Homework03 2021.10.15

1

Compute 8-bit checksum for 01100010 and 10111001, and use an example to show that if the two numbers each has a 1-bit error, the checksum can not detect the errors.

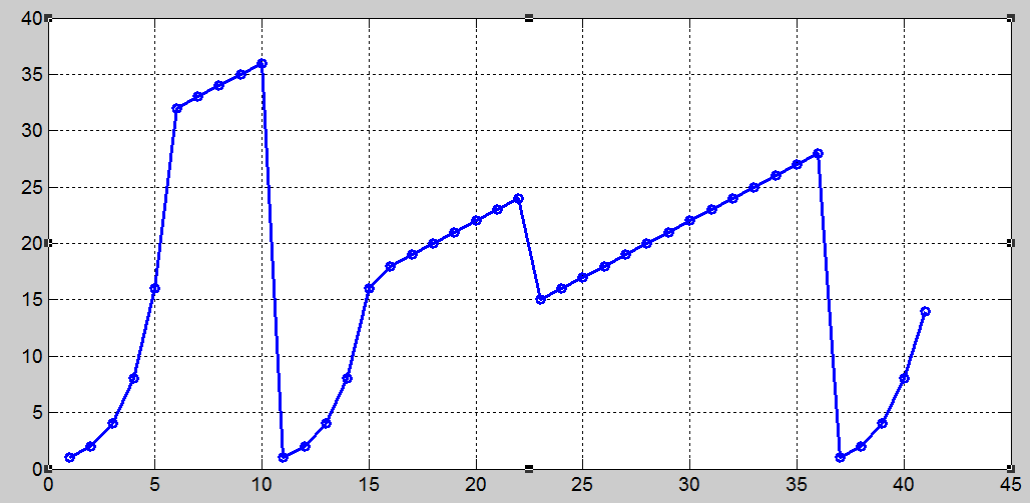
两数相加并进行回卷：$01100010 + 10111001 = 100011011$，回卷得到$00011100$，求反码得到$11100011$

如传输没有差错，则$01100010 + 10111001 + 11100011 = 11111111$

如果传输出错，01100010变成01110010，10111001变成10101001，。而$01110010 + 10101001 + 11100011 = 11111111$，为全1串无法检验出差错。

2

Consider the following cwnd evolution at a TCP sender:



(a) Is this TCP Tahoe or TCP Reno?

(b) What is the sender's initial ssthresh?

(c) What happens at time 10? What is ssthresh and cwnd at time 11?

(d) What happens at time 22? What is ssthresh and cwnd at time 23?

(e) What happens at time 36? What is ssthresh and cwnd at time 37?

(f) When is the 50th segment is sent?

(g) Which intervals the TCP connection is under slow start?

(a) $Reno$. 因为从图中可以看出有快速恢复状态

(b) $32MSS$

(c) 超时指示的丢包事件；$ssthresh = 18MSS \quad cwnd = 1MSS$

(d) 当收到3个冗余ACK的丢包事件；$ssthresh = 12MSS \quad cwnd = 15MSS$

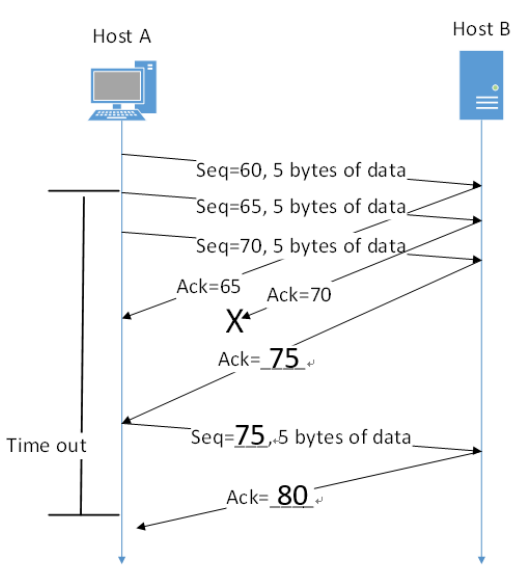
(e) 超时指示的丢包事件；$ssthresh = 14MSS \quad cwnd = 1MSS$

