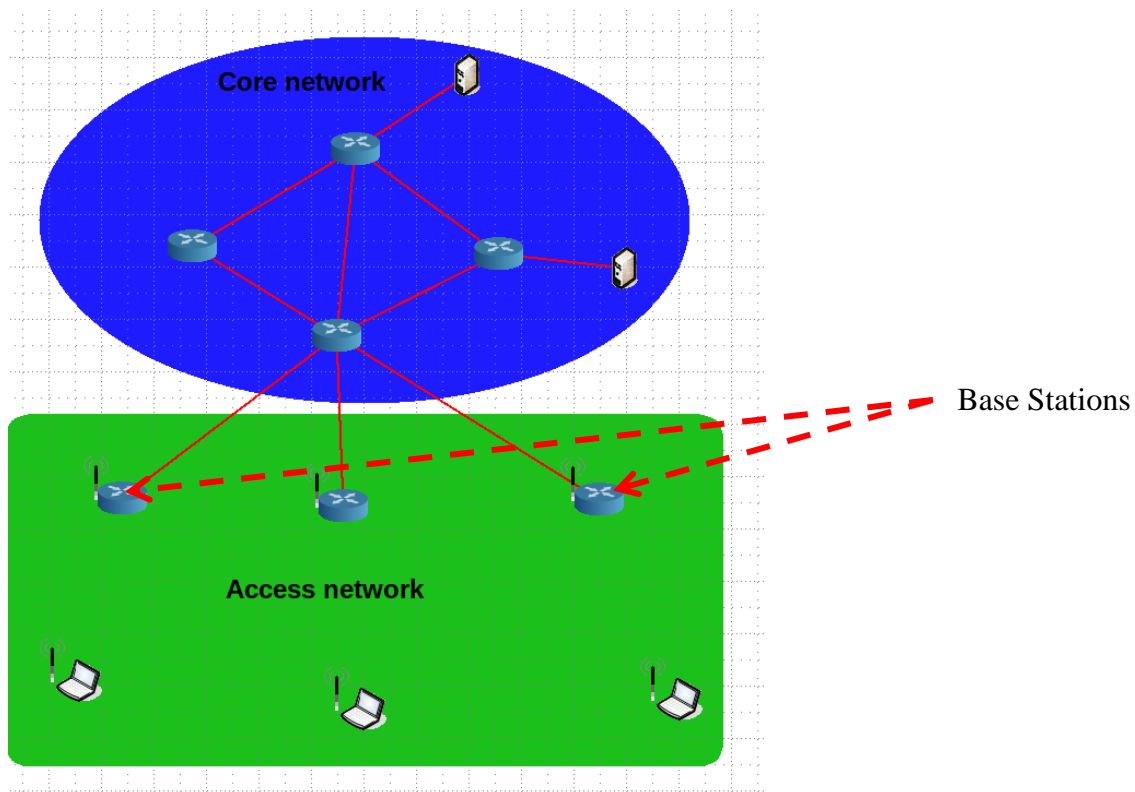


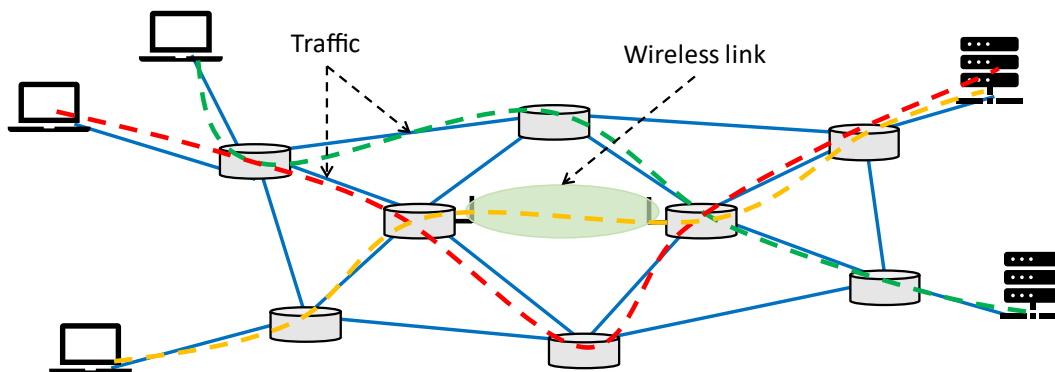
Thesis: Simulation of an LTE access network with CORE and EMANE.

