

Operating System Project

MetaChat

{Secure and Deadlock Safe Chat System}

Group Members: -

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Operating System Project

About Project: -

In this Project, we created a Chat System which is deadlock safe and End-to-End Encrypted for the privacy purpose which is needed in today's world extensively.

The users have to first create an account on the server with password (case sensitive) and login again with the same password. The username should be unique to a user.

In this chat system, multiple users can interact with each other on a single server. They can send messages to specific users or broadcast message to all users which are online at that moment.

We have established a system which will encrypt data from the user and send the encrypted data to the server and after the message reaches its destined user, it will get decrypted and message can be read by that user.

We created a deadlock safe environment in which we use mutex locks for process synchronisation and prevent system in going in a deadlock state.

In this system, a user can login from multiple terminals/devices as the credentials will be store in the server as long as the server is running.

Operating System Project

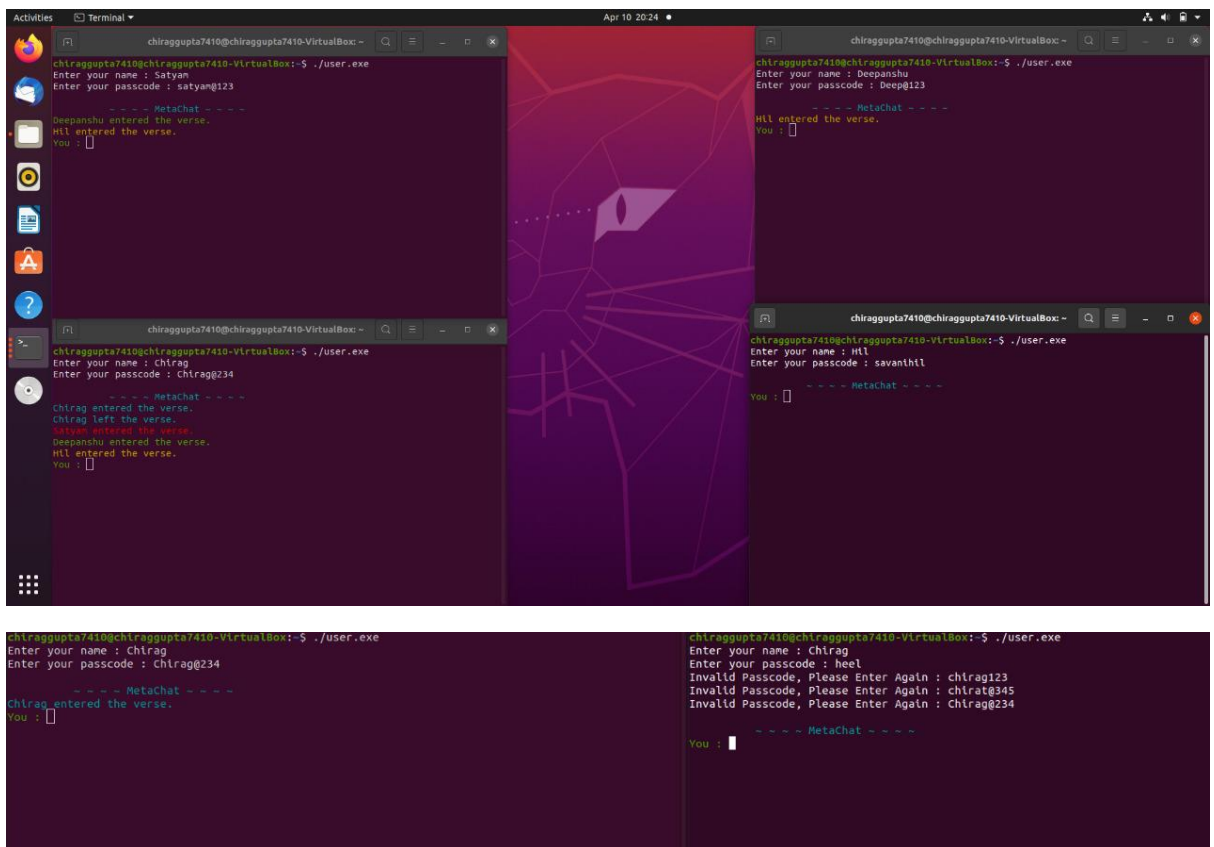
Working: -

- Initializing the Server: -

```
chiraggupta7410@chiraggupta7410-VirtualBox:~$ g++ Server.cpp -lpthread -o serv.exe
Server.cpp: In function 'bool checkflag(int, int)':
Server.cpp:310:1: warning: no return statement in function returning non-void [-Wreturn-type]
  310 | }
      | ^
Server.cpp: In function 'bool Check_password(std::string, int)':
Server.cpp:126:1: warning: control reaches end of non-void function [-Wreturn-type]
  126 | }
      | ^
chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./serv.exe

~ ~ ~ MetaChat Server ~ ~ ~
```

