# What is Computer Network?

A computer network is a group of interconnected nodes or computing devices that exchange data and resources with each other. A network connection between these devices can be established using cable or wireless media. Once a connection is established, communication protocols -- such as TCP/IP, Simple Mail Transfer Protocol and Hypertext Transfer Protocol -- are used to exchange data between the networked devices

## How does a computer network work?

Devices attached to a computer network use IP addresses that are resolved into hostnames through a domain name system server to communicate with each other over the internet and on other computer networks. A variety of protocols and algorithms are also used to specify the transmission of data among endpoints.

# Working of a Computer Network

The nodes (like computers, switches, and modems) are the sources of generating and transmitting data. Then the link (a transmission media) is used to bond among the nodes.

By following the protocols, the nodes will transfer and receive data via connections. computer network architecture defines the design associated among these physical and logical components. It provides the definitions for the network's physical components, functional organization, protocols, and procedures.

## Uses of Computer Network:

- It allows you to share resources such as printers, scanners, etc.
- You can share expensive software and database among network users.
- It facilitates communications from one computer to another computer.
- It allows the exchange of data and information among users through a network.

## Popular Computer Networks:

- Local Area Network (LAN)
- Metropolitan Area Network (MAN)
- Wide Area Network (WAN)

## Local Area Network (LAN):

As the name suggests, the local area network is a computer network that operates in a small area, i.e., it connects computers in a small geographical area like within an office, company, school, or any other organization. So, it exists within a specific area, e.g. home network, office network, school network, etc.

A local area network may be a wired or wireless network or a combination of both. The devices in a LAN are generally connected using an Ethernet cable, which offers an interface to connect multiple devices like router, switches, and computers. For example, using a single router, few Ethernet cables, and computers, you can create a LAN at your home, office, etc. In this network, one computer may act as a server and other computers, which are part of the network, may serve as clients.

**Features of LAN**

- The network size is small, which consists of only a few kilometres.
- The data transmission rate is high, ranging from 100 Mbps to 1000 Mbps.
- LAN is included in bus, ring, mesh, and star topologies.
- Some network devices connected to the LAN will be limited.
- If more devices are added than prescribed network may fail.

Benefits of LAN:

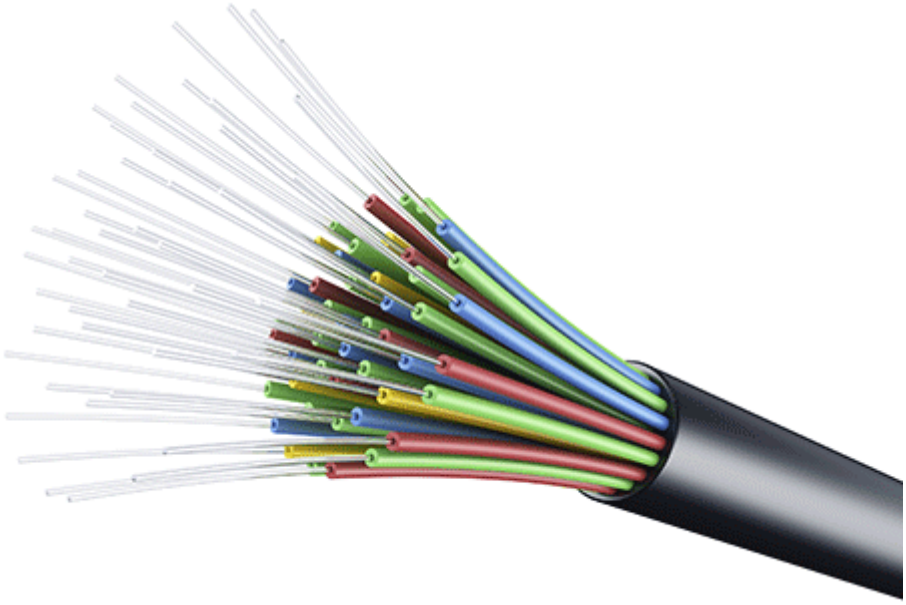
- It offers a higher operating speed than WAN and MAN.
- It is less expensive and easy to install and maintain.
- It perfectly fulfills the requirement of a specific organization, such as an office, school, etc.
- It can be wired or wireless or a combination of both.
- It is more secure than other networks as it is a small set up that can be easily taken care of.

