Computer Networks Lab7

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TCP,UDP : These are the two protocols used in transport layer

- **TCP** (transmission control protocol)
- In TCP the data is connection dependent which does not necessarily say, physical/wireless connection.
- Here data sent in form of packets and each packet is sent in same connection.
- In TCP connection dependent implies a dedicated connection/path for a group of system.
- In TCP first connection should be established and then the packet is sent.

UDP (User Datagram Protocol)

- Data is sent in from of datagrams
- Data gram packet can travel independently -> independent unit.
- In udp it is virtual connection and do not follow same path.

TCP VS UDP

Tcp is more reliable whereas UDP is faster.
TCP for messaging/mail etc, while UDP is used for streaming, media where some data lost may not be required.

Establishing Connection (network) between server and client and checking

```
Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2401:4900:4e06:99cc:300f:d98d:dcf2:8508
   Temporary IPv6 Address. . . . . . : 2401:4900:4e06:99cc:e8fa:89df:e0ac:39ea
   Link-local IPv6 Address . . . . . : fe80::f5ea:f1ba:87c2:8cb7%9
   IPv4 Address. . . . . . . . . . . : 192.168.60.56
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : fe80::c079:4ff:feff:a280%9
                                       192.168.60.155

Ethernet adapter Bluetooth Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

C:\Users\kello>ping 192.168.60.43

Pinging 192.168.60.43 with 32 bytes of data:
Reply from 192.168.60.43: bytes=32 time=8ms TTL=128
Reply from 192.168.60.43: bytes=32 time=8ms TTL=128
Reply from 192.168.60.43: bytes=32 time=6ms TTL=128
Reply from 192.168.60.43: bytes=32 time=8ms TTL=128

Ping statistics for 192.168.60.43:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 8ms, Average = 7ms
```

Client Side:

```java
import java.net.*;

public class UDPClient {
    public static void main(String[] args) {
        try {
            DatagramSocket socket = new DatagramSocket();
            InetAddress serverAddress = InetAddress.getByName("localhost");
            String message = "Hello Server";
            byte[] sendData = message.getBytes();word

            DatagramPacket sendPacket = new DatagramPacket(sendData,
sendData.length, serverAddress, 6666);
            socket.send(sendPacket);

            System.out.println("Message sent to server: " + message);
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

Here local host should be replaced by ip address of server for establishing connection

Server Side:

```
import java.net.*;

public class UDPServer {
    public static void main(String[] args) {
        try {
            DatagramSocket socket = new DatagramSocket(6666);
            byte[] receiveData = new byte[1024];

            while (true) {
                DatagramPacket receivePacket = new
DatagramPacket(receiveData, receiveData.length);
                socket.receive(receivePacket);
                String message = new String(receivePacket.getData(), 0,
receivePacket.getLength());
                System.out.println("Message received from client: " +
message);
            }
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

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