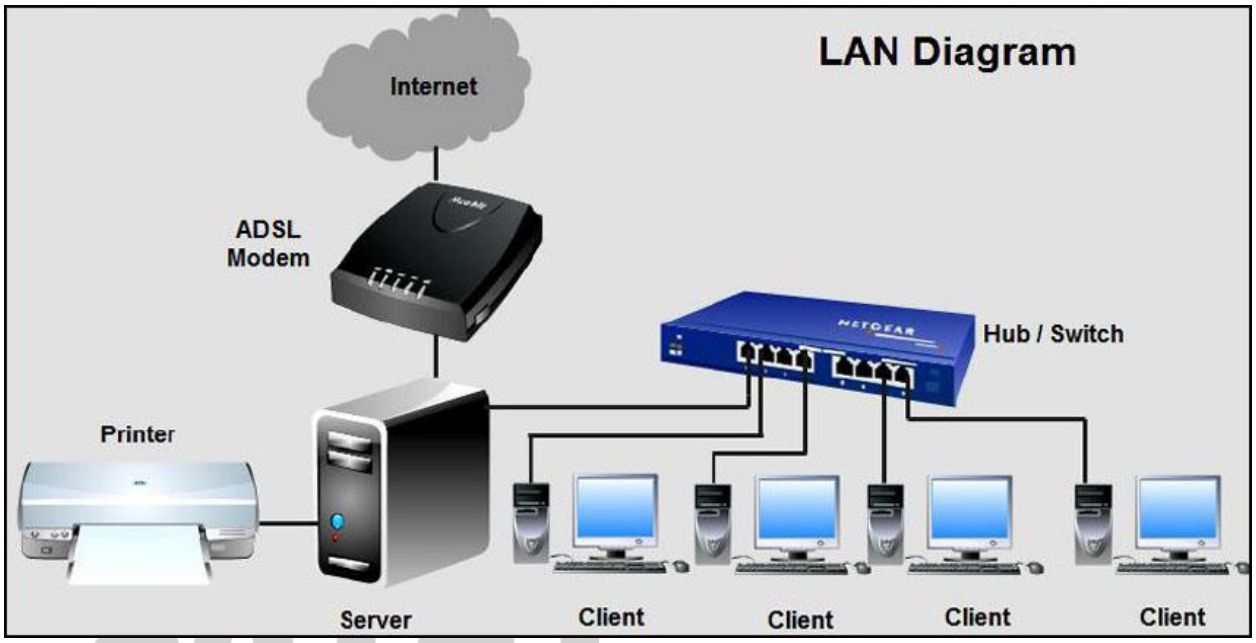
NETWORK BASICS

What is networking?

Networking: Connecting two or More computers or network device (Routers/Print Servers /Firewall Devices.etc) for sharing the Resources (Print /Internet /Data/Software…etc)



What are the advantages or need Networking

By Sharing the Network Resources

- You can reduce the cost
- You can manage /Control the resources form single location
- You can provide safety and security to the resources

What are the different types of Networks ?

- ✓ LAN – Local Area Network
- ✓ WAN –Wide Area Network
- ✓ MAN-Metropolitan Area Network
- ✓ SAN- Storage Area Network ,System Area Network , Server Area Network, or Sometime Small Area Network
- ✓ WLAN – wireless Local Area Network
- ✓ CAN – Campus Area Network

But mainly network are classified as two types

LAN and WAN

What is LAN (Local Area Network)

LAAN (Local Area Network) : Connecting two or more computers or network devices within a single room /building by using physical media/wireless access devices (WLAN Card) is called as LA.(Refer Figure 1.1)

What is WAN (wide area Network?)

