

Client/Server Chat Program

Report

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November 18, 2023

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Purpose

The chat.c program's purpose is to allow you to communicate between a server and clients. Also, this program helps us to understand the flow of TCP traffic. Utilizing Wireshark, we are able to see the traffic flow of the communication within the program and between different operating systems.

Requirements

Task	Status
<code>./build/chat -a <ip addr> <port></code>	Fully implemented
<code>./build/chat -c <ip addr> <port></code>	Fully implemented
Hello	Fully implemented
world	Fully implemented
Number 1 or 2 or 3	Fully implemented
<code>./build/chat -c <ip addr> <port> < files.txt</code>	Fully implemented
Abc (at the same time)	Fully implemented

Platforms

Chat.c has been tested on:

- macOS 12.2
- FreeBSD
- Fedora 34

Language

- ISO C17
- Compiles with gcc and clang

Documents

- [Design](#)
- [Testing](#)
- [User Guide](#)

Findings

Fedora Server to Mac Client:

75 22.857103859	192.168.0.27	192.168.0.165	TCP	78 49252 → 9996 [SYN] Seq=0
76 22.857194234	192.168.0.165	192.168.0.27	TCP	74 9996 → 49252 [SYN, ACK] S
77 22.859951291	192.168.0.27	192.168.0.165	TCP	66 49252 → 9996 [ACK] Seq=1
92 24.888596629	192.168.0.27	192.168.0.165	TCP	72 49252 → 9996 [PSH, ACK] S
93 24.888650546	192.168.0.165	192.168.0.27	TCP	66 9996 → 49252 [ACK] Seq=1
125 29.071769342	192.168.0.165	192.168.0.27	TCP	72 9996 → 49252 [PSH, ACK] S
126 29.089806078	192.168.0.27	192.168.0.165	TCP	66 49252 → 9996 [ACK] Seq=7
130 31.038826557	192.168.0.27	192.168.0.165	TCP	66 49252 → 9996 [FIN, ACK] S
131 31.038980837	192.168.0.165	192.168.0.27	TCP	66 9996 → 49252 [FIN, ACK] S
132 31.040194819	192.168.0.27	192.168.0.165	TCP	66 49252 → 9996 [ACK] Seq=8

Protocol	Percent Packets	Packets	Percent Bytes
Frame	100.0	10	100.0
Ethernet	100.0	10	20.2
Internet Protocol Version 4	100.0	10	28.9
Transmission Control Protocol	100.0	10	50.9
Data	20.0	2	1.7

75 22.857103859	192.168.0.27	192.168.0.165	TCP	78 49252 → 9996 [SYN] Seq=0
76 22.857194234	192.168.0.165	192.168.0.27	TCP	74 9996 → 49252 [SYN, ACK] S
77 22.859951291	192.168.0.27	192.168.0.165	TCP	66 49252 → 9996 [ACK] Seq=1
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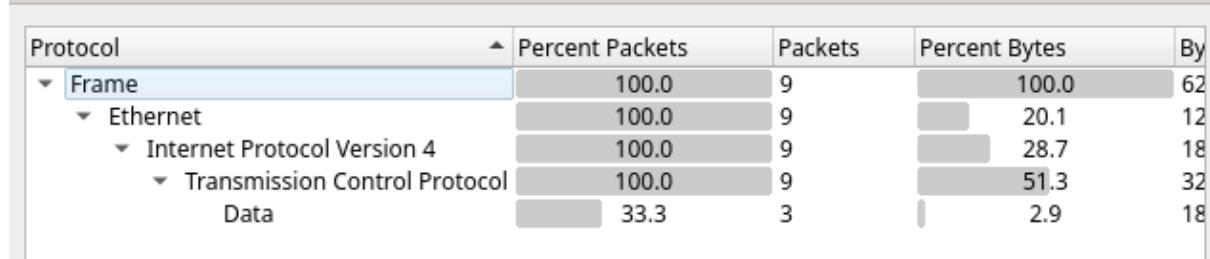
Clang Fedora:

```
[wilsonsue@fedora bin]$ cd /home/wilsonsue/CLionProjects/Project3980
[wilsonsue@fedora Project3980]$ ./build.sh
[ 33%] Running clang-format
[ 33%] Built target format
[ 66%] Building C object CMakeFiles/chat.dir/chat.c.o
[100%] Linking C executable chat
Running clang-tidy
8709 warnings generated.
Running cppcheck
[100%] Built target chat
[wilsonsue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Server listening on 192.168.0.165:9999
New connection from 192.168.0.3:58882, assigned to Client 0
hello
Received from Client 0: hello\
^Z
[1]+  Stopped                  ./build/chat -a 192.168.0.165 9999
[wilsonsue@fedora Project3980]$ exit
There are stopped jobs.
```

