

# COMPUTER NETWORKS AND SECURITY LABORATORY

Assignment No. 5 A

NAME :- OJUS P. JAISWAL

ROLL NO. :- TACO19108

YEAR AND DIV :- TE A

**Ques :-** Write a program to simulate Go back N of Sliding Window Protocol in Peer-to-Peer mode.

**Solution :-**

Program :

1) Server =

//Lab Assignment 3: 3. Write a program to simulate Go back N Modes of Sliding Window Protocol in peer to peer mode.

//\*\*\*\* Server Code \*\*\*\*

import java.io.\*;

import java.net.\*;

import java.util.\*;

class testserver

{

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

{

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

System.out.println("Waiting for connection....");

InetAddress addr=InetAddress.getByName("localhost");

ServerSocket ss=new ServerSocket(500);

Socket client=new Socket();

client=ss.accept();

```
BufferedInputStream in=new BufferedInputStream(client.getInputStream());
```

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

```
System.out.println("Received request for sending frames");
```

```
int p=in.read();
```

```
boolean f[]=new boolean[p];
```

```
int pc=in.read(); //Choice ... Error or non-error
```

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

```
if(pc==0)//No error case
```

```
{
```

```
    for(int i=0;i<p;++i)
```

```
    {
```

```
        System.out.println("sending frame number "+i);
```

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

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

```
        System.out.println("Waiting for acknowledgement");
```

```
        try
```

```
        {
```

```
            Thread.sleep(7000);
```

```
        }
```

```
catch(Exception e){}

int a=in.read();

System.out.println("received acknowledgement for frame "+i+" as "+a);

}

out.flush();

}

else // Error Case
{

    for(int i=0;i<p;++i)
    {
        if(i==2) //Creating a scenario of error (not sending the frame)
        {
            System.out.println("sending frame no "+i);
        }
        else
        {
            System.out.println("sending frame no "+i);
            out.write(i);
            out.flush();
            System.out.println("Waiting for acknowledgement ");
            try
            {
                Thread.sleep(7000);
```

```

        }
    catch(Exception e){}

    int a=in.read();

    if(a!=255)
    {
        System.out.println("received ack for frame no: "+i+" as "+a);
        f[i]=true;
    }
    }// end of inner else
}

// check which frames have not been ack

for(int a=0;a<p;++a)
{
    if(f[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("received ack for frame no: "+a+" as "+b);
    f[a]=true;
    }
}

out.flush();
} // end of else which is for error


in.close();
out.close();
client.close();
ss.close();
System.out.println("Quiting");


} // end main method
} // end main class

```

2) Client =

//Lab Assignment 3: Write a program to simulate Go back N Modes of Sliding Window Protocol in peer to peer mode.

/\*\* client Code \*\*

import java.io.\*;

import java.net.\*;

import java.math.\*;

import java.util.\*;

class testclient

{

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

{

InetAddress addr=InetAddress.getByName("localhost");

System.out.println(addr);

Socket connection=new Socket(addr,500);

BufferedInputStream in=new BufferedInputStream(connection.getInputStream());

DataOutputStream out=new DataOutputStream(connection.getOutputStream());

Scanner scr=new Scanner(System.in);// this will be used to accept i/p from console

```
System.out.println(".....Client.....");  
System.out.println("Connect");  
System.out.println("Enter the number of frames to be requested to the server");  
int c=scr.nextInt();
```

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

```
System.out.println("Enter the type of trans. Error=1 ; No Error=0");  
int choice=scr.nextInt();  
out.write(choice);
```

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

```
if(choice==0)  
{  
    for(j=0;j<c;++j)  
    {  
        i=in.read();  
        System.out.println("received frame no: "+i);  
        System.out.println("Sending acknowledgement for frame no: "+i);  
        out.write(i);
```



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

else //Error case
{
    for(j=0;j<c;++j)
    {
        i=in.read();
        if(i==check)
        {
            System.out.println("received frame no: "+i);
            System.out.println("Sending acknowledgement for frame no: "+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();
}
```

```
    }  
    }//end of else for error  
  
    in.close();  
    out.close();  
    System.out.println("Quiting");  
  
    }// end of main method  
    }// end of main class
```

Output :

1) Error = 0

Server

```
C:\Windows\system32\cmd.exe
(c) Microsoft Corporation. All rights reserved.

C:\Users\OJUS>cd C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>javac testserver.java
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>java testserver
.....Server.....
Waiting for connection...
Received request for sending frames
Sending...
sending frame number 0
Waiting for acknowledgement
received acknowledgement for frame 0 as 0
sending frame number 1
Waiting for acknowledgement
received acknowledgement for frame 1 as 1
sending frame number 2
Waiting for acknowledgement
received acknowledgement for frame 2 as 2
sending frame number 3
Waiting for acknowledgement
received acknowledgement for frame 3 as 3
Quiting
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>
```

Client

```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.19043.1266]
(c) Microsoft Corporation. All rights reserved.

C:\Users\OJUS>cd C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>javac testclient.java
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>java testclient
Localhost/127.0.0.1
.....Client.....
Connect
Enter the number of frames to be requested to the server
4
Enter the type of trans. Error=1 ; No Error=0
0
received frame no: 0
Sending acknowledgement for frame no: 0
received frame no: 1
Sending acknowledgement for frame no: 1
received frame no: 2
Sending acknowledgement for frame no: 2
received frame no: 3
Sending acknowledgement for frame no: 3
Quiting
C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>
```

## 2) Error = 1

### Server

```
Select C:\Windows\system32\cmd.exe

C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>java testserver
.....Server.....
Waiting for connection....
Received request for sending frames
Sending....
sending frame no 0
Waiting for acknowledgement
received ack for frame no: 0 as 0
sending frame no 1
Waiting for acknowledgement
received ack for frame no: 1 as 1
sending frame no 2
sending frame no 3
Waiting for acknowledgement
Resending frame 2
Waiting for ack
received ack for frame no: 2 as 2
Resending frame 3
Waiting for ack
received ack for frame no: 3 as 3
Quitting

C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>
```

### Client

```
C:\Windows\system32\cmd.exe

C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>java testclient
Localhost/127.0.0.1
.....Client.....
Connect
Enter the number of frames to be requested to the server
4
Enter the type of trans. Error=1 ; No Error=0
1
received frame no: 0
Sending acknowledgement for frame no: 0
received frame no: 1
Sending acknowledgement for frame no: 1
Discarded frame no: 3
Sending NEGATIVE ack
received frame no: 2
Sending acknowledgement for frame no: 2
received frame no: 3
Sending acknowledgement for frame no: 3
Quitting

C:\Users\OJUS\OneDrive\Desktop\@CNS\Lab\5 A>
```