NAME : Bhavik Ransubhe
CLASS : T.E(B)
ROLL.NO : 39055

Problem Statement :
Write a program using UDP sockets for wired network to implement a. Peer to Peer Chat b. Multiuser Chat Demonstrate the packets captured traces using Wireshark Packet Analyzer Tool for peer to peer mode.

CLIENT 1(NEW THREAD) :-

```
import java.io.*;
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;
import java.net.SocketException;
import java.util.Scanner;


public class Client1 {

    static DatagramSocket client1Socket;
    static byte[] sendData;
    static byte[] receiveData;
```

```
    private static InetAddress ip;

    public Client1(){

        try {
            client1Socket = new DatagramSocket(6000);
            ip = InetAddress.getLocalHost();
            sendData = new byte[1024];
            receiveData = new byte[1024];


        }catch (Exception e){
            System.out.println("Socket could not be connected");
        }

    }

    public static void main(String[] args) throws IOException,
InterruptedException {

        Client1 client1 = new Client1();

        client1.startChat();

    }



    private void startChat() throws IOException, InterruptedException
{

        System.out.println("\n\t\t\t\t\t\tConnection with Client :
Success\n");

        DatagramPacket receivePacket = new
DatagramPacket(receiveData,receiveData.length);
        client1Socket.receive(receivePacket);
        String nameOfOtherClient = new
String(receivePacket.getData());
```

```
        System.out.println(nameOfOtherClient + " is online.\n");

        Scanner sc = new Scanner(System.in);
        System.out.println("************************* Register
************************");
        System.out.print("Name : ");
        String name  = sc.nextLine();
        sendData = name.getBytes();
        DatagramPacket sendPacket = new
DatagramPacket(sendData,sendData.length,ip,6000);
        client1Socket.send(sendPacket);

System.out.println("*********************************************
************");


    }
}
```

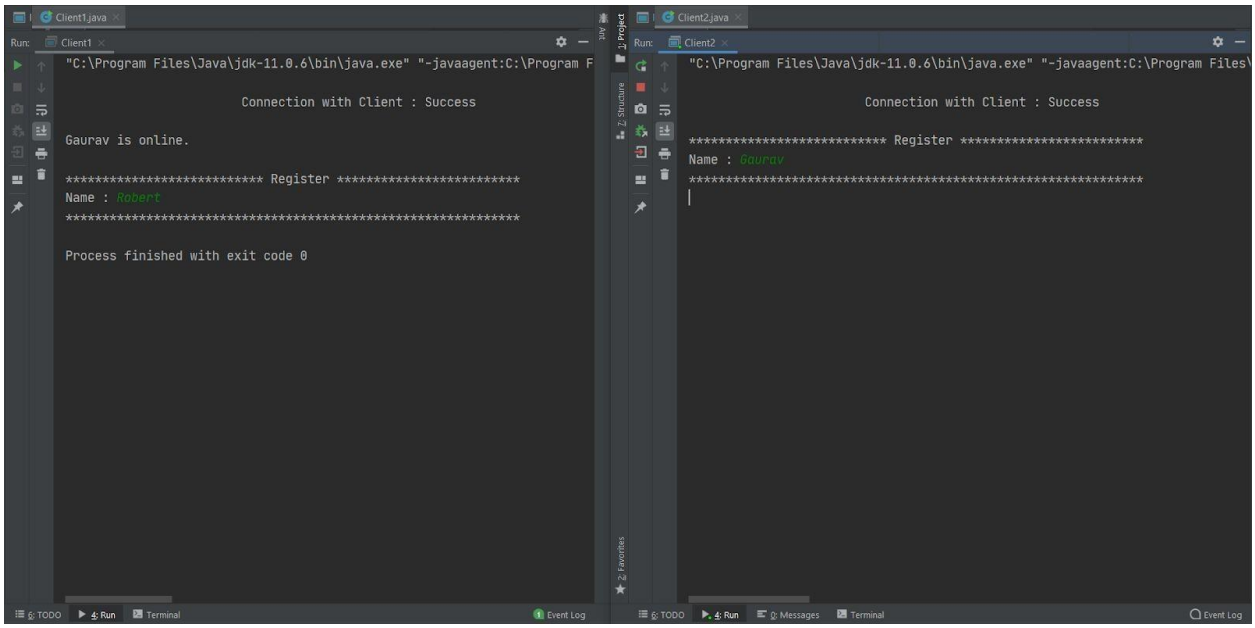
CLIENT 2(NEW THREAD) :-

```
import java.io.*;
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;
import  java.util.Arrays;
import java.util.Scanner;

public class Client2 {

    static DatagramSocket client2Socket;
    static byte[] sendData;
    static byte[] receiveData;
    private static InetAddress ip;


    public Client2() {
        try {
```

```
            client2Socket = new DatagramSocket();
            ip = InetAddress.getLocalHost();
            sendData = new byte[1024];
            receiveData = new byte[1024];


        } catch (Exception e) {
            System.out.println("Socket could not be connected");
        }
    }


    public static void main(String[] args) throws IOException,
InterruptedException {

        Client2 client2 = new Client2();

        client2.startChat();

    }


    private void startChat() throws IOException, InterruptedException
{

        System.out.println("\n\t\t\t\t\t\tConnection with Client :
Success\n");

        Scanner sc = new Scanner(System.in);
        System.out.println("************************* Register
************************");
        System.out.print("Name : ");
        String name  = sc.nextLine();
        sendData = name.getBytes();
        DatagramPacket sendPacket = new
DatagramPacket(sendData,sendData.length,ip,6000);
        client2Socket.send(sendPacket);
```

```
System.out.println("**********************************************
*************");

        DatagramPacket receivePacket = new
DatagramPacket(receiveData,receiveData.length);
        client2Socket.receive(receivePacket);
        String nameOfOtherClient = new
String(receivePacket.getData());

        System.out.println(nameOfOtherClient + " is online.");


System.out.println("\n                              Conversation
                \n");


    }
}
```

