

# Optimizing messaging using Apache Kafka and Apache Flink



## Bachelor's Thesis

**Our goal is the profound control of systems and processes in networked product and high performance automation, intelligent building automation and pre-analytical processes in the laboratory. With more than 150 employees and 30 years of experience, STIWA Software inspires customers from various industries worldwide.**

## Motivation

Apache Kafka is agnostic about the content of the messages being sent. Therefore, Kafka can be used to send messages with any serialization format. Currently, STIWA uses the text-based JSON as serialization format. Binary protocols such as MessagePack, Avro, ... seem to have some advantages over text-based JSON, such as small data volumes, faster serialization/deserialization, general resource saving. For this reason, JSON will be compared in detail with binary protocols in the context of Apache Kafka and Apache Flink.

## Targets

- The aim of the work is to have a solid basis for the decision of a serialization format. The selected serialization format will be used as a standard at STIWA for many years, which is why this detailed comparison is necessary.

## Tasks

- Comparison of different serialization formats based on a list of criteria: theoretical consideration of the alternatives, practical consideration based on test setups
- Concept development for the test setups (comparison of alternatives under realistic conditions, Apache Kafka and Apache Flink as important system components, impact of the serialization formats on these technologies in terms of programming, performance, data volume, efficiency and robustness from analysis of the current development process).

## PLEASE CONTACT US

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