Fedora Server to FreeBSD Client:

tcp.port == 9997						
No.	Time	Source	Destination	Protocol	Length	Info
810	142.336955419	192.168.0.5	192.168.0.160	TCP	74	47615 → 9997 [SYN] Seq=0 Win=65535
811	142.337079427	192.168.0.160	192.168.0.5	TCP	74	9997 → 47615 [SYN, ACK] Seq=0 Ack=1 Win=31856
812	142.338146970	192.168.0.5	192.168.0.160	TCP	66	47615 → 9997 [ACK] Seq=1 Ack=1 Win=31856
828	144.077602127	192.168.0.5	192.168.0.160	TCP	72	47615 → 9997 [PSH, ACK] Seq=1 Ack=1 Win=31856
829	144.077678881	192.168.0.160	192.168.0.5	TCP	66	9997 → 47615 [ACK] Seq=1 Ack=1 Win=31856
843	145.634568085	192.168.0.160	192.168.0.5	TCP	72	9997 → 47615 [PSH, ACK] Seq=1 Ack=1 Win=31856
844	145.684469948	192.168.0.5	192.168.0.160	TCP	66	47615 → 9997 [ACK] Seq=7 Ack=7 Win=31856
853	147.559224425	192.168.0.5	192.168.0.160	TCP	72	47615 → 9997 [PSH, ACK] Seq=7 Ack=7 Win=31856
854	147.559282648	192.168.0.160	192.168.0.5	TCP	66	9997 → 47615 [ACK] Seq=7 Ack=13 Win=31856

Time	192.168.0.5	192.168.0.160	Comment
142.336955419	47615 → 9997 [SYN] Seq=0 Win=65535 Len=0 TSO	9997	TCP: 47615 → 9997 [SYN] Seq=0 Win=65535 Len=0 MSS=146...
142.337079427	9997 → 47615 [SYN, ACK] Seq=0 Ack=1 Win=31856 Len=0 TSO	9997	TCP: 9997 → 47615 [SYN, ACK] Seq=0 Ack=1 Win=31856 Len=0...
142.338146970	47615 → 9997 [ACK] Seq=1 Ack=1 Win=65728 Len=0 TSO	9997	TCP: 47615 → 9997 [ACK] Seq=1 Ack=1 Win=65728 Len=0 TS...
144.077602127	47615 → 9997 [PSH, ACK] Seq=1 Ack=1 Win=65728 Len=0 TSO	9997	TCP: 47615 → 9997 [PSH, ACK] Seq=1 Ack=1 Win=65728 Len=0...
144.077678881	9997 → 47615 [ACK] Seq=1 Ack=7 Win=31872 Len=0 TSO	9997	TCP: 9997 → 47615 [ACK] Seq=1 Ack=7 Win=31872 Len=0 TS...
145.634568085	47615 → 9997 [PSH, ACK] Seq=1 Ack=7 Win=31872 Len=0 TSO	9997	TCP: 47615 → 9997 [PSH, ACK] Seq=1 Ack=7 Win=31872 Len=0...
145.684469948	9997 → 47615 [ACK] Seq=7 Ack=7 Win=65728 Len=0 TSO	9997	TCP: 47615 → 9997 [ACK] Seq=7 Ack=7 Win=65728 Len=0 TS...
147.559224425	47615 → 9997 [PSH, ACK] Seq=7 Ack=7 Win=65728 Len=0 TSO	9997	TCP: 47615 → 9997 [PSH, ACK] Seq=7 Ack=7 Win=65728 Len=0...
147.559282648	9997 → 47615 [ACK] Seq=7 Ack=13 Win=31872 Len=0 TSO	9997	TCP: 9997 → 47615 [ACK] Seq=7 Ack=13 Win=31872 Len=0 TS...



