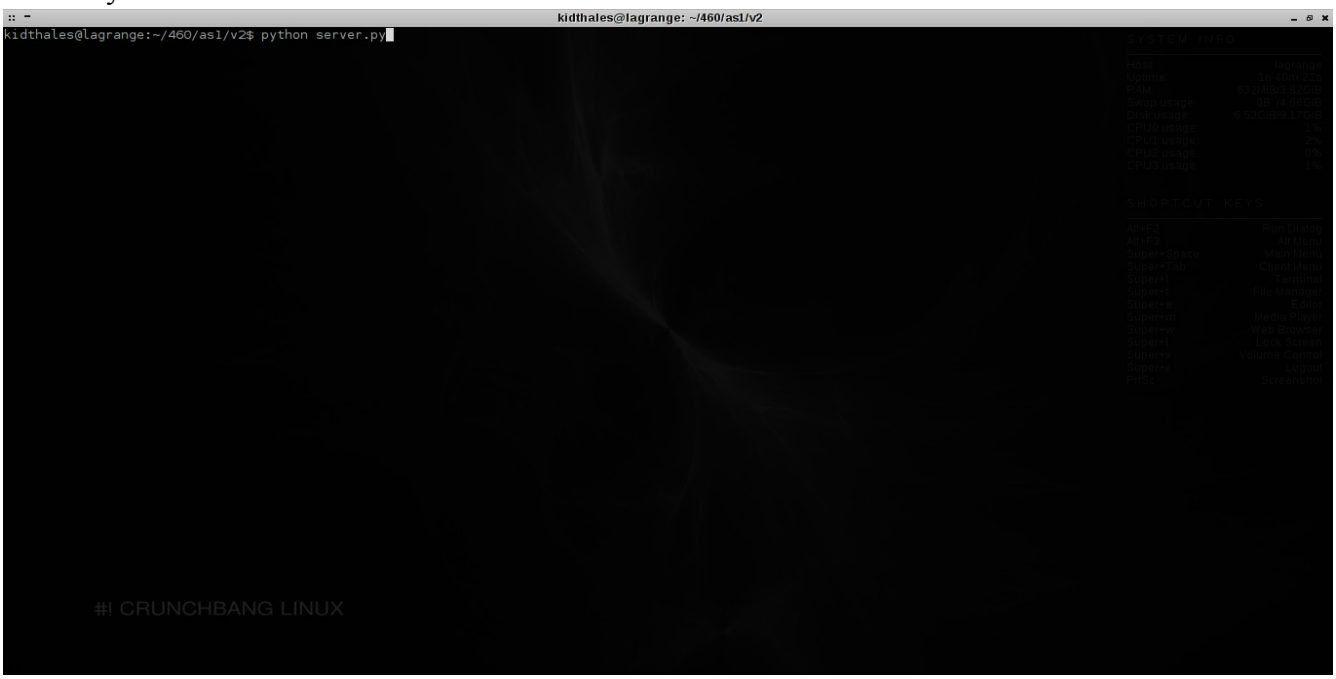
## Server

### Starting the Server

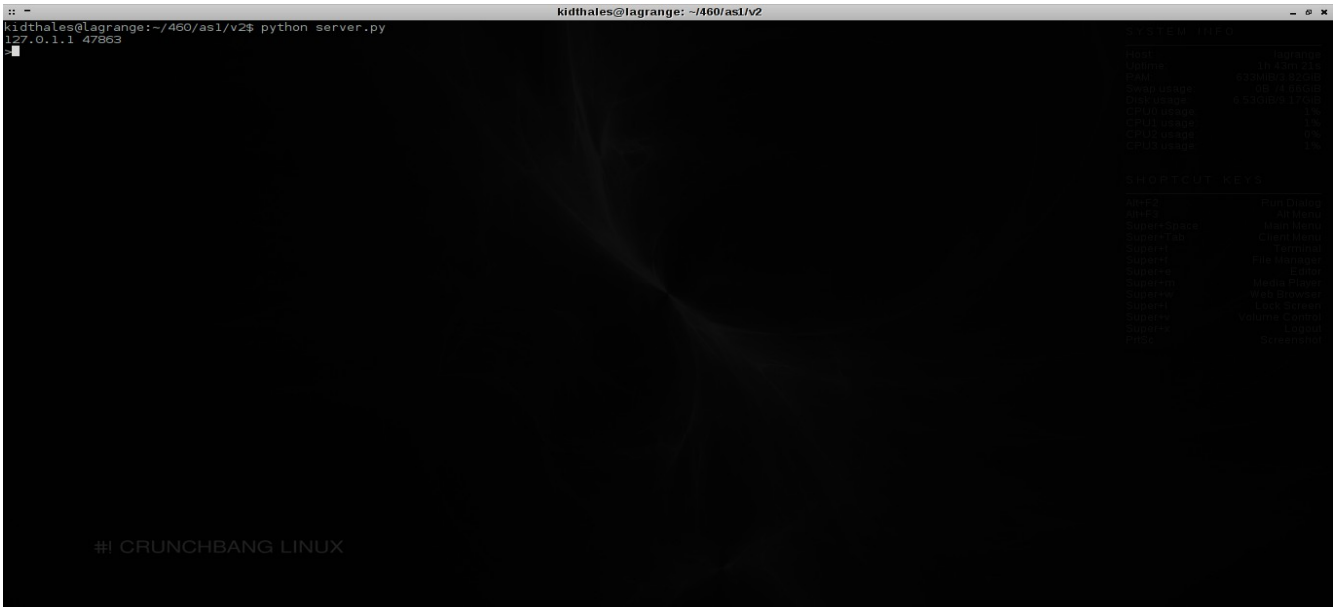
Navigate to the directory containing the file server.py. Type python server.py and press the enter key.




*Server Invocation*

