



**Deutsches Zentrum  
für Luft- und Raumfahrt e.V.**  
in der Helmholtz-Gemeinschaft

The German Aerospace Center (DLR) is Germany's national research center for aeronautics and space and Germany's space agency. Its extensive research and development work in Aeronautics, Space, Transportation and Energy is integrated into national and international cooperative venture. Approximately 5,500 people are employed in DLR's 28 institutes and facilities at eight locations in Germany.

The **Institute of Communications and Navigation** (location Oberpfaffenhofen near Munich) is offering a

## **DIPLOMA WORK / MASTER WORK**

Investigation of Local Mobility Optimizations for the Aeronautical Telecommunication Network (ATN)

The future IPv6 based Aeronautical Telecommunication Network (ATN/IP) is being designed and standardized by the International Civil Aviation Organization (ICAO) that recently adopted Mobile IPv6 (MIPv6) as the required global IP mobility management protocol for the ATN/IP. In addition ICAO specified that providing additional local mobility solutions (e.g. Proxy Mobile IPv6) are optional and implementation decisions are left to the service providers. In parallel, Standards Development Organizations (e.g. 3GPP, WiMAX) are standardizing MIPv6 and its extensions for their networks, meaning that in the future, personal communication tools (e.g. 3G mobile phones, laptops) will use MIPv6 and Proxy MIPv6 (PMIPv6). The focus of this thesis will be to investigate the performance enhancement of PMIPv6 compared to pure Mobile IPv6 solution within the ATN. The investigations will cover understanding the relevant PMIPv6 Request For Comments (RFCs) and implementing the necessary functionalities within the simulation environment. The software implementation will be based on the discrete event simulator OMNeT++, written in C++.

### **Tasks**

- Investigation of the MIPv6 and PMIPv6 specifications (i.e. RFC 3775, draft-ietf-netlmm-proxymip6)
- Implementation of the relevant PMIPv6 functionalities in OMNeT++
- Assessing the performance enhancement of PMIPv6 compared to MIPv6
- Analyzing the integration of MIPv6 with PMIPv6

### **Required Knowledge**

- C++ programming experience
- Computer Networks

### **Contact**

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