



Sample Project: Process management and monitoring of a large computing farm for the Trigger and Data Acquisition system of the ATLAS

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| Code | EP5542 |
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experiment at CERN

Title

Process management and monitoring of a large computing farm for the Trigger and Data Acquisition system of the ATLAS experiment at CERN

Description

The Trigger and Data Acquisition (TDAQ) system of the ATLAS experiment (<http://atlas.ch>) is composed of thousands of distributed hardware and software components which in a coordinated manner provide the data taking functionality of the overall system.

The High Level Trigger (HLT) farm of the TDAQ system is made up of several thousands of commodity servers hosting processes selecting interesting events over a large background. In its current implementation, the HLT processing is synchronous with respect to the ATLAS data taking sessions. That implies, for the HLT farm, to provide all the needed computing power for 'real time' analysis. In the context of the upgrades to the TDAQ system needed to cope with the higher luminosity provided by the LHC in Run IV, the possibility to have the HLT farm as a continuous processing service (hence not directly bound to the lifetime of the single data taking session) shall be evaluated. In such a scenario, and given the very large number of running processes (about 20000 as today), a proper process management and monitoring system is vital.

The candidate will be an active member of the ATLAS TDAQ group. He/she shall design and implement a solution for a proper management of the HLT farm, starting from software products already available in the Open Source area and falling under the umbrella of the 'cluster management' systems (Apache Mesos - <http://mesos.apache.org/> - being a good example). The candidate will first carefully evaluate performances, scalability and reliability of the proposed solution, and then produce a prototype fulfilling all the needed requirements.

Skills

Information Technologies: Developing distributed computing systems (e.g. clusters, batch systems), Developing with virtualised infrastructure (e.g. Openstack), Using software development tools (e.g. Git, Jira, Trac). Programming Languages: C++, Java, Python, Shell Script

Application deployment, RESTful interfaces, software containers

Disciplines

Information Technologies

To edit this project go to https://hrapps.cern.ch/auth/f?p=131:4:::P4_ID:5542