

- Isliye data link layer ka flow control actual flow control hai.
- Agar A se D far data send karke hai, aur
- Now data-link layer ne frames, physical layer ko pass ki.

4 PHYSICAL LAYER :-

- Now physical layer kya karte hai ??
- Ans:- Jis it converts the data into voltage level agar voltage level nahi hai toh corresponding wave form, infrared, microwave.
- Agar wired media hai toh voltage level mein.
- Agar digital to analog conversion agar karna hai toh wo bhi kaha hoga physical layer far hoga.
- Wave forms se related jo bhi chiz hogi woh kaha hogi physical layer far hogi.
- Now jaisehi physical layer far data aaya toh basically woh kaha aagaya apki cable far, now cable ki help se jo destination D far bacha gaya.
- Now aabhi tak hamne kaha tak ki activity dekhe hai send end tak ki.
- Now aab hum dek rahi hai Receiver end ki

activity •

- Receiver end par sabse pahle data kaha available hoga, physical layer par.
- Physical layer yaha kya karugi, physical layer ne sender end par kya kiya tha bits ko voltage level mein convert kiya tha.
- yaha physical layer kya convert karugi means receiver end par kya karugi, bits ko volt // voltage level ko bits mein convert karugi.
- Then bits murghe ho ke kya banayegi frames, woh ~~frame~~ frames kiske pass chahiyege ~~data-link~~ layer k pass ~~jayegi~~ jayegi.
- Woh frames kiske pass jayegi data-link k pass jayegi.
- Sender end par bhi datalink layer par kya the frames aur receiver end par bhi datalink layer par kya mil gayi frames.
- Now suppose sender ki datalink layer ne ek packet ko char part mein divide kiya tha. Toh ab receiver ki datalink layer kya karugi char frames ligi aur unko murghe karugi aur kya banayegi ek packet banayegi aur woh packet kisko mil jayega network layer ko.
- Toh sender end par bhi kya tha banana pass

- network layer par packets aur receiver end par bhi hamare pass kya hai wahi packets hai.
- Network Layer ko bata hi nahi chala ki woh frames mein divide hogaya aur wapas merge bhi hogaya.
- Sender end par bhi network-layer par kya the packets aur receiver end par bhi hamne kya mile packets hi mile.
- Now suppose sender ki network-layer ne ek segment ko 10 packets mein divide kiya tha, toh receiver end par woh kya karegi, un 10 packets ko legi, merge karegi aur ek segment banayegi.
- Aur woh segment kisko de degi transport layer ko.
- Ich transport layer par bhi segment available tha sender end par aur receiver end par bhi kya available hai segment.
- Transport layer ko kabhi bata hi nahi chala ki packet packet kiska segment kabhi packet mein divide hua hoga aur packets kabhi frames mein divide huye kogi hongy.
- Now aab transport layer ne segment receive kiye, aur segments ko merge karke kya banani ek file, woh file kiske pass gayi session layer k pass, session layer dialog maintain karegi woh yaha par dialog maintain kar rahi hai aur sender

end far bhi dialog hi maintain karrahai hai.

- Phir session layer se kaha gayi woh presentation layer far.
- Sender end far presentation layer ne data ko encrypt kiya tha, toh yaha receiver end far kya kar nahi hai decrypt karrahai hai.
- Waha compression kiya tha yaha decompressed kar nahi hai.
- Toh sender end far kiya tha uski reverse process receiver end far karraha hai.
- Aur wahi data kaha pack gaya application layer far.
- Application Layer far data jaise sender end far visible tha as it is wahi data kaha available hogaya receiver end far available hogaya.
- Application Layer ke pack ho jahi chala ke woh 6 layer se pass hoke uske paas pachucha hai.
- Jaisa sender end far available hai as it is kaha available hogaya at receiver end far.
- Yeh thi OSI model ki seven layers. Far yeh model theoretical model hai, yeh practically implemented

model nahi hai.

