

## Demonstration of the Server's ability to be run and connected by clients on different networks

Due to the lack of a second laptop and my friend is not always available for testing my chat app, I have instead used my phone and run the python file on the app Pydroid. In the phone, I have turned off my wifi and open 3G mobile data connection, which uses a different network from my wifi router

First of all, I need to check my global IPv4 address. I opened my ASUS account that links to my router. The global IPv4 address of my router is: 87.92.16.209



I set my global IPv4 above as the IP connection address of client\_IPv4.py file with port 34000

```
localIPv4 = "192.168.1.208"
globalIPv4 = "87.92.16.209"

# Remember to Disable firewall

port_IPv4 = 34000
buffer = 4096
backlog = 5
```

Similarly, I set my global IPv6 above as the IP connection address of client\_IPv6.py file with port 34000

```

localIPv6 = "fe80::c10c:de5e:2cbf:132c%9"
globalIPv6 = "2001:14ba:a0bd:dd00:c10c:de5e:2cbf:132c"

# Remember to Disable firewall for clients in other network

portIPv6 = 36000
buffer = 1024
backlog = 5

```



For my server.py file, the IPv4 address of the server is my local IPv4 address with the port number 34000 and the IPv6 address of the server is my global IPv6 address with the port 34000

```

localIPv4 = "192.168.1.208"
globalIPv4 = "87.92.16.209"
localIPv6 = "fe80::c10c:de5e:2cbf:132c%9"
globalIPv6 = "2001:14ba:a0bd:dd00:c10c:de5e:2cbf:132c"
port_IPv4 = 34000
port_IPv6 = 36000
address_IPv4 = (localIPv4, port_IPv4)
address_IPv6 = (globalIPv6, port_IPv6)
socket_IPv4 = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
socket_IPv6 = socket.socket(socket.AF_INET6, socket.SOCK_STREAM)

```

Now I will carry out port forwarding. I access my ASUS router and set my port forwarding as follows:

Port Forwarding List (Max Limit : 32)						
Service Name	Source Target	Port Range	Local IP	Local Port	Protocol	Add / Delete
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	TCP	
Anyone		34000	192.168.1.208	34000	TCP	

Local port and Local IP are the IPv4 and port 34000 of my local chat server

Source target is left empty as all clients can send packets to my server. Port range for client would still be 34000 as specified above.

=> Each time any packets on the net is sent to the global IPv4 of my router 87.92.16.209 on the port 34000 will be forwarded to the port 34000 of my chat server.

In order for the different network connection to happen, Firewall has been disabled on my laptop

## Requirement 1: The clients can connect to different networks

First user is Binh, connected via the laptop using the wifi of the router (first address - IPv6)

Second user is Hoa, connected via the phone using 3G mobile network (second address - IPv4)

Third user is Dat, connected via the laptop using the wifi of the router (third address - IPv4)

```
PS C:\Users\nguye\Desktop\Basic Principles in Networking\Assignment 2\Instant Message App V2> python -u "c:\Users\nguye\Desktop\Basic Principles in Networking\Assignment 2\Instant Message App V2\server.py"
Waiting for the clients to connect...
fe80::c10c:de5e:2cbf:132c:60836:0:9 has connected.
87.94.111.3:5141 has connected.
192.168.1.1:60857 has connected.
```

### Binh's chat screenshot

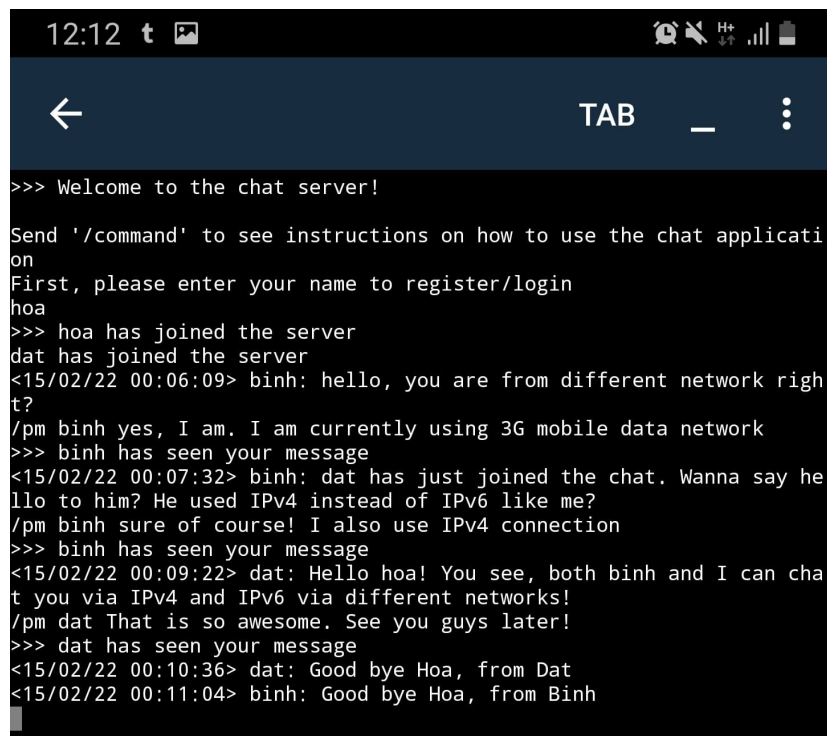
```
Which version of IP would you like to connect, IPv4 or IPv6? Please type 4/6
>>> 6
Welcome to the chat server!
Send '/command' to see instructions on how to use the chat application
First, please enter your name to register/login
>>> binh
binh has joined the server
>>> hoa has joined the server
dat has joined the server
/pm hoa hello, you are from different network right?
>>> hoa has seen your message
<15/02/22 00:06:54> hoa: yes, I am. I am currently using 3G mobile data network
/pm hoa dat has just joined the chat. Wanna say hello to him? He used IPv4 instead of IPv6 like me?
>>> hoa has seen your message
<15/02/22 00:08:18> hoa: sure of course! I also use IPv4 connection
/pm hoa Good bye Hoa, from Binh
hoa has seen your message
```