OUTPUT:



- First client's name was successfully transmitted to the second client notifying him about his online status through the UDP Protocol.
- But, as you can see, second client's name was not transmitted successfully to the earlier client.

This is because, UDP is considered a connectionless protocol because it doesn't require a virtual circuit to be established before any data transfer occurs. The communication protocol just sends the packets, which means that it has much lower bandwidth overhead and latency. With UDP, packets may take different paths between sender and receiver, and as a result, some packets may be lost or received out of order.

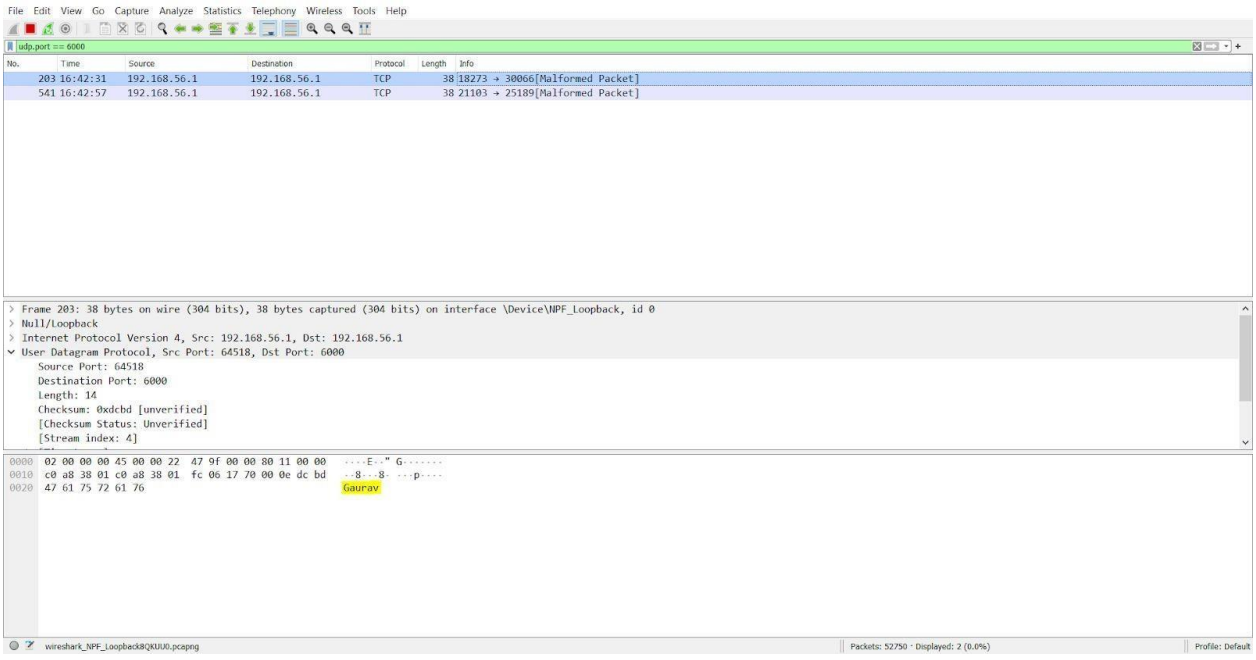
- UDP is not reliable protocol.