### Server Operation

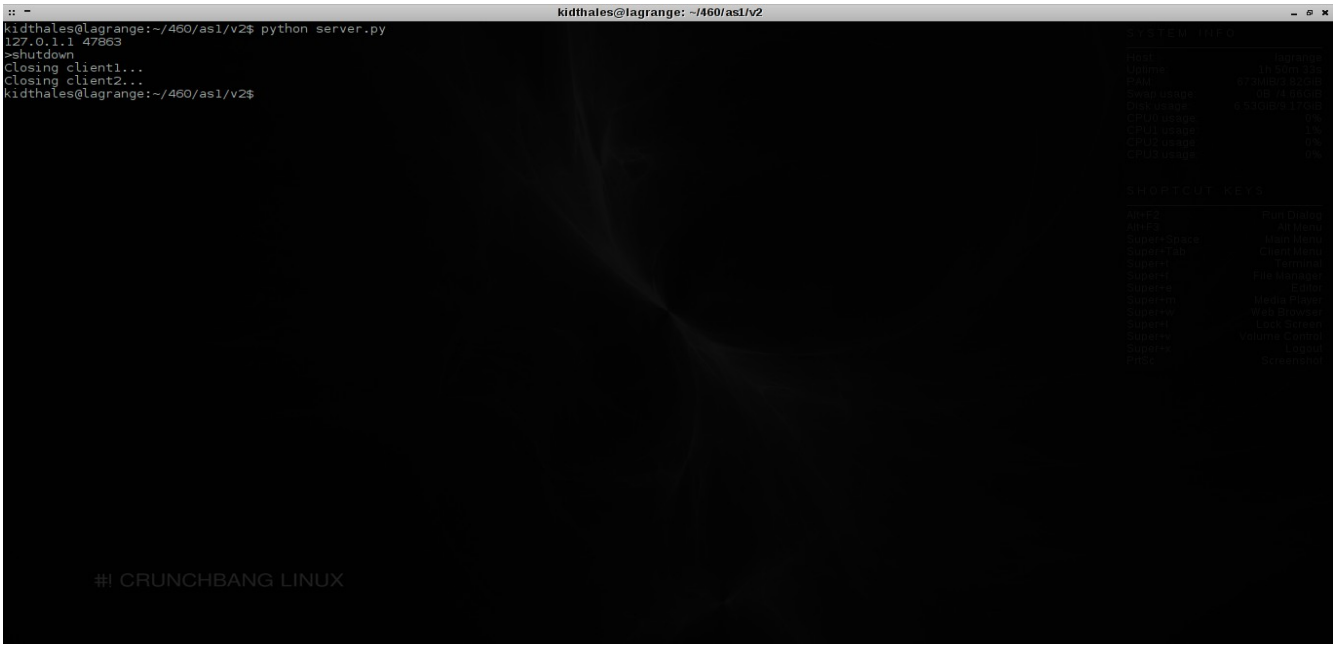
Upon start, the server will display the IP address and port number that the server is listening on for incoming connections. The server will also display a prompt for user input.




