Now aab hum dekte hai groblem kaise nahi aayegi.

Sabsi fahali sendur ne fahali frame send ki with the frame number 0, ruiever ne usko ruieve kar liga, now aab ruiever kya accept kariga frami with sequince number 1.

Now frame a ka acknowledgement Network mein lost hogaya, top sender he frie se frame o Send Ki.

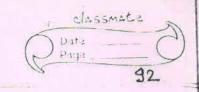
Now Recieve kya konega, woh toh frame o Ko except hi hahi karraha tha, toh aab Hurever kya konega toh it will discoud that dulphicate frame.

Lekon Museru Cas, Hume K live auknowied : m: 1/2

Now Huieren kya expect karnahai hai frame with Sequence number I, now sender ne frame with Sequence number I Send Ki, recieven ne recieve Kari.

Now suppose frame I network mein loct hogi toh aarse situation mein kya hoga, tah jab tak frame with Seduna humber I ka acknowledgement sender k fass hahi fachuchega ted jab tak sender next frame send hi hahi karuga:

Joh timout hone k baad gender woh wali frame rubiansmit kandega.



Joh Stop and wait muin hum I bit Ka sequena humber lite hai.

· Pahali frame ka Seduna number O rakte hai next wali ka L , fhir third ka fhir o and so on:

1 bit si hamani froblem folke horahai hai, ck bit si jada ki janurat hammi nahi hai.

Joh hamane Jumbering Kyo Ki, dulphicale aux origonal frame ko differendiate karne k lige.

Agan frame number severet hogaya I ka o hogaya, hamanî evron control technique ne use detect kan liya, ki evron hai toh woh detect hojayegi.

But agan venore control bhi cletect yahê tarbayî kê kohê evror haî tah woh usko nayê frame Samaj k accept tarbejî.

Agar undetect veron har tip woh us frame ko have fram: Samaj k detect karliga.

Ervor control hum kon-kon si layer far taxte hai, data-link layer aur beansford layer far

Transport Layer far top ever kaha chuck hoti hai kawal Utimate host aux ultimate distination far, bich & station far nahi hoti hai. Awe data-link ki evron A & B far gayi tah B ki datalink layer ne check karliga ki sahi aaya hai kya.

tabhi. Asb B kisko send tanga C ko;

Now datalink layer har System fan venou check Kovrahai hai ton fhin transfort layer fan ek aun baan check kanne ki kya jammat hai.

Woh. Islike Check karde hai ki ctgar duta-link. layer duta pahi kar fayi, kohi bhi evror-control technique yeh gaurantly nahi dete hai ki woh evror ko Loo! detect kar legi.

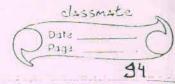
Agan woh ernon datalink-layor four detect nahi hopayi, to toh # shayad woh transport layor four detect hojaye.

Islige datrilink leger fan ennen control k. lige dusni technique use karte hai aun transford lager fan diffment.

Plosakta ki datalink layer detect nahi kan þayi, usko Kon detut kan le transport layer ki everu mentral Ki technique

Yeh bhi possible hai ki dono hi detect pahi tar

Kohî bhi protocol ho, usko kya îmfortant hoti Efficiency îmfortant hoti hai.



H →	How to	compute	Efficiency	of	Stop and wail-	
	Brotocol:	7	27 4	4	J	1

→ In gennal Officiency kaise nikalte hai.

Efficiency = Useful Time = Butfut.
Jotal Time Input

Ø yaha fan injuk kya hai total hamanı Kitana time invest kija,

Aux outbut kya har useful time.

Yaho fan funi overall activity mien system sinf Kêtanî der busy haî tx, jab woh databransfer kan Maha haî tab woh fusy otherwise woh busy nahî haî.

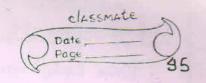
Jotal time :→ fahali framı sınd ki jab tak aagali frame sınd karna ka timı nahi najata woh uska total timı hojayega.

Para time mini effedie kya send kouraha hai ek frame.

Joh Ek fiami ko sind kovini min kêtana têmi lag Haha haî yaha fari- RTT:

Joh total time kitana RTT. RTT mun kawal ck frame send kawaha hai.

Useful time kya hai hamara, transmission time



hamara useful hai i'e tx, uske aalawa hamara System i'deal hai:

Jotat kitana time innæst konnaha har hum isme

RTT Kitana hai hamara Ext 2 Lp.

Efficiency = tx = tx tx+2tp = RTT

Order: A/4 Kbbs / Channel

Who be send over 1000 bits are to be send over 1 cbbs

Channel Whom signal traverse at the speed 213

of the light and distance between the station

of the light and distance between the station

is I km. What is the officency if Stop & wait

Ans: 7 brotocol is used.

