

## GOBACK-N PROTOCOL

### SERVER.JAVA

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

class goback_server{
    public static void main(String args[])throws IOException{

        System.out.println("...Server...");
        System.out.println("...Waiting...");
        InetAddress address = InetAddress.getByName("Localhost");
        ServerSocket ss = new ServerSocket(500);

        Socket s1 = new Socket();
        s1 = ss.accept();
        BufferedInputStream in = new BufferedInputStream(s1.getInputStream());
        DataOutputStream out = new DataOutputStream(s1.getOutputStream());

        System.out.println("received request for sending frames");
        int n = in.read();

        boolean[] array = new boolean[n];

        int pc = in.read();
        System.out.println("...Sending...");
```

```
if(pc==0){
for(int i=0;i<n;i++){
System.out.println("Sending frame => "+i);
out.write(i);
out.flush();
System.out.println("..Waiting for acknowledge..");
try{
Thread.sleep(5000);
}
catch (Exception e){}
int a = in.read();
System.out.println("received acknowledgment for frame => " +i+ " as "+a);
}
out.flush();
}
else{
for(int i=0;i<n;i++){
if(i==3) {
System.out.println("Sending frame number => " +i);
}
else{
System.out.println("sending frame no => " +i);
out.write(i);
out.flush();
System.out.println("Waiting for acknologment ");
```

```
try {
    Thread.sleep(7000);
}
catch(Exception e){}

int a = in.read();

if(a!=255){

    System.out.println("received ack for frame num =>" + i + " as " + a);
    array[i]=true;
}

}

}

for(int a=0;a<n;a++){

    if(array[a]==false){

        System.out.println("Resending frame => " + a);
        out.write(a);
        out.flush();
        System.out.println("waiting for ack ");

        try {

            Thread.sleep(5000);

        }

        catch(Exception e){}

    }

    int b = in.read();

    System.out.println("receiving ack for frame num => " + a + " as " + b);
```

```
array[a]=true;
}
}
out.flush();
}
in.close();
System.out.println("Quiting");
}
}
```

### **CLIENT.JAVA**

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

class goback_client{

public static void main(String args[]) throws IOException{
InetAddress address = InetAddress.getByName("Localhost");
System.out.println(address);
Socket s1 = new Socket(address,500);
BufferedInputStream in = new
BufferedInputStream(s1.getInputStream());

DataOutputStream out = new
DataOutputStream(s1.getOutputStream());
```

```
Scanner sc = new Scanner(System.in);
```

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

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

```
System.out.println("Enter the num of frames to be request to  
server");
```

```
int c = sc.nextInt();
```

```
out.write(c);
```

```
out.flush();
```

```
System.out.println("Enter type of trans. Error =1 : No Error=0");
```

```
int choice = sc.nextInt();
```

```
out.write(choice);
```

```
int i=0,j=0,check =0;
```

```
if(choice==0){
```

```
    for(j=0;j<c;j++){
```

```
        i = in.read();
```

```
        System.out.println("receiver frame number => " +i);
```

```
        System.out.println("Sending acknowlwdgement for frame  
number=> "+i);
```

```
        out.write(i);
```

```
        out.flush();
```

```
    }
    out.flush();
}
else{
    for(j=0;j<c;j++){
        i = in.read();
        if(i==check){
            System.out.println("i => " +i+ "check => " +check);
            System.out.println("received frame number => "+i);
            System.out.println("sending acknowledgement for
frame num => " +i);
            out.write(i);
            check++;
        }
        else{
            j--;
            System.out.println("Discarded frame no => " +i);
            System.out.println("Sending negative ack ");
            out.write(-1);
        }
        out.flush();
    }
}
in.close();
```

```

out.close();

System.out.println("Quiting");

}

}

