Monitoring.

25-10-02

Background

A monitoring component, based on requirements collected in the past, is provided by the online system. This facility has been successfully used in the ATLAS test beam DAQ. The online system also includes a component (the information service) designed to transport status information. This issue is related to the collection and transport of “monitoring” data, it does not include tools and means to analyse the data (although this may be an important issue on its own, it is probably not relevant to the architecture).

During informal discussions between the working group and TDAQ people, it emerged that while the need for "monitoring" is generally acknowledged, qualitative (what kind of monitoring is requested, from where, to where) and quantitative (how much data is expected to be transported between what points in the system) information is partially lacking. It is important to understand what types of monitoring are required, for example:

- Sampling event data to check the detector behavior. Some (most?) of this is probably done at the level of the ROD; however we should be understand whether fragment/event sampling is required, for this purpose, at other levels in the system.
- Transporting monitoring data, e.g. histograms or other summary data, produced by system components, the RODs in particular.
- Sampling event data (fragments, groups of fragments, full events) for the purpose of checking the behavior of the read-out chain (including in particular the front-end electronics). Questions in this case are related to where (at which level in TDAQ) sampling should be done and at what rate.
- Collecting monitoring information related to the TDAQ system itself, in particular the status information provided by the switches (lost packets, errors, etc.) and other TDAQ components.

The current implementation of the monitoring facility expects to transport the data over the "control network" (the network used by the run control system to transport the controls commands/information etc.). The current TDAQ system does not use, on purpose, the data flow networks and links to transport monitoring data. It was an initial design decision to separate the flow of detector data from any other data. Hence a control network, which is expected to be used for initialization/loading/configuration of all the TDAQ elements, general control, information sharing (including error messages) and monitoring.

Scope

Monitoring is relevant to the architecture insofar as the requirements for the type of data that is needed, their source and destination and their transport are concerned. The scope of this issue include:

- The definition of the data needed for monitoring,
- The collection and transport to their destinations of the data and
- The location and processing requirements for analyzing the data
- The relationship with DCS (in particular as regards monitoring related to the LHC machine)

Tools and means to analyze the data are not in the scope of this issue.

Objectives

The objectives of this action are:

- To extract monitoring requirements from the detectors, in particular as regards these latter needs at different levels of the TDAQ system (ROD, ROS, SFI, etc.)
- To define monitoring requirements for the triggers.
- To define other monitoring requirements using event data (e.g. read-out chain checks).
- To define monitoring requirements based on statistics and status provided by TDAQ hardware (e.g. switches) and software (e.g. applications).
- To define requirements related to where analysis software will run.

The above will be collected into a document, to be used as backup for the TDR, which should be delivered by end January 2003. This document will also contain a table detailing: type of data, amount, source and destination for the various types of monitoring.

Proposal for action

It is suggested that one (or more) persons should be given the task of collecting the requirements and producing the document; this not necessarily in the context of an ad hoc working group. Also it is suggested that a “Monitoring workshop”, probably one day long, be organized during the next ATLAS TDAQ week.