# Introduction to networking:-

1. **The process of connecting the resources (computers) together to share the data is called networking.**

**2) Java.net is package that contains number of classes by using that classes we are able to provide connection between the devices (computers) to share the information.**

**3) Java.net** **package provides support for the TCP (Transmission Control Protocol),UDP(user datagram protocol) protocols.**

**4) In the network we are having to components**

**a**. **Sender**

**b. Receiver**

**Sender/source: -the person who is sending the data is called sender.**

**Receiver/destination:**- **the person who is receiving the data is called receiver.**

**In the network one system can acts as a sender as well as receiver.**

5) **In networking terminology everyone says client and server.**

**I. Client**

**II. Server**

**Client:-the person who is sending the request and taking the response is called client.**

**Server:-the person who is taking the request and sending the response is called server.**

**Categories of network:-**

We are having two types of networks:

1) Peer-to-peer network.

2) Client-server network.

**Client-server:-**

**In the client server architecture always client system behaves as a client and server system behaves as a server.**

**Peer-to-peer:-**

**In peer to peer, client system sometimes behaves as a server, server system sometimes behaves like a client the roles are not fixed.**

**Types of networks:-**

**Intranet:-**

**It is also known as a private network. To share the information in limited area range(within the organization) then we should go for intranet.**

**Internet:-**

**It is also known as public networks. Where the data maintained in a centralized server hence we are having more sharability. And we can access the data from anywhere.**

**Extranet:-**

**This is extension to the private network means other than the organization , authorized persons are able to access.**

# **The frequently used terms in the networking:-**

**1) IP Address**

**2) URL(Uniform Resource Locator)**

**3) Protocol**

**4) Port Number**

**5) MAC address.**

**6) Connection oriented and connection less protocol**

**7) Socket.**

**Protocol:-**

**Protocol is a set of rules followed by every computer present in the network and it is useful to send the data physically from one place to another place in the network.**

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**TCP(Transmission Control Protocol)(connection oriented protocol) UDP (User Data Gram Protocol)(connection less protocol)**

**Telnet**

**SMTP(Simple Mail Transfer Protocol)**

**IP (Internet Protocol)**

**IP Address:-**

**1) IP Address is a unique identification number given to a computer to indentify it uniquely in the network.**

**2) The IP Address is uniquely assigned to the computer and it is not duplicated.**

3) **The IP Address range is 0-255.**

4) **We can identify the particular computer in the network with the help of IP Address.**

**5) The IP Address contains four parts:**

a. 125.0.4.255----good

b. 124.654.5.6-----bad

c. 1.2.3.4.5.6-------bad

6) **Each and every website contains its own IP Address we can access the sites through the names else with IP Address.**

**Site Name :- www.google.com**

**IP Address :- 74.125.224.72**

Ex:-

**import java.net.\*;**

**import java.io.\*;**

**class Test**

**{**

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

**{**

**BufferedReader br=new BufferedReader(new InputStreamReader(System.in));**

**System.out.println("please enter site name");**

**String sitename=br.readLine();**

**InetAddress in=InetAddress.getByName(sitename);**

**System.out.println("the ip address is:"+in);**

**}**

**}**

**Compilation :- javac Test.java**

**Execution :- java Test**

**www.google.com**

**The IP Address is:www.google.com/74.125.236.176**

**java Test**

**www.yahoo.com**

**The IP Address is: www.yahoo.com/ 106.10.139.246**

**Java Test**

**Please press enter key then we will get IP Address of the system.**

**The IP Address is : local host/we are getting IP Address of the system**

**Note:- If the internet is not available we are getting java.net.UnKnownHostException.**

**Communication using networking :-**

**In networking two ways of communications are possible:**

1) Connection oriented(TCP/IP communication)

2) Connection less(UDP Communication)

**Connection Oriented:-**

a**) In this type of communication we are using combination of two protocols TCP,IP.**

**b) In this type of communication the main purpose of TCP is transfering the data in the form of packets between the source and destination. And the main purpose of the IP is finding address of a particular system.**

