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Rizvi College of Engineering

Department of Computer Engineering

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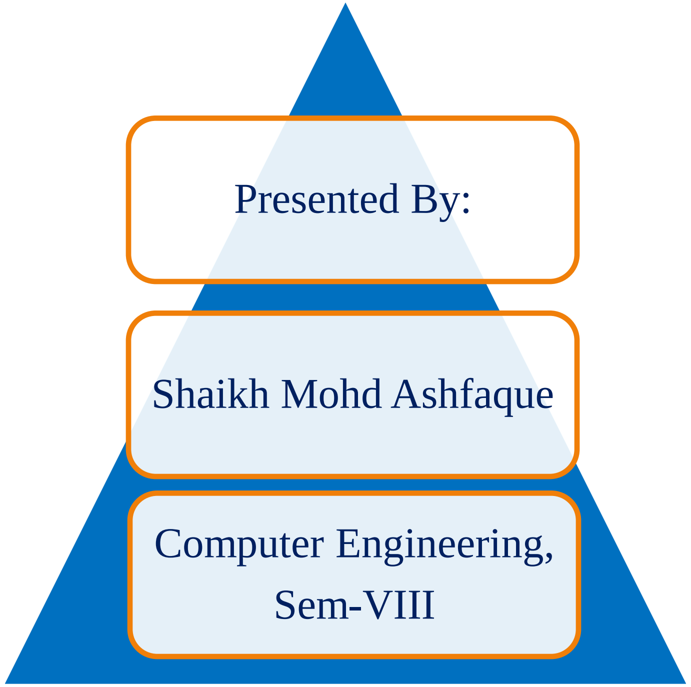
CSL802

01

Distributed Computing Lab

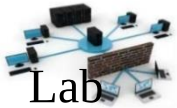


Presented By:

