

“Implementation of Wireless Interface Event/Command Service for a Carrier-Grade Wireless Mesh Network”

Student Project at TU-Berlin/Internship at Deutsche Telekom Laboratories, Berlin

Start: ASAP

Overview:

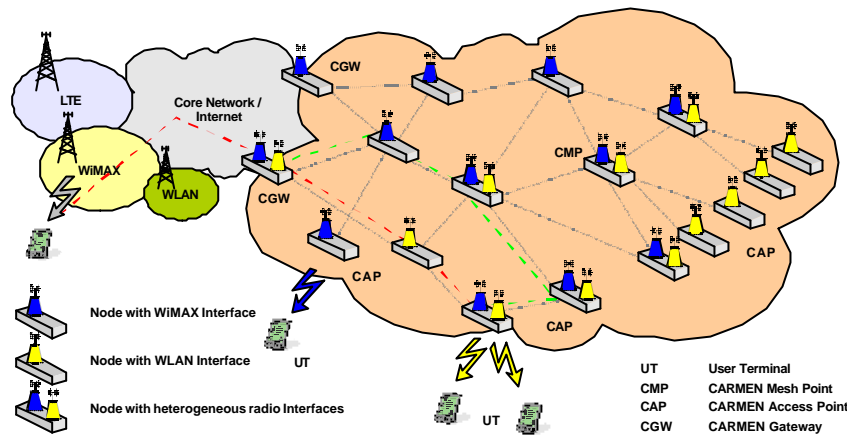


Figure 1: CARMEN network scenario showing different CARMEN nodes and mesh interaction

We are looking for motivated students for a student/internship project within the EU FP7 project CARMEN (CARrier grade MESH Networks). A primary concern for operators is to provide access to voice, video and data services via their existing radio access networks, thereby, leveraging the capital already invested in these networks. To achieve carrier-grade quality while preserving flexibility and cost efficiency is a key challenge due to the inherent limitations of wireless mesh networks, namely limited throughput and scalability. The goal of the CARMEN project is to overcome this challenge and realize such a carrier-class mesh network over heterogeneous wireless network technologies (Figure 1).

Topic:

The different wireless technologies are categorized in the CARMEN project as:

- Coordinated MAC technologies: Implies a centralized scheduler arbitrating physical resources, e.g., spectrum, time (e.g., IEEE 802.16 WIMAX)
- Uncoordinated MAC technologies: Implies a contention-based channel access (e.g., IEEE 802.11)

CARMEN nodes have multiple interfaces fitted with these different MAC technologies. To support this heterogeneity, a MAC Layer Abstraction Interface is proposed to translate service primitives between upper layers (such as routing, self-configuration and spectrum management) and the different technologies. The MAC Layer Abstraction Interface builds on and extends IEEE 802.21 MIH (Media Independent Handover) architecture. The different modules and interactions between them are depicted in Figure 2.

Contact:

Deutsche Telekom Laboratories
Berlin/Darmstadt

Dr. Cigdem Sengul (cigdem.sengul@telekom.de)
Dr. Nico Bayer (nico.bayer@telekom.de)

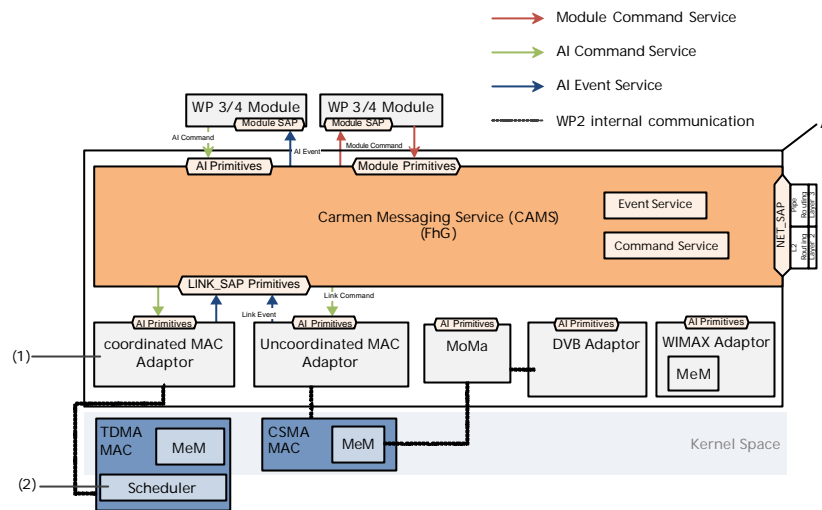


Figure 2: CARMEN Abstract Interface and implementation overview

The student is expected to work on the interface management and implement the following list of commands and functionalities (list represents an overview):

- Responding to queries regarding device properties: These properties include transmit power levels, directionality, available data rates etc. as well as supported events/commands, which are defined by abstract interface (AI).
- Responding to queries regarding the current state: The current values of different parameters (current transmit power level, current transmit rate etc.) should be read and sent to CAMS (CARMEN Messaging Service).
- Setting the values of different parameters: Based on requests forwarded by CAMS, new values are assigned for different parameters (such as setting a new transmit power level)

Basics/requirements:

Sound knowledge about network and Linux kernel programming, C/C++ is required. Knowledge about “madwifi” Linux driver is a plus (and will be needed during the project). Finally, the student is expected to be able to work both independently and in a team.

If you are interested to do your student project or internship in this topic, do not hesitate to contact us and we can arrange an informal meeting to talk about the details.

Contact:

Deutsche Telekom Laboratories
Berlin/Darmstadt

Dr. Cigdem Sengul (cigdem.sengul@telekom.de)
Dr. Nico Bayer (nico.bayer@telekom.de)