

Advanced Data Extraction Infrastructure: Web Based System for Management of Time Series Data

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During operation of high energy physics experiments a big amount of slow control data is recorded. It is necessary to examine all collected data checking the integrity and validity of measurements. With growing maturity of AJAX technologies it becomes possible to construct sophisticated interfaces using web technologies only.

Our solution for handling time series, generally slow control data, has a modular architecture: backend system for data analysis and preparation, a web service interface for data access and a fast AJAX web display. In order to provide fast interactive access the time series are aggregated over time slices of few predefined lengths. The aggregated values are stored in the temporary caching database and, then, are used to create generalizing data plots. These plots may include indication of data quality and are generated within few hundreds of milliseconds even if very high data rates are involved. The extensible export subsystem provides data in multiple formats including CSV, Excel, ROOT, and TDMS. The search engine can be used to find periods of time where indications of selected sensors are falling into the specified ranges. Utilization of caching database allows performing most of such lookups within a second. Based on this functionality a web interface facilitating fast (Google-maps style) navigation through the data has been implemented.

The solution is at the moment used by several slow control systems at Test Facility for Fusion Magnets (TOSKA) and Karlsruhe Tritium Neutrino (KATRIN).

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