Shaikh Mohd Ashfaque

Computer Engineering,
Sem-VIII

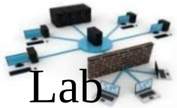
Distributed Computing

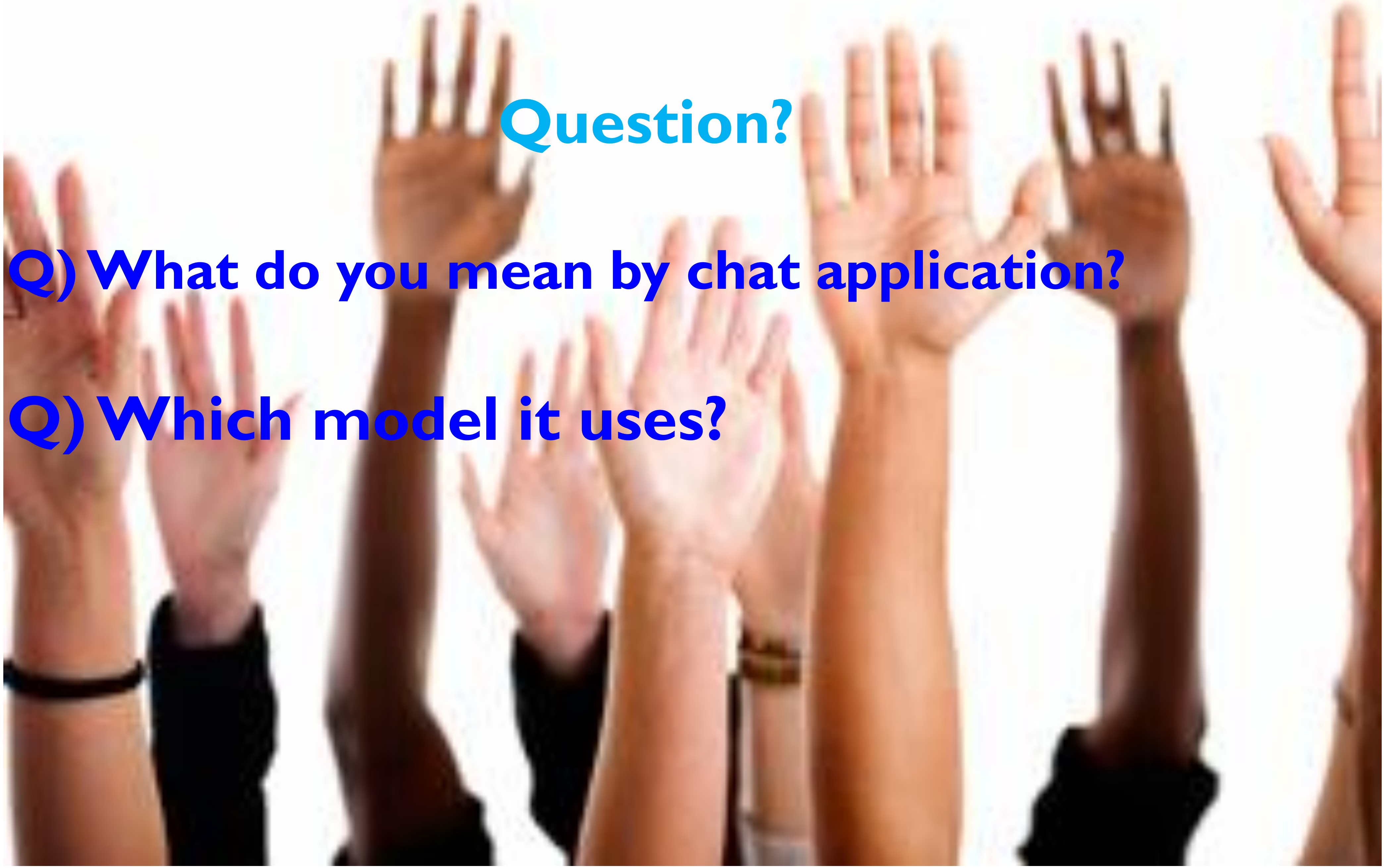


Lab

Experiment No. 01

AIM: Write a program to demonstrate Datagram Socket for chat application using java.



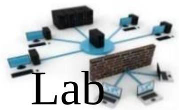


Question?

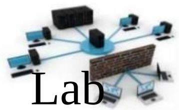
Q) What do you mean by chat application?

Q) Which model it uses?

- Socket programming in Java is a way to create a connection between two programs or devices on a network using sockets. Sockets are endpoints that allow data to be sent and received across a network.

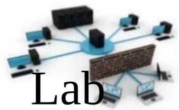


- Java Networking
- Java Networking is a concept of connecting two or more computing devices together so that we can share resources.
- Java socket programming provides facility to share data between different computing devices.
- Java Socket programming can be
  - connection-oriented (TCP)
  - connection-less. (UDP)
- Socket and ServerSocket classes are used for connection-oriented socket programming and DatagramSocket and DatagramPacket classes are used for **connection-less socket** programming.
- The client in socket programming must know two information:
  - IP Address of Server, and
  - Port number.



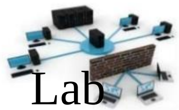
Java DatagramSocket and DatagramPacket

✓ Java DatagramSocket and DatagramPacket classes are used for **connection-less socket** programming using the UDP instead of TCP.



Datagram

- ✓ Datagrams are collection of information sent from one device to another device via the established network. When the datagram is sent to the targeted device, there is no assurance that it will reach to the target device safely and completely. It may get damaged or lost in between. Likewise, the receiving device also never know if the datagram received is damaged or not. The UDP protocol is used to implement the datagrams in Java.



Java DatagramSocket class

- ✓ **Java DatagramSocket** class represents a connection-less socket for sending and receiving datagram packets. It is a mechanism used for transmitting datagram packets over network.`
- ✓ A datagram is basically an information but there is no guarantee of its content, arrival or arrival time.

Commonly used Constructors of DatagramSocket class

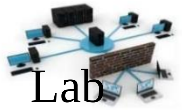
- Commonly used Constructors of DatagramSocket class
  - **DatagramSocket() throws SocketEeption:** it creates a datagram socket and binds it with the available Port Number on the localhost machine.
  - **DatagramSocket(int port) throws SocketEeption:** it creates a datagram socket and binds it with the given Port Number.
  - **DatagramSocket(int port, InetAddress address) throws SocketEeption:** it creates a datagram socket and binds it with the specified port number and host address.