### Dat's chat screenshot

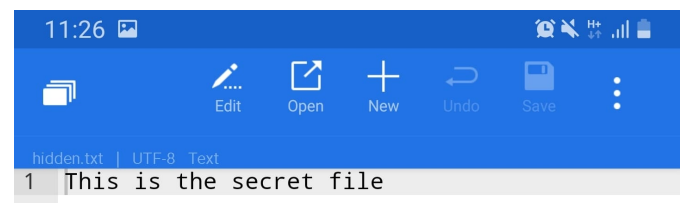
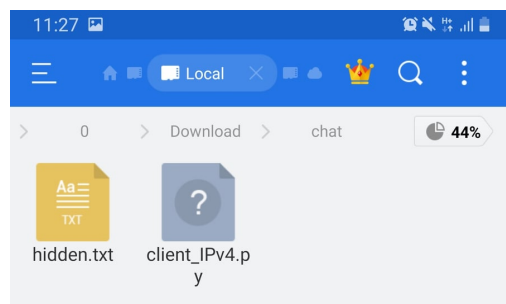
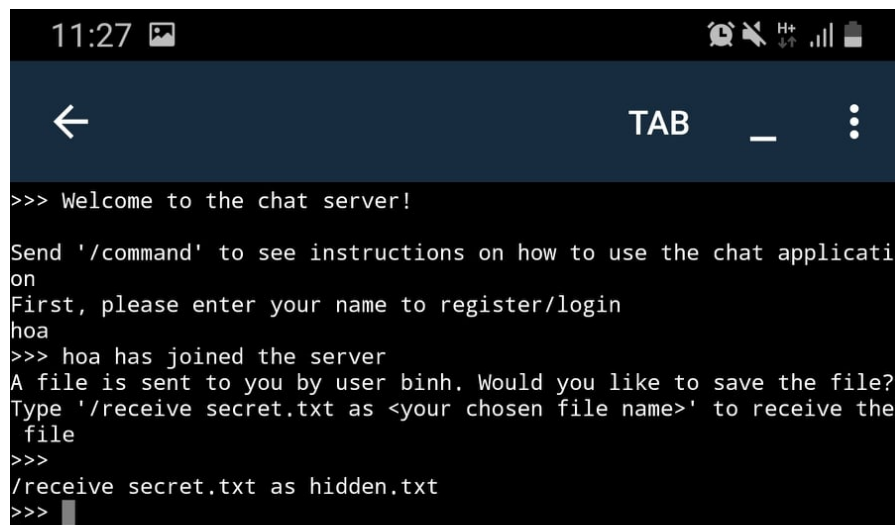
```
Which version of IP would you like to connect, IPv4 or IPv6? Please type 4/6
>>> 4
>>> Welcome to the chat server!

Send '/command' to see instructions on how to use the chat application
First, please enter your name to register/login
dat
>>> dat has joined the server
/pm hoa Hello hoa! You see, both binh and I can chat you via IPv4 and IPv6 via different networks!
>>> hoa has seen your message
<15/02/22 00:10:17> hoa: That is so awesome. See you guys later!
/pm hoa Good bye Hoa, from Dat
>>> hoa has seen your message
```

Hoa's chat screenshot



Beside chat, file transfer is also possible



## Requirement 2: The clients in one group can connect to different networks

This is a group chat called avengers, which have three members above: binh, dat and hoa

