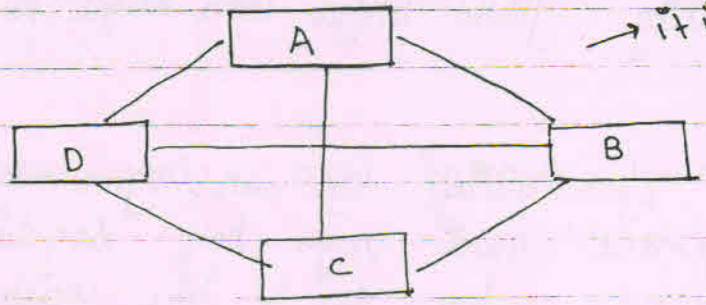


→ it is a complete graph.

- Number of Cables = $^{n}C_2 = \frac{n(n-1)}{2}$.

Reliable Services & UNRELIABLE SERVICES :-

- Network reliable Service provide karvahai hai iska kya matlab hai, iska matlab yeh hai ki Sender ensure ki reciever ne data correctly recieve kiya hai ki nahi kiya hai.

- Now aab Sender ko kaise pata chalega ki reciever ne sahi recieve kiya hai ki nahi ??

Ans- Joh obviously, reciever jaisehi data recieve karega, it Send acknowledgement for data.

- Now acknowledgement nahi aaya toh?? Now yeh toh baad ki baad hai, pahali baat toh kyo nahi aayega ??

Ans- Joh bahut saari possibilities hai, pahale toh, ~~jab~~ joh hamne frame Send ki hai woh kya hogayi lost on Network mein.

- Frame toh sahi pahuch gayi par acknowledgement joh reciever ne Send kiya tha woh hi lost hogaya network par.

Thisari possibility jisko bheja woh khud hi crash hogaya.

- Joh kohi bhi possibility kyo na, agar sender k pass acknowledgement nahi aaya toh sender kya karega toh sender kuch der k liye wait karega acknowledgement k liye.

- Agar us time period tak nahi aaya acknowledgement toh woh retransmission perform karega.

- Agar reliable service hai toh jab tak sender k pass kya nahi aajata hai acknowledgement nahi aajata hai, jab tak woh retransmisst karta rahaiga.

- Har service reliable ho kohi jaruri nahi hai, unreliable services bhi hoti hai.

- Sender ne send kar diya sender ka receiver tak pachucha ki nahi pachucha kohi matlab nahi hai sender ko, agar woh unreliable service hai toh.

CONNECTION-ORIENTED SERVICES AND CONNECTION-LESS ORIENTED SERVICES.

- Jaise telephone service is an example of connection-oriented services.

- Connection-oriented service ka matlab kya hota hai?? Connection-oriented services mein before data transmission, ek pura path decide ho jata hai sender aur receiver k bich mein.

Kya ?? Billions of user hai har user k liye ek wire possible hi nahi hai.

- Internet definitly circuit switch nahi hai but woh aapko connection-oriented service provide karta hai.

- Connectionless Network hai matlab, kohi path define nahi hota jab data aaya tab decide kiya ki konsa path follow karna hai, joh path free hoga us path ko follow karke data receiver tak pachu jayega.

- Joh Connectionless mein pahale se kohi path decide nahi hota hai.

- Jaise ha kohi packet aaya,

- Connection-oriented mein saare packets data k ek hi path ko follow karke jaraha hai receiver k pass.

- Connectionless mein your data may follow different path, uss farak kya pad raha hai hamko, aayega toh system par hi, ek path se aaye ya phir aalag-aalag path se aaye. Ans

- Farak kaha paraga, Connection-oriented service, data ki ~~oriented~~ ordered dilivery ki gaurant deta hai. Ans

- Connectionless mein data ki ordered dilivery ki kohi gaurant nahi hai.

- Ethernet and ATM are packet - switched based network.

- But connectionless servic is faster than connection oriented servic because connectionless mein pahale se kohi path decide nahi hota hai.

- Connectionless ka example hota hai packet-switched Network.

- Live Streaming is an example of connection-~~orient~~ oriented Network because agar connectionless use ki toh data ki unordered dilivery hogi which is not tolerable.

- Connectionless mein faster dilivery hoti hai data ki. Aaisa kyo?? Because Connectionless mein pahale se kohi path decide hota hi nahi hai, joh best dek raha hai usase bhej diya.

- Connectionless servic kaha suitable hai file ko recieve karne mein, agar file ordered nahi bhi aayi hai, toh aapka system usko kya karega ordered, jab tak ordering nahi karleta hai woh aapko show nahi karega ki kya aaya hai.

Ques:→ Sender ki transport layer ne data ko 10 segments mein divide kiya tha toh reciever ki transport layer ko kaise pata chalega ki data ko 10 Segment mein hi divide kiya tha??

Ans- Har layer data k saath aapne information header mein attach karta hai, aur us Header mein specify kiya gaya hoga ki kitane Segments hua hai.

- Now aab hum start karrahai hai data link layer se because physical layer ejabi k syallbus mein nahi hai.

DATA-LINK-LAYER :→

- Data-link layer ka sabse pahala task hai to generate a frame i.e framming.

- Now hum discuss karrahai hai yeh data-link layer framing kaise generate karta hai??