WAN (wide Area Network) : Connecting two or more computers or LANs which are located at different geographical long distance places y using remote media called as WAN

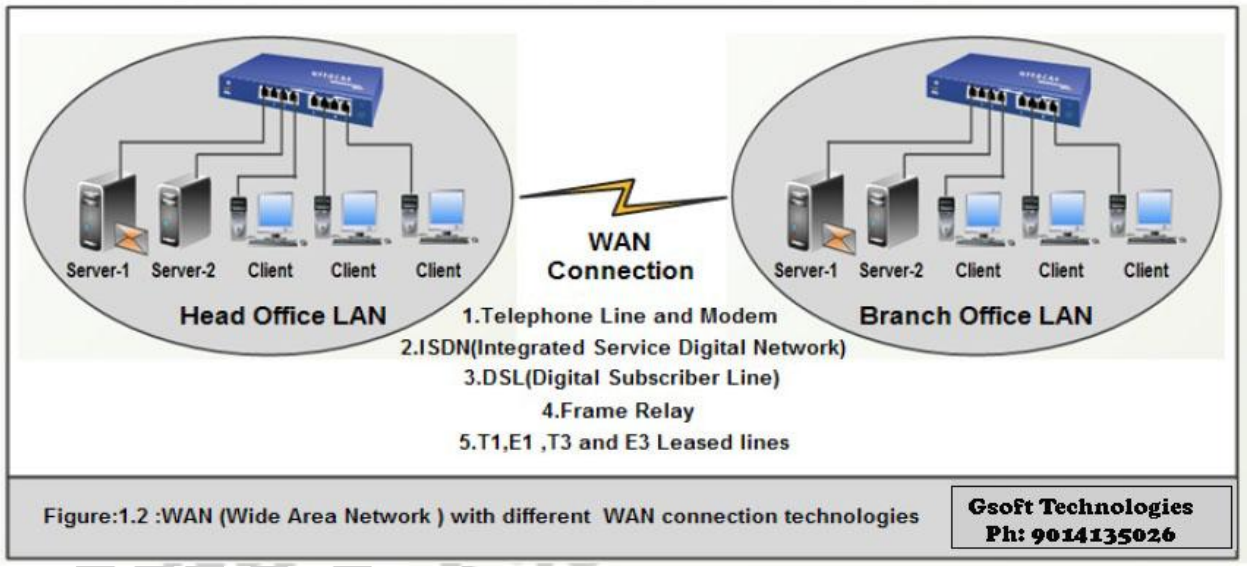


Figure:1.2 :WAN (Wide Area Network) with different WAN connection technologies

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1 Dialup Connection /RAS (Remote Access Service) : Connecting Two LANs or Remote Computer But this is low speed connection : 64 kbps and it is more expensive.

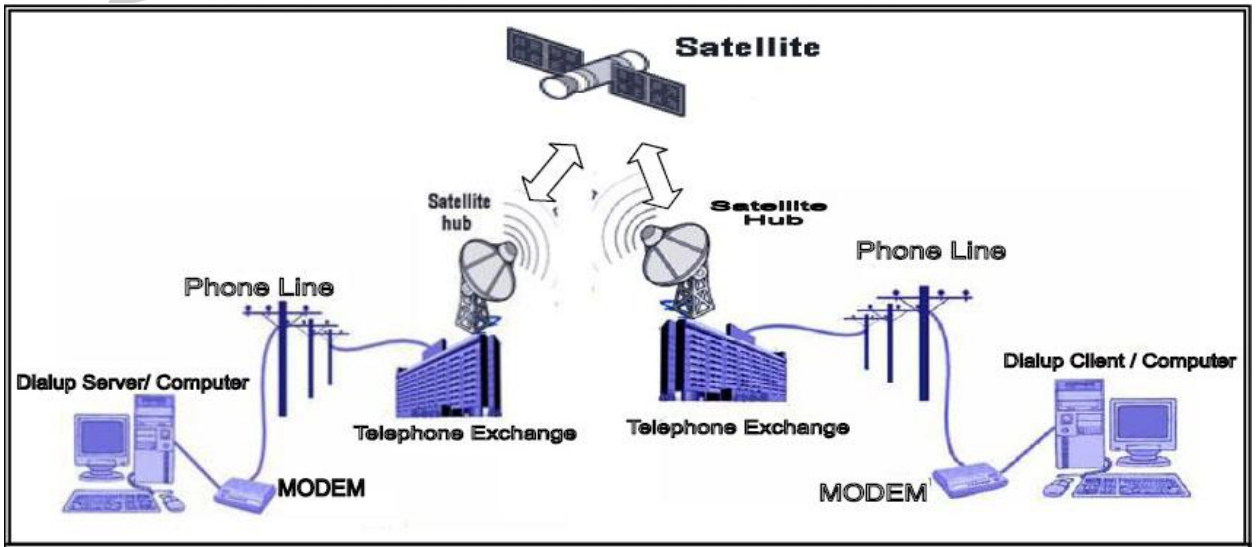

Figure 1.3 :WAN connection by using Telephone Line and Modem (RAS)

What is an ISDN /TI Leased Line ?

