Master’s Thesis

Resilient Response System

Context

IoT services and applications benefit from Fog Computing by extending the Cloud Computing paradigm to the edge of the network. Therefore, fog characteristics like heterogeneity, very large number of nodes, low latency and location awareness support IoT systems. In times of interconnectivity, a reliable and dependable IoT environment should support service continuity in scenarios where the IoT resources are mobile or can become unavailable due to network disconnection, handover problems or even power outage. There is thus a demand for methods and technologies that enable applications to access the edge components’ data when the resources become temporarily unavailable.

State of the Art & Problem:

Due to resource constraints and the mobility of sensors, powerful application servers are typically not used in IoT scenarios to run the services and enable interaction at edge level. Currently, solutions exist where mobility is (1) addressed at network level, (2) supported at the service level where new protocols are introduced, or (3) handled at gateway level so that service availability is assured. IoT services can become unavailable because (1) of the loss of access to the sensor while the handover has not been communicated or (2) due to the loss of signal coverage during the movement process.

Research Opportunity:

The thesis in the context of a Resilient Response System will include the following:

- Analyze current solutions and create a conceptual design for a possible middleware solution at the service level which enables IoT services to be available in a Fog environment
- Build and evaluate a prototype for your solution

Skills:  good knowledge of distributed networks, programming skills, few encounters with either IoT/Edge/Fog computing, cloud services; web technologies

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Our Mission:

Our lectures cover fundamental methods and techniques in the areas of service computing, cloud computing, and enterprise computing. We like to engage students in hands-on building of distributed information systems and to take an interdisciplinary approach to evaluating such systems. Through a close mentoring of students, especially in our seminars, we aim to introduce students to our ongoing research and to excite them to do future studies and research with us.