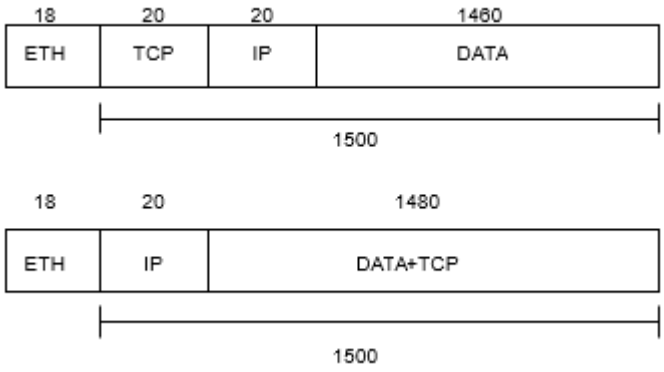
Evaluate the service time to trasmit a TCP segment of 10000 byte over an Ethernet, given that the overhead of the Ethernet frame are 18 bytes long, the max data area is of 1500 byte and the bandwidth is 20 Mbyte/sec.

Solution



The TCP segment size is 65535 byte, the document size is 10000 byte

$$N_{datagram} = \frac{DocumentSize + N_{segment}(TCP_{OH})}{\min MTU - IP_{OH}} = \frac{10000 + 20}{1500 - 20} = 7$$

18	20	20	1460	+
18	20	1480	X 5	+
18	20	1360		

Total overhead:

$$Overhead = N_{segment}TCP_{OVH} + N_{datagram}\ IP_{OVD} + Frame_{OVH} = 286$$

Service time:

$$S = \frac{DocumentSize + Overhead}{10^6 * Bandwith} = \frac{10000 + 286}{10^6 * 20} = 4{,}1\ msec$$