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The Online Histogram Presenter for the ATLAS experiment: a modular system for histogram visualization

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The challenging experimental environment and the extreme complexity of modern high-energy physics experiments make online monitoring an essential tool to assess the quality of the acquired data.

The Online Histogram Presenter (OHP) is the ATLAS tool to display histograms produced by the online monitoring system. In spite of the name, the Online Histogram Presenter is much more than just a histogram display. To cope with the large amount of data, the application has been designed to actively minimise the network traffic; sophisticated caching, hashing and filtering algorithms reduce memory and CPU usage. The system uses Qt and ROOT for histogram visualisation and manipulation. In addition, histogram visualisation can be extensively customised through configuration files. Finally, its very modular architecture features a lightweight plugin system, allowing extensions to accommodate specific user needs.

The Online Histogram Presenter unifies the approach to histogram visualisation inside the ATLAS online environment in a general purpose, highly configurable, interactive application. After an architectural overview of the application, the paper is going to present in detail the solutions adopted to increase the performance and a description of the plugin system. Examples of OHP use from ATLAS commissioning and first LHC beam will also be presented.

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