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# L1 Trigger Offline Software

Complete: 

## Goal of this page

This chapter documents the L1 trigger offline software. The hardware is documented in the Trigger TDR [\[7\]](#) and via some subsystem wiki pages at L1Trigger.

This page, as well as the linked pages, are under active restructuring.

## Introduction

The L1 Trigger offline software includes packages that provide:

- data formats for all the L1 EDM products
- bit-level emulation of the trigger electronics
- tools for interpreting, monitoring, analysing and validating L1 data.

## L1 Trigger Offline Software: Developers, Packages, Development Plans, Tags and Releases

A complete list of L1 Trigger offline packages and the list of persons responsible for these packages, as well as a developer list can be found in the wiki page [L1 Trigger Offline Software: Developers and Packages](#).

Coordination links:

- [L1 Trigger Offline Software Development Planning Web Page](#)
- [L1 Trigger Offline Software: Developers and Packages](#)
- [Development plans for L1 offline software](#)
- [L1 Software milestones](#)
  - ◆ [Status of L1 offline software vs 31X deadline](#)
- [L1 offline software release notes](#)
- [L1 trigger offline software tags](#)
- [Requirements for submitting new L1 trigger tags to integration builds](#)

## L1 Trigger offline software components

### L1 Trigger subsystems offline software

- [ECAL Trigger Primitive Generator](#)
- [HCAL Trigger Primitive Generator](#)
- [Regional Calorimeter Trigger](#)
- [Global Calorimeter Trigger](#)
- [DT Trigger Primitive Generator](#)
- [DT Track Finder](#)
- [CSC Trigger Primitive Generator](#)
- [CSC Track Finder](#)
- [RPC Trigger](#)
- [Global Muon Trigger](#)
- [Global Trigger](#)

- Stage 1 calorimeter trigger upgrade

## L1 Trigger technical triggers

- RPC Technical Trigger
- Beam Scintillation Counters technical triggers

## L1 Trigger common offline software tasks

- Condition formats and O2O and L1 Configuration Objects .
- L1 Data Quality Monitoring
- L1 Offline Software Validation.
- SWGuideL1TriggerHardwareValidation
- SWGuideL1TNTuples
- SWGuideL1TRawToDigi

## Accessing L1 Trigger Data

- L1Trigger Offline FAQ - FAQ about using/accessing L1 results READ IT
- L1GtUtils utility class - : easy access to main L1 trigger quantities
- L1 Trigger "digis" - L1 trigger input tags in various workflows
- L1 Trigger event content - event content for L1 in various data tiers
- L1Extra - physical representation of the L1 hardware output, and interface to the HLT

## Trigger Studies Recipes

- L1SoftwareIntegration - how to run basic integration tests of L1 software
- CMS.L1ValidationGlobalRun - how to run emulator-based hardware validation
- CMS.OnlineWBL1FastAnalyzer - how to run prompt analysis
- SWGuideReRunningL1 - how to re-run the L1 emulator on raw data
- L1MinBiasTriggers - how to use new minbias trigger quantities
- L1EmulatorParameters - how to use various configurable parameters

## Other useful L1 modules

(to be redistributed to specific tasks)

- L1TextToDigi - modules for converting hardware output files to digis, and vice versa
- L1Comparator - templated comparator code for comparing hardware and emulator digis
- L1CondDBTools - custom DB modules for use with the L1 CondDB
- L1Analyzer - for comparison of L1 objects with MC truth or Reco candidates

## Related links

### L1 DPG Group

### L1 Trigger Menu

- [NEW](#) L1 Trigger Menu Twiki
- Available L1 Trigger Menus
- L1 Global Trigger: Trigger Menu Editor
- GT Trigger Menu History for Global Runs

## Trigger Studies Group

### Contacts

Conveners :

- Vasile Ghete - L1 Offline Software Coordinator
- Werner Sun - L1 O2O & offline database

Full list of L1 developers

- L1 Trigger Offline Software: Developers and Packages

Communication

- L1 Trigger hypernews [↗](#) - general L1 Trigger forum
- L1 Trigger offline software hypernews [↗](#) - general L1 trigger offline software forum
- L1 Trigger emulator hypernews [↗](#) - dedicated L1 trigger emulator forum
- Trigger Monitoring hypernews [↗](#)

### Review status

Reviewer/Editor and Date (copy from screen)	Comments
KatiLassilaPerini - 23 Jan 2007	created template page
JimBrooke - 29 Jan 2007	page last content editor
JennyWilliams - 07 Feb 2007	tidied twiki text
VasileGhete - 30 Jan 2009	restructured content

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