- User Login: -



The screenshot shows a Linux desktop environment with four terminal windows. The top-left window shows the server running and receiving a login attempt from 'Satan'. The top-right window shows the server receiving a login attempt from 'Deepanshu'. The bottom-left window shows the server receiving a login attempt from 'Chirag' with a successful login. The bottom-right window shows the server receiving a login attempt from 'Chirag' with an invalid password, followed by two more attempts with different passwords, all of which are rejected.

```
chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Satan
Enter your passcode : satyan@123

~ ~ ~ MetaChat ~ ~ ~
Deepanshu entered the verse.
HLL entered the verse.
You : 

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Deepanshu
Enter your passcode : Deep@123

~ ~ ~ MetaChat ~ ~ ~
HLL entered the verse.
You : 

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Chirag
Enter your passcode : Chirag@234

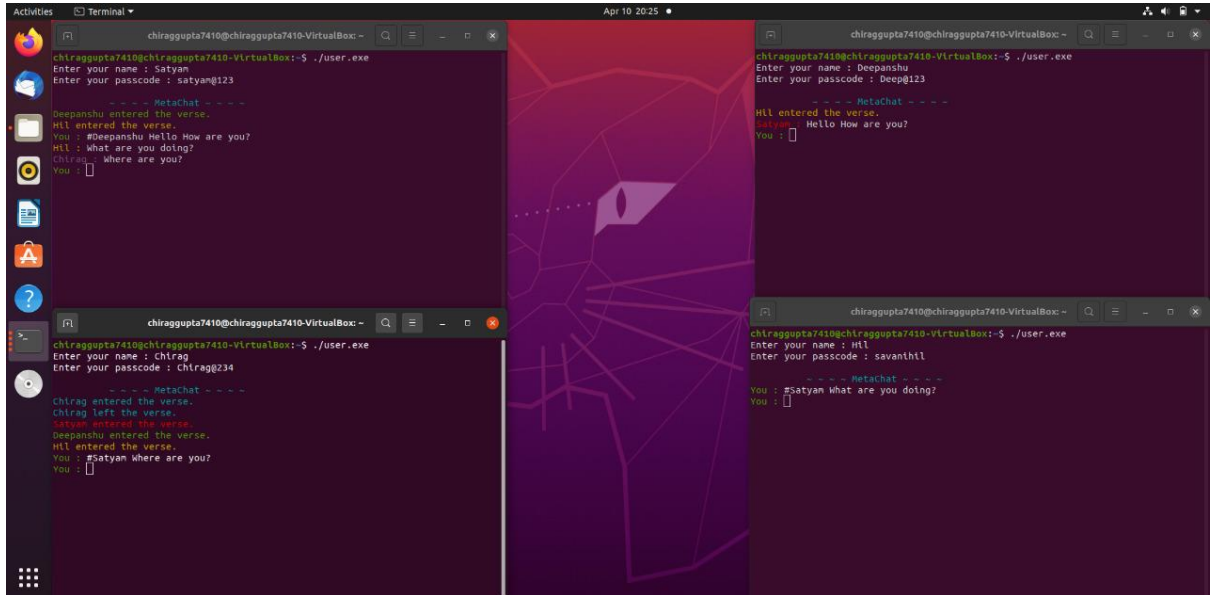
~ ~ ~ MetaChat ~ ~ ~
Chirag entered the verse.
Chirag left the verse.
Satan entered the verse.
Deepanshu entered the verse.
HLL entered the verse.
You : 

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Chirag
Enter your passcode : hee!
Invalid Passcode, Please Enter Again : chirag@345
Invalid Passcode, Please Enter Again : Chirag@234

~ ~ ~ MetaChat ~ ~ ~
You :
```

