Smart Programming : YouTube Channel

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Networking Introduction

=> Networking :-

➔ Networking is the process of connecting two or more systems in order to achieve data sharing or resource sharing.

➔ Types of networking :-

1. LAN (Local Area Network) - Small building like offices, college labs etc
2. PAN (Personal Area Network) - For personal use within 10-12 meters
3. MAN (Metropolitian Area Network) - It is within the city like banks within the city
4. WAN (Wide Area Network) - It is within the states or countries

➔ To establish networking we needs basically 3 things :-

1. Hardware :- systems, routers, switch, hub etc
2. Media :- fibre optics, wires, wireless etc
3. Software :- any programming language (java)

=> Terms used in networking :-

1. IP Address :-

- ➔ IP Address full form is Internet Protocol Address
- ➔ IP address is the unique integer or decimal value which is provided by ISP (Internet Service Provider) whenever the system is connected to the network
- ➔ IP Address allows the computer to send or receive data
- ➔ IP Address confirms to send or receive the data to the accurate system
- ➔ IP Address are of 4 types :- public, private, static, dynamic
- ➔ Command to get the IP Address of my system :- ipconfig or ipconfig/all

2. Port Number :-

➔ Port number is the unique integer value for each and every service or process which is executing in the system
➔ For example : 80 - HTTP, 3306 - MySQL etc
➔ Command to get the Port number :- netstat -ano

3. Protocol :-

➔ It is the set of rules and regulations for data transfer or communication
➔ There are a lot of protocols for example :- IP (Internet Protocol), TCP (Transmission Control Protocol), UDP (User Datagram Protocol), HTTP (Hyper Text Transfer Protocol), FTP (File Transfer Protocol), SMTP (Simple Mail Transfer Protocol), POP3 (Post Office Protocol 3), SSH (Secure Shell) etc

➔ NOTE :-

1. Java provides a package i.e. java.net for TCP and UDP
2. Classes used for TCP : Socket, ServerSocket etc
3. Classes used for UDP : DatagramPacket, DatagramSocket etc
4. Other important classes used for networking are : URL, URLCOnnection, HTTPConnection etc

4. MAC Address :-

➔ MAC Address is the unique integer value for the machine which is embedded in the Network Card (Network Interface Card) at the time of manufacturing

➔ MAC Address cannot be changed (But we can change the IP Address)

➔ MAC Address is also known as Physical Address

5. Socket :-

➔ Socket is the end-point of the communication

➔ Socket is the buffer which is the combination of IP Address, Port Number & Protocol

➔ Socket is an object from which we can read or write the data

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=> What is difference between IP Address and Port Number ?

-> IP address is the unique integer value of the system in the network

Port number is the unique integer value of the services or process running is the current/present system

=> What is difference between TCP & UDP ?

1. TCP :- It is connection oriented

   UDP :- It is connection-less

2. TCP :- It is fast

   UDP :- It is slow

=> What is difference between IP Address & MAC Address ?

➔ IP address is the unique integer value of the system in the network
MAC Address is the unique integer value for the system which is embedded in the Network Card (Network Interface Card) at the time of manufacturing

➔ IP Address is provided by ISP
MAC Address is provided by the manufacturing companies

➔ IP Address can be changed
MAC Address cannot be changed

=> We can create 2 types of applications in java :-

1. Standalone Applications (Desktop Applications) :- Standalone applications are those which does not use client-server architecture and they are executed only on one system. For examples :- TicTacToe game, Editor (Notepad), Billing Software, Car-Racing Game etc

2. Distributed Applications (Client-Server Project) :- Distributed applications are those which use client-server architecture and they can communicate with multiple systems. For examples :- Chat Server, Banking etc

=> Note :-

➔ To prepare distributed applications java has provided multiple technologies i.e.

1. Socket Programming
2. RMI
3. CORBA
4. EJB
5. Web Services

etc

Company Links & Contacts

Company Name: Smart Programming (+91 62838-30308)

Address : Chandigarh & Mohali (Punjab), India

Websites: https://www.smartprogramming.in/

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