*Server Operation*

### Server Shutdown

At the server prompt type shutdown. This will shutdown all clients currently connected to the server, as well as the server itself.

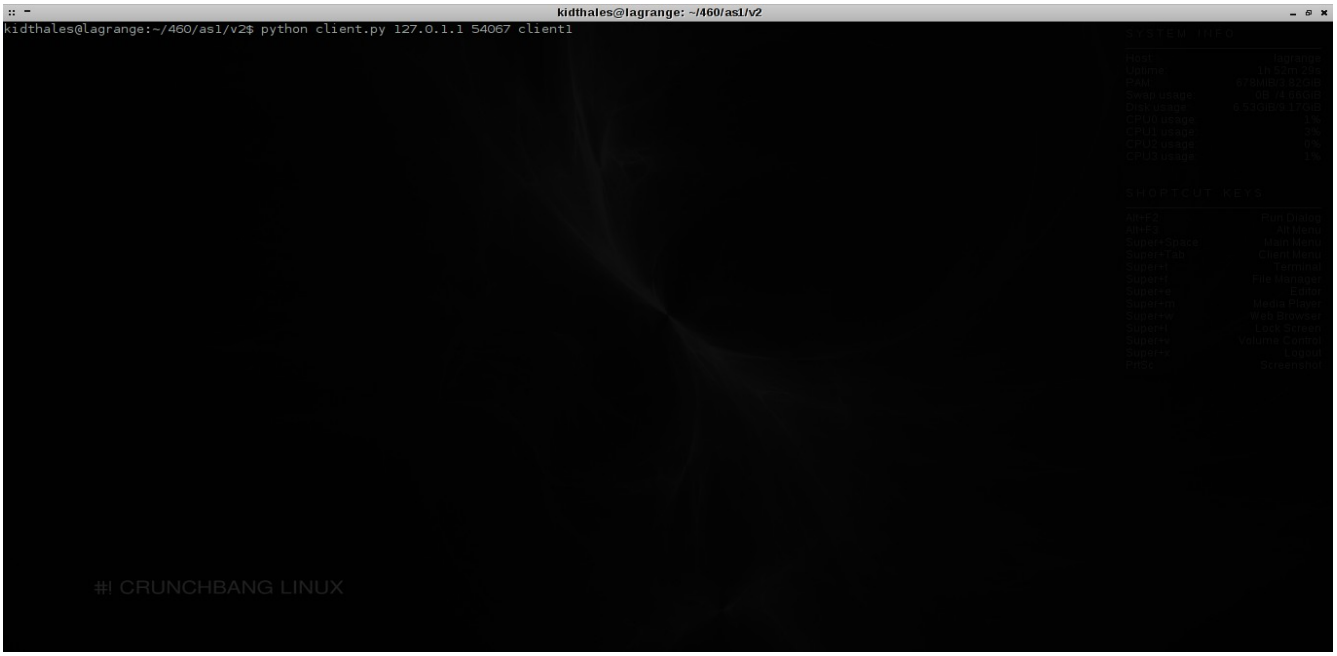



*Server Shutdown - Notice all clients are closed remotely*

## Client

### Starting a Client

Navigate to the directory containing the file client.py.

