Vehicle to vehicle and vehicle to infrastructure (V2X) communication is a promising technology for increasing traffic safety and traffic efficiency. With the currently standardized solution, small messages are broadcasted with high frequency over wireless ad-hoc channels applying frequencies next to the WLAN band. Because of the “open” channel, security is an enabler of the technology. It has to be ensured that only valid and trustworthy senders participate and that transmitted information is not manipulated or faked.

To make cellular networks also usable for V2X communication, the 3GPP is working on a profile for extending the LTE standard to allow direct V2X message exchange between network nodes inside cells of the network operator. Since the message protection is ensured in the WLAN-based V2X communication by applying public key cryptography and in LTE with symmetric keys it should be analyzed in this Master thesis how these two security solutions fit together to allow a hybrid solution that provides a secure low latency wireless ad-hoc communication between vehicles and between vehicles and the infrastructure.

We are looking for a student (m/f) to construct his or her Master Thesis in Bochum at the earliest opportunity.

Goals

- Analyze relevant security goals of V2X communication
- Evaluate the LTE-V2X profile of 3GPP
- Describing a concept to fulfill security requirements to secure LTE-V2X communication
- Evaluate the concept with a proof of concept implementation

Our technical requirements

You are studying computer science, electrical engineering or mathematics in a master’s course and you are one of the best in your year. You have profound knowledge of the following topics:

- IT security and cryptography, i.e. elliptic curve public-key cryptography
- Communication protocols and computer networks, i.e. cellular networks
- Security analysis and security concepts
- Trusted computing and hardware security modules

Your personal qualifications

- Self-initiated way of working
- Team spirit and communication skills
- Responsibility and high quality demands

Our offer

We take your career seriously and offer the possibility to grow with us in a highly qualified, internationally experienced team. Our work environment is harmonic and team oriented, and at the same time, challenging and interesting. We always look to achieve best results, and to learn something new on every day. Please send us your complete application papers with key number MTLTE-1702-BO by email to jobs@escrypt.com.

We look forward to hearing from you!

Still questions?

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