CNL

Assignment No : 12

31147

Title : UDP sockets

Problem Statement :

Write a program using TCP/UDP sockets for wired network to implement

a) Peer to Peer chat

b) Multi user chat.

Demonstrate the packets traces using Wireshark Packet Analyzer Tool.

Objectives :

i) Learn about UDP sockets in Peer to Peer & Multi User chat.

ii) Learn packet tracing using Wireshark.

Outcomes :

Should be able to packet trace.

Should implement peer to peer & multi user chat.

Theory :

Network socket is an internal endpoint for sending or receiving data at a single node in a computer network. Concretely it is a representation of this endpoint in networking such as an entry in a table and is a form of system resource.

The term socket is analogous physical connectors, communication between two nodes through a channel being visualized as a cable with two cable with two male connectors plugging into sockets at each node. Similarly the term port is used for external endpoints at a node and the term socket is also used for an used for an internal endpoint of local inter-process communication (IPC). However, the analogy is strained as network communication need not be one to one or have a channel.

Peer to Peer Chat.

Communication is a mean for people to exchange messages. It has started since the begining of human creation Distant communication began as early as 1800 century with the introduction of television, telegraph and then telephony Interestingly enough, telephone communication stands out as the fastest growing technology.

Multi User Chat:

With Multi-User Chat (and group chat are at XMPP. the chat rooms designated, where multiple users can converse simultaneously.
Similar to the Internet Relay Chat (IRC), a chat room can have different statuses (visible, hidden, password protected etc) and the participant take the role of the participant, visitor or moderator.

Wireshark Packet Analyzer tool

Wireshark is a network packet analyzer. A network packet analyzer will try to capture network packet and tries to display that packet data as detailed as possible.

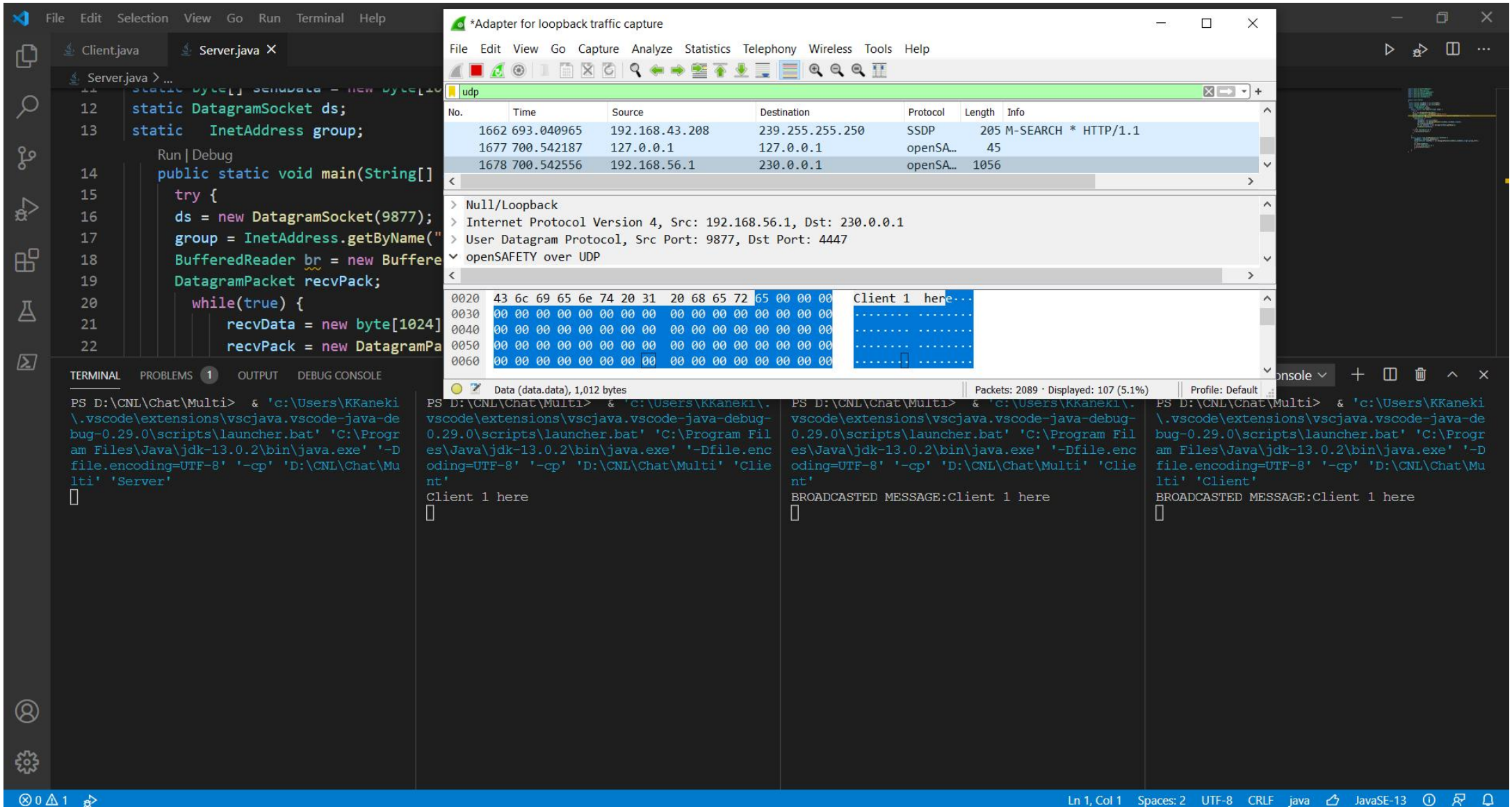
You could think of a network packet analyzer as a measuring device used to examine what going on inside a network cable, just like a voltmeter is used by an electrician what goings on inside an electric cable (but at a higher level, of course).