Operating System Project

- Sending/Receiving Text: -



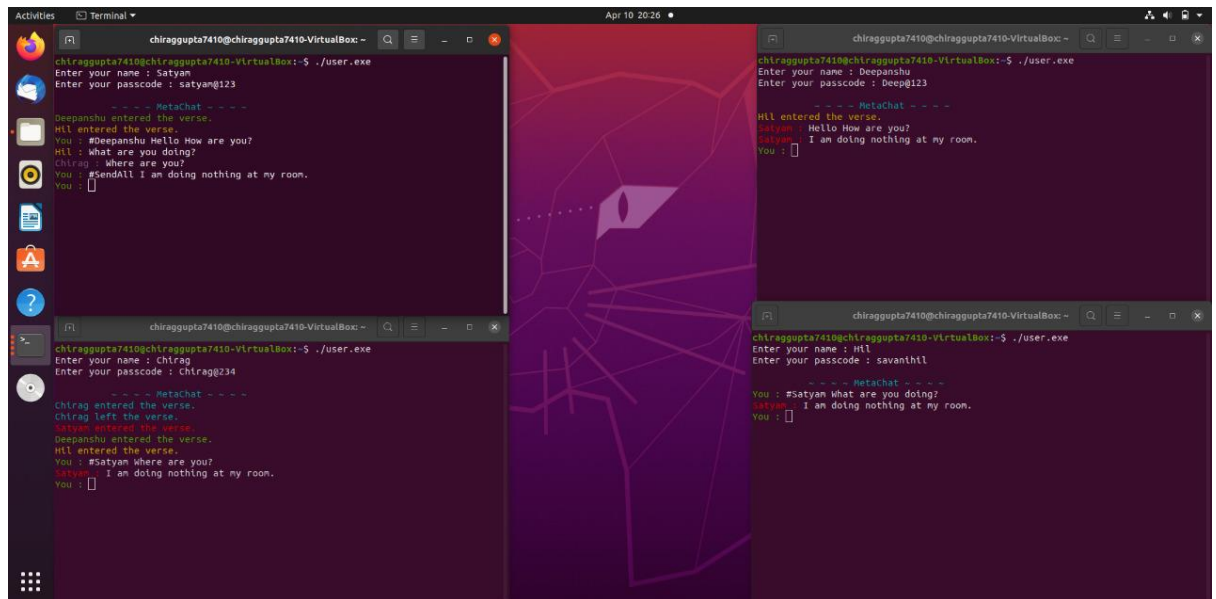
- Encrypted Text on Server with records: -

```
chiraggupta7410@chiraggupta7410-VirtualBox:~$ g++ Server.cpp -lpthread -o serv.exe
Server.cpp: In function 'bool checkflag(int, int)':
Server.cpp:310:1: warning: no return statement in function returning non-void [-Wreturn-type]
  310 | }
      | ^
Server.cpp: In function 'bool Check_password(std::string, int)':
Server.cpp:126:1: warning: control reaches end of non-void function [-Wreturn-type]
  126 | }
      | ^
chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./serv.exe

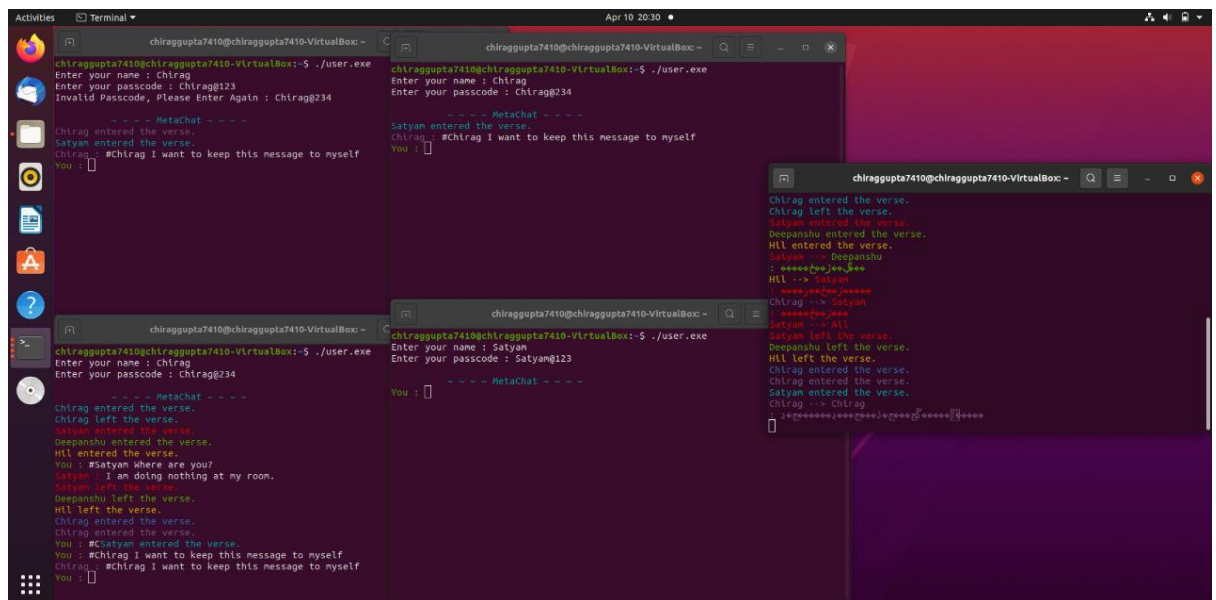
~ ~ ~ ~ MetaChat Server ~ ~ ~ ~
Chirag Gupta entered the verse.
Chirag Gupta entered the verse.
Satyam Pahariya entered the verse.
Satyam Pahariya left the verse.
Chirag Gupta left the verse.
Chirag Gupta left the verse.
Chirag entered the verse.
Chirag entered the verse.
Chirag left the verse.
Satyam entered the verse.
Deepanshu entered the verse.
Hil entered the verse.
Satyam --> Deepanshu
: *****
Hil --> Satyam
: *****
Chirag --> Satyam
: *****
Satyam --> All
```

