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SE20UARI020

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CN assignment

1. Ping Server 1

```java
import java.io.*;
import java.net.*;
import java.util.*;
public class PingServer {
    private static final double Loss = 0.3;
    private static final int Delay = 100;

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

        if (args.length != 1) {
            System.out.println("Required arguments: port");
            return;
        }
        int port = Integer.parseInt(args[0]);
        // Rand num for packet loss simulation
        Random random = new Random();
        // datagram for send and recieve UDP
        DatagramSocket socket = new DatagramSocket(port);
        // Processing loop.
        while (true) {
            // Create a datagram packet to hold incomming UDP packet.
            DatagramPacket request = new DatagramPacket(new byte[1024], 1024);
            // Block until the host receives a UDP packet.
            socket.receive(request);
            // Print the recieved data.
            printData(request)
            // Decide whether to reply, or simulate packet loss.
            if (random.nextDouble() < Loss) {
                System.out.println(" Reply not sent.");
                continue;
            }
            Thread.sleep((int) (random.nextDouble() * 2 * Delay)); // Simulate network delay.
            InetAddress clientHost = request.getAddress();
            int clientPort = request.getPort();
            byte[] buf = request.getData();
            DatagramPacket reply = new DatagramPacket(buf, buf.length, clientHost, clientPort);
            socket.send(reply);
            System.out.println(" Reply sent.");}
    }

    private static void printData(DatagramPacket request) throws Exception {
        byte[] buf = request.getData();
        ByteArrayInputStream bais = new ByteArrayInputStream(buf);
        InputStreamReader isr = new InputStreamReader(bais);
        BufferedReader br = new BufferedReader(isr);
```

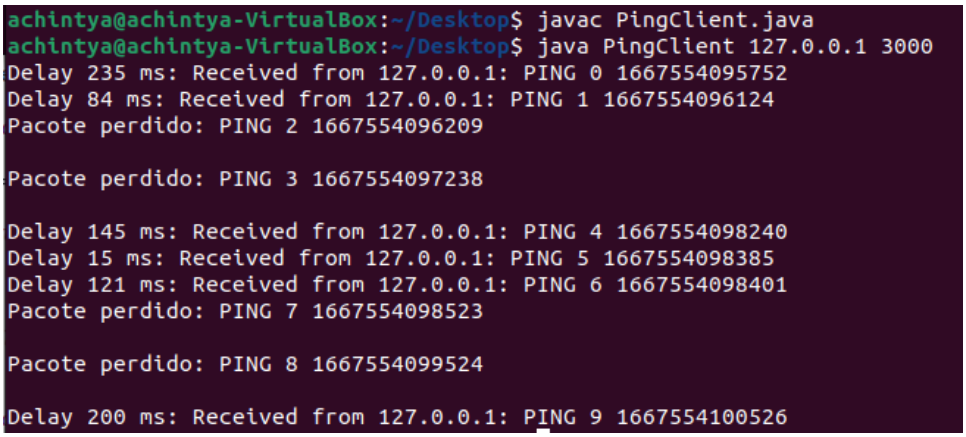
```
achintya@achintya-VirtualBox:~/Desktop$ javac PingServer.java
achintya@achintya-VirtualBox:~/Desktop$ java PingServer 3000
Received from 127.0.0.1: PING 0 1667554095752
 Reply sent.
Received from 127.0.0.1: PING 1 1667554096124
 Reply sent.
Received from 127.0.0.1: PING 2 1667554096209
 Reply not sent.
Received from 127.0.0.1: PING 3 1667554097238