In the past, such tools were either very expensive, proprietary or both. However, with the advent of Wireshark, all has changed.

Wireshark is perhaps one of the best open source packet analyzers available today.

Conclusion :

Implement peer to peer and multiuser chat using UDP socket.


File Edit Selection View Go Run Terminal Help
Client.java
Server.java
Server.java > ...
12 static DatagramSocket ds;
13 static InetAddress group;
Run | Debug
14 public static void main(String[]
15 try {
16 ds = new DatagramSocket(9877);
17 group = InetAddress.getByName("
18 BufferedReader br = new Buffere
19 DatagramPacket recvPack;
20 while(true) {
21 recvData = new byte[1024]
22 recvPack = new DatagramPa
*Adapter for loopback traffic capture
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
udp
No. Time Source Destination Protocol Length Info
1662 693.040965 192.168.43.208 239.255.255.250 SSDP 205 M-SEARCH * HTTP/1.1
1677 700.542187 127.0.0.1 127.0.0.1 openSA... 45
1678 700.542556 192.168.56.1 230.0.0.1 openSA... 1056
Null/Loopback
Internet Protocol Version 4, Src: 192.168.56.1, Dst: 230.0.0.1
User Datagram Protocol, Src Port: 9877, Dst Port: 4447
openSAFETY over UDP
0020 43 6c 69 65 6e 74 20 31 20 68 65 72 65 00 00 00 Client 1 here...
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ....
0060 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 ....
Data (data.data), 1,012 bytes
Packets: 2089 · Displayed: 107 (5.1%)
Profile: Default
TERMINAL PROBLEMS 1 OUTPUT DEBUG CONSOLE
PS D:\CNL\Chat\Multi> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'D:\CNL\Chat\Multi' 'Server'
PS D:\CNL\Chat\Multi> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'D:\CNL\Chat\Multi' 'Client'
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BROADCASTED MESSAGE:Client 1 here
