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## 1. Allgemeines

This dissertation aims at developing distributed security mechanisms for IoT systems based on the Fog Computing paradigm. The main goal is to bridge the security services provisioning between resource-limited Things and computationally rich remotely deployed Cloud Computing servers. A further goal is to enable the automation of the security services using context information in the IoT environment.

## 2. Ergebnisse

The contributions of my dissertation revolve around of advancing the state-of-the-art in creating trustworthy security services at the edge of IoT networks through the proposed messaging and data models. The main thesis contributions are categorized into three major research areas: Fog Computing, trust management, and Context-Aware Access Control.

Contributions to all given research areas are represented through protocols, data models, simulations, and IoT services deployment strategies. To evaluate them, the smart home IoT framework called COSYLab (https://github.com/nemanja-ignjatov) is implemented in the scope of my dissertation. COSYLab has been deployed and evaluated against the devices available on the market: Raspberry Pi 4, Raspberry Pi 3, and Raspberry Pi Zero. The evaluation consisted of measuring CPU usage, memory consumption, as well as COSYLab components processing and networking latency during components startup and execution of the designed protocols. Performed evaluation and analysis of the results prove the feasibility of IoT services deployment on Fog Node devices in local IoT networks. This conclusion allows further research of Fog Computing-based IoT solutions and their enrichment through novel services.

## 3. Geplante weiterführende Aktivitäten

Since I have submitted my dissertation at the University of Vienna, I am currently waiting for the reviews and approval of my thesis defense, which is expected to occur in autumn this year. Until then, I am planning on publishing my research results through conference papers this summer and preparing myself for the upcoming defense presentation.

After completing my Ph.D. studies, I plan to continue researching IoT security in the Fog Computing-based IoT landscape and additionally developing COSYLab, with a focus on scalability and services deployment. The future goal is to enable COSYLab to be used in larger IoT networks like Smart Building or Smart City.

## 4. Anregungen für Weiterführung durch Dritte

IoT security research involves numerous challenges, especially concerning the computational resources of the IoT devices and the scale of the IoT networks. For that reason, the introduction of lightweight security protocols and rethinking the existing ones significantly impact the adoption of IoT. The most important reason for this is the overall safety and security of users and their private information in IoT environments.

Moreover, Fog Computing is established just a couple of years ago and is in its infancy. For that reason, the establishment of future Fog Computing-based IoT services allows seamless possibilities for research and establishment of novel IoT services in the upcoming years. This leads to the creation of more intelligent and self-managed IoT environments, improving the overall quality of life for IoT users.