```

```

C:\Users\91891\Downloads>javac goback_server.java
C:\Users\91891\Downloads>java goback_server
...Server...
...Waiting...
RECEIVED REQUEST FOR SENDING FRAMES
...Sending...
SENDING FRAME : 0
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 0 as 0
SENDING FRAME : 1
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 1 as 1
SENDING FRAME : 2
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 2 as 2
SENDING FRAME : 3
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 3 as 3
SENDING FRAME : 4
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 4 as 4
SENDING FRAME : 5
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 5 as 5
SENDING FRAME : 6
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 6 as 6
SENDING FRAME : 7
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 7 as 7
SENDING FRAME : 8
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 8 as 8
SENDING FRAME : 9
..WAITING FOR ACKNOWLEDGEMENT..
RECEIVED ACKNOWLEDGEMENT FOR FRAME : 9 as 9
QUITTING
C:\Users\91891\Downloads>

C:\Users\91891\Downloads>javac goback_client.java
C:\Users\91891\Downloads>java goback_client
localhost/127.0.0.1
...client...
Connect
ENTER THE NUMBER OF FRAMES REQUIRED :
10
ENTER TYPE OF TRANS. Error =1 : No Error=0
0
RECEIVER FRAME NUMBER : 0
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 0
RECEIVER FRAME NUMBER : 1
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 1
RECEIVER FRAME NUMBER : 2
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 2
RECEIVER FRAME NUMBER : 3
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 3
RECEIVER FRAME NUMBER : 4
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 4
RECEIVER FRAME NUMBER : 5
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 5
RECEIVER FRAME NUMBER : 6
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 6
RECEIVER FRAME NUMBER : 7
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 7
RECEIVER FRAME NUMBER : 8
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 8
RECEIVER FRAME NUMBER : 9
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 9
QUITTING
C:\Users\91891\Downloads>

```

```

C:\Users\91891\Downloads>java goback_server
...Server...
...Waiting...
RECEIVED REQUEST FOR SENDING FRAMES
...Sending...
SENDING FRAME NUMBER : 0
WAITING FOR ACKNOWLEDGEMENT
RECEIVED ACK FOR FRAME NUM : 0 as 0
SENDING FRAME NUMBER : 1
WAITING FOR ACKNOWLEDGEMENT
RECEIVED ACK FOR FRAME NUM : 1 as 1
SENDING FRAME NUMBER : 2
WAITING FOR ACKNOWLEDGEMENT
RECEIVED ACK FOR FRAME NUM : 2 as 2
SENDING FRAME NUMBER : 3
SENDING FRAME NUMBER : 4
WAITING FOR ACKNOWLEDGEMENT
SENDING FRAME NUMBER : 5
WAITING FOR ACKNOWLEDGEMENT
SENDING FRAME NUMBER : 6
WAITING FOR ACKNOWLEDGEMENT
SENDING FRAME NUMBER : 7
WAITING FOR ACKNOWLEDGEMENT
RESENDING FRAME : 3
RECEIVING ACK FOR FRAME NUMBER : 3 as 3
RESENDING FRAME : 4
WAITING FOR ACK
RECEIVING ACK FOR FRAME NUMBER : 4 as 4
RESENDING FRAME : 5
WAITING FOR ACK
RECEIVING ACK FOR FRAME NUMBER : 5 as 5
RESENDING FRAME : 6
WAITING FOR ACK
RECEIVING ACK FOR FRAME NUMBER : 6 as 6
RESENDING FRAME : 7
WAITING FOR ACK
RECEIVING ACK FOR FRAME NUMBER : 7 as 7
QUITTING
C:\Users\91891\Downloads>

C:\Users\91891\Downloads>java goback_client
localhost/127.0.0.1
...client...
Connect
ENTER THE NUMBER OF FRAMES REQUIRED :
8
ENTER TYPE OF TRANS. Error =1 : No Error=0
1
i => 0CHECK : 0
RECEIVED FRAME NUMBER : 0
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 0
i => 1CHECK : 1
RECEIVED FRAME NUMBER : 1
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 1
i => 2CHECK : 2
RECEIVED FRAME NUMBER : 2
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 2
DISCARDED FRAME NO : 4
SENDING NEGATIVE ACKNOWLEDGEMENT
DISCARDED FRAME NO : 5
SENDING NEGATIVE ACKNOWLEDGEMENT
DISCARDED FRAME NO : 6
SENDING NEGATIVE ACKNOWLEDGEMENT
DISCARDED FRAME NO : 7
SENDING NEGATIVE ACKNOWLEDGEMENT
i => 3CHECK : 3
RECEIVED FRAME NUMBER : 3
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 3
i => 4CHECK : 4
RECEIVED FRAME NUMBER : 4
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 4
i => 5CHECK : 5
RECEIVED FRAME NUMBER : 5
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 5
i => 6CHECK : 6
RECEIVED FRAME NUMBER : 6
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 6
i => 7CHECK : 7
RECEIVED FRAME NUMBER : 7
SENDING ACKNOWLEDGEMENT FOR FRAME NUMBER : 7
QUITTING
C:\Users\91891\Downloads>