- Create LTE base stations via the emulation platform CORE (Common Open Research Emulator) and the EMANE (Extendable Mobile Ad-hoc Network Emulator) framework
- The focus will be on creating the access network functionality
- Extension options for the core network (e.g. Webservers, multimedia servers)
- Functionality and behaviour of the base stations should be tested by simulating terminals
- Creation of various test scenarios (e.g. handover, interference etc.) to evaluate the simulation
- CORE: <https://github.com/coreemu/core>
- EMANE: <https://github.com/adjacentlink/emane>
- EMANE-4G: <https://github.com/adjacentlink/srsLTE-emane>
- Contact: Alexander Seng - seng@e-technik.org



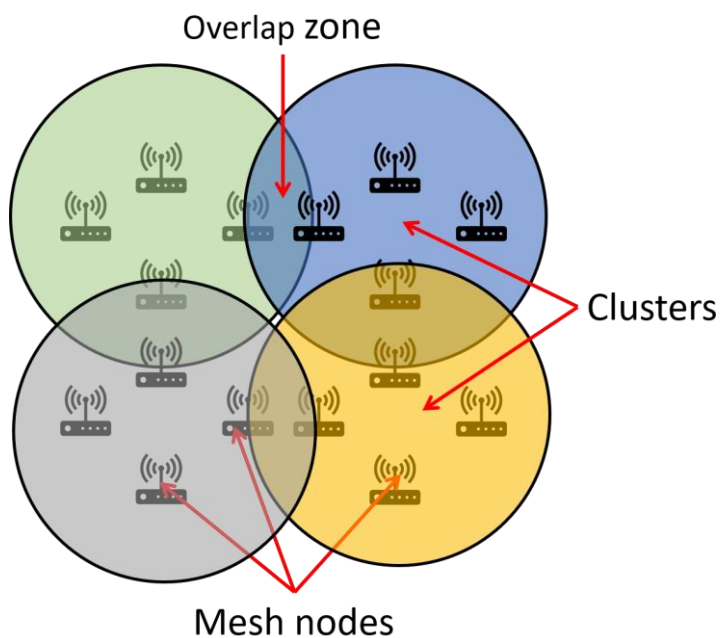
Thesis: SDN-based traffic optimisation in CORE to ensure QoS requirements.

- Creating a software-defined networking based network in the emulation software CORE (Common Open Research Emulator) with different QoS requirements
- The network has to provide different paths with different physical properties (e.g. delay, bandwidth) and also wireless links.
- The network should provide services and user groups that have different QoS requirements
- SDN controller should ensure the QoS by optimising the forwarding decisions of the switches
- Creating different paths through the network based on link utilisation and QoS requirements
- Focus on algorithms that are responsible for the optimisation of the paths
- The used SDN controller must be able to support the creation of complex algorithms and should run on a separate machine
- CORE: <https://github.com/coreemu/core>
- Contact: Alexander Seng - seng@e-technik.org



Project: Simulation of a multi-channel multi-radio Wireless Mesh Network with the ns3 simulator.

- Evaluate the possibilities of building a multi-channel multi-radio wireless mesh network in ns3.
- The nodes should have three interfaces: 2 for building the mesh network and one for working as access point.
- Create clusters of different nodes which use different WiFi-channels.
- For example: Cluster 1 works on channel 2, cluster 2 on channel 3, cluster 2 on channel 6 etc.
- Investigation how the simulation software emulates the wireless hardware.
- Some nodes must operate in the overlap between two clusters.
- NS3: <https://www.nsnam.org/>
- Contact: Alexander Seng - seng@e-technik.org



Project: Implementation of customised antenna types and radio models in CORE/EMANE.

- Create a wireless network in CORE
- Use the EMANE framework to create different antenna types and radio models
- Compare the different radio models and antenna types through measurements in the CORE emulator
- Creating a detailed description of how to build customised antenna types and radio models
- CORE: <https://github.com/coreemu/core>
- EMANE: <https://github.com/adjacentlink/emane/wiki>
- Contact: Alexander Seng - seng@e-technik.org

Project: Simulation of an LTE/5G access network in CORE with the NS3 simulator

- Create a wired backbone network with CORE
- Simulate a LTE/5G access network on access nodes with the NS3 simulator
- The access nodes should simulate one or more base stations and assigned end devices
- The base stations should connect to the backbone through the wired interface
- Communication should also be possible from access to access and also from the backbone to nodes in the access network.
- CORE: <https://github.com/coreemu/core>
- NS3: <https://www.nsnam.org/>
- Additional information:
https://www.nsnam.org/wiki/HOWTO_Use_CORE_to_test_ns-3_protocols
- Contact: Alexander Seng - seng@e-technik.org