ISDN stands for integrated services Digital Network
In ISDN Line simultaneously you can communicate and (Send /Receive) data and voice
It is high speed dedicated connection between client and teclo/ISP
It is more expensiv

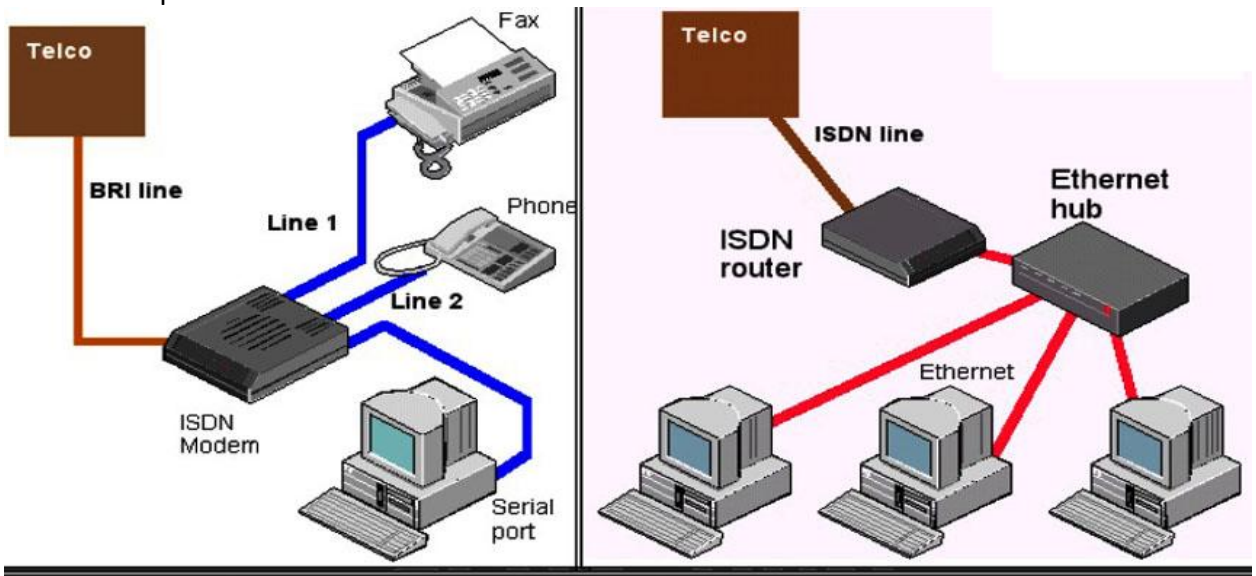

Figure 1.4 : WAN connection by using ISDN Line and ISDN Modem / Router

What is Frame Relay ?

Frame Relay is a virtual circuit-base packet –switching technology that permits WAN implementation of up to speeds (44.7 Mbps)

1. Most implementations of Frame Relay use permanent virtual circuits (PVCs)

Requirements for implementing LAN:

- Server
- Clients
- Network Devices / Equipments (Network Adapters ,Repeaters ,Bridges, Hubs ,
- Switches , Routers)
- Cables.
- Selecting of Network Topology
- Selecting of Network Protocols
- Selecting of Network Models (Workgroup Model or Domain Model)
- Selecting of O.S
- Server: The computer(s) or Network Devices (Routers / Firewall / Print manager / IP Permissions /rights .

Client: The Computers / network devices which can use the resources from server. The client request to server, server checks the permissions and supply the resources to the clients .

Network Adapter / LAN Card / Ethernet Controller / NIC :

- It is an I/O (Input / Output) used for every computer to communicate (send / receive)
- data from one computer to other computers in a network .

What is MAC Address?