 Reply not sent.
Received from 127.0.0.1: PING 4 1667554098240
 Reply sent.
Received from 127.0.0.1: PING 5 1667554098385
 Reply sent.
Received from 127.0.0.1: PING 6 1667554098401
 Reply sent.
Received from 127.0.0.1: PING 7 1667554098523
 Reply not sent.
Received from 127.0.0.1: PING 8 1667554099524
 Reply not sent.
Received from 127.0.0.1: PING 9 1667554100526
 Reply sent.
```

```java
import java.net.*;
import java.util.*;
public class PingClient {
    private static final int TIMEOUT = 1000; // milliseconds
    private static final int MAX_PING_REQUEST = 10;
    private static final int CLIENT_PORT = 5000;
    private static InetAddress serverHost = null;
    private static int serverPort = 0;
    private static DatagramSocket socket = null;
    public static void main(String[] args) throws Exception {

        if (args.length != 2) {
            System.out.println("Required arguments: host port");
            return;}
        serverHost = InetAddress.getByName(args[0]);
        serverPort = Integer.parseInt(args[1]);
        socket = new DatagramSocket(CLIENT_PORT);
        socket.setSoTimeout(TIMEOUT);
        int sequence_number = -1;
        while (++sequence_number < MAX_PING_REQUEST) {
            DatagramPacket response = new DatagramPacket(new byte[1024], 1024);
            Date date = new Date();
            long timestamp = date.getTime();
            String sendMessage = "PING " + sequence_number + " " + timestamp + " \r\n";
            //Convert message into array of bytes
            byte[] buffer = new byte[1024];
            buffer = sendMessage.getBytes();
            DatagramPacket pingRequest = new DatagramPacket(buffer, buffer.length, serverHost, serverPort);
            socket.send(pingRequest);

            try {
                socket.receive(response);
                date = new Date();
                long delayReceived = date.getTime() - timestamp;
                System.out.print("Delay " + delayReceived + " ms: ");
                printData(response);}
            catch (SocketTimeoutException e) {
                System.out.println("Pacote perdido: " + sendMessage);}
        }
    }
    private static void printData(DatagramPacket request) throws Exception {
        byte[] buf = request.getData();
        ByteArrayInputStream bais = new ByteArrayInputStream(buf);
        InputStreamReader isr = new InputStreamReader(bais);
        BufferedReader br = new BufferedReader(isr);
```

