

Diploma / Master Thesis

An adaptive MAC protocol for the IEEE 802.16 standard



Within the European research project ICT-ROCKET the Chair of Communication Networks (ComNets) and eight international partners are working together to improve, optimize, and evaluate the so called Wireless Microwave Access (WiMAX) or, more precisely, the Institute of Electrical and Electronics Engineers (IEEE) 802.16 standard. One of the main topics of the project is

the development of a Medium Access Control (MAC) protocol that dynamically adapts to a changing environment. Together with other techniques that are also being developed within the project a powerful next generation mobile cellular system shall become reality. The system will be competitive and easy to install and operate. It will offer high data rate services of up to 1 Gb/s with high Quality of Service (QoS) to all users anywhere and anytime. Important supporters of this technology are, amongst others, Intel, Samsung, Alvarion, Nortel, Motorola and Alcatel-Lucent. Hence, the future of this technology seems to be very promising. Actually, Intel expects that WiMAX will replace the very popular wireless Local Area Network (LAN) (IEEE 802.11) standard in the near future.

Topic of the diploma / master thesis

During the master thesis algorithms for the dynamic adaptation of the block size in Automatic Repeat reQuest (ARQ) protocols of the IEEE 802.16 standard depending on the current channel quality shall be developed, implemented, and evaluated by means of simulations. As basis for these algorithms methods for estimating the channel quality shall be used. The applicability of existing methods, known from literature, shall be investigated. Furthermore, for one algorithm that seems to be suited a detailed MAC protocol specification shall be written. As basis for the implementation and evaluation a simulator currently under development at the chair shall be used.

At the end of your master thesis you will have detailed knowledge about the WiMAX (IEEE 802.16) technology. Through the work with the Wireless Network Simulator (WNS), a modern simulator for wireless networks, you will gain experience in programming C++ and modern software design. The WNS will allow you to evaluate your ideas for the enhancement of the IEEE 802.16 standard.

The chair

The working atmosphere at the chair and the collaboration with other research assistants and students will allow you to get insights into other mobile radio systems. You may attend lectures and discussions about UMTS, wireless LAN, wireless PAN and other cutting-edge topics. At the end of their work those students who have successfully passed their diploma / master thesis can be pleased about an additional award of the friends of the chair (Förderverein).

...and last but not least we will have fun making sport, having barbecue together, etc...

If you are interested in dealing with this topic you are invited to come by for further information, having a cup of coffee together. We offer a team oriented working atmosphere in a modern environment and expect the necessary commitment to successfully solve the mentioned task.

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