- Every LAN card has unique identification address called as MAC (Media Access
- Control) address.
- MAC Address is 12 bit number like 00-1F-29-80-B8-C3

Specifications / Features of Network Adapters / LAN Card:

- **Speed :** In computers data communicated in the form of zeros and ones (0 AND
- 1).Speed of the network measured in the form of bps (bits per second)

Measurement Units	
b(bit)	0 or 1
1B(Byte)	8bits
1KB(Kilo Byte)	1024Bytes
1MB(Mega Byte)	1024KB
1GB(Giga Byte)	1024MB

LAN Card Speeds	
Ethernet Card	10 / 100 Mbps
Gigabit Ethernet Card	1000 Mbps (1Gbps)
Fast Gigabit Ethernet Card	10Gbps

Figure1.5 : Measurement Units and LAN card speeds Gsoft Technologies Ph : 9014135026

2.Duplex Mode /Type of Communication : Network Adapter communicate data in two ways .

1.Half Duplex : Simultaneously both sending and receiving is not possible

Full Duplex : Simultaneously both sending and receiving is possible

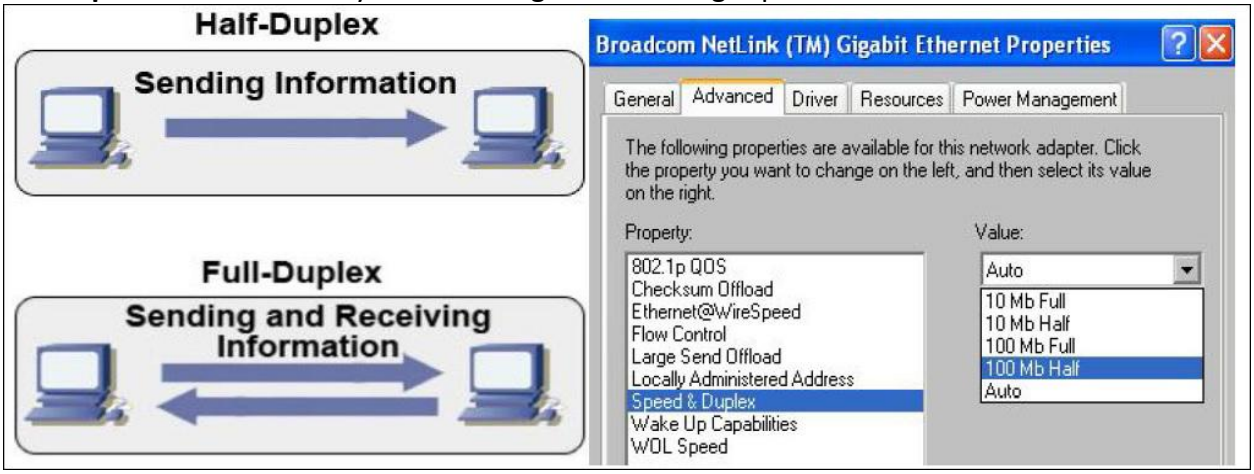

Figure 1.6: Half-Duplex Mode and Full-Duplex Mode Gsoft Technologies Ph : 9014135026