IO Redirection:

```
[wilsonsue@fedora Project3980]$ cd ..
[wilsonsue@fedora CLionProjects]$ cd Project3980
[wilsonsue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Bind failed: Address already in use
[wilsonsue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Server listening on 192.168.0.165:9999
New connection from 192.168.0.3:43376, assigned to Client 0
Received from Client 0: testing1 testing2
alksnjdjasnzdServer closed the connection.
Select error: Bad file descriptor
[wilsonsue@fedora Project3980]$ █
```

```
1  testing1 testing2
2  alksnjdjasnzd█
```

GCC Fedora:

52	11.158862021	192.168.0.3	192.168.0.165	TCP	74	45884 → 9999 [SYN] Seq=0
53	11.158961056	192.168.0.165	192.168.0.3	TCP	74	9999 → 45884 [SYN, ACK] Seq=1
54	11.162646652	192.168.0.3	192.168.0.165	TCP	66	45884 → 9999 [ACK] Seq=1
69	14.708692208	192.168.0.165	192.168.0.3	TCP	72	9999 → 45884 [PSH, ACK] Seq=1
70	14.729876338	192.168.0.3	192.168.0.165	TCP	66	45884 → 9999 [ACK] Seq=1
75	18.128076202	192.168.0.3	192.168.0.165	TCP	72	45884 → 9999 [PSH, ACK] Seq=1
76	18.128160710	192.168.0.165	192.168.0.3	TCP	66	9999 → 45884 [ACK] Seq=7

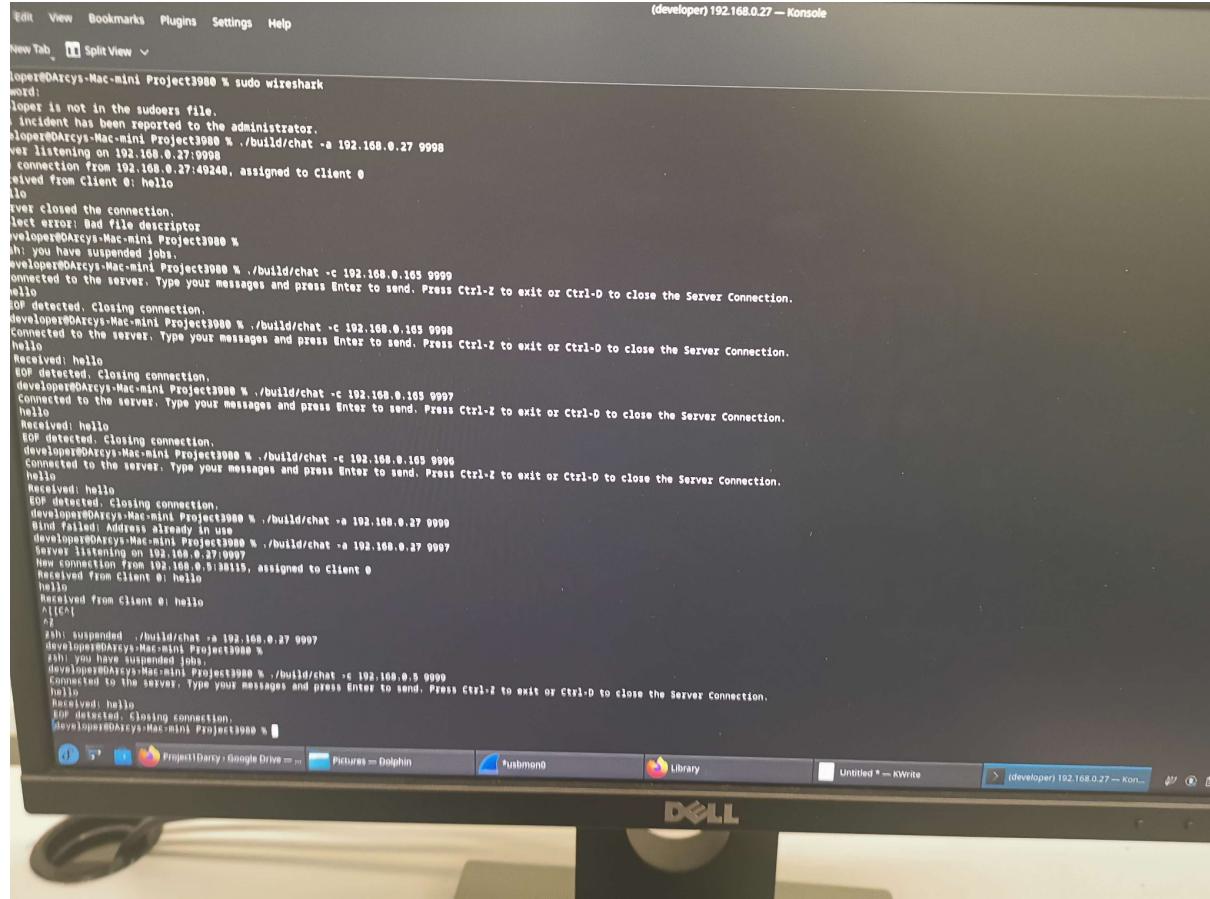
Protocol	Percent Packets	Packets	Percent Bytes
Frame	100.0	7	100.0
Ethernet	100.0	7	20.0
Internet Protocol Version 4	100.0	7	28.6
Transmission Control Protocol	100.0	7	51.4
Data	28.6	2	2.4