PING CLIENT: Ensure the sequence number is less than the max ping request when the ping request limit is 10 ping. Once this happens and data for getting the date and time, convert the message into an array of bytes, once done, receive the socket response and print the response.



NOTE: create random num for packet loss and send and recieve datagram thru UDP and create a datagram to hold said UDP. Block until recieved data then, print. Then simulate packet loss.

2.

```java
public class PingClient1 {
    private static final int TIMEOUT = 1000; // milliseconds
    private static final int MAX_PING_REQUEST = 10; // Numero de ping requests
    private static final int CLIENT_PORT = 5000;
    private static InetAddress serverHost = null;
    private static int serverPort = 0;
    private static DatagramSocket socket = null;

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

        if (args.length != 2) {
            System.out.println("Required arguments: host port");
            return;
        }

        //host port
        serverHost = InetAddress.getByName(args[0]);
        serverPort = Integer.parseInt(args[1]);

        // Datagram to send and recieve UDP
        socket = new DatagramSocket(CLIENT_PORT);
        socket.setSoTimeout(TIMEOUT);

        int sequence_number = -1;

        Long[] delay = new Long[MAX_PING_REQUEST];

        while (++sequence_number < MAX_PING_REQUEST) {
            DatagramPacket response = new DatagramPacket(new byte[1024], 1024);
            Date date = new Date();
            long timestamp = date.getTime();
            String sendMessage = "PING " + sequence_number + " " + timestamp + " \r\n";
            byte[] buffer = new byte[1024];
            buffer = sendMessage.getBytes();
            DatagramPacket pingRequest = new DatagramPacket(buffer, buffer.length, serverHost, serverPort);
            socket.send(pingRequest);
            try {
                socket.receive(response);
                date = new Date();
                long delayReceived = date.getTime() - timestamp;
                delay[sequence_number] = delayReceived;
                System.out.print("Delay " + delayReceived + " ms: ");
                printData(response);
```

```
achintya@achintya-VirtualBox:~$ cd Desktop
achintya@achintya-VirtualBox:~/Desktop$ java PingServer 3000
Received from 127.0.0.1: PING 0 1667554342831
 Reply sent.
Received from 127.0.0.1: PING 1 1667554343248
 Reply sent.
Received from 127.0.0.1: PING 2 1667554343338
 Reply sent.
Received from 127.0.0.1: PING 3 1667554343444
 Reply sent.
Received from 127.0.0.1: PING 4 1667554343502
 Reply not sent.
Received from 127.0.0.1: PING 5 1667554344558
 Reply sent.
Received from 127.0.0.1: PING 6 1667554344684
 Reply sent.
Received from 127.0.0.1: PING 7 1667554344805
 Reply sent.
Received from 127.0.0.1: PING 8 1667554344812
 Reply sent.
Received from 127.0.0.1: PING 9 1667554344860
 Reply not sent.
```

```
achintya@achintya-VirtualBox:~/Desktop$ javac PingClient1.java
achintya@achintya-VirtualBox:~/Desktop$ java PingClient1 127.0.0.1 3000
Delay 302 ms: Received from 127.0.0.1: PING 0 1667554342831
Delay 87 ms: Received from 127.0.0.1: PING 1 1667554343248
Delay 104 ms: Received from 127.0.0.1: PING 2 1667554343338
Delay 57 ms: Received from 127.0.0.1: PING 3 1667554343444
Pacote perdido: PING 4 1667554343502
Delay 126 ms: Received from 127.0.0.1: PING 5 1667554344558
Delay 121 ms: Received from 127.0.0.1: PING 6 1667554344684
Delay 6 ms: Received from 127.0.0.1: PING 7 1667554344805
Delay 48 ms: Received from 127.0.0.1: PING 8 1667554344812
Pacote perdido: PING 9 1667554344860
RTT: minDelay: 6ms / maxDelay: 1000ms / averageDelay: 285ms
```

```
            }
            catch (SocketTimeoutException e) {
                System.out.print("Pacote perdido: " + sendMessage);
                delay[sequence_number] = Long.valueOf(TIMEOUT);
            }
        }

        roundTripTime(delay);

    }

    private static void printData(DatagramPacket request) throws Exception {
        byte[] buf = request.getData();
        ByteArrayInputStream bais = new ByteArrayInputStream(buf);
        InputStreamReader isr = new InputStreamReader(bais);
        BufferedReader br = new BufferedReader(isr);
        String line = br.readLine();
        System.out.println("Received from " + request.getAddress().getHostAddress() + ": " + new String(line));
    }

    private static void roundTripTime(Long[] delay) {
        long minDelay = delay[0];
        long maxDelay = delay[0];
        long averageDelay = 0;
        for (int i = 0; i < delay.length; i++) {
            long d = delay[i];
            if (d < minDelay) {
                minDelay = d;
            }
            if (d > maxDelay) {
            maxDelay = d;
            }
            averageDelay += d;}
```

