CHAPTER 13

Introduction to Transport Layer

Exercises

1. The sequence number of any packet can be found using the following relation:

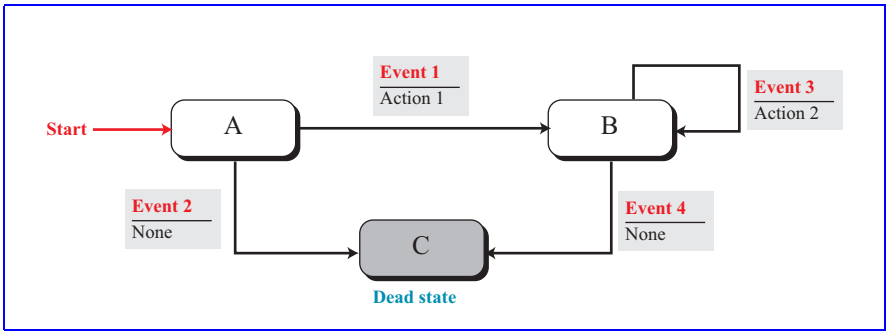
$$\textbf{seqNo = (starting segNo + packet number } -1\textbf{) mod } 2^m$$

in which *m* is the number of bits used to define the sequence number. The sequence number in this case is

$$\text{seqNo} = (0 + 100 - 1) \bmod 2^5 = 99 \bmod 32 = \mathbf{3}$$

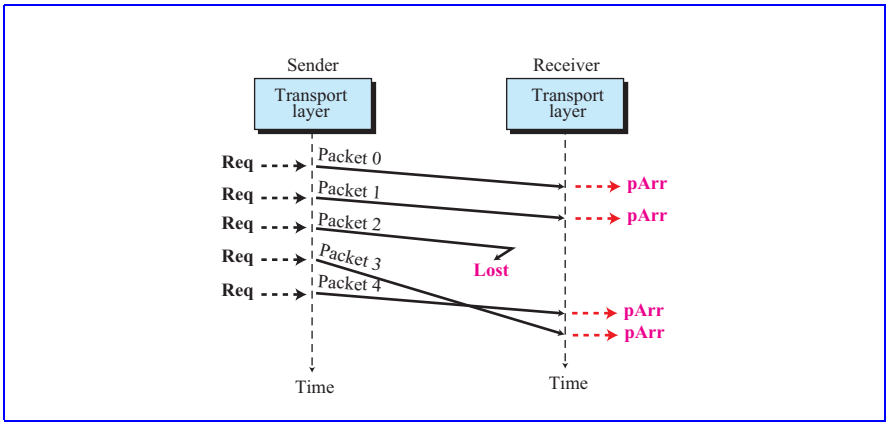
3. See Figure 13.E3.

Figure 13.E3 *Solution to Exercise 3*



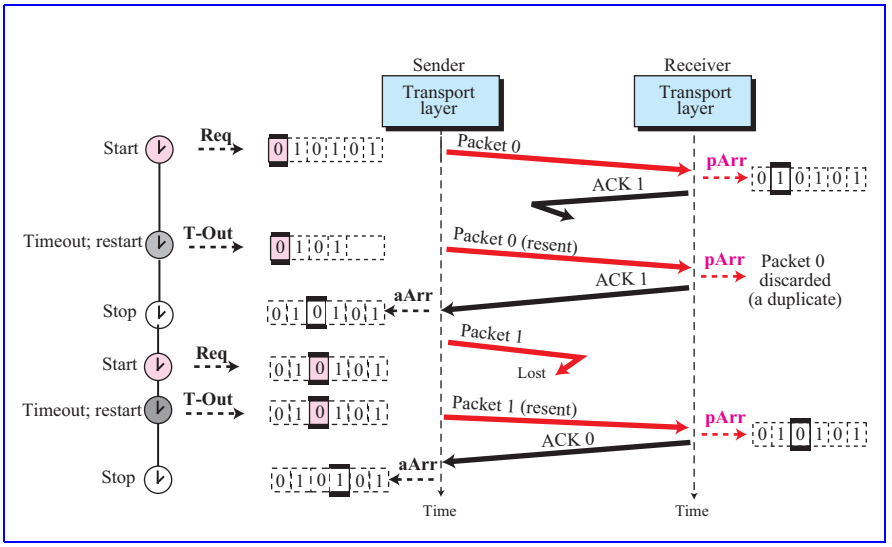
5. Figure 13.E5 shows the outline. Note that since the simple protocol provide no error control, if a packet is lost, the receiving process is responsible to find a solution. The transport layer is not even aware that this has happened.The packets may also be delivered out of order to the receiving process. The responsibility again is on the receiving process to reorder the packets.

