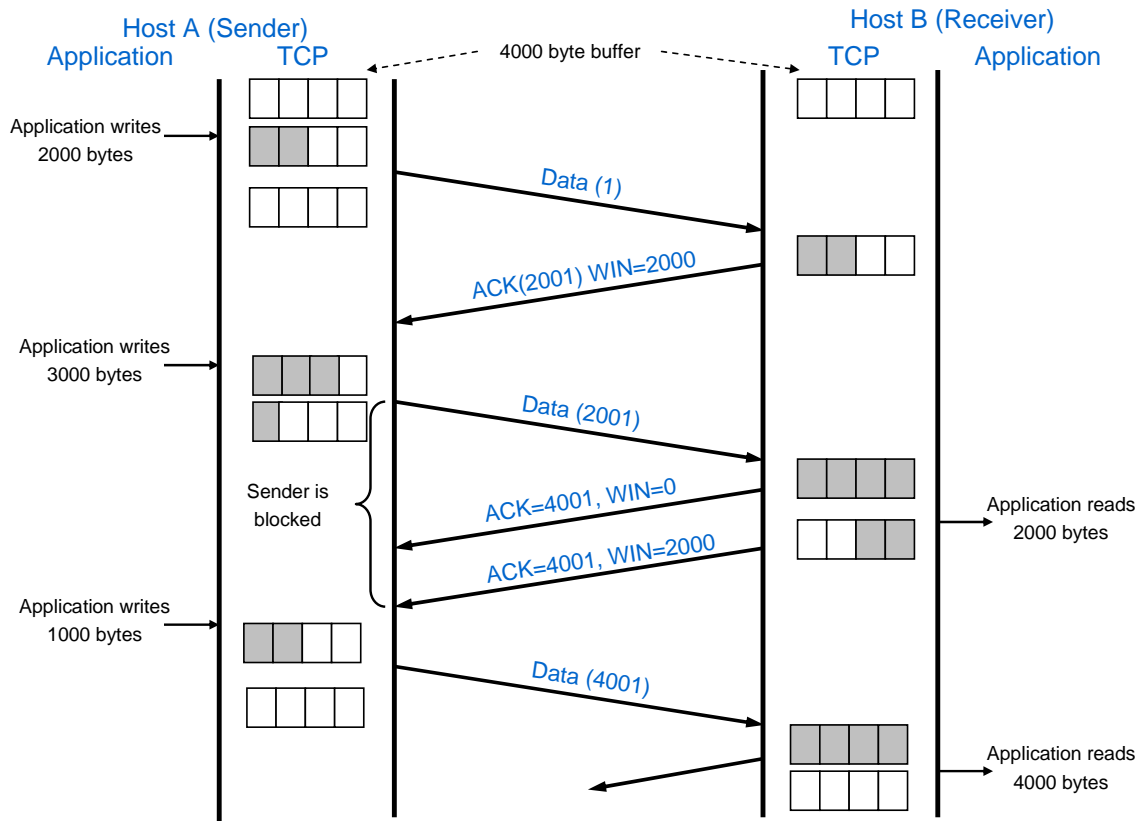


ITS 323 –TCP PRACTICE

1 Questions

Consider the TCP flow control example introduced in the lectures. The transfer of messages is shown below.



1.1 Assumptions

Assume the following:

- Application on Host A writes 2000 bytes of data at time 0
- Application on Host A writes 3000 bytes of data at time 5ms
- Application on Host A writes 1000 bytes of data at time 10ms
- Application on Host B reads 2000 bytes of data at time 12ms
- Application on Host B reads 4000 bytes of data at time 16ms
- Propagation delay is 0.5ms
- Data rate is 1000 bytes/ms
- TCP header is 20 bytes

1.2 Question 1

For the flow control scenario shown, calculate the total time it takes TCP on Host A to successfully send all of the applications data. That is, the time from when TCP A starts sending, until the time when TCP A receives an ACK for the last byte of data.

1.2.1 Hints

It helps to draw the diagram again, but this time showing the transmission time and the propagation time for each message.

Remember a TCP segment contains a header, and optionally some data. An ACK is simply the header, whereas DATA segment is the header plus data.

1.2.2 Answer

The total time is 15.54ms. Note that from TCP A's perspective, the data has been successful sent when it receives an ACK from TCP B saying sequence number 6001 is expected.

1.3 Question 2

Calculate the throughput achieved by TCP A.

1.3.1 Answer

386100 bytes per second