COMPUTER SCIENCE AND ENGINEERING
Indian Institute of Technology, Palakkad
CS4150: Computer Networks Lab   09 Sep, 2022
__Lab 3 (MAC protocols)__

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1. Consider a slotted system with $n \geq 1$ users. In each slot, each user generates a new ethernet frame with probability λ/n, where $\lambda \in [0, 1]$. Assume that slot length is τ, and ethernet frame transmission time is T. All users use a common channel and have to compete with each other for an opportunity to successfully transmit their frames. For a long enough simulation run, average throughput is defined as number of successful transmissions upon number of slots.

   (a) Use slotted ALOHA with $T = \tau$ and $n = 100$, and plot the average throughput as a function of λ. Plot the theoretical prediction and compare with the simulation results. Assume that frames generated are not queued. [50]

   (b) Frames generated are queued. Use p-persistent CSMA with $T = 3\tau$ and $n = 100$, and plot the average throughput as a function of λ for $p = 0.5$ and $p = 0.01$ [50]