Developing a distributed and extensible stream processing framework

Recent trends in Smart Cities, Internet of Things (IoT) and other areas lead to an enormous increase of data sources and available data. The IMA is developing an information-based IoT data platform for structured/unstructured batch/streaming data that is capable of handling data on a semantic information level. To process the amounts data sources, the platform uses the stream processing framework Apache Storm, which lacks multiple useful features, such as modifiable processing pipelines and extensibility with user-defined tasks. Therefore, the goal of this thesis is to develop a prototype framework addressing those drawbacks. Possible research questions for this thesis could be: What are requirements that must be fulfilled and which technologies can be used for realizing such a framework? How could a possible architecture look like and what are its benefits or drawbacks? How does the developed solution perform?

This thesis will be a mixture between the development of a prototype stream processing framework (including requirements analysis) and an evaluation in which the framework should be compared to already existing solutions. It will also be necessary to perform an intensive prior art and related concept research where similar frameworks are identified and compared to the new developed framework.

The goal of this thesis is to develop a Java-based prototype stream processing framework in which already running pipelines can be modified as well as new pipeline tasks can be added at runtime. As a first proof of concept, the prototype should be integrated into the IMA data platform during the thesis. However, the framework should be designed in such a way that it can be used by other projects, too. In addition, the evaluation of the framework builds an essential part of this thesis. Requirements for this thesis are good knowledge in Java.

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Art der Arbeit  
Master