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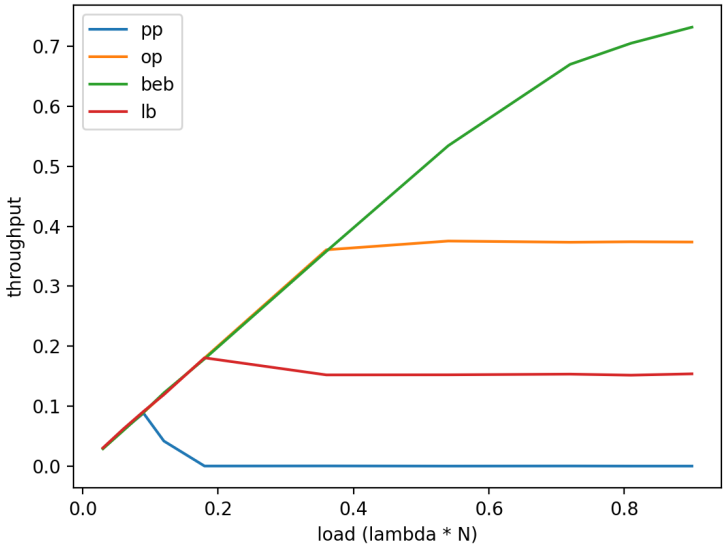
ECS 152A
Project Report

Ethernet-simulation.py

My simulation results:



“Op” analysis:
We know from the book that the maximum efficiency of a p-persistent algorithm is 1/e = 0.37 when p = 1/N. From the “op” line in the graph we can see that as the load increases it maxes out at 0.37 which is what we would expect.

“Pp” analysis:
This shows the throughput of the p-persistent algorithm when p = 0.5. This is the least efficient algorithm because there is too much collision. Since the probability of each node retransmitting in the next slot is 50%, it takes a very small amount of nodes to create a lot of collisions.

“Beb” analysis:
The binary exponential backoff algorithm is the most efficient algorithm, especially when the load on the system is high. The more collisions that a node experiences the longer the delay will be before it attempts to transmit another packet. This algorithm gets up to 0.77 throughput when the load gets up to 1.2.

“Lb” analysis:
The linear backoff algorithm improves from the p-persistent algorithm when p = 0.5 because it chooses a random amount of time to delay so it doesn’t keep colliding with other nodes. However, when the amount of colliding nodes is small and the interval time is large then nodes will wait a long amount of time to retransmit. And when the amount of colliding nodes is large and the interval is small then the nodes will experience too much collision.