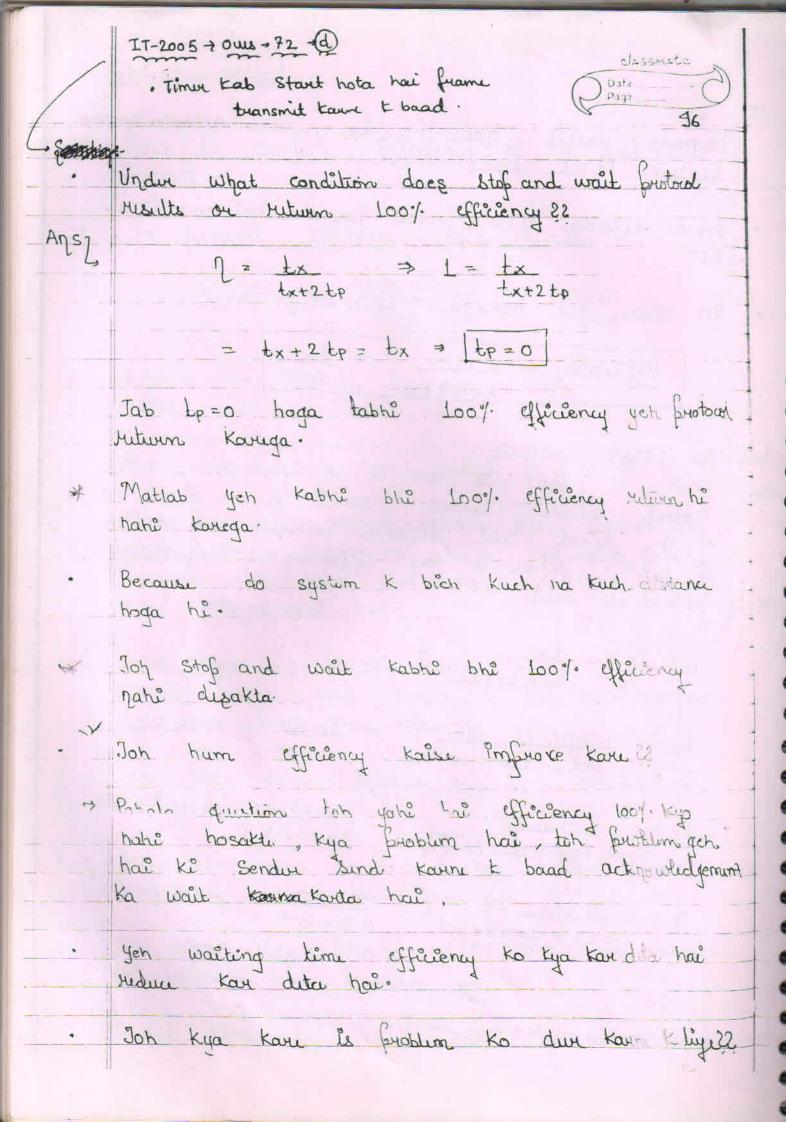
(C=3**108 m/s)

n= tx tx+ tp+ kp

Ex= Length of data = Losa = 0.25 sec Data-transfor Rate 4x103

Ep = Distance | Speed = 1×103 ×8 = 10-5 × 0.5 Signal Propagations address = 2×8×108

 $\eta = \frac{0.25}{0.25 + 2*0.5*10^{-5}} = \frac{0.25}{0.25 + 10^{-5}} = 0.99 \text{ f}$ $Ans \rightarrow = 99\%$



- · Round trip delay brodud = RTT & Bandwath
- · Bandwidth dulay & product = 2 to * Bandwidth
- · Sender wait natie tare, natlab woh contingous Sind Karta Hahai
 - Toh contingous kab tak send koula Mahais toh Sendur ko kab tak send karna Chahiye, jab tak füst frame ka acknowledgement nahi aa-
 - First frame k acknowledgement ko aane mun Kitana time lagter hai equal to RTT.
 - Joh Sender Ko Kab tak send Karna Chahiye frame, upio the time peroid equal to RTT,
 - Agan suffose RTT Time mun hum 100 frames send Karibakte has ton Sender Loo frame Sind Kare Kohi wait hahi kare.
 - Loo Juame send kanne k baad dekte ki first ka acknowledgement aaya hai ki nahi.
 - Agan 100 frame sind kanne K baad first Ka acknowledgement nati saya, top sender first frame K lûge kya hojayega timeout
 - Aux phir se Ist frame ka sert karega.
 - Agan transmission time i.e tx = RTT hojayega tab hum 100% efficiency miligi.
 - frame Matlab jab tak füst ka acknowledgement nahis aufata Sinder frames sind Karta Hahai., top he hamme



Efficiency kitani miligi 100%.

- Lekin broblem kya hai, aki RTT time mient hum Loo frames send kar sakte hai, top sender ko Loo frames afine fass buffer karke Hakhni baregi.
- kyo rakni farugi, agan unka acknowledgement nahi aaya toh & sindre ko un frames ko redreansmit kanna faruga.
- Joh sender k pass itani memory buffer bhi hona Chahiye Ki won too frame ko temborary store kar fake.
- Joh Stop and wait ki efficiency ko Huma improve Kaun k ligh hamne dekha, ki agan hum contingous frame transmit kan without waiting for acknowledgement, toh is case min hamko efficiency loof. mil Sakte hai, ban ismo problem kya hogcyi, agan RTT= Loms hai awn Loms mun Loo framis send kansakte hai, toh Loo frame Store kaune Ki cafacity Seridu end fun honi chahiye.
- Agan itani memory pahi hai toh ach Itani frami
- Definitly itani nahi hai loh 40,50 toh lyaktehai, 60% efficiency toh nahi hur, toh bhi Stop & wait & toh aachi efficiency miligi.
- Aur yaha protocol kya kahalga hamara stideng

Send Kan dega.

EK- eK framı ka ack ada Jaraha hai, aux ekek framı Ko Send Karta Jaraha hai.

Curunally Joh misconcept hota hai Stiding Window Brotocol mein, won yen hotahaiki I si to frame Send kan di, un to frame ka acknowledgement jab tot aajayega usko baad. To frame send tangi-

Par aaisa Kuch nati hota hai sliding window frotocol mein.

Agan window size to hai ton sender window always contain to unacknowledgement frame.

Suppose hamoni whose site that hail, top sabse fahale Sender ne Kya Send Kiya frame number 1, 2, 3

Sender	&	Reciever
ωις fl ω2 [f2 f3)	Send Send send	£1 £2 £3
1 f4 (w3	ack\$2	<u> </u>
J 5 J	\rightarrow	fs