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- Broadcasting Message: -

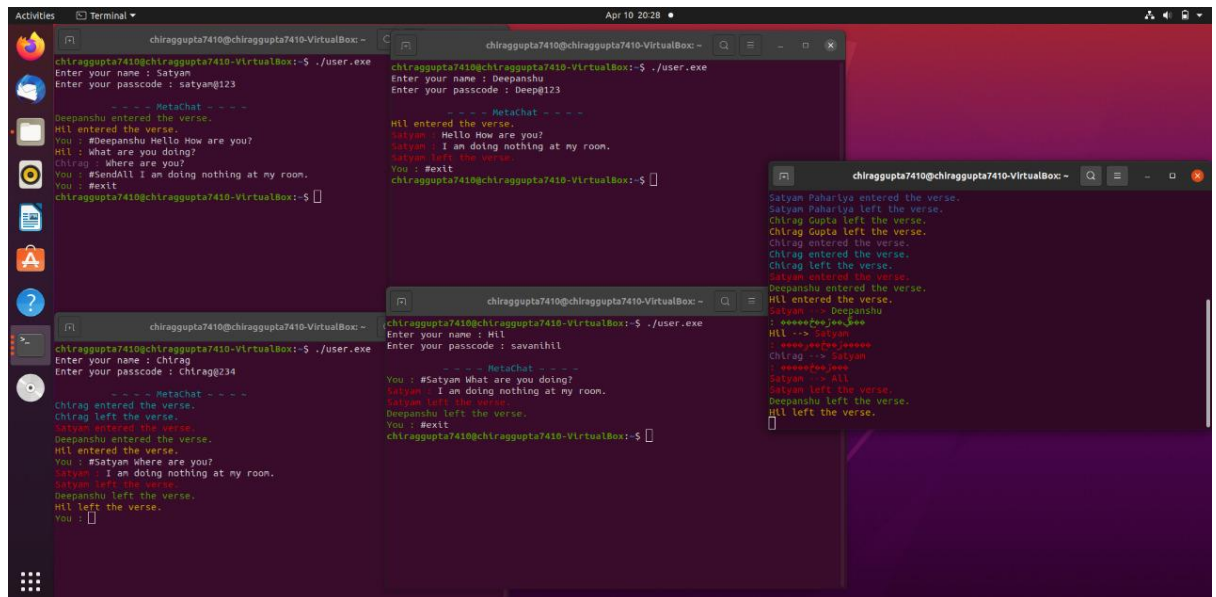


- Sending Text to all your Devices (Preserving Data): -



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- Exiting the Chat: -



```
chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Satyam
Enter your passcode : satyam123

--- MetaChat ---
Deepanshu entered the verse.
Hll entered the verse.
You : #Deepanshu Hello How are you?
Hll : what are you doing?
Chirag : where are you?
You : #SendAll I am doing nothing at my room.
You : #exit
chiraggupta7410@chiraggupta7410-VirtualBox:~$

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Deepanshu
Enter your passcode : Deepg123

--- MetaChat ---
Hll entered the verse.
Satyam : Hello How are you?
Satyam : I am doing nothing at my room.
Satyam left the verse.
You : #exit
chiraggupta7410@chiraggupta7410-VirtualBox:~$

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Chirag
Enter your passcode : Chirag234

--- MetaChat ---
Chirag entered the verse.
Chirag left the verse.
Satyam entered the verse.
Deepanshu entered the verse.
Hll entered the verse.
You : #Satyam Where are you?
Satyam : I am doing nothing at my room.
Satyam left the verse.
Deepanshu left the verse.
Hll left the verse.
You :

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Enter your name : Hll
Enter your passcode : savanihil

--- MetaChat ---
You : #Satyam What are you doing?
Satyam : I am doing nothing at my room.
Satyam left the verse.
Deepanshu left the verse.
You : #exit
chiraggupta7410@chiraggupta7410-VirtualBox:~$

chiraggupta7410@chiraggupta7410-VirtualBox:~$ ./user.exe
Satyam Pahariya entered the verse.
Satyam Pahariya left the verse.
Chirag Gupta left the verse.
Chirag Gupta left the verse.
Chirag entered the verse.
Chirag entered the verse.
Chirag left the verse.
Satyam entered the verse.
Deepanshu entered the verse.
Hll entered the verse.
Satyam : Deepanshu
: #####BeeJeeJee
Hll --> Satyam
Chirag --> Satyam
: #####BeeJeeJee
Satyam --> All
Satyam left the verse.
Deepanshu left the verse.
Hll left the verse.
```