**To achieve the following communication java peoples have provided with following classes.**

**a. Socket**

**b. ServerSocket**

**Layers of the TCP/IP connection.**

Application Layer

TCP

IP

Data Link Layer

Physical Layer

**Application Layer**:-

**Takes the data from the application layer and sends it to the TCP layer.**

**TCP Protocol**:-

**It will take the data which is coming from Application Layer and divide in to small units called Packets, then transfer those packets to the next layer called IP. The packet contains group of bytes of data.**

**IP:-**

**It will take the packets which is coming from TCP and prepare envelop called ‘frames’ hence the frame contains the group of packets. Then it will identify the particular target machine on the basis of the IP address and sent that frames to the physical layer.**

**Physical Layer:-**

**Based on the physical medium it will transfer the data to the target machine.**

**Connection Less :- (UDP)**

**1) UDP is a protocol. by using this protocol we are able to send data without using Physical Connection.**

**2) This is a light weight protocol because no need of the connection between the client and server .**

**3) This is very fast communication as compared to the TCP/IP communication.**

**4) This protocol is not sending the data in proper order, there may be chance of missing the data.**

**5) This communication is used to send the Audio and Video data if some bits are lost but we are able to see the video and images if we are getting any problems.**

**To achieve the UDP communication the java peoples have provided the following classes.**

**1. DataGrampacket.**

**2. DataGramSocket.**

**Socket:-**

**1) Socket is used to create the connection between the client and server.**

**2) Socket is nothing but a combination of IP Address and port number.**

**3) The socket is created at client side.**

**4) Socket is a class present in java.net package**

**5) It is acting as a communicator between the client and server.**

**6) Whenever we want to send the data first we have to create a socket because is acts as a medium.**

**DatagramSocket :**

* **Java DatagramSocket class represents a connection-less socket for sending and receiving datagram packets.**
* **A datagram is basically an information but there is no guarantee of its content arrival or arrival time.**

**DatagramPacket:**

**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.**

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| **//DSender.java**  **import java.net.\*;**  **public class DSender{**  **public static void main(String[] args) throws Exception {**  **{**  **DatagramSocket ds = new DatagramSocket();**  **String str = "Welcome java";**  **InetAddress ip = InetAddress.getByName("127.0.0.1");**  **DatagramPacket dp = new DatagramPacket(str.getBytes(), str.length(), ip, 3000);**  **ds.send(dp);**  **ds.close();**  **}**  **}**  **//DReceiver.**  **java import java.net.\*;**  **public class DReceiver{**  **public static void main(String[] args) throws Exception {**  **{**  **DatagramSocket ds = new DatagramSocket(3000);**  **byte[] buf = new byte[1024];**  **DatagramPacket dp = new DatagramPacket(buf, 1024);**  **ds.receive(dp);**  **String str = new String(dp.getData(), 0, dp.getLength()); System.out.println(str);**  **ds.close();**  **}}**  **//DReceiver.java**  **import java.net.\*;**  **public class DReceiver{**  **public static void main(String[] args) throws Exception**  **{**  **DatagramSocket ds = new DatagramSocket(3000);**  **byte[] buf = new byte[1024];**  **DatagramPacket dp = new DatagramPacket(buf, 1024);**  **ds.receive(dp);**  **String str = new String(dp.getData(), 0, dp.getLength());**  **System.out.println(str);**  **ds.close();**  **}}**  **//DSender.java**  **import java.net.\*;**  **import java.util.Scanner;**  **public class Dsender{**  **public static void main(String[] args) throws Exception**  **{**  **DatagramSocket ds = new DatagramSocket();**  **System.out.println(" ENTER THE DATA u WANT TO SEND");**  **Scanner scanner=new Scanner(System.in);**  **String str=scanner.nextLine();**  **//String str = "Welcome java";**  **InetAddress ip = InetAddress.getByName("127.0.0.1");**  **DatagramPacket dp = new DatagramPacket(str.getBytes(), str.length(), ip, 3000);**  **ds.send(dp);**  **ds.close();**  **}**  **}** |
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