19CSE301 - COMPUTER NETWORKS

Socket Programming

LAB-4 : (10-08-2021)

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1. **Implement the simple UDP client-server**

Client:

```
import java.io.*;
import java.net.*;

class UDPClient {
    public static void main(String args[]) throws Exception
    {

        BufferedReader inFromUser =
                new BufferedReader(new InputStreamReader(System.in));

        DatagramSocket clientSocket = new DatagramSocket();

        InetAddress IPAddress = InetAddress.getByName("hostname");

        byte[] sendData = new byte[1024];
        byte[] receiveData = new byte[1024];

        String sentence = inFromUser.readLine();

        sendData = sentence.getBytes();

        DatagramPacket sendPacket =
                new DatagramPacket(sendData, sendData.length,
IPAddress, 9876);

        clientSocket.send(sendPacket);

        DatagramPacket receivePacket =
                new DatagramPacket(receiveData, receiveData.length);

        clientSocket.receive(receivePacket);

        String modifiedSentence =
                new String(receivePacket.getData());

        System.out.println("FROM SERVER:" + modifiedSentence);

        clientSocket.close();
```

```
    }
}
```

Server:

```
import java.io.*;
import java.net.*;

class UDPServer {
    public static void main(String args[]) throws Exception
    {

        DatagramSocket serverSocket = new DatagramSocket(9876);

        byte[] receiveData = new byte[1024];
        byte[] sendData  = new byte[1024];

        while(true)
        {

            DatagramPacket receivePacket =
                    new DatagramPacket(receiveData,
receiveData.length);

            serverSocket.receive(receivePacket);

            String sentence = new String(receivePacket.getData());

            InetAddress IPAddress = receivePacket.getAddress();

            int port = receivePacket.getPort();

            String capitalizedSentence = sentence.toUpperCase();

            sendData = capitalizedSentence.getBytes();

            DatagramPacket sendPacket =
                    new DatagramPacket(sendData, sendData.length,
IPAddress,
                            port);

            serverSocket.send(sendPacket);
        }
    }
}
```

Output:

```
"C:\Program Files\Java\jdk-16.0.1\bin\java.exe"

Process finished with exit code 0
```

2. Single Datagram:

Code :

Receiver:

```
import java.net.DatagramPacket;
import java.net.DatagramSocket;

class datagramReceiver {
    public static void main(String[] args) {
        try {
            int MAX_LEN = 40;
            int localPortNum = Integer.parseInt(args[0]);
            DatagramSocket mySocket = new
DatagramSocket(localPortNum);
            byte[] buffer = new byte[MAX_LEN];
            DatagramPacket packet = new DatagramPacket(buffer,
MAX_LEN);
            mySocket.receive(packet);
            String message = new String(buffer);
            System.out.println(message);
            mySocket.close();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

Sender:

```
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;

class datagramSender {
    public static void main(String[] args) {
        try {
            InetAddress receiverHost = InetAddress.getByName(args[0]);
            int receiverPort = Integer.parseInt(args[1]);
            String message = args[2];
            DatagramSocket mySocket = new DatagramSocket();
            byte[] buffer = message.getBytes();
            DatagramPacket packet = new DatagramPacket(buffer,
buffer.length, receiverHost,
                    receiverPort);
            mySocket.send(packet);
            mySocket.close();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

Output:

```
C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>javac datagramReceiver.java

C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>java datagramReceiver 9090
Good Evening!

C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>
```

```
C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>javac datagramSender.java

C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>java datagramSender.java localhost 9090 "
Good Evening!"

C:\Users\Administrator\Documents\19CSE301 - CN\Labs\Lab4\src>
```

3. Multi Client Server :

Code:

Receiver :

```
import java.net.DatagramPacket;
import java.net.InetAddress;
import java.net.MulticastSocket;

class multicastReceiver {
    public static void main(String[] args) {
        try {
            InetAddress group = InetAddress.getByName("224.0.0.1");
            MulticastSocket multicastSock = new
MulticastSocket(3456);
            multicastSock.joinGroup(group);
            byte[] buffer = new byte[45];
            DatagramPacket packet = new DatagramPacket(buffer,
buffer.length);
            multicastSock.receive(packet);
            System.out.println(new String(buffer));
            multicastSock.close();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

Sender:

```
import java.net.DatagramPacket;
import java.net.InetAddress;
import java.net.MulticastSocket;
```

```java
class multicastSender {
    public static void main(String[] args) {
        try {
            InetAddress group = InetAddress.getByName("224.0.0.1");
            MulticastSocket multicastSock = new
MulticastSocket(3456);
            String msg = "Hi all,I am Abhinav!!!";
            DatagramPacket packet = new
DatagramPacket(msg.getBytes(), msg.length(), group,3456);
            multicastSock.send(packet);
            multicastSock.close();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

Output :