11.158862021	45884	45884 → 9999 [SYN] Seq=0 Win=32120 Len=0 TS...	9999	TCP: 45884 → 9999 [SYN] Seq=0 Win=32120 Len=0 MSS=146...
11.158961056	45884	9999 → 45884 [SYN, ACK] Seq=0 Ack=1 Win=31...	9999	TCP: 9999 → 45884 [SYN, ACK] Seq=0 Ack=1 Win=31856 Len...
11.162646652	45884	45884 → 9999 [ACK] Seq=1 Ack=1 Win=32128 L...	9999	TCP: 45884 → 9999 [ACK] Seq=1 Ack=1 Win=32128 Len=0 TS...
14.708692208	45884	9999 → 45884 [PSH, ACK] Seq=1 Ack=1 Win=31...	9999	TCP: 9999 → 45884 [PSH, ACK] Seq=1 Ack=1 Win=31872 Len...
14.729876338	45884	45884 → 9999 [ACK] Seq=1 Ack=7 Win=32128 L...	9999	TCP: 45884 → 9999 [ACK] Seq=1 Ack=7 Win=32128 Len=0 TS...
18.128076202	45884	45884 → 9999 [PSH, ACK] Seq=1 Ack=7 Win=32...	9999	TCP: 45884 → 9999 [PSH, ACK] Seq=1 Ack=7 Win=32128 Len...
18.128160710	45884	9999 → 45884 [ACK] Seq=7 Ack=7 Win=31872 L...	9999	TCP: 9999 → 45884 [ACK] Seq=7 Ack=7 Win=31872 Len=0 TS...

```
[wilsonsue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Server listening on 192.168.0.165:9999
New connection from 192.168.0.3:45884, assigned to Client 0
Hello
Received from Client 0: Hello
^Z
[1]+  Stopped                  ./build/chat -a 192.168.0.165 9999
[wilsonsue@fedora Project3980]$ ^C
[wilsonsue@fedora Project3980]$ 
exit
There are stopped jobs.
```

FreeBSD to FreeBSD:

```
closed the connection.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: Hello
Hello
ended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.10 9999
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: hello
Hello
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.27 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: hello
Hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -a 192.168.0.27 9999
Bind failed: Can't assign requested address
root@localhost:/test/Project3980 # ./build/chat -a 192.168.0.5 9999
Server listening on 192.168.0.5:9999
New connection from 192.168.0.27:49253, assigned to Client 0
Received from Client 0: hello
Hello
Server closed the connection.
Select error: Bad file descriptor
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 #
```