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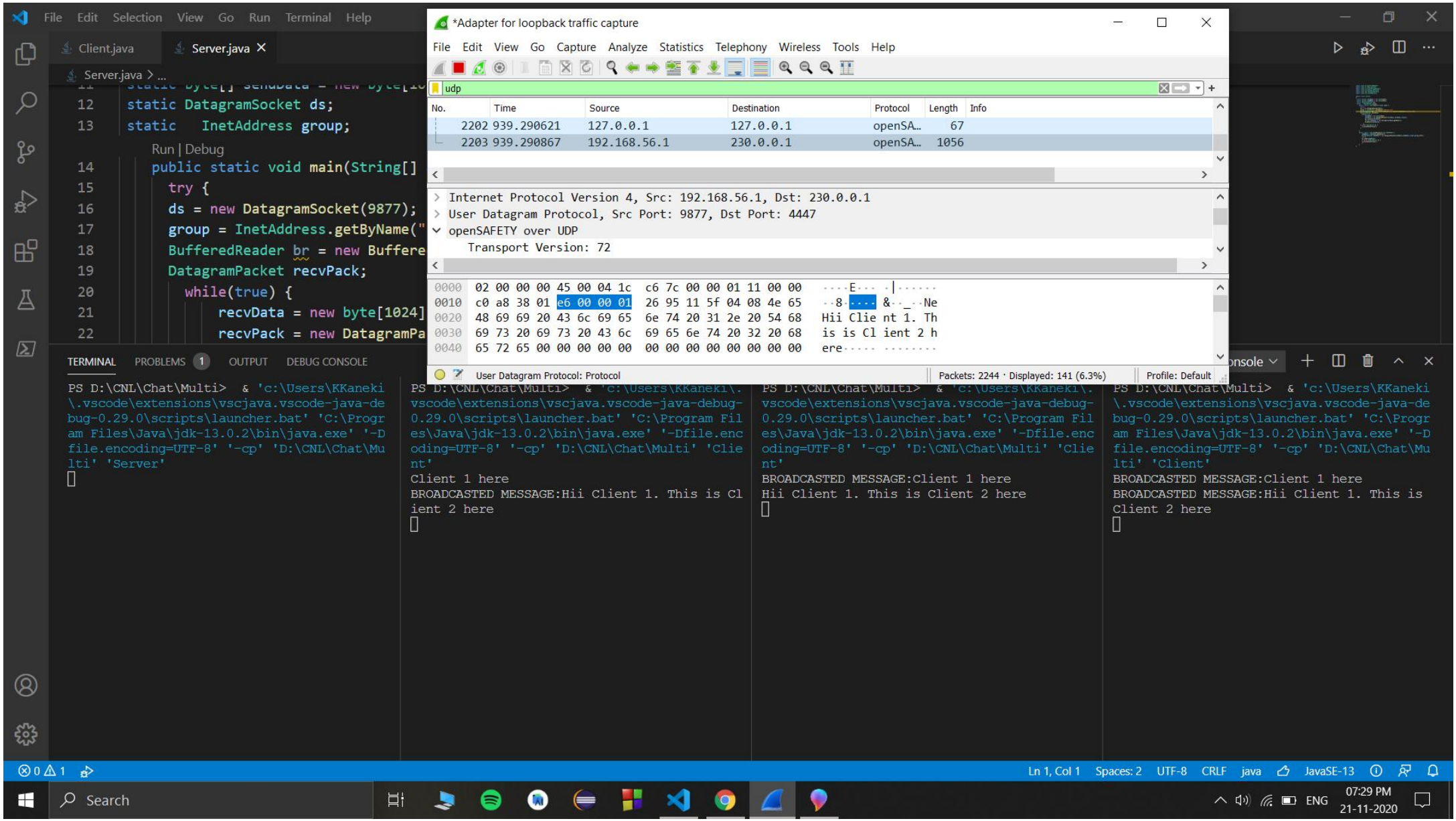
BROADCASTED MESSAGE:Client 1 here
Ln 1, Col 1 Spaces: 2 UTF-8 CRLF java JavaSE-13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Server.java > ...
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21 recvData = new byte[1024]
22 recvPack = new DatagramPa
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File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
udp
No. Time Source Destination Protocol Length Info
2202 939.290621 127.0.0.1 127.0.0.1 openSA... 67
2203 939.290867 192.168.56.1 230.0.0.1 openSA... 1056
Internet Protocol Version 4, Src: 192.168.56.1, Dst: 230.0.0.1
User Datagram Protocol, Src Port: 9877, Dst Port: 4447
openSAFETY over UDP
Transport Version: 72
0000 02 00 00 00 45 00 04 1c c6 7c 00 00 01 11 00 00
0010 c0 a8 38 01 e6 00 00 01 26 95 11 5f 04 08 4e 65
0020 48 69 69 20 43 6c 69 65 6e 74 20 31 2e 20 54 68
