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# LHCb trigger twiki pages

## General information

- **Meetings:** We have our weekly trigger meeting on Friday afternoon at 15:00 in 2-R-30. See the [indico listing](#).
- **Organisation:** See the [HltOrganisation](#) page, the [The HLT WG database](#) (admin instructions), the list of WG liaisons, and the operations twiki.
- **Mailing lists:** Search the archives of [lhcb-hlt-software](#), [lhcb-trigger-software](#), [lhcb-hlt-piquet](#), [lhcb-hlt-operations](#), and [lhcb-hlt2-development](#)
- **Conferences:** See the presentation section of the [HLT WG database](#). For presentations before 2016, see this page. Approved HLT plots for conferences are on this page.
- **Documentation:** See the [lhcb-note](#) section of the [HLT WG database](#). There is also a page listing commissioning notes in preparation.
- **Deadlines:** Jump to this section of the current page.
- **Run 2 trigger changes for analysts:** See the [Run 2 trigger changelog](#)

## Planning

- **LHC Schedule:** Latest 2018 LHC schedule
- **LHC Coordination:** Coordination info page.
- **Deadlines:** Release deadlines
- **JIRA:** The LBHLT JIRA project
- **2018 Commissioning:** The 2018 commissioning epic LBHLT-378

## Information for Hlt Piquets and WG liaisons

The HLT piquets should refer to the [HLT Piquet Guide](#)

## Moore testing

It is expected that anybody developing HLT code, including Hlt2 line authors, should keep an eye on these automatic tests, and report any issues.

Nightly qmtests	Look here under lhcb-head (Moore and MooreOnline). In order to run all tests, you can do: <code>make test ARGS ="-j 12"</code>
Throughput tests with a farm node	Pick the latest entry from here See also LBCORE-1007, and these instructions to test Moore in the online environment on a dedicated node.
HLT rates	See these instructions to use the Moore_RateTest script yourself. Tests are run on a daily basis within the lhcbpr framework, using 30k L0 filtered events from the TestFileDB. Tests are run on samples corresponding to a few different L0 TCKs, and on different nightly build slots. The results are published here. See also gitlab-repo, and these slides. The test runs over 30k events by default to run over more events specify the <code>--evtmax</code> option.
Hlt1 independence test	Under MooreOnline in the nightlies There is some older documentation here.

## Developing Hlt2 lines

**2018 startup deadlines:** presentation of new lines to be included in 2018 is **February 2nd**. Deadline for committing new lines will be **~6 weeks later** (March 16th, subject to changes in the LHC schedule).

If you wish to introduce a new Hlt2 line, or retune an existing one, please follow the steps listed in the table below.

The aim is to have a turnaround time of a few weeks for a new or updated Hlt2 line to enter the data taking. This means there are no specific dead lines and we try to be as flexible as possible.

This turnaround time does not apply at the beginning of a year when potentially many new lines are added at once.

1	Contact your WG liason	Discuss with them any questions you have on the following steps
2	Determine the signal rate in the LHCb acceptance	This should be without any selection or reconstruction cuts (so you don't need MC)
3	Carefully consider need for Turbo(++) or FULL	Please keep your liaison involved
4	Get signal MC	Request or make sure you have already a small signal MC sample <b>with raw banks</b>
5	Read the general guidelines	Make sure you are prepared to follow these instructions, if not speak with your liaison.
6	First HLT ops presentation	After completing the above steps present on the general plan for the new line and tell us your signal rate <b>For new lines intended for the 2018 startup, this must be done by Feb 2nd.</b>
7	Create an LBHLT JIRA task	See for example LBHLT-124 <a href="#">↗</a>
8	Write your trigger line	Follow these instructions.
9	Instrument your line with at least one monitoring histogram	detailed instructions here.
10	Measure the <b>rates</b> of your line(s)	Using with at least 50000 HLT1 accepted events. A dataset is provided in the TestFileDB and there is an example on how to process it with the Moore_RateTest on this page.
11	Measure the <b>efficiency</b> of your lines(s)	Again using the standard Moore_RateTest script, with juggled signal MC, or data, where possible.
12	Estimate the <b>purity</b> of your line(s)	For rare/forbidden/unobserved modes, it is suggested to use e.g. the current world's best limit (cross section x) BF, or if there is no limit, you should use a limit that would be considered "interesting".
13	Independence test	Run the Moore_RateTest script without your line included and use the logfiles (and ntuples) to check that all other lines give the same inclusive rate.
14	Tuning knobs	We need to see the purity and efficiency as a function of rate for a tunable parameter (a cut you're happy to tighten or at worst a prescale)
15	Second HLT ops presentation	It should include the results of <b>all of the above steps. The deadline for this presentation for new lines for the 2018 startup is March 16th.</b>
16	Merge request	Can happen before the second presentation. Mark as WIP if still work in progress. The target should be 2018-patches
17	Create JIRA subtask for new TCK	
18	Check the next nightly tests	
19	Release manager accepts merge request	

