#500#test2  
List from user<test1>  
List from user<test2>  
Exit from user<test2>  
Exit from user<test1>
```