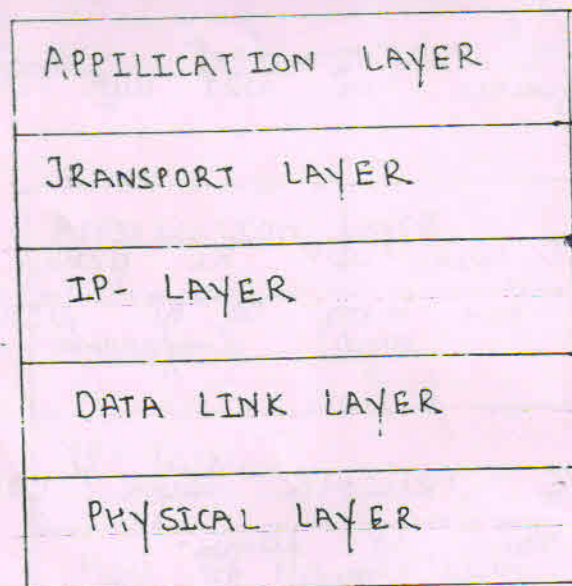
- Practically implemented model is TCP/IP Model.

Q. TCP-IP MODEL :->

Ques:-> Now yeh TCP-IP Model mein kitani layers hote hai??

Ans:-> Jo kuch books likte hai, it is four layer Model, aur kuch books likte hai it is five layer Model. Agar four layered Model hai toh konsi four layer hai aur agar five layer Model hai toh konsi five layer Model hai.

- Jo ^{first} layer of TCP-IP Model is Application Layer.



→ • Application Layer
 • ~~Session~~ - layer
 • Presentation Layer
 • Session-Layer

TCP-IP 5-Layer MODEL

- Joh yaha ki application kya karke hai, toh Joh OSI model first three layer k Joh task hai woh TCP-IP ki Application layer perform karke hai.
- Application Layer k baad next layer is transport layer.
- Yaha par transport layer is either TCP or UDP.
- TCP stands for transmission control protocol & UDP stands for User Datagram Protocol.
- Transport layer par ya toh TCP hoga ya phir UDP hoga dono ek saath nahi hoga.
- Joh kya difference hai UDP aur TCP mein aage dekhegy.
- Yaha par TCP aur UDP ki place par aur bhi options hai, par hum de hi discuss karnege, TCP and UDP.
- OSI - Model ki network layer yaha TCP-IP mein kya kahlati hai IP layer.
- IP stands for Internet Protocol. Routing karna yeh saab kaam IP layer ka hota hai TCP-IP Model mein.
- Phir, if it is four layer Model yaha OSI

model ki jo last two layers hai, woh TCP-IP mein kya kabalati hai Host to Network layer.

- And if it is 5-layer, then last ki dono layer merge nahi hogi woh as its TCP-IP Model mein present hogi.
- Aisa kyo, standard kyo nahi hai, 5 layer hai ki four layer hai.
- Jo TCP-IP bahut sare vendors ne implement kiya hai, toh ek single implementation nahi hai.
- Jo kuch vendors ne inko 5 layer mein bound kiya hai aur kuch ne 4 layer mein bound kiya hai.
- Jo Practically Implemented Model is TCP/IP Model.

APPLICATION LAYER
Transport Layer
IP-Layer
Host to Network Layer

- Application Layer
- Presentation Layer
- Session Layer

TCP/IP with four-layer Model.

- Jo OSI- Model ko practically kyo implement nahi kiya gaya.

- TCP-IP ko hi kyo practically implement kiya gaya ??

Ans:→ Jo OSI model baad mein aaya tha aur TCP/IP pahale se hi implemented tha. Usse koi problem nahi the.

- Phir OSI- Model aayahi kyo ?? uski jarurat hi kya the ??

Ans:→ Jo Network Service ko standard karne ke liye, ki ek network mein kya-kya hona chahiye kya-kya service provide karne chahiye isliye OSI model existence mein laya gaya.

- Now hum kuch aur discuss karu gy then phir hum directly data-link layer se start karu gy, physical layer hamara data ke exchange mein nahi hai isliye usko discuss nahi karu gy.

