CS & IT ENGINEERING



Flow Control

Lecture No-4



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TOPICS TO BE COVERED

Stop and wait
Protocol

Q.5

The values of parameters for the Stop-and-Wait ARQ protocol are as given below:

Bit rate of the transmission channel = 1 Mbps. Propagation delay from sender to receiver = 0.75 ms.

Time to process a frame = 0.25 ms.

Number of bytes in the information frame = 1980. (Payload)

Number of overhead bytes in the information frame = 20. (Header) Number of bytes in the acknowledge frame = 20.

Assume that there are no transmission errors. Then, the transmission efficiency (expressed in percentage) of the Stopand-Wait ARQ protocol for the above parameters is ______. (correct to 2 decimal places).

GATE 2017

Ack size = 20 Byte = 160 bits



$$= 160 \times 10^{-6} \text{suc}$$



A link has a transmission speed of 106 bits/sec. It uses data w packets of size 1000 bytes each. Assume that the acknowledgement has negligible transmission delay, and that its propagation delay is the same as the data propagation delay. Also assume that the processing delays at nodes are negligible. The efficiency of the stop-and-wait protocol in this setup is exactly 25%. The value of the one-way propagation **GATE 2015**

B= 106 bits | SOC Packet size of Framusize = 1000 Byte = 8000 bits Talframe) = Frame size = 8000 bits = 8*103 sac = 8m sac

Bandwidth 106 bits sac

delay(in milliseconds) is _____.



Suppose that the stop-and-wait protocol is used on a link with a bit rate of 64 kilobits per second and 20 milliseconds propagation delay. Assume that the transmission time for the acknowledgment and the processing time at nodes are negligible. Then the minimum frame size in bytes to achieve a link utilization of at least 50% is ____. **GATE CS 2015**

B=64x103 bits/sec) B=20msec=20x103 sec

Frame size=? Officiancy >50%

160

320

640

77501

Usefultime > 1
totaltime

Ta(F) + 2 x Pa + 6 x 4 Pa + Ta(A) 2

Ta(F) = 1
Ta(F) + 2× Pa

7a(F) + 2× Pa

2*T4(F) > T4(F)+2*PL

Ta(F) 724 Pd

Framesize > 2xPd Bandwidth

Framesize > 2x Pax B

Frame size >> 2 x 20 x 10 3 sec x 64 x 103 bits/sec

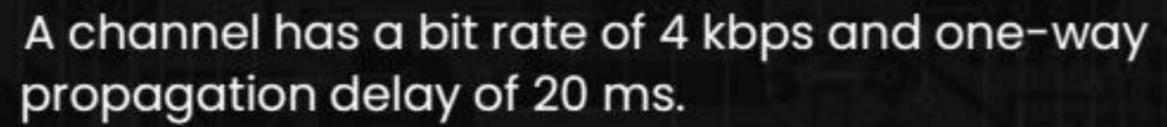
Framesize > 2x20x64 bits

Frame size > 2x20x8 Byte

Franksize >> 320 Byte









The channel uses stop and wait protocol. The transmission time of the acknowledgement frame is negligible. To get a channel efficiency of at least 50%, the minimum frame size should be

A 80 Byte

Frame size = ?

B 80 bits

Frame size > 2*84*B

G 160 bits

D 160 Byte

Q.9

On a wireless link, the probability of packet error is 0.2. A stop-and-wait protocol is used to transfer data across the link. The channel condition is assumed to be independent from transmission to transmission. What is the average number of transmission attempts required to transfer 100 packets?

GATE 2015







D 200

Hvg	No- of	transmission	Legured=	η =	100	= 1000	- 125
				1-P	1-0.2	08	- T&2

A channel has a bit rate of 4Kbps and one way propagation delay of 10ms. The channel uses stop & wait protocol. The transmission time of acknowledgement frame is negligible. To get a channel efficiency of atleast 75% the minimum frame size should be



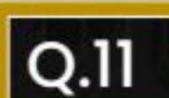


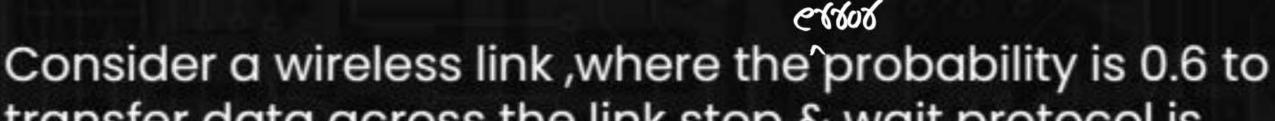




None









transfer data across the link stop & wait protocol is used .the channel condition is assumed to be independent from transmission to transmission. The average number of transmission attempts to transfer x packet is 500) the value of x is ____.

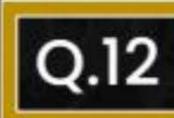
error Probability = 0.6

Aug No of transmission for 'n' pkt =
$$\frac{n}{1-p}$$

Aug No of transmission for 'x' pkt = $\frac{x}{1-p}$
 $\frac{1-p}{1-p}$
 $\frac{500 = x}{1-0.6}$

$$\frac{500 = x}{10.4}$$

 $x = 500 \times 0.4$
 $x = 200$



Consider stop and wait ARQ for flow control, data transfer rate of channel is 32 Kbps, one way end to end propagation delay is 16 ms and frame size is 32 Bytes then the efficiency in percentage is ____.

Ans: 20 %





Consider packet size is 1000 Bytes, distance between two hosts is 2000 KM, 1 Mbps link with 2*108 meter/sec signal speed, if stop and wait protocol is used then the throughput is ____ (in Mbps).

Ans: -985 mb/2





