ISO - OSI Model :- ISO stands for International standard organisation and OSI stands for Open System inter connected

⇒ layers by which we can establish communication over network

1. Application
2. Presentation
3. Session
4. Transport
5. Network
6. Data link layer
7. Physical layer.

each and every layer performs a particular task

Source ⟶ Destination

By the help of these 7 layers source / sender can send the resources to destinations

1. Application = It provides interface
2. Presentation = It performs 2 tasks
   (i) encryption (ii) Compression
3. Session :- It means the time period
4. Transport = It divides the data into segments By the help of this if in any segment there is any error then we have to send that message again only. we didn't have to send the whole message.
5. Network = It decides routes of segments and divides segment into diff. data packets

6. Data link layer = It divides packets into frames
7. Physical layer = It collects all layer and put all the layers in the medium, medium can be of two types wired and wireless

These all are the layers of sender

⇒ Layers of Reciever :-
1. Physical 2. Presentation 3. session
4. Transport 5. Network 6 DLL
7. Physical

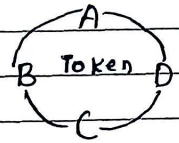
Network topology :- It is just the structure or architecture of all the computers in network there are different type of topologies such as :-
1. Bus 2 Ring 3. Star 4. Mesh
5. Hybrid 6 tree

1. Bus topology :- It is also known as line topology, is a type of network topology in which all devices in the network are connected by one central RJ-45 network table or coaxial cable. The single table, where all data is transmitted b/w devices, is referred to as the bus, backbone or trunk

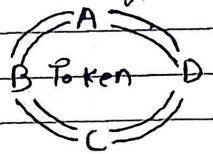
⇒ Advantages :-
1. It works very efficient well when there is a small network
2. Simple architecture
3. easy maintainance
4. effective cost management

⇒ Disadvantages :-
1. Not great for large network
2. Data is not secure

2. Ring topology = A ring topology is a network topology in which each node connects to exactly two other nodes, forming a single continuous pathway for signals through each node.
This type of topology is highly efficient and handles heavier loads better than bus topology
It is divided into two types

① 

single ring

② 

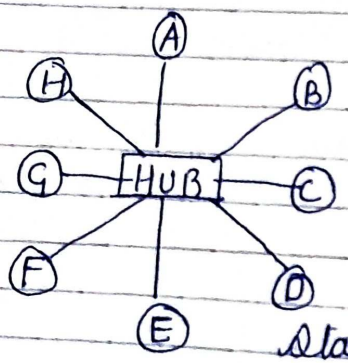
Double ring

⇒ Advantages
1. All data flows in one direction which reduces the chances of packet collisions.
2. A network server is not needed to control network connectivity b/w each workstation.
3. Data transmission speed is high

6. ⇒ Disadvantages:-
7. 1. slower as compared to bus topology
2. expensive
3. system depends on token so if token fails then whole architecture will fail

3. star topology = It is a network topology in which
⇒ each network component is physically connected to a central node such as router, hub or switch. In a star topology, the central hub acts like a server and the connecting nodes act like clients

#

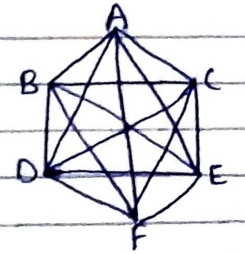


Star topology

⇒ Advantages:-
1. It is very reliable if any one cable fails or device fails then all the other will still work
2. It is high performing as no data collision can occurs
3. easier to put in
4. easily scalable

⇒ Disadvantages:-
1. It is expensive to install as this type of cable uses the most cable (network cable is expensive)
2. Extra hardware is required (hubs or switches) which adds to cost
3. If a hub or switch fails, all the devices connected to it will have no network connection

4. Mesh topology = In a mesh topology there is no central connection point. Instead, each node is connected to at least one other node and usually to more than one. Each node is capable of sending messages to and receiving messages from other nodes. The nodes acts as relays, passing on a message towards its final destination



