

The new inter process communication middle-ware for the ATLAS Trigger and Data Acquisition system.

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The ATLAS Trigger & Data Acquisition project was started almost twenty years ago with the aim of providing a scalable distributed data collection system for the experiment. While the software dealing with physics dataflow was implemented by directly using low level communication protocols, like TCP and UDP, the control and monitoring infrastructure services for the system were implemented on top of the CORBA communication middle-ware. CORBA provides a high-level object oriented abstraction for inter-process communication, hiding communication complexity from the developers. This approach speeds up and simplifies development of communication services but incurs some extra cost in terms of performance and resource overhead.

The ATLAS experience of using CORBA for control and monitoring data exchange in the distributed trigger and data acquisition system has been very successful, mostly due to the outstanding quality of the CORBA brokers which were used in the project: omniORB for C++ and JacORB for Java. However, due to a number of

shortcomings and technical issues the CORBA standard has been gradually losing its initial popularity in the last decade and the availability of long term support for the open source implementations of CORBA is becoming uncertain. Taking into account the time scale of the ATLAS experiment, which goes beyond the next two decades, the trigger and data acquisition infrastructure team reviewed the requirements for inter-process communication middle-ware and performed a survey of the communication software market in order to access modern technologies developed in recent years. Based on the result of that survey several technologies have been evaluated, estimating the long term benefits and drawbacks of using them as a possible replacement for CORBA during the next long LHC shutdown which is scheduled for two years from now. The evaluation was recently concluded with the recommendation to use a communication library called ZeroMQ in place of CORBA.

This presentation will discuss the methodology and results of the evaluation as well as the plans for organizing the migration from CORBA to ZeroMQ.

Tertiary Keyword (Optional)

Control systems

Secondary Keyword (Optional)

DAQ

Primary Keyword (Mandatory)

Trigger

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