0030 69 73 20 69 73 20 43 6c 69 65 6e 74 20 32 20 68
0040 65 72 65 00 00 00 00 00 00 00 00 00 00 00 00 00
User Datagram Protocol: Protocol
Packets: 2244 · Displayed: 141 (6.3%)
Profile: Default
TERMINAL PROBLEMS 1 OUTPUT DEBUG CONSOLE
PS D:\CNL\Chat\Multi> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'D:\CNL\Chat\Multi' 'Server'
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Client 1 here
BROADCASTED MESSAGE:Hii Client 1. This is Client 2 here
PS D:\CNL\Chat\Multi> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'D:\CNL\Chat\Multi' 'Client'
BROADCASTED MESSAGE:Client 1 here
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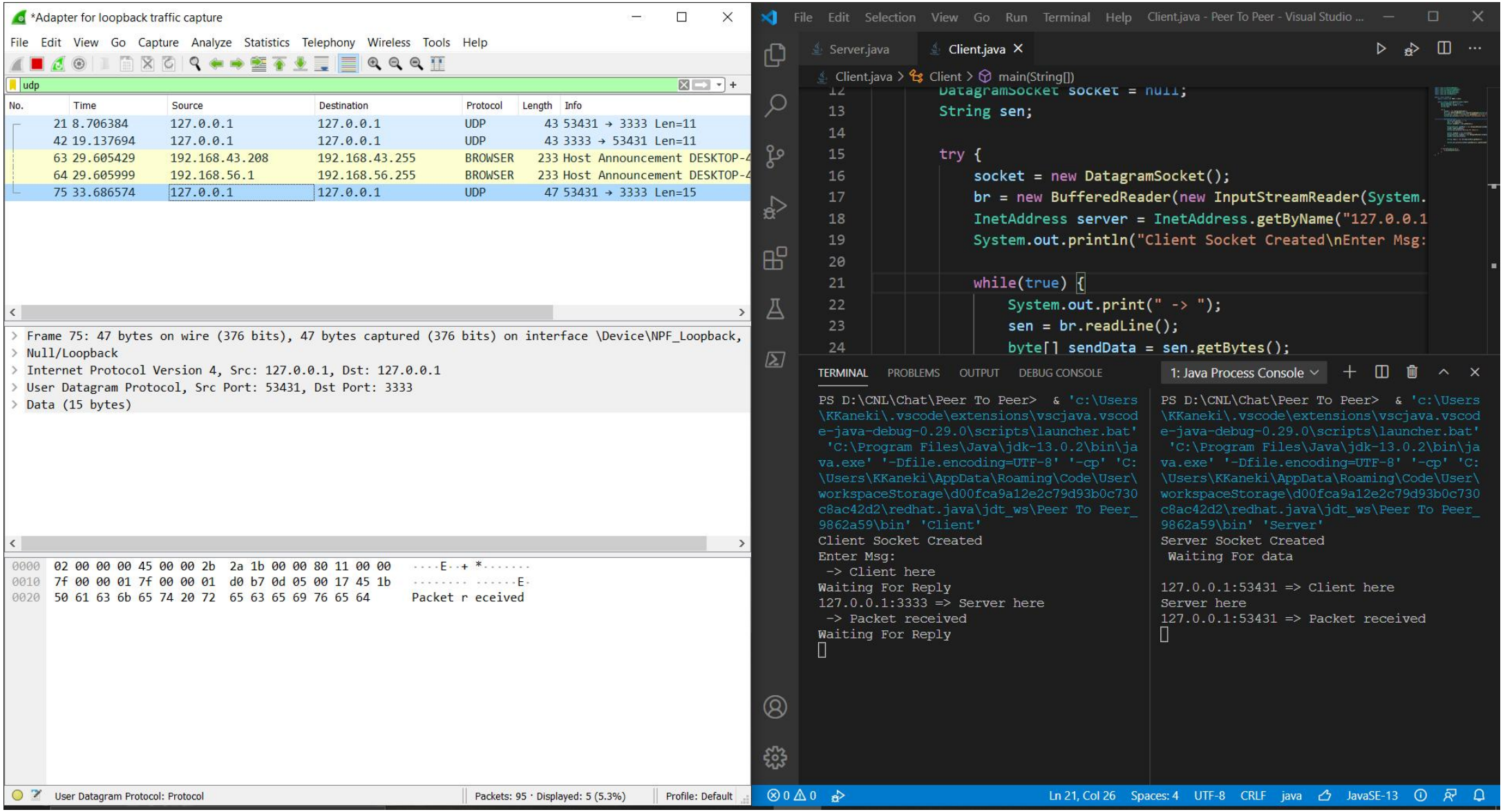
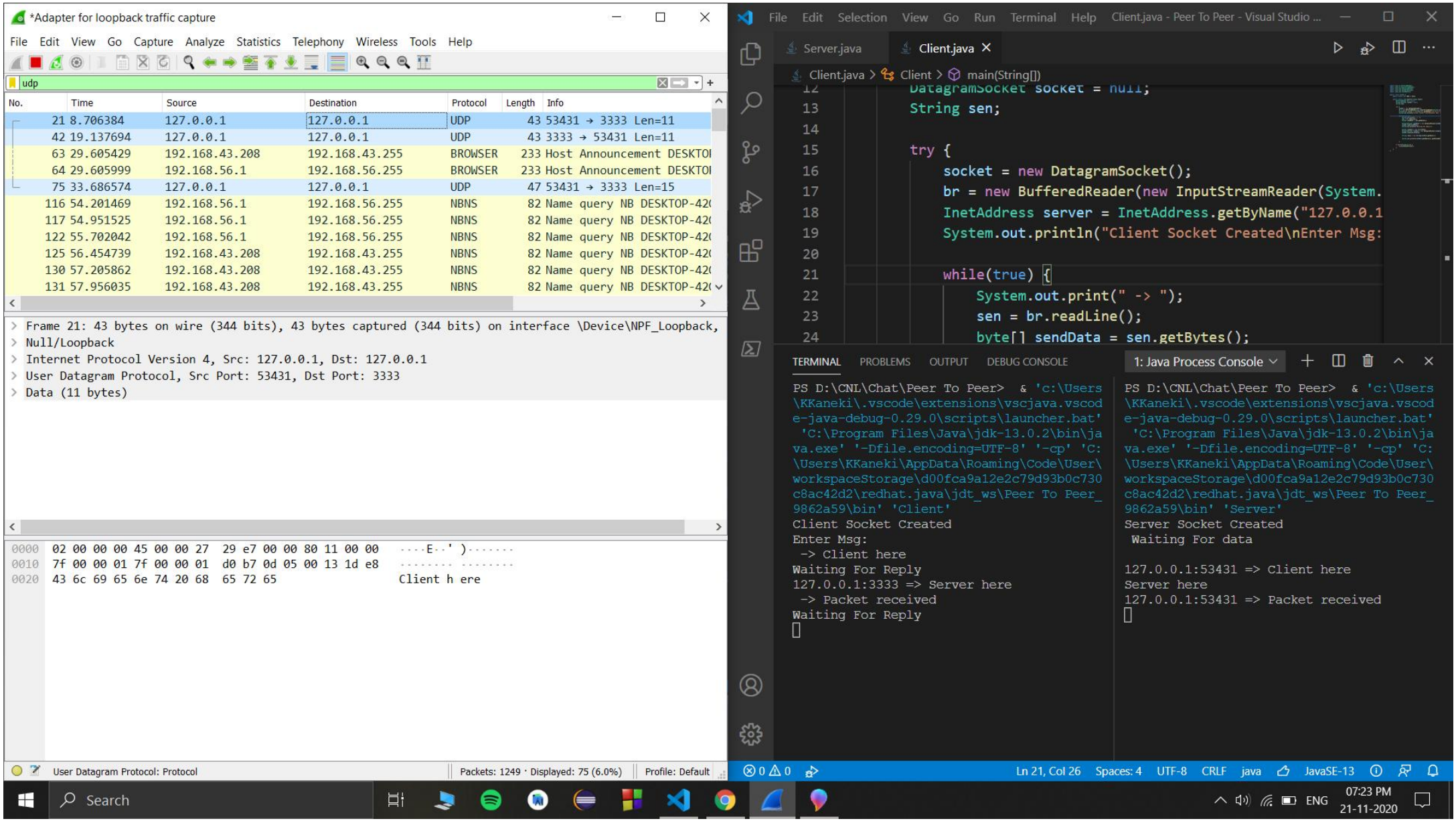
BROADCASTED MESSAGE:Client 1 here
BROADCASTED MESSAGE:Hii Client 1. This is Client 2 here
Ln 1, Col 1 Spaces: 2 UTF-8 CRLF java JavaSE-13
Search
ENG
07:29 PM
21-11-2020