Binh's group chat screenshot

```
>>> /send avengers Hey guys, what are the avengers about?
>>> Members dat, hoa have seen your message
<15/02/22 01:41:24> Group avengers, hoa: I dont know. Maybe we will fight bad guys?
<15/02/22 01:42:18> Group avengers, dat: Joker has invaded Gotham. We ought to do something!
<15/02/22 01:43:10> Group avengers, hoa: Okay then, I will be Wonder Woman :3
/send avengers And I will be Batman! Lets stop the Joker together!
>>> Members dat, hoa have seen your message
<15/02/22 01:44:27> Group avengers, dat: Amazing. Let's roll out, my heroes!
□
```

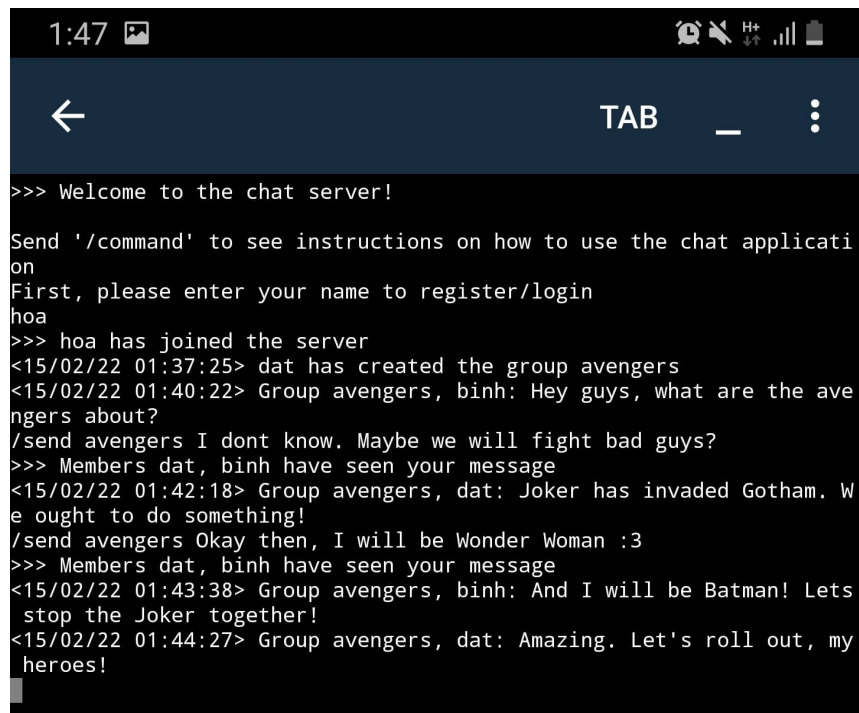
Dat's group chat screenshot

```
>>> <15/02/22 01:37:25> dat has created the group avengers
/add abc hoa binh
>>> The specified group does not exist. Please check misspellings
/add avengers hoa binh
>>> User hoa has been added to your group avengers

User binh has been added to your group avengers

<15/02/22 01:40:22> Group avengers, binh: Hey guys, what are the avengers about?
<15/02/22 01:41:24> Group avengers, hoa: I dont know. Maybe we will fight bad guys?
/send avengers Joker has invaded Gotham. We ought to do something!
>>> Members hoa, binh have seen your message
<15/02/22 01:43:10> Group avengers, hoa: Okay then, I will be Wonder Woman :3
<15/02/22 01:43:38> Group avengers, binh: And I will be Batman! Lets stop the Joker together!
/send avengers Amazing. Let's roll out, my heroes!
>>> Members hoa, binh have seen your message
□
```

Hoa's group chat screenshot



The screenshot shows a mobile application interface for a chat server. At the top, there is a status bar with the time 1:47 and various icons. Below it is a dark blue header bar with a back arrow, the word 'TAB', and a menu icon. The main chat area has a black background with white text. The chat history includes a welcome message, instructions on how to use the chat, and a list of messages from dat, hoa, and binh. The messages are timestamped and show the group name 'avengers'.

```
>>> Welcome to the chat server!

Send '/command' to see instructions on how to use the chat applicati
on
First, please enter your name to register/login
hoa
>>> hoa has joined the server
<15/02/22 01:37:25> dat has created the group avengers
<15/02/22 01:40:22> Group avengers, binh: Hey guys, what are the ave
ngers about?
/send avengers I dont know. Maybe we will fight bad guys?
>>> Members dat, binh have seen your message
<15/02/22 01:42:18> Group avengers, dat: Joker has invaded Gotham. W
e ought to do something!
/send avengers Okay then, I will be Wonder Woman :3
>>> Members dat, binh have seen your message
<15/02/22 01:43:38> Group avengers, binh: And I will be Batman! Lets
stop the Joker together!
<15/02/22 01:44:27> Group avengers, dat: Amazing. Let's roll out, my
heroes!
```