FaST: A Model-Driven Framework For Efficient Visualization Of Large-Scale Time Series

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Résumé

Scientists who analyze physical phenomena typically work with data gathered from various sensors placed throughout the environment. Visualizing massive amount of data is crucial to the analysis process, but implementing a reliable and efficient visualization tool can be challenging, especially without the support of a large-scale platform.
We propose to take up this challenge with FaST (an efficient model-driven Framework for visualizing large-Scale Time series).

FaST is a model-driven framework that provides a complete solution for the storage, the querying and the visualization of time series in a big data context. It offers a dedicated language for data scientists to efficiently specify the solution's architecture and the data it has to handle. The deployment process is streamlined through code generation and server-side dockerization. The generated tool itself is optimized for performance through ad hoc optimizations. On the server-side, these optimizations involve pre-computation of views based on the Min-Max principle. On the client-side, they come from the anticipation of queries related to the data navigation abilities of the generated tool.
Our current work focuses on a data collection system that involves a USV (Unmanned Surface Vehicle) equipped with various sensors, which is designed to cater to a group of users seeking to monitor the sensors' data. To achieve this, we propose a generic model-driven framework based on the publish-subscribe pattern that enables efficient transmission of the emitted data to the users.

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