

Chat Application using Socket



A project under the guidance of -

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Introduction

Ngrok

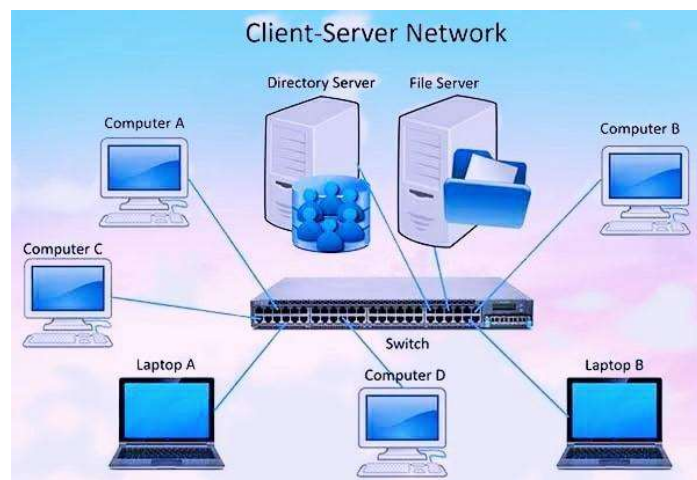
It is a cross-platform programme that allows developers to quickly and easily expose a local development server to the Internet. The programme lets your locally hosted web server seem to be hosted on a ngrok.com subdomain, removing the necessity for a public IP or domain name on the local system.

Server

A server is a computer programme or device that delivers functionality to other programmes or devices called clients. The client–server model is the name for this design. Multiple processes or devices are used to perform a single overall calculation.

Client

In the client–server model of computer networks, a client is a piece of computer hardware or software that accesses a service provided by a server. The server is frequently (but not always) located on another computer system, while the client uses a network to access the service.

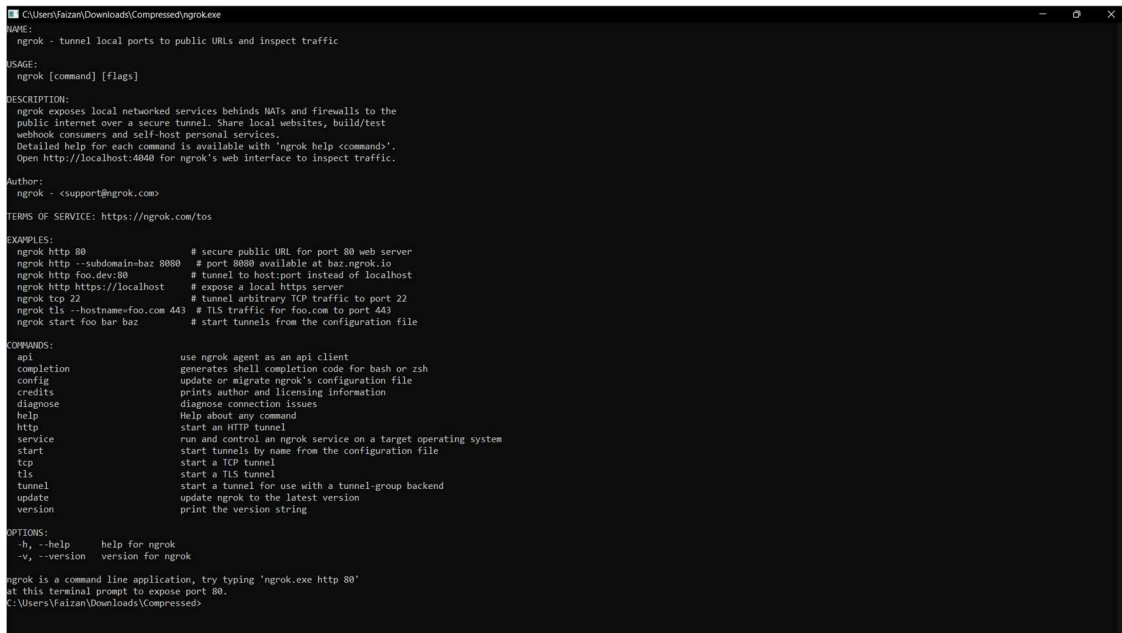


IP Address

An IP address is a one-of-a-kind address that differentiates one device from another on the internet or in a network. IP, or Internet Protocol, is a collection of instructions for setting up data transfer via the internet or any other local network.