3.

```java
public class PingClient2 {
    private static final int TIMEOUT = 1000; // milliseconds
    private static final int MAX_PING_REQUEST = 10;
    //number of ping requests
    private static final int CLIENT_PORT = 5000;
    private static InetAddress serverHost = null;
    private static int serverPort = 0;
    private static DatagramSocket socket = null;

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

        if (args.length != 2) {
            System.out.println("Required arguments: host port");
            return;
        }
        //Host port
        serverHost = InetAddress.getByName(args[0]);
        serverPort = Integer.parseInt(args[1]);
        //datagram socket for send and receieve UDP
        socket = new DatagramSocket(CLIENT_PORT);
        socket.setSoTimeout(TIMEOUT);
        Timer timer = new Timer();
        RemindTask remindTask = new RemindTask(MAX_PING_REQUEST, socket, serverHost, serverPort);
        timer.schedule(remindTask, 0, 1000);
    }
    public static void ping(DatagramSocket socket, int sequence_number, InetAddress serverHost, int serverPort) {
        DatagramPacket response = new DatagramPacket(new byte[1024], 1024);
        Date date = new Date();
        long timestamp = date.getTime();
        String sendMessage = "PING " + sequence_number + " " + timestamp + " \r\n";
        byte[] buffer = new byte[1024];
        buffer = sendMessage.getBytes();

        DatagramPacket pingRequest = new DatagramPacket(buffer, buffer.length, serverHost, serverPort);

        try {
            socket.send(pingRequest);
            socket.receive(response);
            date = new Date();
            long delayReceived = date.getTime() - timestamp;

            System.out.print("Delay " + delayReceived + " ms: ");
            printData(response);
        } catch (SocketTimeoutException e) {
            System.out.print("Pacote perdido: " + sendMessage);
```

```
achintya@achintya-VirtualBox:~/Desktop$ javac PingClient2.java
achintya@achintya-VirtualBox:~/Desktop$ java PingClient2 127.0.0.1 3000
Delay 315 ms: Received from 127.0.0.1: PING 0 1667554519829
Delay 56 ms: Received from 127.0.0.1: PING 1 1667554520829
Pacote perdido: PING 2 1667554521831
Delay 185 ms: Received from 127.0.0.1: PING 3 1667554522861
Delay 67 ms: Received from 127.0.0.1: PING 4 1667554523861
Delay 117 ms: Received from 127.0.0.1: PING 5 1667554524861
Delay 138 ms: Received from 127.0.0.1: PING 6 1667554525861
Pacote perdido: PING 7 1667554526861
Pacote perdido: PING 8 1667554527862
Pacote perdido: PING 9 1667554528863
```

```
        } catch (SocketTimeoutException e) {
            System.out.print("Pacote perdido: " + sendMessage);
        } catch (IOException e) {
            e.printStackTrace();
        } catch (Exception e) {
            e.printStackTrace();}
    }

    private static void printData(DatagramPacket request) throws Exception {

        byte[] buf = request.getData();
        ByteArrayInputStream bais = new ByteArrayInputStream(buf);
        InputStreamReader isr = new InputStreamReader(bais);
        BufferedReader br = new BufferedReader(isr);
        String line = br.readLine();
        System.out.println("Received from " + request.getAddress().getHostAddress() + ": " + new String(line));
    }
}
class RemindTask extends TimerTask {
    private int maxPingRequests;
    private int times = -1;
    private DatagramSocket socket;
    private InetAddress serverHost;
    private int serverPort;


    public RemindTask(int maxPingRequests, DatagramSocket socket, InetAddress serverHost, int serverPort) {
        this.maxPingRequests = maxPingRequests;
        this.socket = socket;
        this.serverHost = serverHost;
        this.serverPort = serverPort;
    }

    public void run() {
```

```
achintya@achintya-VirtualBox:~$ cd Desktop
achintya@achintya-VirtualBox:~/Desktop$ java PingServer 3000
Received from 127.0.0.1: PING 0 1667554519829
 Reply sent.
Received from 127.0.0.1: PING 1 1667554520829
 Reply sent.
Received from 127.0.0.1: PING 2 1667554521831
 Reply not sent.
Received from 127.0.0.1: PING 3 1667554522861
 Reply sent.
Received from 127.0.0.1: PING 4 1667554523861
 Reply sent.
Received from 127.0.0.1: PING 5 1667554524861
 Reply sent.
Received from 127.0.0.1: PING 6 1667554525861
 Reply sent.
Received from 127.0.0.1: PING 7 1667554526861
 Reply not sent.
Received from 127.0.0.1: PING 8 1667554527862
 Reply not sent.
Received from 127.0.0.1: PING 9 1667554528863
 Reply not sent.
```