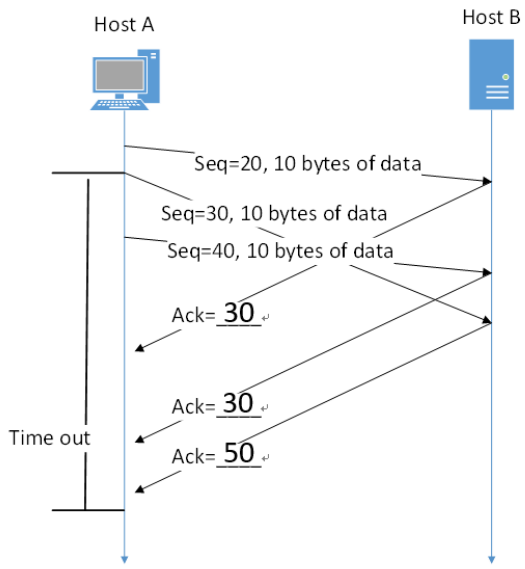
(f) $time6$

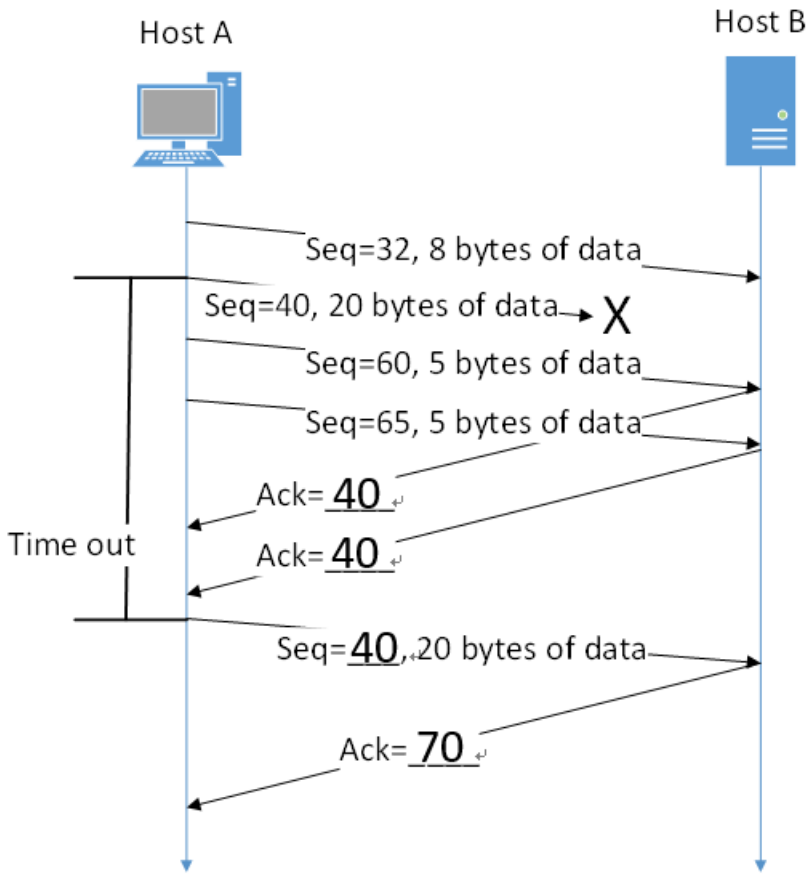
(g) $time1 - time6 \quad time11 - time16 \quad time37 - time41$

3

Host A sets up a TCP connection with Host B, fill in the blanks the appropriate sequence and acknowledgement numbers.







4

Two TCP connections A and B strictly follow AIMD and they share a same bottleneck of 100 Mbps. Initially connection A has a throughput of 64 Mbps, connection B has a throughput of 32 Mbps, the two connections increase their throughputs at a same rate.

1. **Fill in following table.**
2. **After how many loss events, the difference between the two connections' throughputs is within 5 Mbps?**

Round	A	B	different
1st loss event	**64→66→33**	**32→34→17**	16
2nd loss event	33→58→29	17→42→21	8
3rd loss event	29→54→27	21→46→23	4
4th loss event	27→52→26	23→48→24	2

1. 如上表所示
2. 经历3轮loss event，两连接的吞吐量差距在 5 Mbps以内