

[2015 Advanced Computer Networks Homework 3]

● 主旨

利用 TCP Socket 實作一個多人聊天室。

練習在 mininet 下執行這個程式。

Port number:

Use your student ID to set your port number.

Master student: M0X3040ABC → 6XABC

College student: B0X3040ABC → 5XABC

Ex. M0**3**3040**028** : port number is 63028

1. **Server: (70%)**

Usage: `./server <port number>`

1. Use multi-thread to handle requests from clients.
2. List all the members and chat room online, client can choose which room to join.
3. Handle clients request:
 - i 訊息傳送給同一個群組下的成員。
 - ii 判斷訊息傳送的對象是人還是群組並將訊息傳給指定的人或者群組。
 - iii 有人加入聊天室或者離開聊天室時, 通知所有的成員。

2. Client: (15%)

Usage: `./client <Server IP> <Port number>`

1. Connect to server.

2. Handle input:

i `<Message>`

訊息傳送給同一個群組下的成員

ii `/W <Name or room> <Message>`

判斷訊息傳送的對象是人還是群組並將訊息傳給指定的人或者群組

iii `Bye`

中斷連線

3. 執行環境：(15%)

練習在 mininet 下建立不只 2 個 host 並且可以互相 ping 到

Example: 以 h1 為 server

h2 h3 h4 為 client

```
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3 h4
h2 -> h1 h3 h4
h3 -> h1 h2 h4
h4 -> h1 h2 h3
*** Results: 0% dropped (12/12 received)
mininet> net
h1 h1-eth0:s1-eth1
h2 h2-eth0:s1-eth2
h3 h3-eth0:s1-eth3
h4 h4-eth0:s1-eth4
s1 lo: s1-eth1:h1-eth0 s1-eth2:h2-eth0 s1-eth3:h3-eth0 s1-eth4:h4-eth0
c0
```

Sample output:

顯示的訊息不強制要求，只要功能有做到就可以

```
root@shawn-OptiPlex:~/ACN# ./server 63028
Waiting for clients on port 63028...
client [Cindy] log in room [room1]
client [Tom] log in room [room1]
client [Sam] log in room [room2]
client [Sam] leave.
[]

root@shawn-OptiPlex:~/ACN# ./client 10.0.0.1 63028
[ Welcome! ]
Please enter your name: Cindy
[ Member List ]
Null
-----
Please enter group name(if doesn't exist,then create): room1
Usage: <Message>
/U <Name or room> <Message>
Bye
-----
Cindy > [note : client [Tom] log in room [room1]]
Cindy > [note : client [Sam] log in room [room2]]
Cindy > Hello
Cindy > Cindy : Hello"
Cindy > [note : client [Sam] leave.]
Cindy > []

root@shawn-OptiPlex:~/ACN# ./client 10.0.0.1 63028
[ Welcome! ]
Please enter your name: Tom
[ Member List ]
Cindy [room1]
-----
Please enter group name(if doesn't exist,then create): room1
Usage: <Message>
/U <Name or room> <Message>
Bye
-----
Tom > [note : client [Sam] log in room [room2]]
Tom > "Cindy : Hello"
Tom > /U Sam Hi
Tom > [note : client [Sam] leave.]
Tom > []

root@shawn-OptiPlex:~/ACN# ./client 10.0.0.1 63028
[ Welcome! ]
Please enter your name: Sam
[ Member List ]
Cindy [room1]
Tom [room1]
-----
Please enter group name(if doesn't exist,then create): room2
Usage: <Message>
/U <Name or room> <Message>
Sam
-----
Sam > "Tom : Hi"
Sam > Bye
root@shawn-OptiPlex:~/ACN# []
```

● 規則

1. 請使用 **C** 語言完成本次作業並在 **Ubuntu 14.04** 系統上進行執行、測試。
2. 必須上傳能編譯本次作業之 **Makefile**，內容不拘，未寫零分。
3. 請對你的程式碼有深入瞭解，demo 時助教會問。

4. 對作業有問題歡迎來信助教群（net_ta@net.nsysu.edu.tw）或是寄信約時間到實驗室（EC5018）詢問，但不幫忙 debug。
5. 逾期以零分計算，不接受補交，有問題請事先告知，demo 時間會另外通知。
6. 嚴禁抄襲其他同學的作業，參與者(抄襲與被抄襲)均以零分計算。

● 作業上傳

1. 請壓縮成 zip 或 tar 的壓縮檔，並上傳至中山網路大學，作業命名規則為“學號_TCPIP_HW3.zip”。

Example: M033040028_TCPIP_HW3.zip

2. 作業截止時間為 2015/10/21 (Wed.) 23:59，請在時間內上傳作業。