Contribution ID: **486** Type: **Poster**

A web-based solution to visualize operational monitoring data in the Trigger and Data Acquisition system of the ATLAS experiment at the LHC

Tuesday, 11 October 2016 16:30 (15 minutes)

The Trigger and Data Acquisition system of the ATLAS detector at the Large Hadron Collider at CERN is composed of a large number of distributed hardware and software components (about 3000 machines and more than 25000 applications) which, in a coordinated manner, provide the data-taking functionality of the overall system.
During data taking runs, a huge flow of operational data is produced in order to constantly monitor the system and allow proper detection of anomalies or misbehaviors. In the ATLAS trigger and data acquisition system, operational data are archived and made available to applications by the P-Beast (Persistent Back-End for the Atlas Information System of TDAQ) service, implementing a custom time-series database.

The possibility to efficiently visualize both real-time and historical operational data is a great asset facilitating both online identification of problems and post-mortem analysis. This paper will present a web-based solution developed to achieve such a goal: the solution leverages the flexibility of the P-Beast archiver to retrieve data, and exploits the versatility of the Grafana dashboard builder to offer a very rich user experience. Additionally, particular attention will be given to the way some technical challenges (like the efficient visualization of a huge amount of data and the integration of the P-Beast data source in Grafana) have been faced and solved.

Tertiary Keyword (Optional)

DAQ

Secondary Keyword (Optional)

Databases

Primary Keyword (Mandatory)

Visualization

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Session Classification: Posters A / Break

Track Classification: Track 1: Online Computing