Working Student for Implementing and Maintaining a 5G Roaming Testbed

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1 Overview

5G is the newest generation of mobile networks allowing for higher data-rates, lower latency and many new features like network slicing. Its central element is the 5G Core, which is a network of specialised Network Functions (NFs). Roaming allows subscribers to connect to the internet via other network operator’s networks if they have a roaming agreement. We are looking for a student to help implement and maintain a 5G Roaming testbed. At first, that is planned as an open source testbed leveraging Open5GS. Later, the plan is to connect this open source testbed to the LKN campus network.

This working student position may run parallel to Master Theses with more focused implementation and evaluation works. The working student is welcome to follow up on this work with his/ her own research internship or Master’s thesis.

2 Objectives

The primary objective of this work is to help implement and maintain a 5G Roaming testbed. This testbed shall then be used for investigation of security mechanisms and performance measurements. Those are not the main job of the student, but the student is supposed to help.

1. Work into 5G Roaming
2. Implement missing Roaming functionalities into Open5GS
3. Maintain Roaming Testbed
4. Connect open source 5G Roaming testbed with Campus Network (once possible)
5. Aid in security investigations
6. Aid in performance measurements
7. Potentially add other NFs later

3 Prerequisites

- Motivation and team spirit
- Basic understanding of 5G networks advantageous; especially of the 5G core network
  - interest and motivation to learn the system are sufficient
- Programming knowledge in C useful (for Open5GS)
- Interest in Roaming functionalities
- Interest in security