

## A Persistent Back-End for the ATLAS TDAQ Online Information Service (P BEAST)

ATLAS is the largest of several experiments built along the Large Hadron Collider at CERN, Geneva. Its aim is to measure particle production when protons collide at a very high center of mass energy, thus reproducing the behavior of matter a few instants after the Big Bang. The detecting techniques used for this purpose are very sophisticated and the amount of digitized data created by the sensing elements requires a very large data acquisition system, based on thousands of interconnected computers.

The experiment is successfully taking data since the end of 2008 and the trigger and data acquisition are now in a production stage. The main development efforts of the ATLAS Controls and Configurations work group are guided towards adding easy to use and intuitive tools to aid experts monitor different components or subsystems. P BEAST is an example of such a tool. It facilitates the storage of vast amounts of operational information which is otherwise lost. With this data at hand, long term analysis is possible.

This paper describes the work done and the results obtained in implementing a persistent system for the ATLAS Online Information Service. The novelty of this research consists of using a modern key-value storage technology (Cassandra) to satisfy the massive time series data rates, flexibility and scalability requirements entailed by the project. Cassandra's horizontally scalable system accounts for the fact that the the TDAQ hardware and software infrastructure will continue growing in the next few years and thus the amount operational information data to store will increase. The loose schema allows for seamless evolution of the stored information with the one flowing in the system, creating a permanent footprint of the data coming into the Information Service. This allows past issues to be investigated without needing to reproduce the problem in order to observe behavior of different components.

**Primary author:** Mr SICOE, Alexandru Dan (CERN)

**Co-authors:** Ms LEHMANN MIOTTO, Giovanna (CERN); Mr SOLOVIEV, Igor (University of California Irvine (US)); Mr MAGNONI, Luca (CERN); Mr KOLOS, Serguei (University of California Irvine (US))

**Presenter:** Mr SICOE, Alexandru Dan (CERN)

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