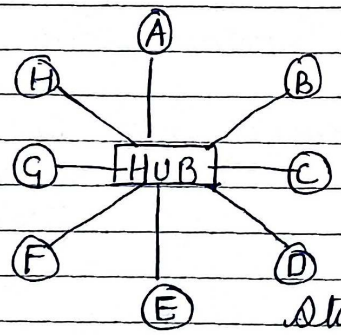
Mesh topology

⇒ Advantages:-
1. Many ways to share the data to one node
2. It provides high privacy and security
3. Data transmission is more consistent because failure doesn't disrupt its processes
4. easily scalable

⇒ Disadvantages:-

1. slower as compared to bus topology
2. expensive
3. system depends on token so if token fails then whole architecture will fail

3. star topology = It is a network topology in which each network component is physically connected to a central node such as router, hub or switch. In a star topology, the central hub acts like a server and the connecting nodes act like clients



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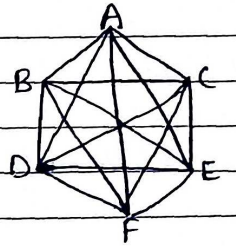


Mesh topology

⇒ Advantages:-

1. Many ways to share the data to one node
2. It provides high privacy and security
3. Data transmission is more consistent because failure doesn't disrupt its processes.
4. easily scalable

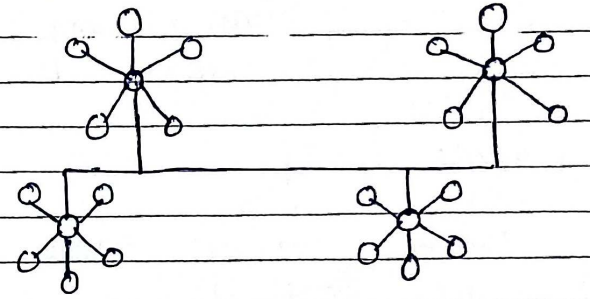
⇒ Disadvantages:-
1. Not easy to main
2. Expensive as compared to other topologies
3. Power requirement is higher as all the nodes will need to remain active all the time and
4. Share the load.
5. complex process

5. Hybrid topology = It is an integration of two or more diff. topologies to form a resultant topology which has many advantages (as well as disadvantages) of all the constituent basic topologies rather than having characteristic of one specific topology

⇒ Advantages:-
1. It is extremely flexible
2. It is very reliable
3. It is easily scalable
4. Error detection and trouble shooting is easy
5. Faster flow of data
6. Security increases
7. It has two backbones so if any backbone fails so atleast it has one

⇒ Disadvantages:-
1. Expensive
2. Design of a hybrid network is very complex
3. Usually hybrid architecture are usually larger in scales so they require a lot of cables in installation process.
1. Not easy to maintain

6. Tree topology:- A tree topology, or star bus topology, is a hybrid network topology in which star network are interconnected via bus network. Tree networks are hierarchical, and each node can have an arbitary no. of child nodes.

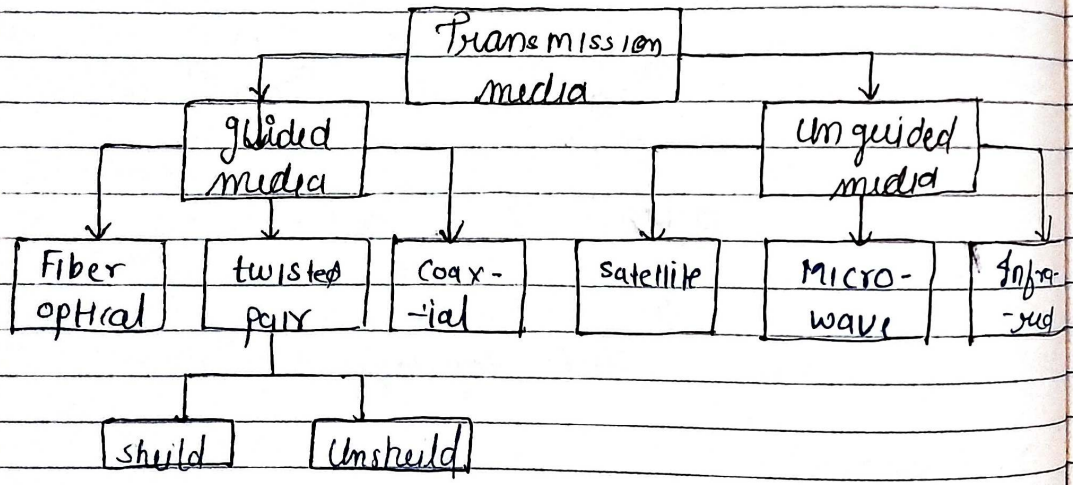


Tree topology

⇒ Advantages:-
1. In a tree topology error detection becomes easy
2. If a single node gets defected, it will not affect the other nodes.
3. easily scalable
4. Secure