Working of our Project

- We begin by running the 'Ngrok' application. It's available for download at <https://ngrok.com/download>. To utilise it, you must first create an account. This is what it would look like the first time you ran it.



```
C:\Users\Faizan\Downloads\Compressed\ngrok.exe
NAME:
  ngrok - tunnel local ports to public URLs and inspect traffic

USAGE:
  ngrok [command] [flags]

DESCRIPTION:
  ngrok exposes local networked services behind NATs and firewalls to the
  public internet over a secure tunnel. Share local websites, build/test
  webhooks consumers and self-host personal services.
  Detailed help for each command is available with 'ngrok help <command>'.
  Open http://localhost:4040 for ngrok's web interface to inspect traffic.

Author:
  ngrok - <support@ngrok.com>

TERMS OF SERVICE: https://ngrok.com/tos

EXAMPLES:
  ngrok http 80 # secure public URL for port 80 web server
  ngrok http --subdomain=baz 8080 # port 8080 available at baz.ngrok.io
  ngrok http foo.dev:80 # tunnel to host:port instead of localhost
  ngrok http https://localhost # expose a local https server
  ngrok tcp 22 # tunnel arbitrary TCP traffic to port 22
  ngrok tls --hostname=foo.com 443 # TLS traffic for foo.com to port 443
  ngrok start foo bar baz # start tunnels from the configuration file

COMMANDS:
  api          use ngrok agent as an api client
  completion   generates shell completion code for bash or zsh
  config       update or migrate ngrok's configuration file
  credits      prints author and licensing information
  diagnose     diagnose connection issues
  help         Help about any command
  http        start an HTTP tunnel
  service      run and control an ngrok service on a target operating system
  start        start tunnels by name from the configuration file
  tcp         start a TCP tunnel
  tls         start a TLS tunnel
  tunnel       start a tunnel for use with a tunnel-group backend
  update       update ngrok to the latest version
  version      print the version string

OPTIONS:
  -h, --help    help for ngrok
  -v, --version version for ngrok

ngrok is a command line application, try typing 'ngrok.exe http 80'
at this terminal prompt to expose port 80.
C:\Users\Faizan\Downloads\Compressed>
```

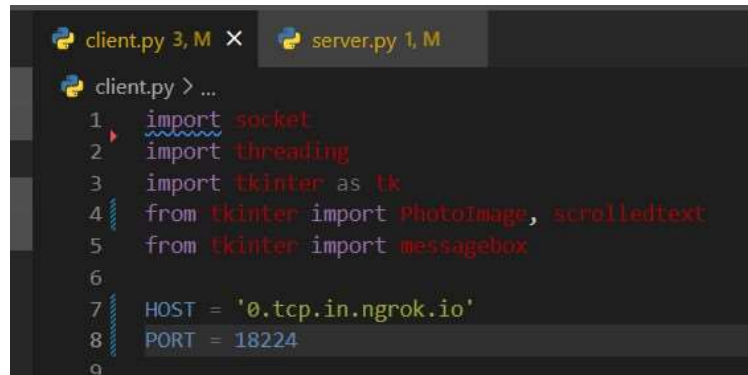
- Because our server is listening on port '1234,' we'll run the following command on the ngrok command box to perform the following command.

ngrok tcp 1234

- A command box with a unique web interface address should appear. An example may be as follows:

