Wireless Lab 1

Aloha & Slotted Aloha

ALOHA is a multiple access protocol for transmission of data via a shared network channel. It operates in the medium access control sublayer (MAC sublayer) of the open systems interconnection (OSI) model. Using this protocol, several data streams originating from multiple nodes are transferred through a multi-point transmission channel.

In this lab, you will simulate the unslotted/slotted aloha protocols in Python.

Given N stations that share the same medium, each timestamp a new frame arrives at each station with probability P. A frame typically takes M units of time to get transmitted. Whenever a collision is detected, the frame gets retransmitted after a random delay.

For pure aloha, a station can transmit at any unit of time. While in slotted aloha, stations transmit only if current_time % M == 0.

Plot graphs for:

- Throughput (rate of packets that get transmitted successfully) against the number of stations N.
- Throughput against time of frame M.

Deliverables:

- Source files.
- Plots for slotted/unslotted aloha.

Team size: 1 to 2 students