CS342 – Assignment 4 Report

Application No. 5

Points to note -

1. TCP Westwoodplus is used at node 0, TCP Hybla is used at node 2. The description of the topology, with assigned IP addresses is described at beginning of the code.cc file.

2. At the physical layer, we have used the Yans error rate model to model the packet drops, and the channel follows the random error rate model.

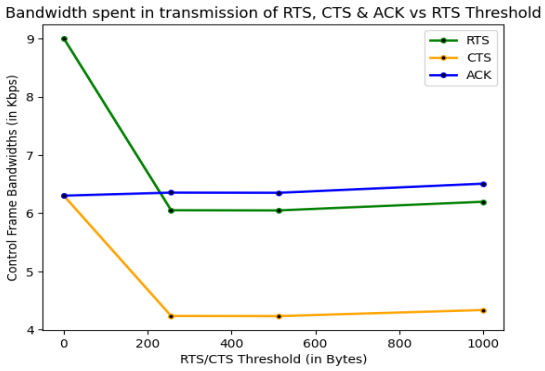
3. At the application layer, node 1 has a packet sink application which receives and acknowledges all packets it receives, and node 0 and node 2 have an on-off application running, which periodically turns on and off, sending a burst of packets while on.

4. Data rate is set at 500Kbps, simulation time is 50 seconds.

5. Some assumptions and execution instructions are written in the readme file

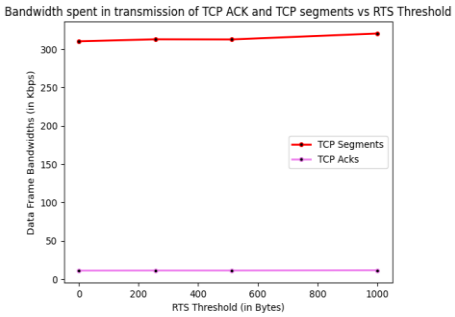
Results –

1. RTS-CTS-ACK Bandwidths



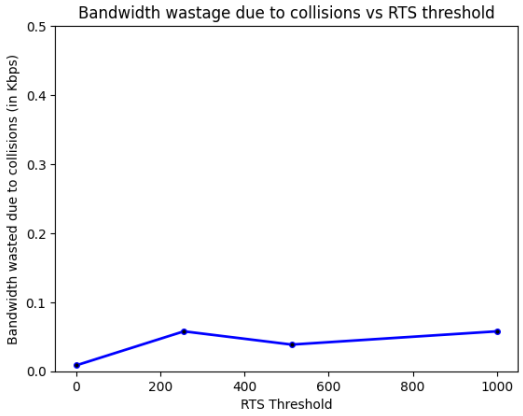
RTS and CTS have similar looking graphs, as they have same number of transmitted frames, only their sizes are different (20 bytes, 14 bytes). When RTS threshold is 0, all TCP segments and TCP acks require 1 RTS and 1 CTS frame to be exchanged before packet transmission. At higher thresholds, large TCP segments require this exchange, but not TCP acks as they are smaller in size than the threshold. Since most TCP segments are 1000 bytes (greater than or equal to the threshold values here) so after a point, the RTS and CTS bandwidths are almost constant. ACK frames are sent for each segment sent from any end, so they are mostly independent of the threshold value.

2. TCP segment and TCP Ack Bandwidths



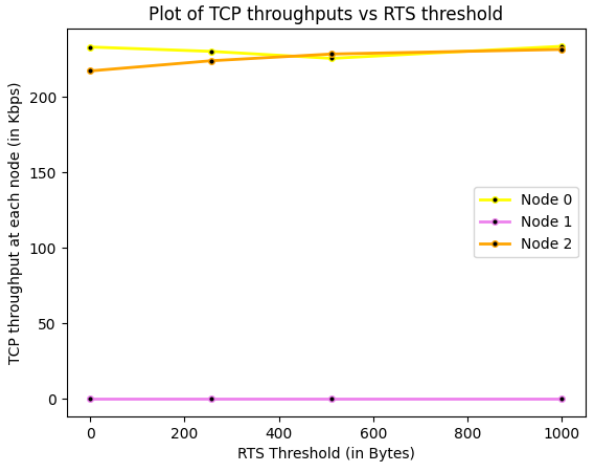
TCP segments and TCP Acks have an average bandwidth that is almost independent of the RTS threshold.

3. Bandwidth wasted due to collisions



As the error rate of the channel and the physical layer is low, the number of collisions is close to zero, relative to the other bandwidths. This value is mostly independent of RTS threshold, and as the channel error model is a random one, we may see this graph having peaks in some simulations.

4. TCP throughput at each node



As node 1 is not transmitting any application layer data, its TCP throughput is always 0, node 0 and node 2 have roughly equal throughputs, differing only because of the different TCP variants used there