

Project A) Implementation and Analysis of MPLS- and LDP-based Network

- Theoretical background: MPLS and LDP and their relationship to each other
- Design of a network topology/infrastructure in which the functionality of MPLS and LDP could be demonstrated
- Implementation of the network topology/infrastructure using CORE (MPLS and LDP shall be enabled through FRR)
- Analysis of MPLS and LDP within the network topology regarding their intended functionalities
- CORE: <https://github.com/coreemu/core>
- CORE-Documentation: <https://coreemu.github.io/core/>
- FRR user guide: <http://docs.frrouting.org/en/latest/>
- FRR MPLS user guide: <http://docs.frrouting.org/en/latest/zebra.html#mpls-commands>
- FRR LDP user guide: <http://docs.frrouting.org/en/latest/ldpd.html>
- Contact: Gregor Frick - frick@e-technik.org

Project B) Implementation and Analysis of Protocol Independent Multicast

- Theoretical background: protocol independent multicast (PIM) and related aspects (IGMP, etc.)
- Design of a network topology/infrastructure in which the functionality of PIM could be demonstrated
- Implementation of the network topology/infrastructure using CORE (PIM shall be enabled through FRR)
- Analysis of PIM within the network topology regarding its intended functionality
- CORE: <https://github.com/coreemu/core>
- CORE-Documentation: <https://coreemu.github.io/core/>
- FRR user guide: <http://docs.frrouting.org/en/latest/>
- FRR PIM user guide: <http://docs.frrouting.org/en/latest/pim.html>
- Contact: Gregor Frick - frick@e-technik.org

Project C) Implementation and Analysis of a Wireless Mesh Network based on CORE and EMANE

- Theoretical background: wireless mesh networks and EMANE (Extendable Mobile Ad-hoc Network Emulator)
- Examine existing tutorials of EMANE for an improved understanding of its functionality
- Setting up CORE with EMANE being enabled/installed
- Analysis of EMANE regarding the implementation of a multi-channel multi-radio wireless mesh network (each node/host has two interfaces operating in different wireless channels)
- Optional: enforcing different radio models using EMANE within CORE
- CORE: <https://github.com/coreemu/core>
- CORE-Documentation: <https://coreemu.github.io/core/>
- EMANE-Wiki: <https://github.com/adjacentlink/emane/wiki>
- EMANE: <https://github.com/adjacentlink/emane>
- EMANE-Tutorials: <https://github.com/adjacentlink/emane-tutorial>
- EMANE in CORE: <https://coreemu.github.io/core/emane.html>
- Contact: Gregor Frick - frick@e-technik.org

Project D) Implementation and Evaluation of a Babel-based Wireless Mesh Network using CORE and EMANE

- Theoretical background: Wireless Mesh Networks, Babel, EMANE

- Setting up CORE with EMANE being enabled/installed
- Configuration of a multi-channel wireless mesh network within CORE with EMANE
- Enforcing the routing protocol Babel with FRR within the network
- Analysis of behaviour of Babel within the emulated network
- CORE: <https://github.com/coreemu/core>
- CORE-Documentation: <https://coreemu.github.io/core/>
- EMANE-Wiki: <https://github.com/adjacentlink/emane/wiki>
- EMANE: <https://github.com/adjacentlink/emane>
- EMANE-Tutorials: <https://github.com/adjacentlink/emane-tutorial>
- EMANE in CORE: <https://coreemu.github.io/core/emane.html>
- FRR Babel user guide: <https://docs.frrouting.org/en/latest/babeld.html>
- Contact: Gregor Frick - frick@e-technik.org

Project E) Implementation of SIP-based Video Conferencing using Kamailio and Jitsi

- Theoretical background: Conferencing in SIP, Jitsi (especially Jitsi Video Bridge), Jigasi (Jitsi gateway for SIP clients)
- Setting up network environment for Jitsi Meet
- Further extension of the network environment to allow SIP User Agents to participate in a conference (will high likely require Kamailio and Jigasi – including suitable configurations)
- Testing and analysis of the video conferencing (in terms of SIP behaviour and performance)
- Jitsi Meet Handbook: <https://jitsi.github.io/handbook/docs/intro>
- Jigasi: <https://github.com/jitsi/jigasi>
- Contact: Gregor Frick - frick@e-technik.org