- UDP is not reliable. A datagram may get lost at any time
- UDP packets usually do no not traverse NATs just like that

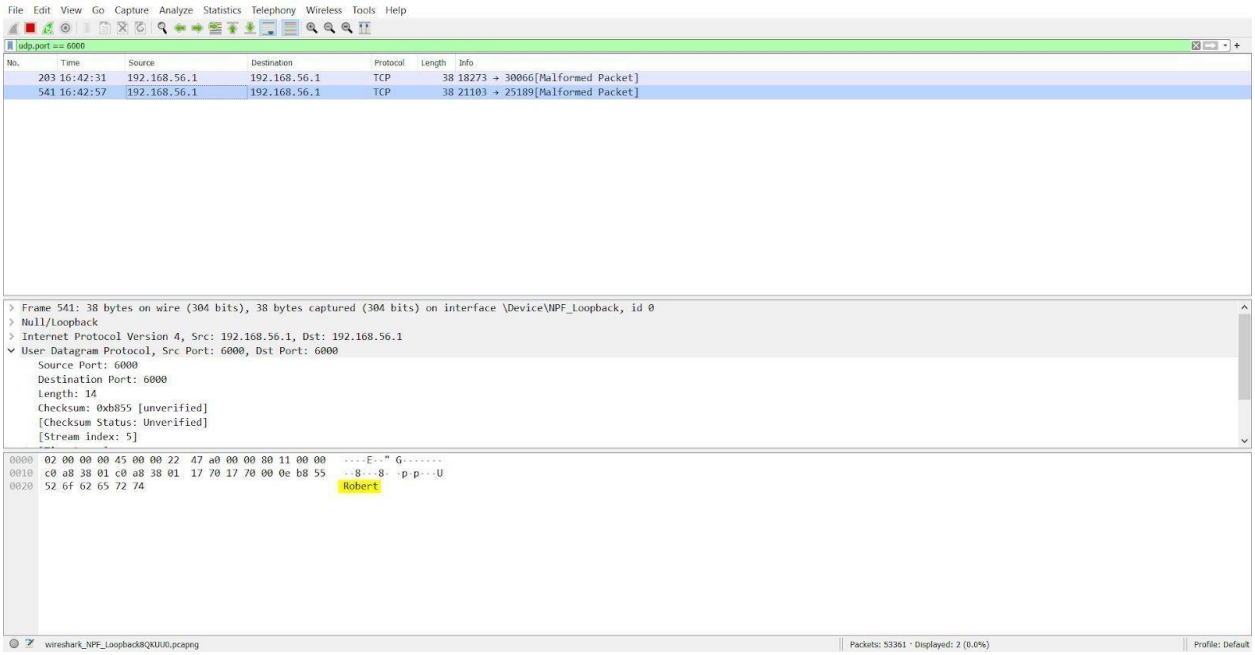
For the sake of systematic troubleshooting, make sure the packets really get to their destination using a packet sniffer/analyzer (like tcpdump or wireshark)

WIRESHARK TOOL:-

CLIENT 1 (Name is captured):



CLIENT 2 (Name is captured):


File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
udp.port == 6000
No. Time Source Destination Protocol Length Info
203 16:42:31 192.168.56.1 192.168.56.1 TCP 38 18273 → 30066[Malformed Packet]
541 16:42:57 192.168.56.1 192.168.56.1 TCP 38 21103 → 25189[Malformed Packet]
Frame 541: 38 bytes on wire (304 bits), 38 bytes captured (304 bits) on interface \Device\NPF_Loopback, id 0
Null/Loopback
Internet Protocol Version 4, Src: 192.168.56.1, Dst: 192.168.56.1
User Datagram Protocol, Src Port: 6000, Dst Port: 6000
Source Port: 6000
Destination Port: 6000
Length: 14
Checksum: 0xb855 [unverified]
[Checksum Status: Unverified]
[Stream index: 5]
0000 02 00 00 00 45 00 00 22 47 a0 00 00 80 11 00 00
0010 c0 a8 38 01 c0 a8 38 01 17 70 17 70 00 0e b8 55
0020 52 6f 62 65 72 74
Robert
wireshark_NPF_Loopback8QKUU0.pcapng
Packets: 53361 · Displayed: 2 (0.0%)
Profile: Default