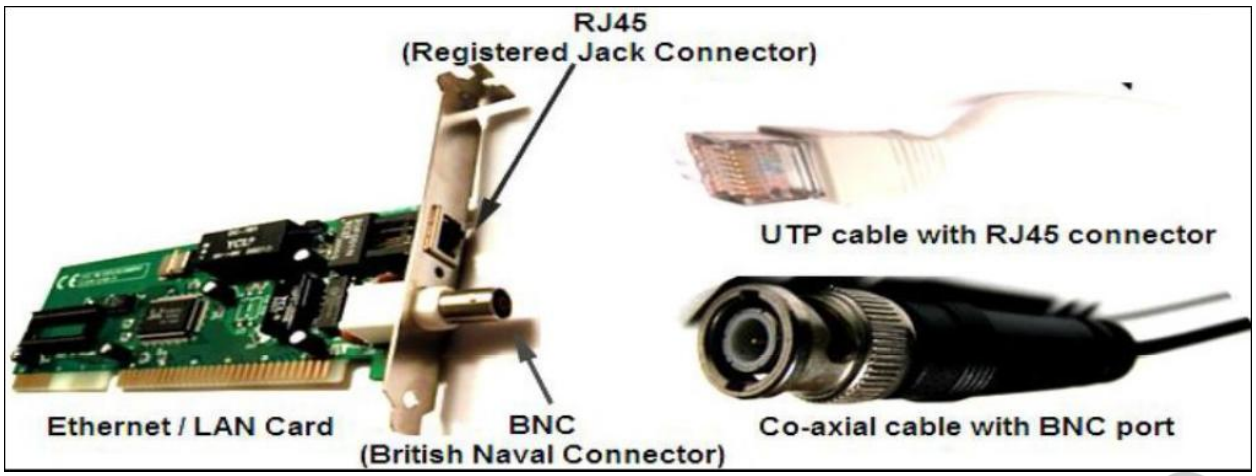

Figure 1.7: LAN card with different cables and connectors Gsoft Technologies
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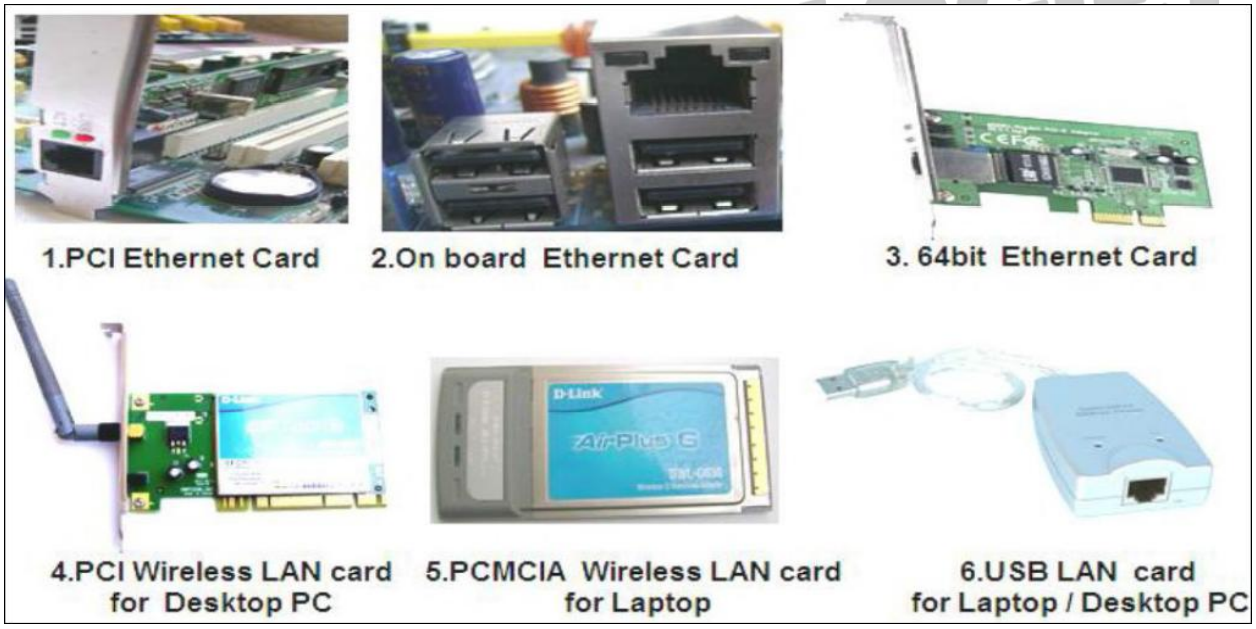

Figure 1.8: Different types of Ethernet / LAN cards Gsoft Technologies
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What is CSMA / CD ?

- Ethernet networking **uses Carrier Sense Multiple Access With Collision Detection (CSMA/CD).**A protocol that helps devices share the bandwidth evenly
- without having two devices transmit at the same time on the network medium.
- When the collision occurs on the Ethernet LAN?
- A jam signal informs all devices that a collision occurred.
- The collision invokes a random backoff algorithm.
- Each device on the Ethernet segment stops Transmitting for a short time until
- the Times Expire.
- All hosts have equal priority to transmit after the timers expired.