```

## SELECTIVE REPEAT PROTOCOL

### SERVER.JAVA

```
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.net.ServerSocket;
import java.net.Socket;
import java.net.SocketException;

class selective_server
{
    static ServerSocket Serversocket;
    static DataInputStream dis;
    static DataOutputStream dos;

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

        try
        {
            int a[] = { 30, 40, 50, 60, 70, 80, 90, 100 };
            Serversocket = new ServerSocket(8011);
            System.out.println("WAITING FOR CONNECTION");
            Socket client = Serversocket.accept();
```



```
        dis = new DataInputStream(client.getInputStream());
        dos = new
DataOutputStream(client.getOutputStream());

        System.out.println("THE NUMBER OF PACKETS SENT
IS : " + a.length);

        int y = a.length;
        dos.write(y);
        dos.flush();

        for (int i = 0; i < a.length; i++)
        {
            dos.write(a[i]);
            dos.flush();
        }

        int k = dis.read();

        dos.write(a[k]);
        dos.flush();

    }
    catch (IOException e)
    {
        System.out.println(e);
    }
}
```

```
        }
        finally
        {
            try
            {
                dis.close();
                dos.close();
            }
            catch (IOException e)
            {
                e.printStackTrace();
            }
        }
    }
}
```

### **CLIENT.JAVA**

```
import java.lang.System;
import java.net.*;
import java.io.*;
import java.text.*;
import java.util.Random;
import java.util.*;
```

```
class selective_client {  
    static Socket connection;  
  
    public static void main(String a[]) throws SocketException {  
        try {  
            int v[] = new int[10];  
            int n = 0;  
            Random rand = new Random();  
            int rand = 0;  
  
            InetAddress addr =  
InetAddress.getByName("localhost");  
            System.out.println(addr);  
            connection = new Socket(addr, 8011);  
            DataOutputStream out = new DataOutputStream(  
                connection.getOutputStream());  
            DataInputStream in = new DataInputStream(  
                connection.getInputStream());  
            int p = in.read();  
            System.out.println("NO OF FRAME IS : " + p);  
  
            for (int i = 0; i < p; i++) {  
                v[i] = in.read();  
                System.out.println(v[i]);  
            }  
        }  
    }  
}
```

```

        //g[i] = v[i];
    }
    rand = rand.nextInt(p);
    v[rand] = -1;
    for (int i = 0; i < p; i++)
    {
        System.out.println("RECEIVED FRAME IS: " + v[i]);

    }
    for (int i = 0; i < p; i++)
        if (v[i] == -1) {
            System.out.println("REQUEST TO
RETRANSMIT FROM PACKET NO "+ (i+1) + " again!!");
            n = i;
            out.write(n);
            out.flush();
        }
    System.out.println();
    v[n] = in.read();
    System.out.println("RECEIVED FRAME IS: " +
v[n]);

```

```

        System.out.println("QUITTING");
    } catch (Exception e) {
        System.out.println(e);
    }
}
}
}

```

```

C:\Users\91891>cd downloads
C:\Users\91891\Downloads>javac selective_server.java
C:\Users\91891\Downloads>java selective_server
WAITING FOR CONNECTION
THE NUMBER OF PACKETS SENT IS :8
C:\Users\91891\Downloads>

C:\Users\91891\Downloads>javac selective_client.java
C:\Users\91891\Downloads>java selective_client
localhost/127.0.0.1
NO OF FRAME IS :8
30
40
50
60
70
80
90
100
RECEIVED FRAME IS : -1
RECEIVED FRAME IS : 40
RECEIVED FRAME IS : 50
RECEIVED FRAME IS : 60
RECEIVED FRAME IS : 70
RECEIVED FRAME IS : 80
RECEIVED FRAME IS : 90
RECEIVED FRAME IS : 100
REQUEST TO RETRANSMIT FROM PACKET NO 1 again!!

RECEIVED FRAME IS : 30
QUITTING
C:\Users\91891\Downloads>

```

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