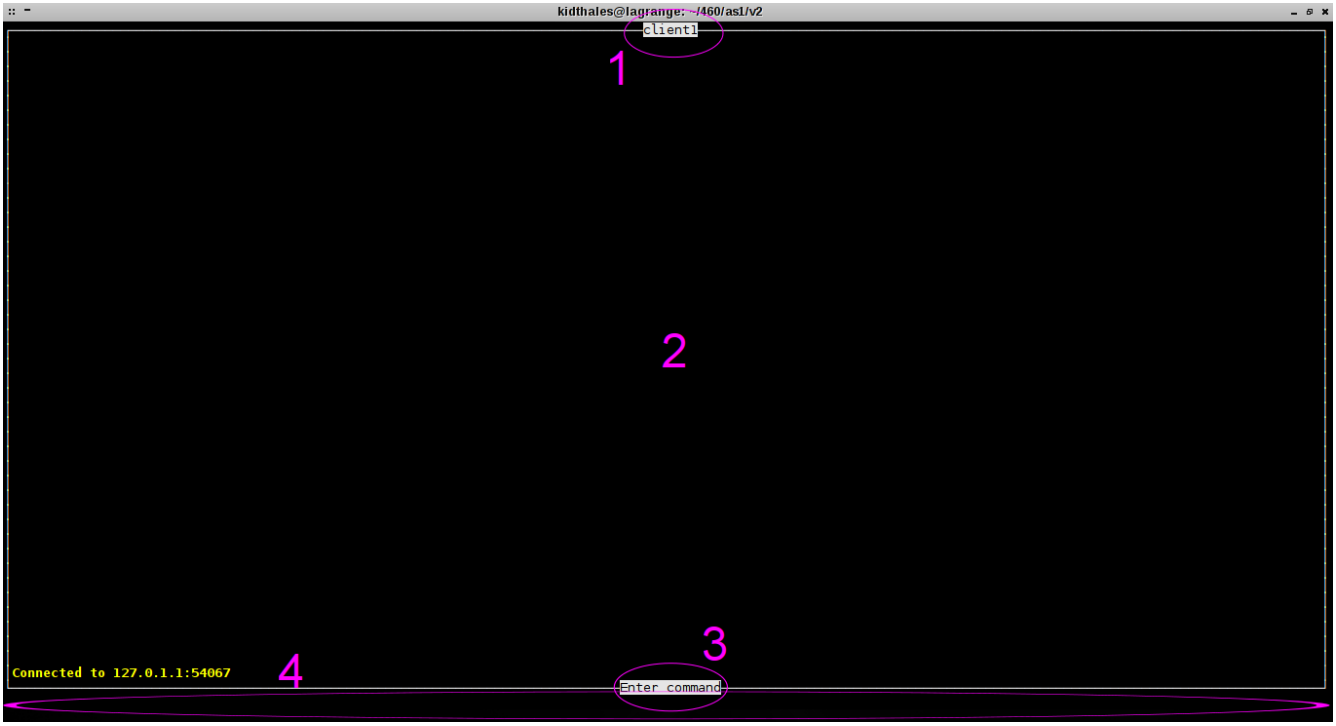



*Client Invocation*

Type python client.py serverip serverport clientname and press the enter key.