Primary Functions of LAN:

- **Sharing of files:** It allows you to share or transfer files from one computer to another computer within the LAN. For example, in a bank, it can be used to send a file with the details of transactions of a customer from the server to clients.
- **Sharing of printers:** It also allows shared access to a printer, file servers, etc. For example, ten computers that are connected through LAN can use a single printer, file server, fax machine, etc.
- **Sharing of Computational capabilities:** It allows the clients to access to the computational power of a server, e.g., an application server as some applications which run on clients in a LAN may require higher computational capabilities.
- **Mail and message related services:** It allows sending and receiving mails between computers of a LAN. You are required to have a mail server for this.
- **Database services:** It also allows storing and retrieving data with the help of a database server.

# What is OFC ?

***OFC stands for Optical Fibre Cable. Optical fibre cables are made up of thin strands, or optical fibres, of either glass or plastic.*** One cable may have two or even hundreds. These optical fibre cables transmit information using light-based or optical technology between two locations. The light beams will emerge from the other end of the optical fibre cable (OFC) once they have travelled down from one end. Then, a photoelectric cell is required in order to convert the light pulses into electrical information so that the computer can understand it.



Light bounces off walls repeatedly as it travels down fibre optic cable. Because the beam of light hits the glass at very shallow angles, it doesn't leak from the edges. The light reflects back as if it were a mirror. This is known as total internal reflection. Cable structure is another factor that keeps it inside the pipe.

Fibre cable has many benefits, including higher bandwidth and greater reach. OFC or optical fibre cables are more popular than old copper telecom cables because they offer high-speed broadband service. *Copper wires lose 94% of their signal, while optical fibre loses only 3%. Optic fibres last longer than copper wires which are less fragile. Copper wire is easy to tap, but optical fibres are much more difficult. Optic fibre has lower latency (the time it takes to transmit data) than copper wires.*

## Optical Fibre

***Optical fibre is a hair-thin material made of glass. The diameter of optical fibre is generally 125 micrometers (mm).*** This is the actual diameter of the outer reflecting layer or cladding. Sometimes, the core, or inner transmitting tube, can have a smaller diameter (10 mm). Total internal reflection allows light rays to be reflected into the core's fibres. This can occur over great distances without any attenuation or

reduction in density. The wavelength determines the degree of attenuation, but there is little attenuation in intensity.

## What's the purpose of optical fibre cable?

Indian optical fibre cables are becoming popular day by day. The Indian government continues to invest in OFC network infrastructure development in various projects. *This is driving the growth. By 2023, the Indian market for optical fibre cable (OFC) is expected to grow at 17% CAGR*. Fibre-to-the-Home connectivity has seen an increase in adoption thanks to government initiatives like Digital India, Smart Cities, or Bharatnet. This growth will be further fueled by the increasing number of data centers located in India.

One of the main uses for optical fibre communication is in the telecom industry. Optical fibre communication is the only way to meet the growing demand for high-speed connectivity 24x7 and increased data traffic from services like voice, messaging, and downloads.

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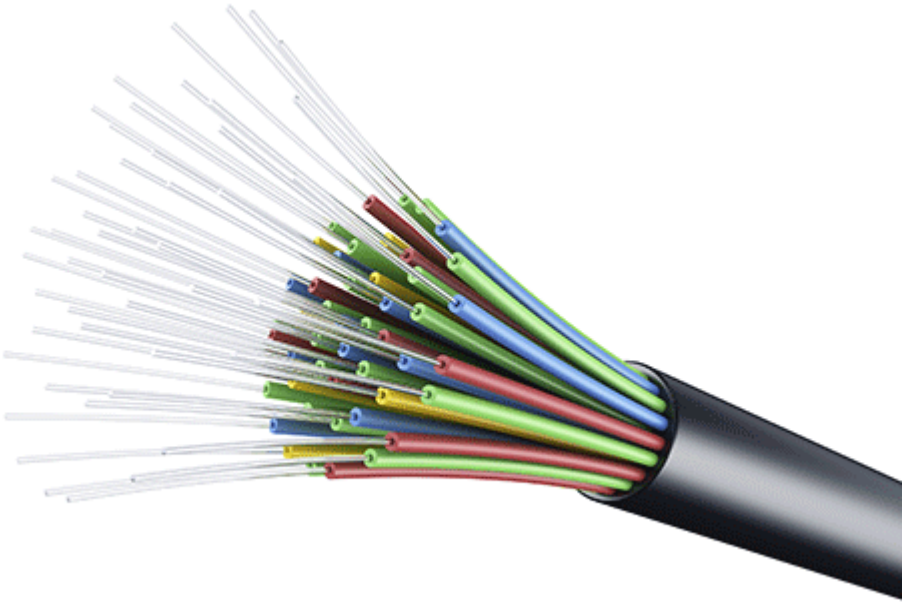

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