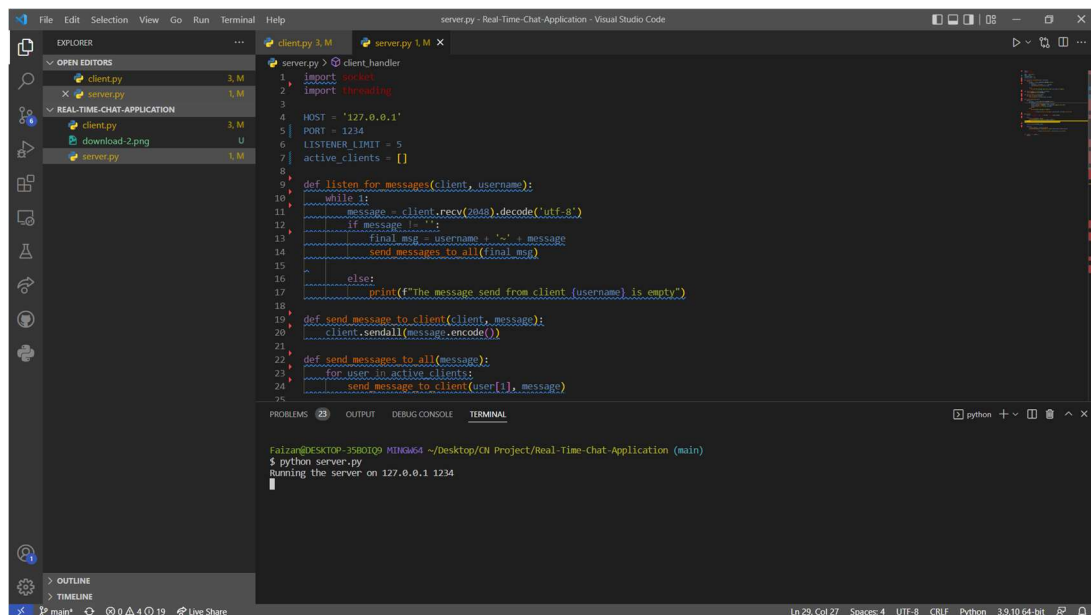
tcp://0.tcp.in.ngrok.io:18224 -> localhost:1234

- The five-digit port number is then copied to the client code at the area where a port number is assigned. The number in my example is '18224.' As a result, we assign the same number to the port in my code.



```
client.py 3, M X server.py 1, M
client.py > ...
1 import socket
2 import threading
3 import tkinter as tk
4 from tkinter import PhotoImage, scrolledtext
5 from tkinter import messagebox
6
7 HOST = '0.tcp.in.ngrok.io'
8 PORT = 18224
9
```

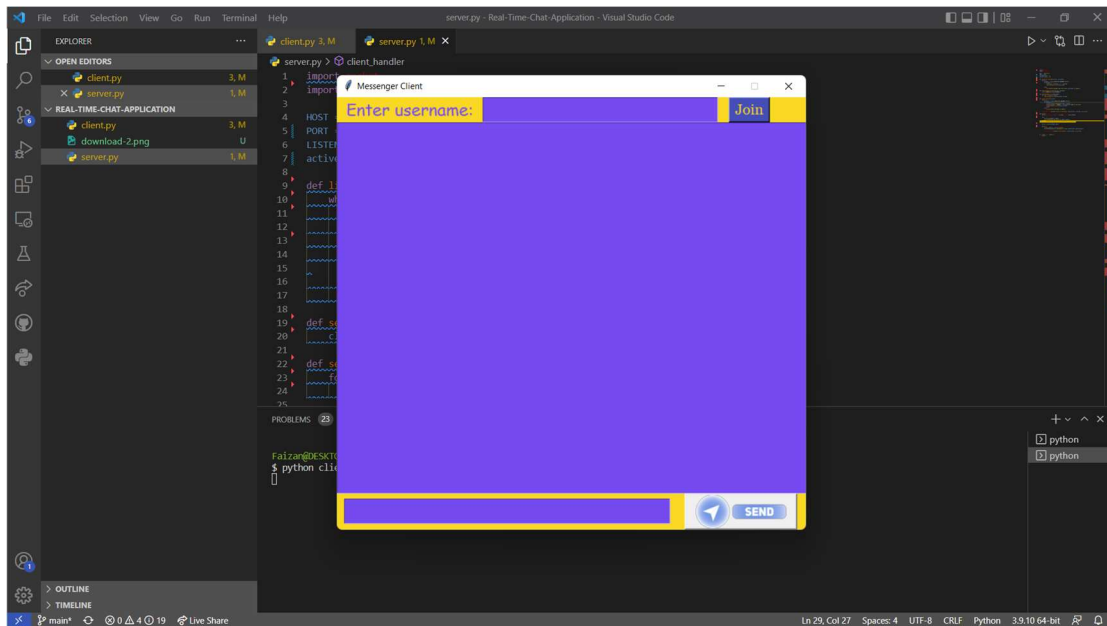
- Run the server code first. 'Running the server on 127.0.0.1 1234' should appear in the terminal when it has been successfully started, as illustrated in the image below.



