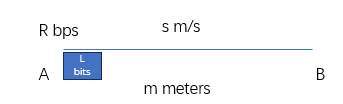
Assignment 1 .

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**Problem1:**



a,.dprop=m/s(s)

b.dtrans=L/R(s)

c.dnodal=dtrans+dprop=m/s+L/R (s)

d. just at the begin (A side) of the link

e. On the link,which is far away from A , the distance is s\*dtrans (m)

f. At B buffer

g. If dprop=dtrans , then m=L\*s/R = 120bits\*2.5\*108m/s / 56\*103 bps =5.357\*105m

**Problem2:**

a.   
Ts-h1= 8\*106bits/2Mbps=4s  
Ts-d=3\* 8\*106bits/2Mbps=12s

b.  
ts-h1=10000bits/2Mbps=0.005s  
tb2=2\*10000bits/2Mbps=0.01s

c.  
ts-d= 8\*106bits/2Mbps+2\*10000bits/2Mpbs=4.01s  
ts-d<Ts-dusing message segmentation saved time a lot. The larger message and more switch it uses, the more obvious saving effect it shows.

d.  
1.for information security  
2.and if there are some packets lost, the source can just resend the lost part rather than resent the whole Message  
3.Saving the buffer memory size

e.  
1.The process of segmenting and reassembling make processing time larger.  
2.An increase in the number of packets leads to a higher total amount of data headers.

**Question:**

**1.WhatsApp:**   
WhatsApp is renowned for its end-to-end encryption, which is facilitated by the **Signal Protocol.** This protocol ensures that messages, calls, photos, and videos sent over WhatsApp are secured and can only be read by the intended recipients. For voice and video calls, WhatsApp employs the **Secure Real-time Transport Protocol (SRTP)** to provide encryption, integrity, and authentication of the media stream. The application also **uses a combination of HTTP and TCP** for communication over the internet, with **mmTLS (mobile-optimized Transport Layer Security)** to secure these connections.

**2.WeChat:** WeChat, developed by Tencent, operates on a variety of protocols to ensure efficient and secure communication. It primarily uses **HTTP and TCP** for stable data transmission. For added security, WeChat employs **mmTLS**, which is designed to provide a secure connection tailored for mobile devices. Additionally, WeChat utilizes a combination of **MTProto (a custom protocol developed by Telegram) and HTTPS** to enhance the privacy and security of its messaging service. **UDP and DNS** are also part of the technology stack that WeChat uses for its operations.

**Citation:**

"WhatsApp."Wikipedia,Wikimedia Foundation,<https://en.wikipedia.org/wiki/WhatsApp>.

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