RWTH AACHEN UNIVERSITY

E.ON Energy Research Center
ACS | Institute for Automation of Complex Power Systems

Bachelor thesis

Data handling for distribution grid management and congestion identification

Context

Distribution System Operators (DSOs) are currently upgrading their infrastructure with digital technologies that allow them unlocking advanced tools for monitoring and identification of possible issues in the grid. Due to the large size of distribution grids, large amounts of data are expected to be collected from the devices being installed in the field. These data can serve simultaneously for different distribution system management and control applications. As a matter of fact, the efficient organization and management of these data is thus crucial for the DSOs for being able to enable new applications and services aimed at improving the distribution grid operation.

This thesis will be performed in close collaboration with the Italian DSO Unareti, which operates the grids of Milan, Brescia and other cities in the north of Italy. The objective of this thesis is to support the DSO in its work for improving the data management system currently in use, with the goal of achieving a faster access to relevant data for the congestion visualization dashboards. The thesis work serves also as a step forward in the data architecture definition planned in the context of the SOGNO project currently being developed by ACS in the framework of the Linux Foundation for Energy. The work in this thesis will allow the student to work closely with an industrial partner and to see the systems currently in use in the distribution management system of an advanced DSO. Due to the current contingency the thesis work can be done remotely and the student will access DSO data via a dedicated VPN.

Your tasks

In the first weeks, you will have the opportunity to interact with the industrial partner and to acquire confidence with the system and requirements for data management from the DSO. In the second phase, you will actively contribute to the re-structuring of the data system planned by the DSO. This will include the definition of an architectural schema based on message broker to access and process real-time data from the field to be presented in the congestion visualization dashboard of the DSO. Overall, your main tasks will include:

- Review of the systems currently in use by the DSO and of the available data structures
- Definition of an architectural schema based on message broker for data access and processing
- Implementation of the software connectors to access the data and of the other required components in a testing environment
- Testing of the implemented solution and performance evaluation

Due to the current situation, the thesis work will be done remotely and the student will access DSO systems and data via a dedicated VPN.

The thesis and its supervision will be in English.

For additional details or information, feel free to contact me.

Contact:

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