- serverip is the IP address that the server is listening on
- serverport is the port number the server is listening on
- clientname is the name you wish to register with the server; this name must be unique – it identifies your client with respect to other clients and the server

**Client User Interface**




*Client User Interface*

The user interface for the client is laid out as follows:

1. This label displays the name of the client
2. All messages received from clients is displayed in this area
3. This label provides context for user commands; multi-input commands will change this label based on the required input from the user
4. This field is for user input such as commands and messages to other clients

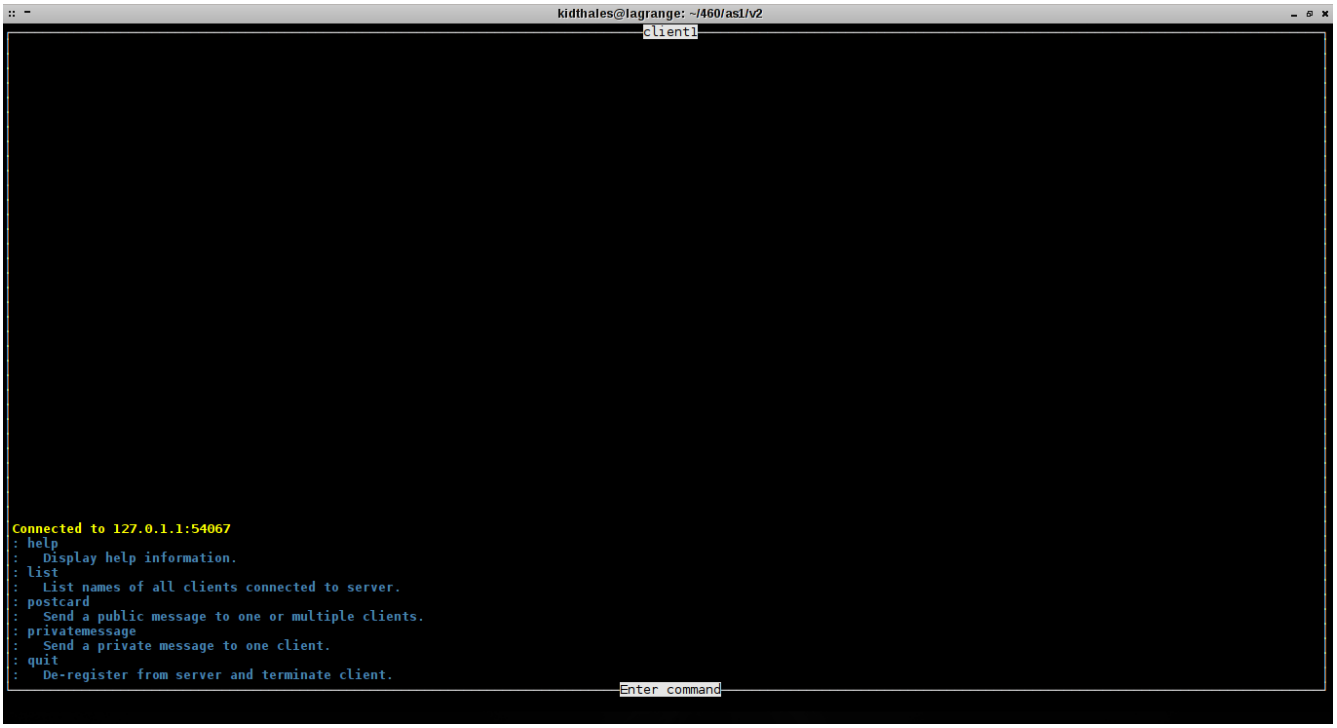
**Client Operations Overview**

There are three single input commands: help, list, and quit. There are two multi-input commands that correspond to message sending: postcard and privatemessage.

**Client Operations – help**

Provides a list and general overview of valid commands.


*Client help Command - Input*




*Client help Command - Output*

### Client Operations – list

Lists names of all currently connected and registered clients. The querying client's name is also included in the list.


*Client list Command - Input*


*Client list Command - Output*

### Client Operations – quit

De-registers client name with server and terminates client execution.


*Client quit Command - Input*


*Client quit Command - Output*

### Client Operations – **postcard**

Upon entering this command, the user will be prompted for a list of clients (delineated by whitespace) to send a message to. Upon entering the clients, the user will be prompted to enter a one line message. This message will be sent to all clients in the given list that are registered with the

server; output of the entire command is also displayed in the sending client.


