Lab B2: Network Simulator 3 – WiFi networks

Points 100

Objective:

To understand and modify simple WiFi based network scenarios. To understand basic performance metrics provided by the FlowMonitor tool of Ns3. Understand what criteria should be used to select propagation model.

Description

Install and execute example simulations to get familiar with Ns3 environment. Next, study FlowMonitor tool within the Ns3 to analyze simulation results. Identify the provided performance measures and come up with derived performance metrics (using the info from simulation code and the FlowMonitor). Simulate grid topology for various traffic scenarios and propagation models, and analyze the results.

Tasks and Deliverables

1. Modify the "wifi-simple-adhoc-grid.cc" to run a series of simulations (**100 points**)
    a. Employ the FlowMonitor tool and print the metrics from task 2.
    b. Run several simulations while increasing amount of generated traffic. Identify for what parameters the performance is maximized.
    c. Add new, background traffic flows (new applications generating traffic) to the simulations (e.g. have 1, 2, 3, … N added flows). Observe the impact of those additional flows on performance of the original flow.
    d. Use Nakagami propagation loss model "NakagamiPropagationLossModel" to observe impact of such model on performance.
    e. Discuss results – compare them, explain the observed behavior. (**70 points out of 100**)

Highly recommended tutorials:

- https://www.nsnam.org/docs/tutorial/singlehtml/index.html
- https://www.nsnam.org/doxygen/classns3_1_1_nakagami_propagation_loss_model.html