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## High Level Trigger Configuration and Handling of Trigger Tables in the CMS Filter Farm

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The CMS experiment at the CERN Large Hadron Collider is currently being commissioned and is scheduled to

collect the first pp collision data towards the end of 2007.

CMS features a two-level trigger system. The Level-1 trigger, based on custom hardware, is designed to reduce the collision rate of 40 MHz to approximately 100 kHz. Data for events accepted by the Level-1 trigger are read

out and assembled by an Event Builder through a complex of switched networks. The High Level Trigger (HLT),

running on a computing farm consisting of standard CPU (Filter Farm), employs a set of sophisticated software algorithms, based on the same full-fledged reconstruction framework used for offline, to analyze the complete event information, and further reduce the accepted event rate by approximately three orders of magnitude.

This paper describes the design and implementation of the HLT configuration management system.

The creation of an HLT configuration, consisting of many software modules organized in a number of trigger paths, and its deployment into the distributed online environment consisting of O(1000) CPU, are centered around a robust database design, abstracting the features of the algorithms and their organization in a trigger table. The evolution of the underlying code, and the issues related to migration of existing tables across software

releases, are addressed by a thin code parsing layer. The population of tables, using a dedicated GUI, their retrieval by the Run Control System for deployment in the HLT, and access to historic data all use a unique interface. Reformatting and deployment are decoupled from the database, thus permitting the target configuration grammar to evolve independently.

Referential integrity and data consistency are expected to be guaranteed by this system across the entire lifetime

of the experiment.

First experiences from the commissioning of the HLT system are also reported.

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