*Client postcard Command - Input*


*Client postcard Command - Client List Input (Note the command context label)*


*Client postcard Command - Message Input (Note the command context label)*

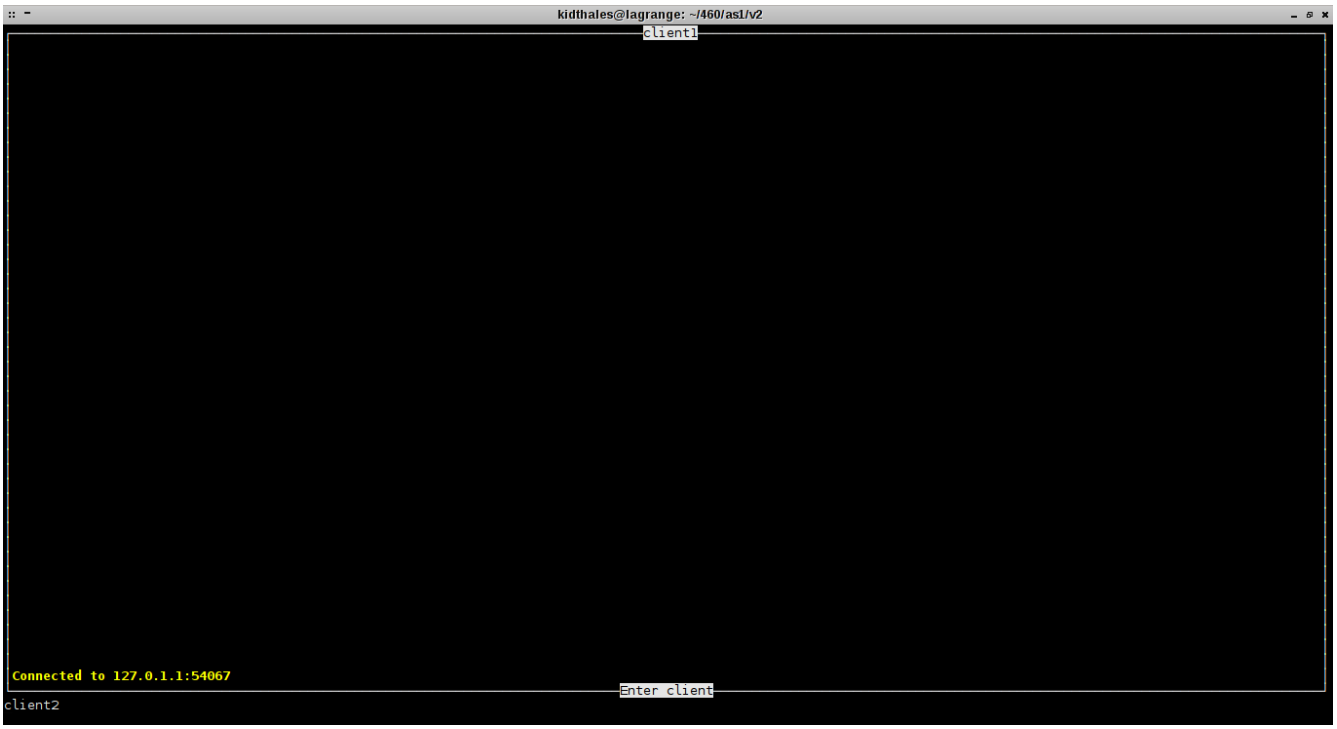

*Client postcard Command - Sender Output (In this example the sender sent the message to himself and one other)*


*Client postcard Command - Receiver Output*

### Client Operations – privatemessage

Upon entering this command, the user will be prompted for a client to send a private message to. Upon entering the client, the user will be prompted to enter a one line message. This message will be sent to the chosen client without passing through the server; output of the entire command is also displayed in the sending client.


*Client privatemessage Command - Input*




*Client privatemessage Command - Client Input (Note the command context label)*


*Client privatemessage Command - Message Input (Note the command context label)*


*Client privatemessage Command - Sender Output*


*Client privatemessage Command - Receiver Output*