*Adapter for loopback traffic capture
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help
udp
No. Time Source Destination Protocol Length Info
21 8.706384 127.0.0.1 127.0.0.1 UDP 43 53431 → 3333 Len=11
42 19.137694 127.0.0.1 127.0.0.1 UDP 43 3333 → 53431 Len=11
63 29.605429 192.168.43.208 192.168.43.255 BROWSER 233 Host Announcement DESKTOP-4
64 29.605999 192.168.56.1 192.168.56.255 BROWSER 233 Host Announcement DESKTOP-4
75 33.686574 127.0.0.1 127.0.0.1 UDP 47 53431 → 3333 Len=15
Frame 75: 47 bytes on wire (376 bits), 47 bytes captured (376 bits) on interface \Device\NPF_Loopback,
Null/Loopback
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
User Datagram Protocol, Src Port: 53431, Dst Port: 3333
Data (15 bytes)
0000 02 00 00 00 45 00 00 2b 2a 1b 00 00 80 11 00 00 ····E··+ *·····
0010 7f 00 00 01 7f 00 00 01 d0 b7 0d 05 00 17 45 1b ···· ·····E·
0020 50 61 63 6b 65 74 20 72 65 63 65 69 76 65 64 Packet r eceived
User Datagram Protocol: Protocol
Packets: 95 · Displayed: 5 (5.3%)
Profile: Default
File Edit Selection View Go Run Terminal Help Client.java - Peer To Peer - Visual Studio ...
Server.java
Client.java
Client.java > Client > main(String[])
DatagramSocket socket = null;
String sen;
try {
socket = new DatagramSocket();
br = new BufferedReader(new InputStreamReader(System.
InetAddress server = InetAddress.getByName("127.0.0.1
System.out.println("Client Socket Created\nEnter Msg:
while(true) {
System.out.print(" -> ");
sen = br.readLine();
byte[] sendData = sen.getBytes();
TERMINAL PROBLEMS OUTPUT DEBUG CONSOLE
1: Java Process Console
PS D:\CNL\Chat\Peer To Peer> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\KKaneki\AppData\Roaming\Code\User\workspaceStorage\d00fca9a12e2c79d93b0c730c8ac42d2\redhat.java\jdt_ws\Peer To Peer_9862a59\bin' 'Client'
Client Socket Created
Enter Msg:
-> Client here
Waiting For Reply
127.0.0.1:3333 => Server here
-> Packet received
Waiting For Reply
PS D:\CNL\Chat\Peer To Peer> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\KKaneki\AppData\Roaming\Code\User\workspaceStorage\d00fca9a12e2c79d93b0c730c8ac42d2\redhat.java\jdt_ws\Peer To Peer_9862a59\bin' 'Server'
Server Socket Created
Waiting For data
127.0.0.1:53431 => Client here
Server here
127.0.0.1:53431 => Packet received
Ln 21, Col 26 Spaces: 4 UTF-8 CRLF java JavaSE-13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116 54.201469 192.168.56.1 192.168.56.255 NBNS 82 Name query NB DESKTOP-42(
117 54.951525 192.168.56.1 192.168.56.255 NBNS 82 Name query NB DESKTOP-42(
122 55.702042 192.168.56.1 192.168.56.255 NBNS 82 Name query NB DESKTOP-42(
125 56.454739 192.168.43.208 192.168.43.255 NBNS 82 Name query NB DESKTOP-42(
130 57.205862 192.168.43.208 192.168.43.255 NBNS 82 Name query NB DESKTOP-42(
131 57.956035 192.168.43.208 192.168.43.255 NBNS 82 Name query NB DESKTOP-42(
Frame 21: 43 bytes on wire (344 bits), 43 bytes captured (344 bits) on interface \Device\NPF_Loopback,
Null/Loopback
Internet Protocol Version 4, Src: 127.0.0.1, Dst: 127.0.0.1
User Datagram Protocol, Src Port: 53431, Dst Port: 3333
Data (11 bytes)
0000 02 00 00 00 45 00 00 27 29 e7 00 00 80 11 00 00 ····E··')·····
0010 7f 00 00 01 7f 00 00 01 d0 b7 0d 05 00 13 1d e8 ···· ····
0020 43 6c 69 65 6e 74 20 68 65 72 65 Client h ere
User Datagram Protocol: Protocol
Packets: 1249 · Displayed: 75 (6.0%)
Profile: Default
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Client Socket Created
Enter Msg:
-> Client here
Waiting For Reply
127.0.0.1:3333 => Server here
-> Packet received
Waiting For Reply
PS D:\CNL\Chat\Peer To Peer> & 'c:\Users\KKaneki\.vscode\extensions\vscjava.vscode-java-debug-0.29.0\scripts\launcher.bat' 'C:\Program Files\Java\jdk-13.0.2\bin\java.exe' '-Dfile.encoding=UTF-8' '-cp' 'C:\Users\KKaneki\AppData\Roaming\Code\User\workspaceStorage\d00fca9a12e2c79d93b0c730c8ac42d2\redhat.java\jdt_ws\Peer To Peer_9862a59\bin' 'Server'
Server Socket Created
Waiting For data
127.0.0.1:53431 => Client here
Server here
127.0.0.1:53431 => Packet received
Ln 21, Col 26 Spaces: 4 UTF-8 CRLF java JavaSE-13
Search
ENG
07:23 PM
21-11-2020