FreeBSD to MAC:

```
[root@localhost:~/test/Project3980]# ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
or closed the connection.
[root@localhost:~/test/Project3980]# ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: Hello
o
ived: Hello

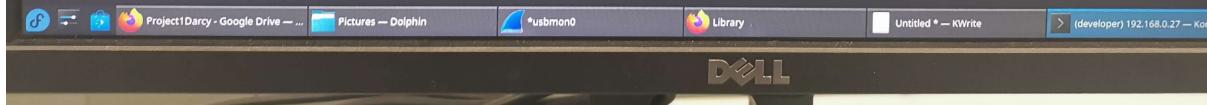
pended
[root@localhost:~/test/Project3980]# ^D
There are suspended jobs.
[root@localhost:~/test/Project3980]# ./build/chat -c 192.168.0.10 9999
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: hello

uspended
[root@localhost:~/test/Project3980]# ^D
There are suspended jobs.
[root@localhost:~/test/Project3980]# ./build/chat -c 192.168.0.10 9998
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Hello
Received: Hello
Hello
^Z
Suspended
[root@localhost:~/test/Project3980]# ^D
There are suspended jobs.
[root@localhost:~/test/Project3980]#
```

```
ed from Client 0: hello
: closed the connection.
: error: Bad file descriptor
developer@Darcys-Mac-mini Project3980 %
you have suspended jobs.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9999
ected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
o
detected. Closing connection.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9999
ected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
lo
eived: hello
: detected. Closing connection.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9999
nected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
lio
eceived: hello
DF detected. Closing connection.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9999
nected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
ello
Received: hello
EOF detected. Closing connection.
developer@Darcys-Mac-mini Project3980 % ./build/chat -a 192.168.0.27 9999
Bind failed: Address already in use
developer@Darcys-Mac-mini Project3980 % ./build/chat -a 192.168.0.27 9997
Server listening on 192.168.0.27:9997
New connection from 192.168.0.5:38115, assigned to Client 0
Received from Client 0: hello
hello
Received from Client 0: hello
^[[CA[
^Z
zsh: suspended ./build/chat -a 192.168.0.27 9997
developer@Darcys-Mac-mini Project3980 %
zsh: you have suspended jobs.
developer@Darcys-Mac-mini Project3980 %
```



```
File Edit View Bookmarks Plugins Settings Help (developer) 192.168.0.27 — Konsole
New Tab Split View v
C Compiler: /usr/bin/gcc
COMPILER_NAME: gcc
-- Configuring done (0.0s)
-- Generating done (0.0s)
-- Build files have been written to: /Users/developer/Project3980/build
developer@Darcys-Mac-mini Project3980 % ./build.sh
[ 33%] Running clang-format
[ 33%] Built target format
[ 66%] Building C object CMakeFiles/chat.dir/chat.c.o
[100%] Linking C executable chat
Running clang-tidy
7015 warnings generated.
Running cpcheck
[100%] Built target chat
developer@Darcys-Mac-mini Project3980 % ./build/chat -a 192.168.0.27 9999
Server listening on 192.168.0.27:9999
New connection from 192.168.0.165:34004, assigned to Client 0
Received from Client 0: hello
hello
zsh: suspended ./build/chat -a 192.168.0.27 9999
developer@Darcys-Mac-mini Project3980 %
zsh: you have suspended jobs.
developer@Darcys-Mac-mini Project3980 % sudo wireshark
password
developer is not in the sudoers file.
This incident has been reported to the administrator.
developer@Darcys-Mac-mini Project3980 % ./build/chat -a 192.168.0.27 9998
Server listening on 192.168.0.27:9998
New connection from 192.168.0.27:49248, assigned to Client 0
Received from Client 0: hello
hello
Server closed the connection.
Select error: Bad file descriptor
developer@Darcys-Mac-mini Project3980 %
zsh: you have suspended jobs.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9999
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
hello
EOF detected. Closing connection.
developer@Darcys-Mac-mini Project3980 % ./build/chat -c 192.168.0.165 9998
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
hello
Received: hello
EOF detected. Closing connection.
developer@Darcys-Mac-mini Project3980 %
```



```
Received: hello
^Z
[1]+  Stopped                  ./build/chat -c 192.168.0.27 9999
[wilsonue@fedora Project3980]$ exit
There are stopped jobs.
[wilsonue@fedora Project3980]$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
            inet6 ::1/128 scope host noprefixroute
                valid_lft forever preferred_lft forever
2: enp2s0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc fq_codel state DOWN group default qlen 1000
    link/ether 50:eb:f6:d3:c8:10 brd ff:ff:ff:ff:ff:ff
3: wlp3s0: <BROADCAST,MULTICAST,UP,BROADCAST> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether b4:8c:9d:54:8f:31 brd ff:ff:ff:ff:ff:ff
        inet 192.168.0.165/24 brd 192.168.0.255 scope global dynamic noprefixroute wlp3s0
            valid_lft 15089sec preferred_lft 15089sec
            inet6 fe80::c24a:8e82:18d:9764/64 scope link noprefixroute
                valid_lft forever preferred_lft forever
[wilsonue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Bind failed: Address already in use
[wilsonue@fedora Project3980]$ hello
bash: hello: command not found...
Install package 'hello' to provide command 'hello'? [N/y] N

[wilsonue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Bind failed: Address already in use
[wilsonue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9999
Bind failed: Address already in use
[wilsonue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9998
Server listening on 192.168.0.165:9998
New connection from 192.168.0.27:49250, assigned to Client 0
Received from Client 0: hello
hello
Server closed the connection.
Select error: Bad file descriptor
[wilsonue@fedora Project3980]$ ./build/chat -a 192.168.0.165 9997
Server listening on 192.168.0.165:9997
New connection from 192.168.0.27:49251, assigned to Client 0
Received from Client 0: hello
hello
Server closed the connection.
Select error: Bad file descriptor
[wilsonue@fedora Project3980]$
```

```
Suspended
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.160 9999
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Hello
Received: Hello
Hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Hello
Received: Hello
Hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Hello
Server closed the connection.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.160 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: Hello
Hello
Received: Hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.10 9999
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Received: hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.10 9998
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
Hello
Received: Hello
Hello
^Z
Suspended
root@localhost:/test/Project3980 # ^D
There are suspended jobs.
root@localhost:/test/Project3980 # ./build/chat -c 192.168.0.10 9998
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
```

