IRC

Internet Relay Chat

Summary: *The goal of this project is to make you write your own IRC server. To do so, you will test your work with a real IRC client. Internet is ruled by solid and standards protocols that allow a strong interaction between every connected computer. It's always good to know about it.*

Version: 5

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Chapter I

Common Instructions

- Your program should not crash in any circumstances (even when it runs out of memory), and should not quit unexpectedly. If this happens, your project will be considered non functional and will receive a 0 during the evaluation.

- If the subject requires it, you must submit a `Makefile` which will compile your source files to the required output. Your Makefile must not relink.

- Your `Makefile` must at least contain the rules `$(NAME)`, `all`, `clean`, `fclean` and `re`.

- We encourage you to create test programs for your project even though this work **won't have to be submitted and won't be graded**. It will give you a chance to easily test your work and your peers' work. You will find those tests especially useful during your defense. Indeed, during defence, you are free to use your tests and/or the tests of the peer you are evaluating.

- Submit your work to your assigned git repository. Only the work in the git repository will be graded. If Deepthought is assigned to grade your work, it will be done after your peer evaluations. If an error happens in any section of your work during Deepthought's grading, the evaluation will stop.

Chapter II

Introduction

Internet Relay Chat or IRC is a textual communication protocol on the Internet. It is instantaneous communication mainly in the form of discussions in groups via discussion channels, but can also be used for one-to-one communication.

IRC client programs connect to an IRC server to access a specific channel. IRC servers are connected between them to provide a global network with unique channels.

Chapter III

Mandatory Part

Program name	`ircserv`
Turn in files	
Makefile	`Yes`
Arguments	

External functs.	` Everything in C++ 98.  socket, setsockopt,`
	`getsockname, getprotobyname, gethostbyname,`
	`getaddrinfo, freeaddrinfo, bind, connect, listen,`
	`accept, htons, htonl, ntohs, ntohl, inet_addr,`
	`inet_ntoa, send, recv, signal, lseek, fstat,fcntl,`
	`poll (or equivalent)`

Libft authorized	
Description	`Write an IRC server in C++ 98`

- You must write an IRC server in C++ 98.

- If you need more C functions, you can use them but always prefer C++.

- The C++ standard must be C++ 98. Your project must compile with it.

- No external library, no Boost, etc...

- Try to always use the most "C++" code possible (for example use <cstring> over <string.h>).

- In the subject and the scale we will mention poll but you can use equivalent like select, kqueue, epoll.

- Communication between client and server must be done via TCP/IP(v4) or (v6)

- You `won't need` to code a client

- You `won't need` to handle server to server communication

- Your executable will be used as follows:

```
./ircserv [host:port_network:password_network] <port> <password>
```

- ○ `host` is the hostname on which IRC must connect to join a already existing network

- ○ `port_network` is the server port on which IRC must connect on `host`

- ○ `password_network` is the password needed to connect on `host`

- ○ `port` is the port number on which your server will accept incoming connections.

- ○ `password` is the password needed by any IRC client who wants to connect to your server.

- ○ If `host`, `port_network` and `password_network` aren't given, you must create a `new IRC network`

- The server must be capable of handling multiple clients at the same time and never hang. Forking is not allowed, all I/O operations must be non blocking and use only 1 poll (or equivalent) for all (read, write, but also listen, ...)

> We've let you use fcntl because MacOS X doesn't implement write the same way as other Unix OSes.
> You must use non-blocking FD to have a result similar to other OSes.

> Because you are using non-blocking FD, you could use read/recv or write/send functions without poll (or equivalent) and your server would be not blocking. But it would consume more system resources. So again trying to read/recv or write/send in any FD without going through a poll (or equivalent) will give you a mark equal to 0 and the end of the evaluation.

> You can only use fcntl as follow: fcntl(fd, F_SETFL, O_NONBLOCK);
> Any other flags are forbidden.

- You are of course expected to build a clean code. Verify absolutely every error and in cases where you might have a problem (partial data received, low bandwidth...)

- To verify that your server correctly uses everything you send, an initial test can be done with `nc` (Use ctrl+d to send parts of the command):

```
\$> nc 127.0.0.1 6667
com^Dman^Dd
\$>
```

This will allow you to first send the letters `com`, `man`, `d\n`. You must first aggregate the packets to rebuild the command `command` to handle it.

- Several IRC clients exist you must choose one as a reference and it will be used during the defense.

- To be compatible with this client you will need to implement at least some part of the IRC official RFC.

- Using the client on your server must be like using it on any official IRC server but to be sure we will list the minimal required features.

- You must be able to connect the reference client to your server without producing any error.

- You must be able to authenticate, set a nickname, a username, join a channel, send and receive private messages using this client.

- all messages from one client on a channel are sent to all other clients of the channel.

- You must have operators and regular users.

- Some operator's specific actions/commands.

Chapter IV

Bonus part

Here are the bonuses you can add to your IRC to make it closer to the actual IRC. Of course, if the mandatory part is not perfect, don't even think about bonuses.

- File transfer.

- A bot.