Figure 13.E5 *Solution to Exercise 5*



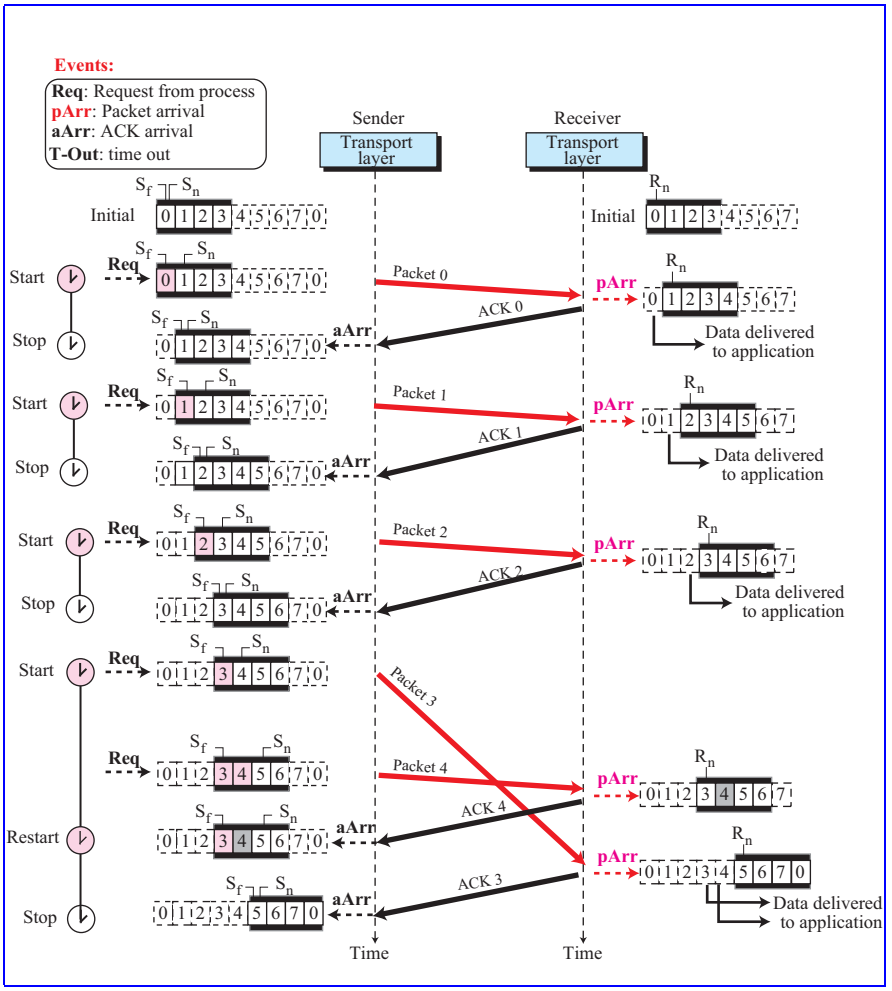
7. See Figure 13.E7.

Figure 13.E7 *Solution to Exercise 7*



9. See Figure 13.E9.

Figure 13.E9 *Solution to Exercise 9*



11. We assume each event is independent.

a. seqNo = **15**.

b. Five packets with seqNo set to 10, 11, 12, 13, and 14 are to be resent.

c. S_f = **13** and S_n = **15**.

d. The size of the window remains the same. Max $W_{size} = 2^6 - 1 =$ **63**.

e. S_f = **18** and S_n = **21** Next state = ***ready***

f. R_n = **17** Action: an ACK with ackNo = 17 is sent.