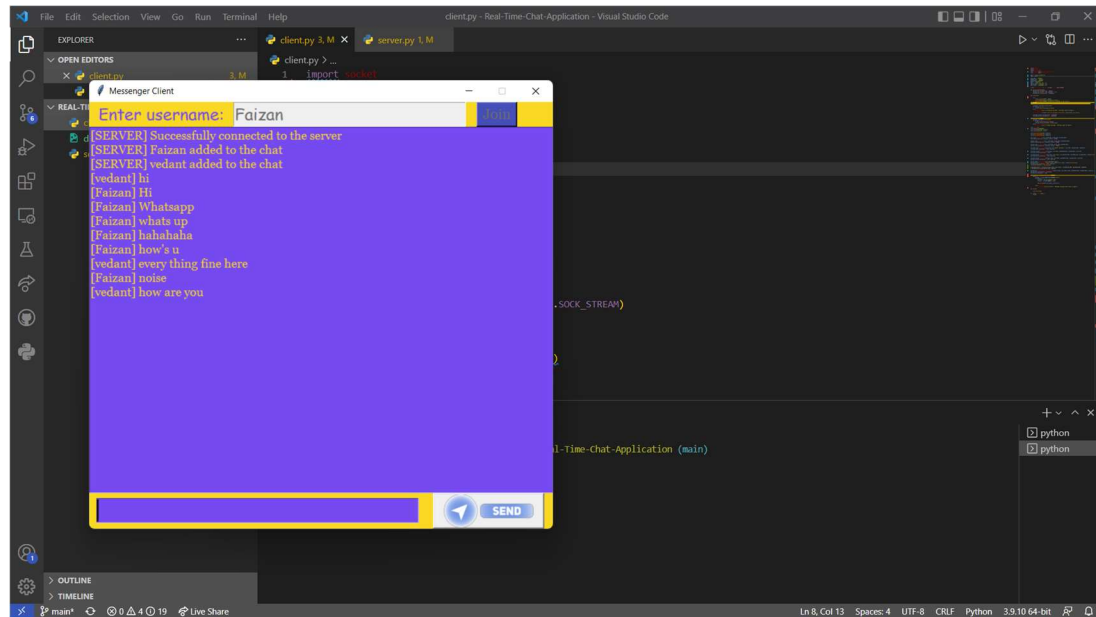
```
server.py - Real-Time-Chat-Application - Visual Studio Code
server.py 3, M X client.py 3, M
server.py > client_handler
1 import socket
2 import threading
3
4 HOST = '127.0.0.1'
5 PORT = 1234
6 LISTENER_LIMIT = 5
7 active_clients = []
8
9 def listen_for_messages(client, username):
10     while 1:
11         message = client.recv(2048).decode('utf-8')
12         if message != '':
13             final_msg = username + ': ' + message
14             send_messages_to_all(final_msg)
15         else:
16             print(f"The message send from client (username) is empty")
17
18 def send_message_to_client(client, message):
19     client.sendall(message.encode())
20
21 def send_messages_to_all(message):
22     for user in active_clients:
23         send_message_to_client(user[1], message)
24
25
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
python python 3.9.10 64-bit
Faizang@DESKTOP-35801Q9 MINGW64 ~/Desktop/CH Project/Real-Time-Chat-Application (main)
$ python server.py
Running the server on 127.0.0.1 1234
```

- Then, on a fresh terminal, run the client code. As indicated in the image below, a pop-up box should appear.



- Join by entering your name. To join the conversation, the other person only has to run the client code. A maximum of ten persons can converse at the same time.



Future Scope

- A more appealing and user-friendly interface is required.

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- There would be no need to utilise third-party software like 'ngrok' if we could acquire a domain or put the code database in the cloud.
 - A group system, similar to whatsapp, may also be built in the code, where a specific number of individuals are invited to join and can read and write the conversation at any time.
 - If we assign each user a unique key for joining the chat, we can also build an invite option.

Acknowledgement

We are very much thankful to our mentor Dr. Debashish Bera for providing us the chance to explore and learn from this topic. This not only helps us expand our chest of knowledge but also gives us an insight of the vast universe of Computer Network.