Java DatagramPacket Class

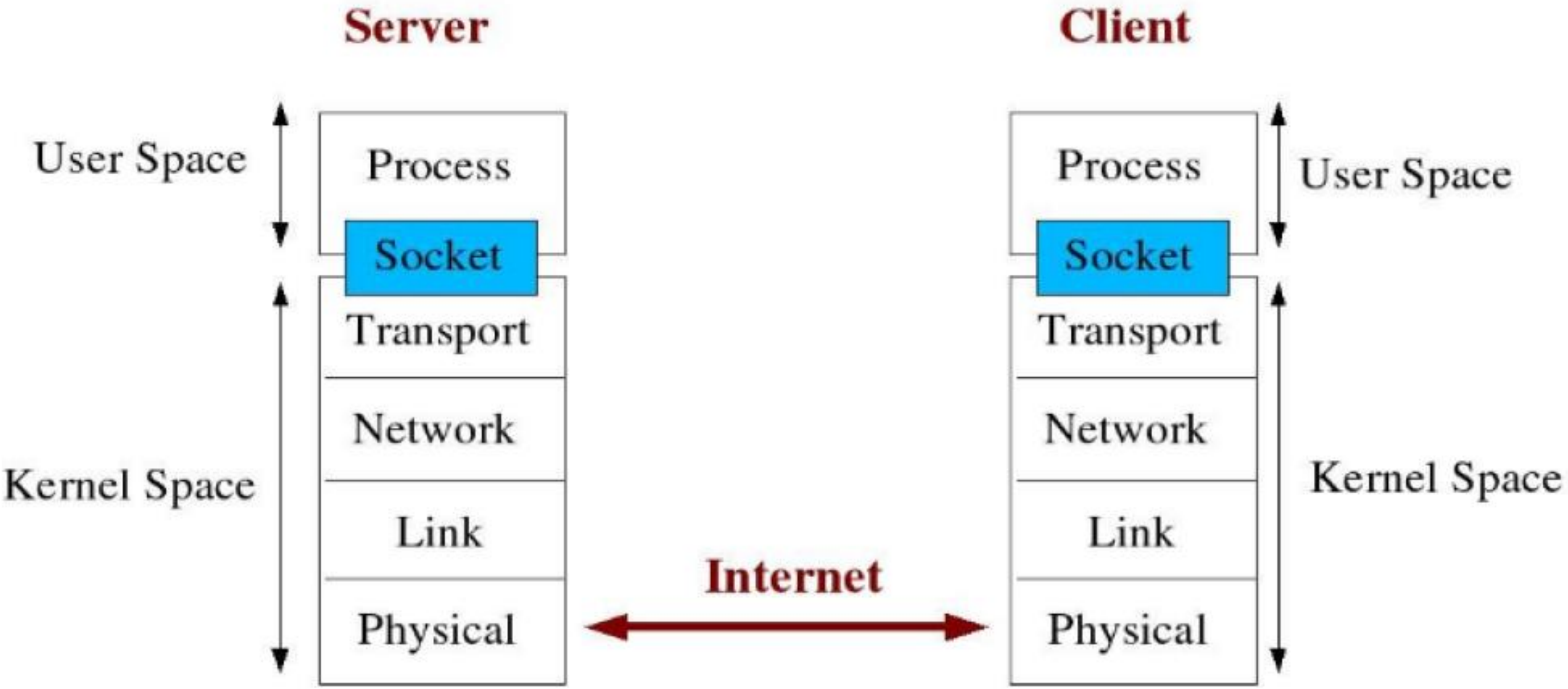
- **Java DatagramPacket** is a message that can be sent or received. If you send multiple packet, it may arrive in any order. Additionally, packet delivery is not guaranteed.
- Commonly used Constructors of DatagramPacket class
  - **DatagramPacket(byte[] barr, int length):** it creates a datagram packet. This constructor is used to receive the packets.
  - **DatagramPacket(byte[] barr, int length, InetAddress address, int port):** it creates a datagram packet. This constructor is used to send the packets.

What is Datagram Socket Programming?

- ✓ The server continuously receives datagram packets over a datagram socket. Each datagram packet received by the server indicates a client request for a quotation. When the server receives a datagram, it replies by sending a datagram packet that contains a one-line "quote of the moment" back to the client.
- ✓ The client application in this example is fairly simple. It sends a single datagram packet to the server indicating that the client would like to receive a quote of the moment. The client then waits for the server to send a datagram packet in response.
- ✓ Socket is an interface between an application process and transport layer. The application process can send/receive messages to/from another application process (local or remote) via a socket.



Socket Description



There are a few steps involved in using sockets:

- Create the socket
- Identify the socket
- On the server, wait for an incoming connection
- On the client, connect to the server's socket
- Send and receive messages
- Close the socket

Algorithm

- ✓ datagramsocket,datagrampacket,BufferedReader,InetAddress.
- ✓ Start the main function
- ✓ In the main function using while loop it perform the loop until str.equals is STOP
- ✓ There important while loop function are
- ✓ clientsocket = new DatagramSocket(cport);
- ✓ dp = new DatagramPacket(buf, buf.length);
- ✓ dis = new BufferedReader(new
- ✓ InputStreamReader(System.in));
- ✓ ia = InetAddress.getLocalHost(); if it is stop then break the while loop

Applications

DatagramSockets are Java’s mechanism for network communication via UDP instead of TCP. Java provides DatagramSocket to communicate over UDP instead of TCP. It is also built on top of IP. DatagramSockets can be used to both send and receive packets over the Internet.

https://www.geeksforgeeks.org/working-udp-datagramsockets-java

✓ One of the examples where UDP is preferred over TCP is the **live coverage of TV channels.** In this aspect, we want to transmit as many frames to live audience as possible not worrying about the loss of one or two frames. TCP being a reliable protocol add its own overhead while transmission.

✓ Another example where UDP is preferred is **online multiplayer gaming.** In games like counter-strike or call of duty, it is not necessary to relay all the information but the most important ones. It should also be noted that most of the applications in real life uses careful blend of both UDP and TCP; transmitting the critical data over TCP and rest of the data via UDP.

Summary

- In this Practical, we have learnt to:

How to write a Program to Demonstrate Datagram Socket for chat application using java.

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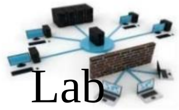

Lab

Thank You

SUCCESS
KEEP ON DOING
DO AGAIN
DO
TRY
PLANNING
ANALYSIS
THINK
START