Contribution ID: **30** Type: **not specified**

Scalable solutions for the Control Unit of the KM3NeT DAQ system

Thursday, 8 September 2022 17:12 (18 minutes)

The neutrino telescopes of KM3NeT are experiencing an exciting phase of quick growth, and will scale up the number of detection units of the current configuration by a factor between 10 and 25 in the coming years. In addition, the telescopes are becoming less homogeneous with new versions of optical modules running new versions of firmware and new instrumentation for calibration introduced in the originally repetitive lattice. The inner architecture and information flow of the Control Unit of the KM3NeT telescopes is described, along with qualitative and quantitative information and estimates concerning present and future computational and architectural complexity. The CPU, memory and network load will be shown to scale smoothly and slowly, not faster than O(N log N) where N is the number of detection units. The behaviour of the Control Unit will be shown in the case of temporary downgraded operation, as would happen in the case of failure of one or more computing machines. The flexible design and the roles of the Control Unit as an automatic load balancing system and hardware abstraction layer will show up naturally. The current goal is to control two full blocks of ARCA, i.e. 4370 CLBs and 128340 photomultipliers for 230 detection units, with a single mid-range commercial server machine. The option of a superscalar approach, with the control of the detector split among several dedicated servers, is also described along with its implementation details.

Summary

Primary author: BOZZA, Cristiano (Istituto Nazionale di Fisica Nucleare)

Presenter: BOZZA, Cristiano (Istituto Nazionale di Fisica Nucleare)

Session Classification: Hardware and Software developments