20	Update Tesla configuration	In case a new Turbo or TurCal line is updated, the Tesla production step needs to be updated to know about the new line, otherwise the productions will crash. The HLT should inform the production team about this change in advance.
21	HLT piquet to prepare new HLT2 TCK	
22	PPG/OPG sign off for deployment	
23	TCK deployment	
24	Validation of data	Line authors are expected to look at the monitoring histograms for the lines, and at the output data, and report back to HLT ops within 1-2 weeks of first data with the new TCK.

## The Tesla project

- Tesla project
- Turbo++

## HLT Monitoring

- RunIIMonitoring -- Monitoring in RunII
- Hlt2AnalysisTasks -- Analysis of histograms produced in HLT2.

## Level-0

- **TCKs:** All released ones as listed here [↗](#). See also slide-9 [↗](#).
- **Bandwidth division:** More details on this page
- **Testing L0 TCKs:** See these instructions to run L0App and print the rates.
- **Software:** See this page on the L0App application, and these details on L0Muon emulation.

## Trigger performance studies

- Timing Studies: Checking the impact of increasing the number of Kalman iterations on Hlt execution time
- Hlt2Rates: Rates of Hlt2 lines
- HltCorrelations: Correlations of L0, Hlt and Stripping lines

## Upgrade Trigger development

- Upgrade Monte Carlo Samples: Samples for development of the Upgrade Trigger
- GPU Studies: Studies of running (part of) HLT1 on GPUs

## Physics working group specific pages

- Charm WG

## About the HLT

- HltFAQ
- How do I run the HLT2 without PID selections?
- HltLine -- Basic Structural Unit of the HLT

- [Facts about the Event Filter Farm](#)
- [TCKs -- Trigger Configuration Keys](#)
- [MCTCKs -- How to make an 'MC' version of a TCK](#)
- [How to create a TCK](#)
- [PrivateTCK -- Using a private TCK for running on MC with special settings \(deprecated\)](#)
- [whichTCK -- How to find out which TCK was used for a given dataset](#)
- [seeTCK -- How to see if a given TCK exists in the software](#)
- [Update TCK -- How to change algorithm properties and make a new TCK based on an existing one](#)
- [updateL0TCK - Updating the L0 part of a TCK](#)
- [Hlt triggers naming convention](#)
- [MDF files -- Creating and running on them](#)
- [Tracking in HLT](#)
- [Running the upgrade HLT emulation](#)
- [Legacy Trigger --- discussions and plans for rerunning older trigger code in the future, 2015+](#)
- [HltRunOnePerformanceRev -- WG feedback on the trigger performance in Run-1](#)
- [Summary and description of HLT routing bits](#)
- [HLT Developers Checklist](#)
- [LHCbTCK: Pages describing the complete \(L0+HLT\) procedure for modifying an existing TCK](#)
- [RunningMooreOnMC: How to \(re\)run the HLT on MC](#)
- [HltEfficiency: How to measure the Hlt efficiency\]\] and how not to measure it](#)
- [HltDSTOutput: How to look at DSTs produced by Moore](#)
- [TriggerTisTos: Trigger TisTos Tool](#)
- [EmulatingPrescales: How to emulate Prescales in MC](#)
- [TCKsh: How to find out what's contained in a TCK](#)
- [MuFromFill: How to find out the value of mu in given data for a given run/fill](#)
- [DataSets: Data sets for trigger studies](#)
- [RawEventJuggler: Moving around the raw event for processing, A description of the framework in place for moving around the raw event.](#)
- [How to run FEST from your office \(link to the online twiki\)](#)
- [Configuring FEST for benchmarks](#)
- [Hlt piquet 2015 tutorial](#)
- [Hlt discussion drop box -- for sharing tables, plots etc.](#)

## Old pages

**A list of historic, and probably obsolete, pages on the LHCbTrigger is here.**

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This topic: [LHCb > LHCbTrigger](#)

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