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Batch: 03

EXPERMINT: 10

●Aim: - -TCP Client and Server Socket Programming using Java.

●Theory:

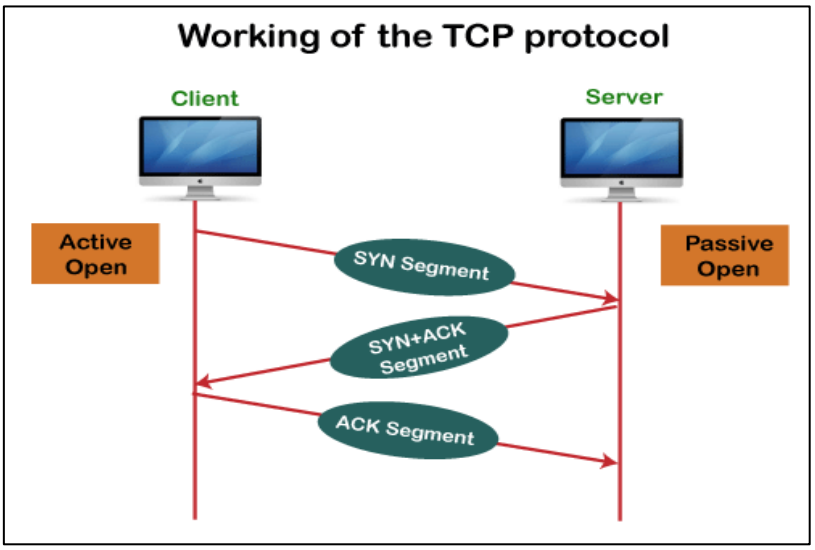
TCP stands for **Transmission Control Protocol**. It is a transport layer protocol that facilitates the transmission of packets from source to destination. It is a connection-oriented protocol that means it establishes the connection prior to the communication that occurs between the computing devices in a network. This protocol is used with an IP protocol, so together, they are referred to as a TCP/IP.

Features of TCP protocol:

- Reliable
- Order of the data is maintained
- Connection-oriented
- Full duplex

Working of TCP

In TCP, the connection is established by using three-way handshaking. The client sends the segment with its sequence number. The server, in return, sends its segment with its own sequence number as well as the acknowledgement sequence, which is one more than the client sequence number. When the client receives the acknowledgment of its segment, then it sends the acknowledgment to the server. In this way, the connection is established between the client and the server.



Advantages of TCP

- It provides a connection-oriented reliable service, which means that it guarantees the delivery of data packets.
- If the data packet is lost across the network, then the TCP will resend the lost packets.
- It provides a flow control mechanism using a sliding window protocol.

Disadvantage of TCP

- It increases a large amount of overhead as each segment gets its own TCP header, so fragmentation by the router increases the overhead.

Source Code:

Server:

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

public class GossipServer{

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

{

ServerSocket sersock = new ServerSocket(3000); System.out.println("Server ready for chatting"); Socket sock = sersock.accept( );

// reading from keyboard (keyRead object) BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));

// sending to client (pwrite object)

OutputStream ostream = sock.getOutputStream(); PrintWriter pwrite = new PrintWriter(ostream, true);

// receiving from server ( receiveRead object) InputStream istream = sock.getInputStream(); BufferedReader receiveRead = new BufferedReader(new

InputStreamReader(istream));

String receiveMessage, sendMessage; while(true)

{

if((receiveMessage = receiveRead.readLine()) != null)

{

System.out.println(receiveMessage);


}
```

```
            sendMessage = keyRead.readLine(); pwrite.println(sendMessage); pwrite.flush();
}}}
```

OUTPUT:

```
dblab01@dblab01-OptiPlex-390:~$ cd Downloads/
dblab01@dblab01-OptiPlex-390:~/Downloads$ cd sarin-CN/
dblab01@dblab01-OptiPlex-390:~/Downloads/sarin-CN$ javacGossipServer.java
dblab01@dblab01-OptiPlex-390:~/Downloads/sarin-CN$ javaGossipServer
Server ready for chatting

hi
hello
```

Client:

```
import java.io.*;
import java.net.*;
public class GossipClient
{
public static void main(String[] args) throws Exception
{
Socket sock = new Socket("127.0.0.1", 3000);
// reading from keyboard (keyRead object)
BufferedReader keyRead = new BufferedReader(newInputStreamReader(System.in));
// sending to client (pwrite object)
OutputStream ostream = sock.getOutputStream();
PrintWriter pwrite = new PrintWriter(ostream, true);
// receiving from server ( receiveRead object)
InputStream istream = sock.getInputStream();
BufferedReader receiveRead = new BufferedReader(newInputStreamReader(istream));
System.out.println("Start the chitchat, type and press Enter key");
String receiveMessage, sendMessage;
```

```
while(true)
{
sendMessage = keyRead.readLine(); // keyboard reading
pwrite.println(sendMessage); // sending to server
pwrite.flush(); // flush the data
if((receiveMessage = receiveRead.readLine()) != null) //receive from
server
{
System.out.println(receiveMessage); // displaying at DOS prompt
}
}
}
}
```

OUTPUT:

dblab01@dblab01-OptiPlex-390:~$ cd Downloads/

dblab01@dblab01-OptiPlex-390:~/Downloads$ cd sarin-CN/

dblab01@dblab01-OptiPlex-390:~/Downloads/sarin-CN$ javac GossipClient.java

dblab01@dblab01-OptiPlex-390:~/Downloads/sarin-CN$ java GossipClient

Start the chitchat, type and press Enter key

hi

hello

- **Conclusion**: Thus, we have studied about **TCP Client and Server Socket Programming** using Java.