Activities Terminal Dec 6 21:18 *wlo1

charminjung@fedora:~/Assignment4

```
No. charminjung@fedora:~/Assignment4 [charminjung@fedora Assignment4]$ Hello
8 Received from Client 0: Hello
8 ^Z
8 [5]+ Stopped ./build/chat -a 192.168.0.160 9999
8 [charminjung@fedora Assignment4]$ exit
8 There are stopped jobs.
8 [charminjung@fedora Assignment4]$ ./build/chat -a 192.168.0.160 9999
Bind failed: Address already in use
[charminjung@fedora Assignment4]$ ./build/chat -a 192.168.0.160 9998
Bind failed: Address already in use
> [charminjung@fedora Assignment4]$ ./build/chat -a 192.168.0.160 9997
Bind failed: Address already in use
[charminjung@fedora Assignment4]$ New connection from 192.168.0.5:47615, assigned to Client 0
Received from Client 0: Hello
Hello
Received from Client 0: Hello
^Z
[6]+ Stopped ./build/chat -a 192.168.0.160 9997
[charminjung@fedora Assignment4]$ exit
There are stopped jobs.
[charminjung@fedora Assignment4]$ [charminjung@fedora Assignment4]$
```

Activities Terminal Dec 6 21:05

FreeBSDserverToFedoraClient.pcap

charminjung@fedora:~/Assignment4

```
charminjung@fedora:~ — sudo wi... x charminjung@fedora:~/Assignment4...
```

Connection failed: Connection refused
[charminjung@fedora Assignment4]\$./build/chat -c 192.168.0.5 9999

1 Connection failed: Connection refused
1 [charminjung@fedora Assignment4]\$./build/chat -c 192.168.0.5 9998
1 Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.

^Z
[1]+ Stopped ./build/chat -c 192.168.0.5 9998
[charminjung@fedora Assignment4]\$ █

▶ Franexit
▶ Eth There are stopped jobs.
▶ Int [charminjung@fedora Assignment4]\$./build/chat -c 192.168.0.5 9997
Connected to the server. Type your messages and press Enter to send. Press Ctrl-Z to exit or Ctrl-D to close the Server Connection.
hello
Received: Hello
^Z
[2]+ Stopped ./build/chat -c 192.168.0.5 9997
[charminjung@fedora Assignment4]\$ exit
There are stopped jobs.
[charminjung@fedora Assignment4]\$

Profile: D

