2.1 Internet:

The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries an extensive range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support email.

To develop a network following network communication devices are required which are listed below:

- Network Interface cards
- Routers
- Hubs
- Switches
- Gateways
- Modems
- Networking Cables

2.2 Ports and Protocols:

Basically a port is an access channel and a protocol is a standardized way for computers to exchange information.
Computers in a network must send and receive data to communicate. Data on the Internet is sent and received by software that automatically organizes such data to be transferred into packets. These packets are made in a standardized way (a protocol) so other computers can recognize them as data and decode them. Network clients use different ports or channels (that are given standardized numbers) to transfer this data. Generally one port is used to send data and another

to receive it, so packets don't collide. The port number (and the destination IP address) is included as part of the header each packet is given. Ports range from 1 to 65535 for TCP and UDP.

Port numbers are generally divided into three ranges:
1. The Well Known ports: 0 to 1023
2. The Registered ports: 1024 to 49151
3. The Dynamic and/or Private ports: 49152 to 65535

2.3 IP Address:

An IP (Internet Protocol) address is an identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. An IP address serves two principal functions: host or network interface identification and location addressing. Its role has been characterized as follows: "A name indicates what we seek. An address indicates where it is. A route indicates how to get there."

The designers of the Internet Protocol defined an IP address as a 32-bit number and this system, known as Internet Protocol Version 4 (IPv4), is still in use today. However, due to the enormous growth of the Internet and the predicted depletion of available addresses, a new version of IP (IPv6), using 128 bits for the address, was developed in 1995.

The Internet Assigned Numbers Authority (IANA) manages the IP address space allocations globally and delegates five regional Internet registries (RIRs) to allocate IP address blocks to local Internet registries (Internet service providers) and other entities.

In the early stages of development of the Internet Protocol, network administrators interpreted an IP address in two parts: network number portion and host number portion. The highest order octet (most significant eight bits) in an address was designated as the network number and the remaining bits were called the rest field or host identifier and were used for host numbering within a network.

This early method soon proved inadequate as additional networks developed that were independent of the existing networks already designated by a network number. In 1981, the Internet addressing specification was revised with the introduction of classful network architecture.

Classful network design allowed for a larger number of individual network assignments and fine-grained sub-network design. The first three bits of the most significant octet of an IP address were defined as the class of the address. Three classes (A, B, and C) were defined for universal uni-cast addressing. Depending on the class derived, the network identification was based on octet boundary segments of the entire address. Each class used successively additional octets in the network identifier, thus reducing the possible number of hosts in the higher order classes (B andC). The following table gives an overview of this now obsolete system.

Class	Leading Bit	Range	Host Octets	Network Octets
A	0	0-127	3	1
B	10	128-191	2	2
C	110	192-223	1	3
D(multicast)	111	224-239	-	-
E(Research)	1111	240-255	-	-