

LTE Network Simulation in NS-3 – Assignment 08

1 Objective

The objective of the project is to gain hands-on experience in simulating an LTE network using the Network Simulator 3 (NS-3) framework. Students will create a comprehensive network scenario, configure LTE parameters, and analyze network performance.

2 Task

2.1 Scenario Definition

Define a network scenario including, but not limited to, the following elements:

- At least two eNodeBs.
- A minimum of ten User Equipment (UE) devices.
- At least one remote host (server) on the Internet.
- Appropriate IP addressing and routing configuration.

2.2 Mobility

Study the position allocators and mobility models in NS-3. Assign appropriate mobility models for the eNodeBs and the UEs according to the following requirements:

- Geographically distribute eNodeBs and UEs to create a realistic network topology. Use 2 different position allocators for the eNodeBs and the UEs.
- Five UEs are stationary, five UEs mimic the movement of pedestrians.

2.3 Path loss model

Study the available propagation loss models in NS-3. Choose a suitable propagation loss model to simulate the scenario where the UEs are in a building.

2.4 Traffic Generation

Study the available applications in NS-3. Choose the suitable applications to simulate the scenario where the UEs are browsing the web.

2.5 Simulation Run

- Execute the simulation with different sets of parameters and collect data on network performance.
- Run the simulation for a sufficient duration to observe network behavior.
- Capture and analyze key metrics, such as throughput, latency, and packet loss.

2.6 Analysis and Report

Prepare a detailed report that includes the following:

- Description of your network scenario.
- Configuration settings, including LTE and application parameters.
- Results and analysis of network performance.
- Any issues encountered during the simulation and how they were resolved.
- Recommendations for improving network performance (if applicable).

3 Submission

- Submit your report in a digital format, along with any necessary simulation scripts and configuration files.
- Prepare a presentation (max. 10 min) highlighting the key ideas and results of your project.