⇒ Disadvantages =
1 The use of tree topology are limited due to its difficult installation process
2 - Security is weak

Transmission Media
In data communication terminology a transmission media is a physical path b/w the transmitter and the receiver i.e it is a channel through which data is send from one place to another transmission medium is classified into two types



→ Guided media = It is also suffered as wired transmission medium. Signal being transmitted are directed and confined in the narrow path way by using physically links

⇒ Features of Guided media
1 High speed = The speed of transmission of data is high
2 Secure
3. Used for comparitively shorter distance

There are three types of guided media :-

• Twisted pair = It consisted of two separately insulated conducted wire wound about each other. Generally such pairs are bundle together in a protective shield. They are the most widely used transmission medium. They are the pair of insulated wires that are twisted together to improve electromagnetic capability and to reduce noise from outside sources
There are two types of twisted pair cables :-
(i) Unshield (UTP) :- It consist of two insulated copper wire twisted around one another. This ~~are~~ type of cables has the ability to block interference & does not depend on a physical shield for their purpose. It is used for telephonic application.
Advantages of UTP :-
1. least expensive
2. Easy to install
3. High speed capacity
4. Susceptible to external interference
5. Lower capacity and performance as compared

to STP (Shield Twisted pair cable)
6 short distance Transmission

ii) Shielded (STP):- It consist of a special jacket to block external interference. It is used in fast data rate ethernet and invoice and data channels of telephone lines

Advantages of STP:-
1. Better performance at a higher data rates as compared to UTP.
2. Eliminate crosstalk 3. Comparitively faster
4 Comparitively difficult to install & manufacture
5. More expensive 6. Bulky

- Coaxial Cable (coax):- This type of cable consist of a solid wire core surrounded by one or more foil or wire shields, each separated by some kind of plastic insulator. The two most commonly used types of coaxial cables are thicknet and thinnet

- fiber Optic Cable (or Optic fiber cable):- A fiber optic cable consist of a bundle of glass threads, each of which is capable of transmitting messages modulated onto light waves. Common types of fiber optic cables are single mode and multi modes

⇒ Unguided media:- The computer network that use environment or air as the media, through which information is transmitted without requiring ~~wires~~ like any cable or wire or other electronic conductors, rather by using electromagnetic wave like IR (Infrared), RF (radio frequencies), Satellite etc. are unguided/ wireless media

- Microwave = Microwaves are high frequency ~~the~~ wave that can be used to transmit data wirelessly over long distances. The microwave transmission consist of a transmitter receiver and the atmosphere. Microwave radiation can be used to transmit signals such as mobile phone calls

- Radio wave = Radio waves are used to transmit television and radio programmes. All radios today, use continuous sine waves to transmit information (audio, video, data). WiFi that has become a common word today also used radio wave to transmit data among connected devices

- Satellite :- Satellite communication is a special case of microwave relay system. Satellite communication use the synchronous satellite to relay the radio signal transmitted from

grauned station

HTML = HTML stands for Hyper text Markup language
It is basically a standared markup language for geiving a static skeleton to web application and websites
Its a well standardized system

CSS = Cascading style sheet which is known as CSS is a style sheet language that used to handle the presentation of the web page containing HTML.
It makes owe websites beautiful and modern looking.

Javascript = Java script which is often known as JS is a high-level dynamic interpreted programming language

It allows client side scripting to create complete dynamic web application and websites

- Java Script was initially designed for making pages alive
- Scripts can be executed in the browser itself
- Java script and java are diff. progeramming language
- It can be executed on the browser as well as the server
- Java scripts is a safe language when used in browser

There are many language that get "transpiled" to java script