PDC

PROJECT REPORT

[CHAT APPLICATION]

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Parallel and Distributed Chat Application

➢ Introduction

The Parallel and Distributed Chat Application is a Python-based client-server project developed to showcase essential concepts of parallelism and distributed computing. This application enables clients to exchange text messages through a central server, emphasizing parallel processing of client requests and the distribution of data across connected clients.

➢ Features

Text Communication: Clients can concurrently send text messages to the server, highlighting parallel processing capabilities.

➢ Project Structure

Server-Side (server.py)

handle_client: A concurrent function that manages communication with each connected client, illustrating parallel processing.

connected_clients: A list to maintain the state of connected client sockets, showcasing parallel data handling.

Server configuration includes host, port, and buffer size.

Client-Side (client.py)

Clients can send text messages concurrently, demonstrating the parallel capability of handling multiple clients.

Client configuration includes host, port, and buffer size.

➢ Compilation

Ensure that you have Python 3.x installed on your system.

No explicit compilation is required for Python scripts. However, make sure to have the necessary dependencies installed by running:

```
pip install -r requirements.txt
```

➢ Usage

1. **Run Server:**

```
python server.py
```

2. **Run Multiple Clients:**

```
python client.py
```

3. **Interaction:**

Clients can concurrently send and receive text messages, showcasing parallel communication.

➢ Parallel and Distributed Aspects

- Parallel Processing: The server's handle_client function demonstrates the parallel handling of multiple clients, allowing for simultaneous text transfer.
- Distributed Data Handling: The list connected_clients on the server side illustrates the distribution of client state across the server, enabling coordinated data exchange.

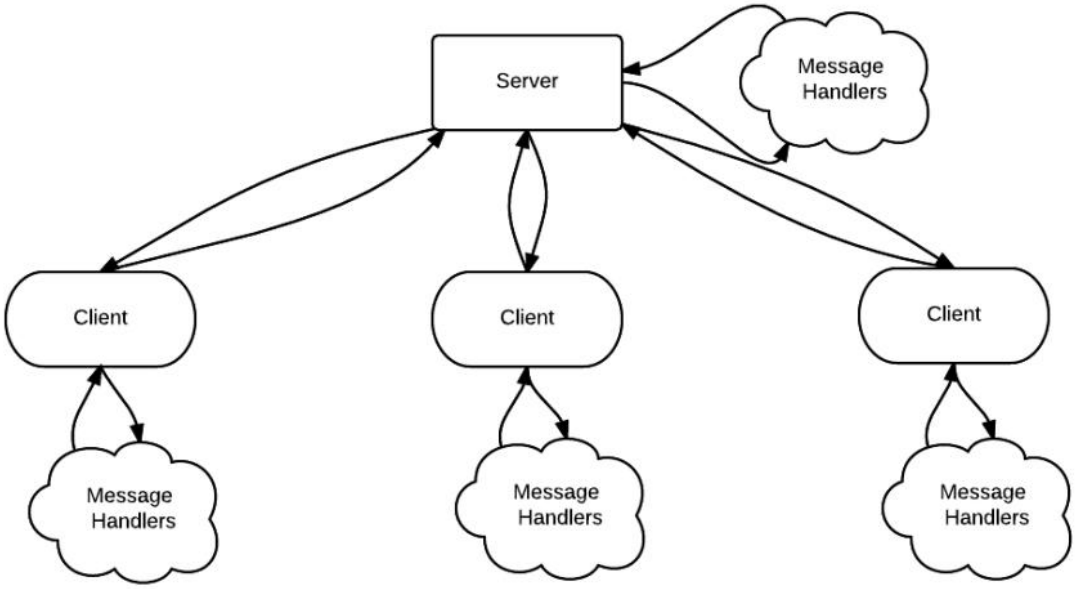
➢ Dependencies

Python 3.x

➢ Conclusion

The Parallel and Distributed Chat Application provides a foundational understanding of parallel and distributed computing concepts within the context of a text-based chat application. This project serves as a basis for further exploration into advanced distributed systems, scalability, fault tolerance, and load balancing.

- Project Structure:



Findind out the available address:

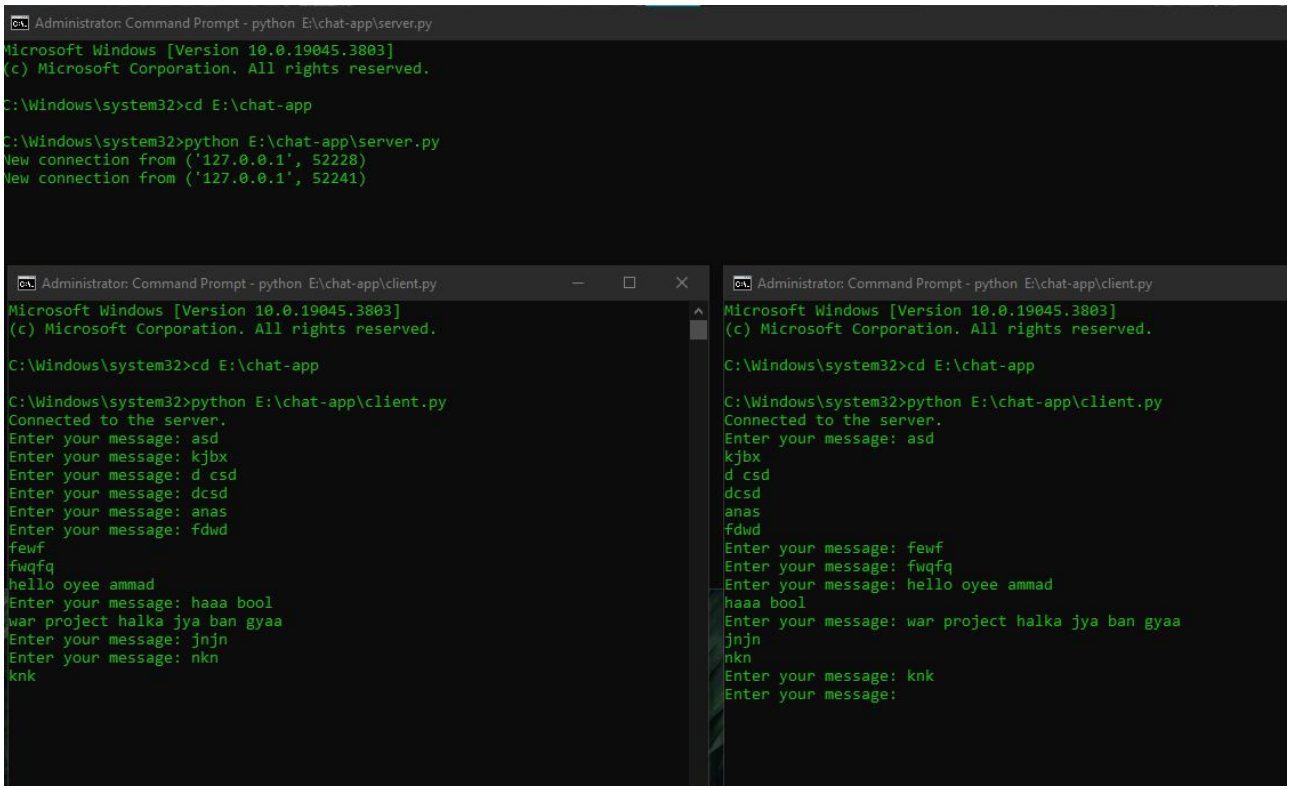
```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.3803]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\system32>netstat -ano

Active Connections

  Proto  Local Address          Foreign Address        State           PID
  TCP    0.0.0.0:135            0.0.0.0:0              LISTENING       948
  TCP    0.0.0.0:445            0.0.0.0:0              LISTENING       4
  TCP    0.0.0.0:5040           0.0.0.0:0              LISTENING       6744
  TCP    0.0.0.0:5357           0.0.0.0:0              LISTENING       4
  TCP    0.0.0.0:49664          0.0.0.0:0              LISTENING       688
  TCP    0.0.0.0:49665          0.0.0.0:0              LISTENING       608
  TCP    0.0.0.0:49666          0.0.0.0:0              LISTENING       1256
  TCP    0.0.0.0:49667          0.0.0.0:0              LISTENING       1264
  TCP    0.0.0.0:49668          0.0.0.0:0              LISTENING       3380
  TCP    0.0.0.0:49671          0.0.0.0:0              LISTENING       680
  TCP    127.0.0.1:5354         0.0.0.0:0              LISTENING       3764
  TCP    127.0.0.1:5354         127.0.0.1:49669        ESTABLISHED     3764
  TCP    127.0.0.1:5354         127.0.0.1:49670        ESTABLISHED     3764
  TCP    127.0.0.1:27015        0.0.0.0:0              LISTENING       3748
  TCP    127.0.0.1:49669        127.0.0.1:5354         ESTABLISHED     3748
  TCP    127.0.0.1:49670        127.0.0.1:5354         ESTABLISHED     3748
  TCP    127.0.0.1:62036        127.0.0.1:62037        ESTABLISHED     2764
  TCP    127.0.0.1:62037        127.0.0.1:62036        ESTABLISHED     2764
  TCP    127.0.0.1:62040        0.0.0.0:0              LISTENING       2764
  TCP    192.168.43.159:139     0.0.0.0:0              LISTENING       4
  TCP    192.168.43.159:61479   74.125.206.188:5228    ESTABLISHED     2380
  TCP    192.168.43.159:61849   20.198.119.143:443     ESTABLISHED     4048
  TCP    192.168.43.159:61992   104.17.188.189:443     CLOSE_WAIT      9100
  TCP    192.168.43.159:61998   52.84.251.32:443       CLOSE_WAIT      9100
```

Output:


Administrator: Command Prompt - python E:\chat-app\server.py
Microsoft Windows [Version 10.0.19045.3803]
(c) Microsoft Corporation. All rights reserved.
C:\Windows\system32>cd E:\chat-app
C:\Windows\system32>python E:\chat-app\server.py
New connection from ('127.0.0.1', 52228)
New connection from ('127.0.0.1', 52241)
Administrator: Command Prompt - python E:\chat-app\client.py
Microsoft Windows [Version 10.0.19045.3803]
(c) Microsoft Corporation. All rights reserved.
C:\Windows\system32>cd E:\chat-app
C:\Windows\system32>python E:\chat-app\client.py
Connected to the server.
Enter your message: asd
Enter your message: kjbx
Enter your message: d csd
Enter your message: dcsd
Enter your message: anas
Enter your message: fdwd
fewf
fwqfq
hello oyee ammad
Enter your message: haaa bool
war project halka jya ban gyaa
Enter your message: jnjn
Enter your message: nkn
knk
Administrator: Command Prompt - python E:\chat-app\client.py
Microsoft Windows [Version 10.0.19045.3803]
(c) Microsoft Corporation. All rights reserved.
C:\Windows\system32>cd E:\chat-app
C:\Windows\system32>python E:\chat-app\client.py
Connected to the server.
Enter your message: asd
kjbx
d csd
dcsd
anas
fdwd
Enter your message: fewf
Enter your message: fwqfq
Enter your message: hello oyee ammad
haaa bool
Enter your message: war project halka jya ban gyaa
jnjn
nkn
Enter your message: knk
Enter your message: