ATLAS

ATLAS TDAQ Online Software

Online Histogramming Requirements

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Abstract

This document contains requirements for the Online Histogramming component of the TDAQ Online Software.

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Table 1 Document Change Record

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1 Introduction

The aim of the Online Histogramming (OH) subsystem is to provide a framework for histograms transportation in the distributed environment. It is responsible for communication between two types of user application: Histogram Provider (HP) and User Histogram Task (UHT).

This document covers aspects related to selection and transport of histograms. Other aspects like histogram booking / filling, storage and presentation are addressed in a wider ATLAS context [1]. The Requirements have been produced from input received from the Trigger / DAQ subsystems (Data flow ROS and HLT, Online) and input from some of the detectors (LAr, SCT).

This text is an update on the previous requirements document [2].

1.1 Purpose of the document

This document presents the requirements for the Online Histogramming component of the ATLAS TDAQ Online Software system. They shall be the basis for the design and implementation of the Online Histogramming in the context of the ATLAS Trigger DAQ system.

1.2 Glossary, acronyms and abbreviations

For general TDAQ terms see Atlas TDAQ Glossary [3]. Here you can find only these that are not included there.

1.2.1 Acronyms and Abbreviations

AIDA Abstract Interface for Data Analysis

API Application Program Interface

HP	Histogram Provider
JAS	Java Analysis Studio
LAr	Liquid-Argon Calorimeter
SCT	Silicon Strip Semiconductor Tracker
UHT	User Histogram Task

1.3 References

1 M.Smizanska, HLT Online Histogramming Requirements, http://atlasinfo.cern.ch/Atlas/GROUPS/DAQTRIG/HLT/hlt.html

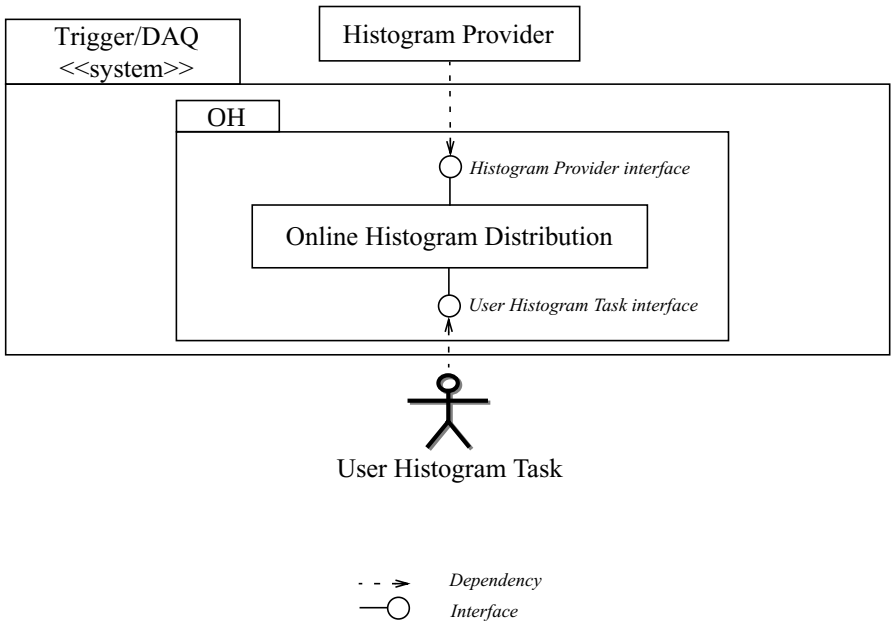
2 A.Bogaerts et al., User Requirements for Online Histogramming for the ATLAS DAQ Prototype - 1, ATLAS TDAQ Technical Note 174

3 ATLAS TDAQ Glossary - http://mdobson.home.cern.ch/mdobson/tdaq/glossary.html

2 General Description

The Online Histogramming (see Figure 1) allows UHT to retrieve histogram data from a number of HP which could be e.g. user monitoring or analysis tasks, or tasks providing histograms already produced in a ROD. UHT request histograms with particular characteristics (e.g. for monitoring or analysis purposes) from the Online Histogramming subsystem which fulfils the request.

Figure 1: Diagram of the Online Histogramming subsystem.



In the OH subsystem each histogram, or set of histograms, should has a unique identifier. A set should has a well defined content of two or more histograms, as defined by the HP who is providing the set.

3 Specific Constraints and Requirements

3.1 Constraints

CO001 The OH should be provided on the ATLAS Trigger / DAQ supported platforms (e.g. Linux, Solaris).

CO002 The OH should be compatible in terms of compiler versions and compiler options with the analysis packages it is supporting.

3.2 Functional Requirements

UR001 The OH shall provide histograms to UHT on request.

Priority high

UR002 The OH shall provide sets of histograms to UHT on request.

Priority high

UR003 The OH shall return un error if the requested histogram or histogram set doesn't exist.

Priority high

UR004 The OH shall allow histograms or histogram sets to be requested according to an identifier which may contain wild cards

Priority high
Note Wild cards make it possible to request a range of different histograms or histogram sets from one or more histogram provider

UR005 The OH shall allow UHT to obtain a list of valid histogram and histogram set identifiers.

Priority high

UR006 The OH shall allow HP to define new histogram and histogram set identifiers dynamically.

Priority high

UR007 The OH shall allow HP to register new histogram or to update the content of a histogram.

Priority medium
Note HP should be able to define always new histogram or update the old one.

UR008 The OH shall allow to sent necessary commands to HP (e.g. reset or update histogram command)

Priority medium

UR009 The OH shall provide utility which allow user to browse and display histograms.

Priority medium
Note The application should provide possibility for changing display option like e.g. setting axis parameters (maximum, minumum, log/lin, etc) and for saving histograms in necessary format (e. g. root or ps format)

UR010 The OH shall allow to perform operations on histograms or set of histograms (merging).

Priority medium
Note Example: It should be possible to combine two or more histograms (linear combination).

UR011 The OH shall allow to archive histograms.

Priority medium

3.3 Non-Functional Requirements

UR012 The OH shall provide the HP API.

Priority high

UR013 The HP API shall allow HP to export histograms to the OH from one of the common histogram packages used at CERN.

Priority high

UR014 The HP API should allow HP to export histograms or histogram sets to the OH from a user defined format.

Priority high
Note Example: RODs may produce histograms in their own format.

UR015 The HP API should be extendable to allow HP to export histograms to the OH from additional formats if necessary.

Priority high

UR016 The OH shall provide the UHT API.

Priority high

UR017 The UHT API shall allow UHT to import histograms from the OH to one of the common analysis packages used at CERN (e.g. JAS, ROOT).

Priority high

UR018 The UHT API should be extendable to allow UHT to import histograms from the OH to additional analysis packages or histogram formats if necessary.

Priority high

UR019 The OH shall allow multiple UHT to run concurrently and independently.

Priority high

UR020 The OH shall allow multiple HP to run concurrently and independently.

Priority high

This document has been prepared using the SDLT Single File Template that have been prepared by the IPT Group (Information, Process and Technology), IT Division, CERN (The European Laboratory for Particle Physics). For more information, go to http://framemaker.cern.ch/.