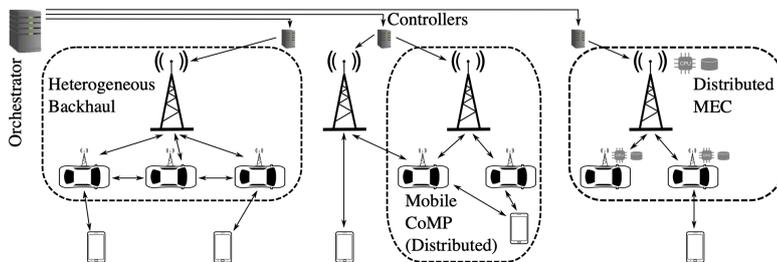


Bachelor/Master's Thesis

Simulation Model of the DyMoNet Architecture

Abstract

The evolution of current wireless access networks towards 5G and beyond is characterized, among others, by the provisioning of high-bandwidth services and by the capability of serving traffic from a large number of heterogeneous devices. Among the key approaches for provisioning high capacity in such networks, a prominent role is played by network densification. The main goal of the DyMoNet project is to enable a moving network paradigm, by addressing some of the key open research challenges which stand in the way of its practical feasibility. Specifically, the project will aim at: (1) identifying those scenarios and use cases in which the moving network paradigm holds the highest potential to increase networking performance and resource efficiency with respect to traditional static deployments; (2) developing mechanisms for reliable wireless mobile backhaul, for the interconnection of moving base stations to the core of the network; (3) elaborating QoS-aware mechanisms for dynamic interference management, enabling an efficient provisioning of connectivity under tight QoS constraints; and (4) investigating dynamically resource allocation and slicing in order to satisfy specific QoS constraints, while accounting for the dynamics of service demand as well as of the moving network infrastructure.



Content

The goal of this thesis is to develop a simulation model of the general DyMoNet architecture. Cars are acting as small cell base stations connecting other users to the 5G network. The simulation model is also to include multi-hop communication from the car via other relay cars to the 5G base station.

Possible milestones are as follows:

- Literature research on small cell base stations and vehicular edge computing.
- Getting familiar with the Veins simulation framework.
- Integrating small cell base stations in the scenario.
- Making such small cell base stations move (with the car).
- Adding relay connections to the 5G base stations.
- Evaluating the proposed solutions.

Collaboration

This thesis is in collaboration with Paderborn University and co-advised by Dr. Florian Klingler.

Requirements

It will be helpful to have a basic understanding of *Telecommunication Networks*, *Vehicular Networking*, *Network Simulation*, and *C++*. In case you are not familiar with these requirements, you will need to familiarize yourself during the thesis.