- Joh frame generate karne mein kya problem hai??

Ans→ Pahala data aaya 50Kb ka 50Kb ka send karde dusra data aaya 100Kb ka 100 Kb ka data send karde.

- Reciever ne initially 50Kb recieve kiya phir 100's aane lag gaya, toh reciever ko pata hi nahi chalega ki pahali frame mein kitana data hai aur dusri frame mein kitana data hai.

- Framing mein kya major problem hai, how reciever decides frame boundaries.

- Joh frame boundaries kyo decide karna hai reciever ko, kyoki humko error control kisper karna hai ek-ek frame par karna hai.

- Jab tak reciever ko yeh nahi pata chalega ki pahali frame kaha khamtam horaha hai aur dusri kaha se start horaha hai, woh error control perform hi nahi karsakta.

- Reciever mein framing mein sabse badi problem kya hai, how to decide frame boundaries.
- Sender kaise batayega ki mein yehn wali frame end kar raha hu aur dusri frame start karraha hu.
- Pahala joh obviously hamare mind mein aata hai, ki har frame ki length fixed kar do,.
- Pahali 100 byte aaye woh 1st frame ka part hai, next 100 byte aayi woh 2nd frame ka part hogayi. and so-on.
- Joh kisa kar do frame ki length fix kar do. Lekin fix karne par problem kya hogi, hamesa apke pass 100 byte ka data ho send karne k liye koi jaruri nahi hai.
- Joh fixed length frame format practically fisible nahi hai.
- Pahala tarika humne kya dekha framming ka frame ki length ~~ke~~ hi fixed kardo.
- Pahali 100 byte pahali frame, dusri 100 byte dasri frame. next 100 byte third frame.
- Lekin Agar mere 100 byte frame size hai, toh data hamesa 100 byte k multiple mein ho koi jaruri nahi hai.
- Agar hamare pass 5 byte ka data hi hai send karne

Ko, par harware hamko toh 100 bytes chahiye kahase layegey.

- Toh frame length fix karna fesible nahi hai. Toh phir framing ki konsi technique follow ki jaye.

- Toh pahali technique hai toh practically use ki jasakte hai -

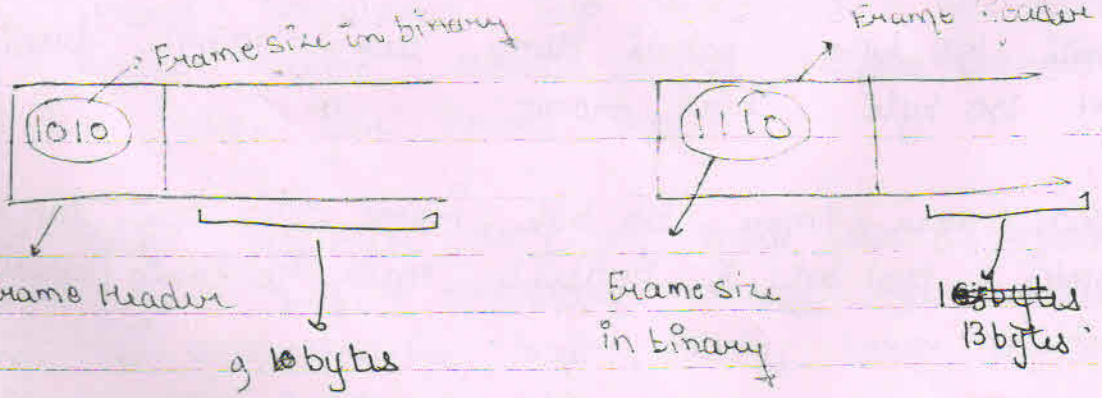
→ Specify the frame length in frame Header.
Frame Header matlab frame k starting mein.

SPECIFY FRAME LENGTH IN FRAME HEADER:

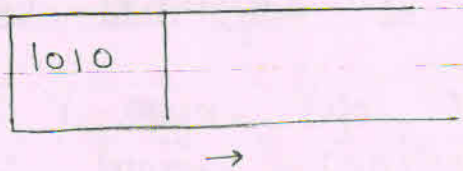
- Sabse pahale data aaya lo,

- Frame k beginning mein 1o aaya toh receiver kya assume karlega ki us frame ki length kitani hai 1o.

- Agali frame ki beginning mein aaya 16, toh receiver kya assume karlega aabagi frame ki length kitani hai 16. ~~hai~~



- Now problem kya hogi jaise hi aapne jaise hi yeh transmit kiya



transmit

- yeh frame corrupt hogayi. Toh hamara frame kuch aaise hogi network mein, matlab reciever k pass woh frame pachuchane se pahale.

- Corrupt hone k karan lo se 11 hogi hamari frame length.

- Toh reciever aab kya assume karega ki pahali frame ki length kitani hai 1❌1 hai.
hai woh

- Toh second frame ki jo pahali byte. Reciever kiska part man liya first frame ka part man liya due to corruption.

- Now aab second ~~lengt~~ frame k jo bhi second byte mein hoga, usko reciever kya assume karlega second length ki frame length.

- Toh yeh sahi hai kya toh nahi hai kyoki uske baad aap ek bhi frame aap aache se recongize nahi kar paoogey.