Chapter 3 2015302580184 张文蔚

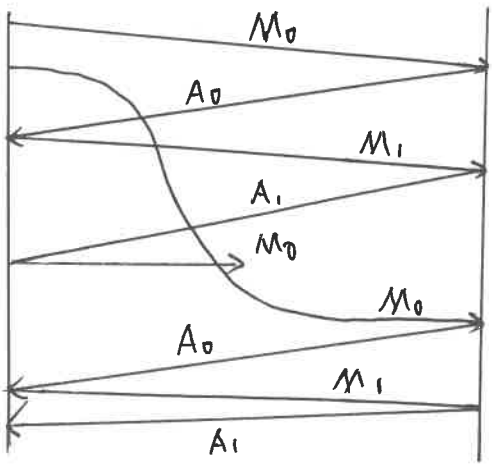
Problem 1.

	source port numbers	destination port numbers
a) A→S	467	23
b) B→S	513	23
c) S→A	23	467
d) S→B	23	513

e): Yes

f): No

Problem 13:



old version of M0 accepted

Problem 15: It takes 12 microseconds to send a packet, as $1500\times8/10^9=1.2\times10^{-6}$

In order for the sender to be busy 98% of the time.

we must have util $=0.98=(0.012n)/30.012$, or $n\approx2451$ packets.

Problem 16: Yes. this actually causes the sender to send a number of pipelined data into the channel.

Yes. Here is one potential problem, If data segments are lost in the channel, then the sender of rdt 3.0 won't re-send those segments, unless there are some additional mechanism in the application to recover from loss.

Problem 52: Note W represents maximum window size. total number of segments

$S=W/2+\frac{W}{2}(1+\alpha)+\cdots+\frac{W}{2}(1+\alpha)^k$ $\therefore k=\log_{1+\alpha}2$, $S=W\frac{(2\alpha+1)}{2\alpha}$

Loss rate $L=\frac{1}{S}=\frac{2\alpha}{W\cdot(2\alpha+1)}$

The time that TCP takes to increase its window size from $\frac{W}{2}$ to W is: $k\times RTT=\log_{1+\alpha}2\cdot RTT$. is independent of TCP's average throughput.

$B=MSS*S/((k+1)*RTT)=\frac{MSS}{L*(1+k)*RTT}$

which is different from TCP which has average throughput $B=\frac{1.22\cdot MSS}{RTT\cdot\sqrt{L}}$