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## **Investigation of Time Synchronization between Access Points Using the RBS Protocol**

### **Abstract**

Time synchronization has become a major topic in the development of wireless sensor networks. The importance of synchronizing electronic systems has increased with the demand on more precise time measurements. Once synchronization accuracy increases also the difficulty involved in keeping all nodes in a network synchronized does. In networks with sensors that monitor the physical world require a synchronization precision in the sub-microsecond range. This requirement is also part of the Lange Project.

The Savonia University of Applied Sciences has set up the Lange Project. Several students from different countries have been involved in the development of this project. In order to fulfill the requirements of this project these students investigated different protocols in terms of synchronization accuracy. The target of the Lange Project is to find a solution that is suitable for the requirements of the companies involved in this project.

Previous solutions achieved the requirements, but only for a wired connection. The task to investigate the best solution for wireless networks exposes the reference broadcast synchronization (RBS) as reliable. The next step is to achieve sufficient synchronization accuracy for two or more access points.

Two possible solutions have been considered. The first option is to use multi-hop RBS in order to pass on the synchronization information to the next network. The second option involves a dedicated reference that provides information from a central point.

The programming of the first option has been started, but could not be finished. However, the source of the issue was detected. The task of further investigation is to solve this problem and to realize both possible solutions.

**Examiner: Prof. Dr.-Ing. Uwe Meier**