H SOME FREQUENTLY USED TERMINOLOGY:

Very first is Network Topology:

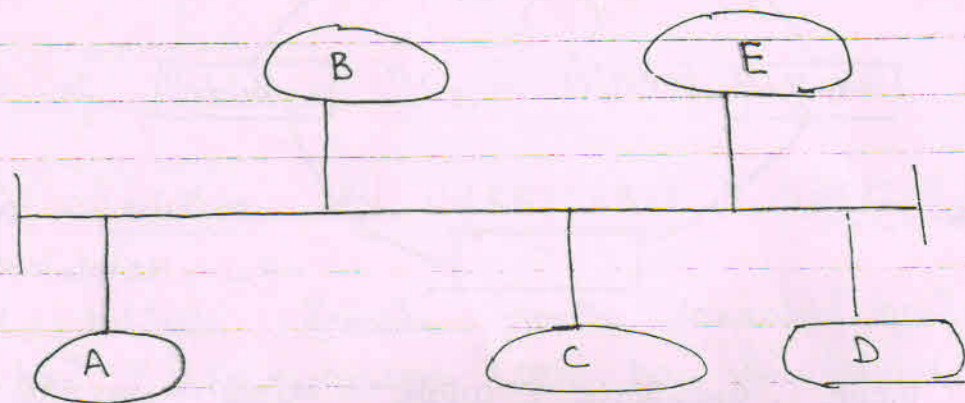
(i) Network Topology:

Now yeh Network Topology se kya matlab hota hai, toh Network kya hoga ek system ek dusre se connected hai toh woh network kahaata hai, par woh ek dusre se kis-way mein connected hai, wo kahaata hai unki Topology.

- Jo सबसे simple topology कंसी होती है, Bus topology.

BUS TOPOLOGY :-

Bus topology में एक common bus होती है उसके through सारे system एक दूसरे से connected होते हैं.

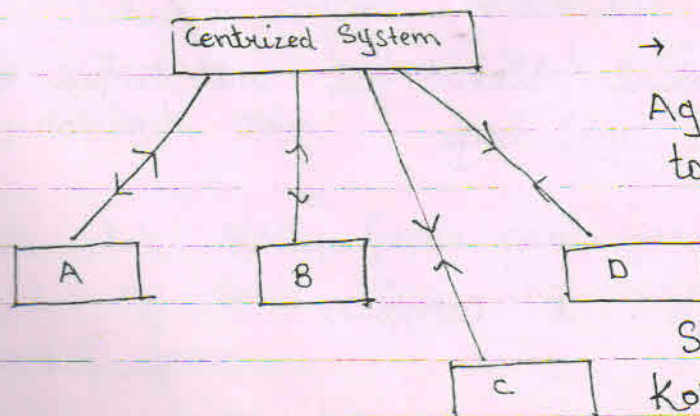


- इस topology का क्या advantage it is simple to implement and is topology का क्या drawback, अगर common bus fail तो पूरा network fail.

- Now Bus topology के बाद Star Topology :-

STAR TOPOLOGY :-

- Star topology में क्या होता है एक centralized system से सारे systems connected होते हैं.



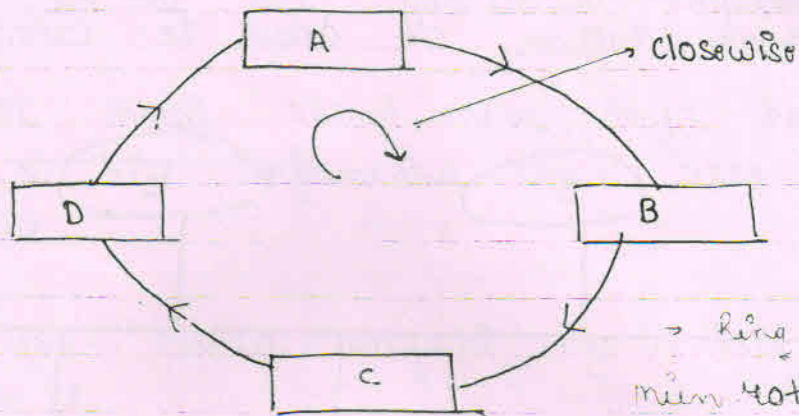
→ Drawback :-

अगर centralized system fail तो पूरा network fail हो जाएगा.

• अगर कोई individual system fail हुआ है तो कोई problem नहीं है.

RING TOPOLOGY :-

- Ring topology mein system milke ring form karte hai.



- Ring mein drawback agar ring mein ek system fail toh pura network fail.
- Joh sabse jada joh fault tolerant, Robust topology hai woh hai Mesh Topology.

MESH TOPOLOGY :-

- Fully connected topology (Robust)
- In Mesh Topology every computer is interconnected with every other computer system.

Advantage :-

Agar bahut saari link fail bhi hojati hai, jab bhi network fail nahi hoga.

Disadvantage :-

Hardware design is complex.