Status of the Trigger Tool

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DESY ATLAS Group Meeting

Zeuthen

Outline

- Introduction
- Operation
- Tools for consistency checks
- The process of triggertool
- Next steps
- Summary and future work

Introduction

The TriggerTool is intended to be the central tool for the operation of the Trigger. It's stand-alone, Java-based graphical user interface to the TriggerDB. It allows to:

- browse the TriggerDB
- make new configurations
- store these configurations in the TriggerDB
- apply consistency checks, etc.

The tool is intended for both LVL1 and HLT configuration.

Currently the LVL1 part is more or less complete; the HLT part is being developed with basic functionalities already available.

cmt checkout Trigger/TrigConfiguration/TriggerTool

https://twiki.cern.ch/twiki/bin/view/Atlas/TriggerTool

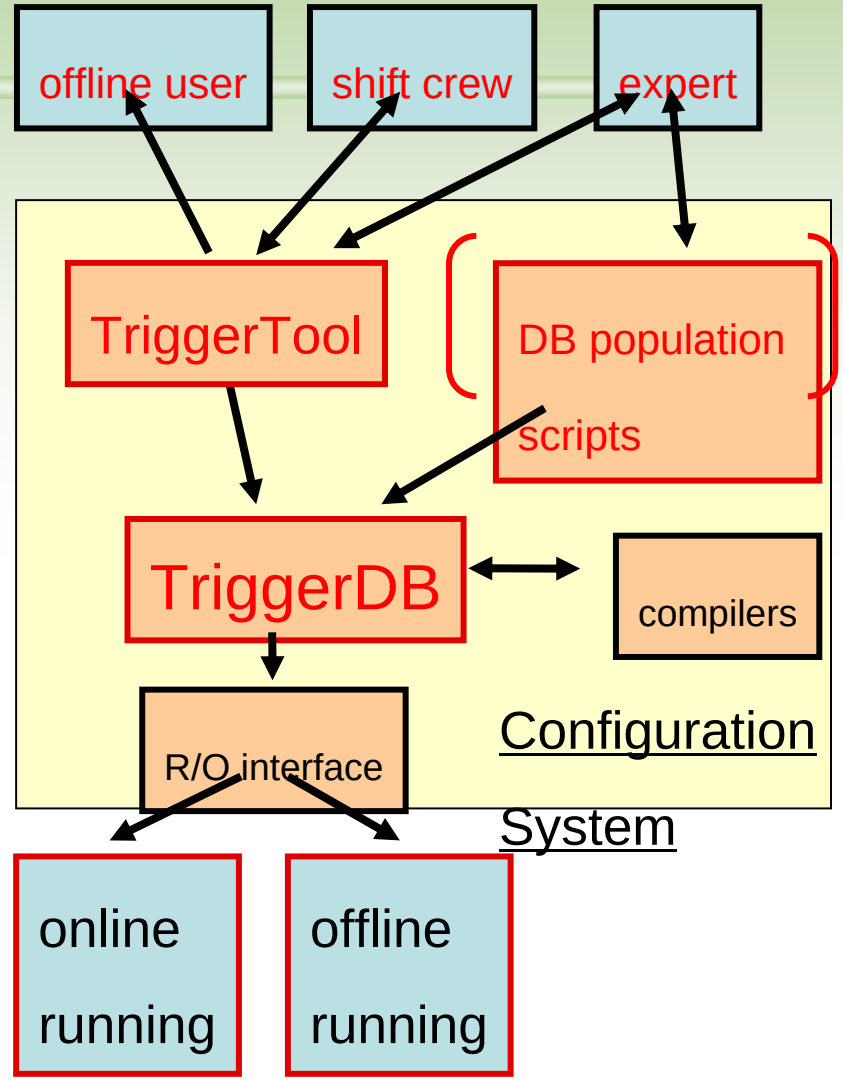
The Trigger Configuration System

LVL1 + HLT has integrated system

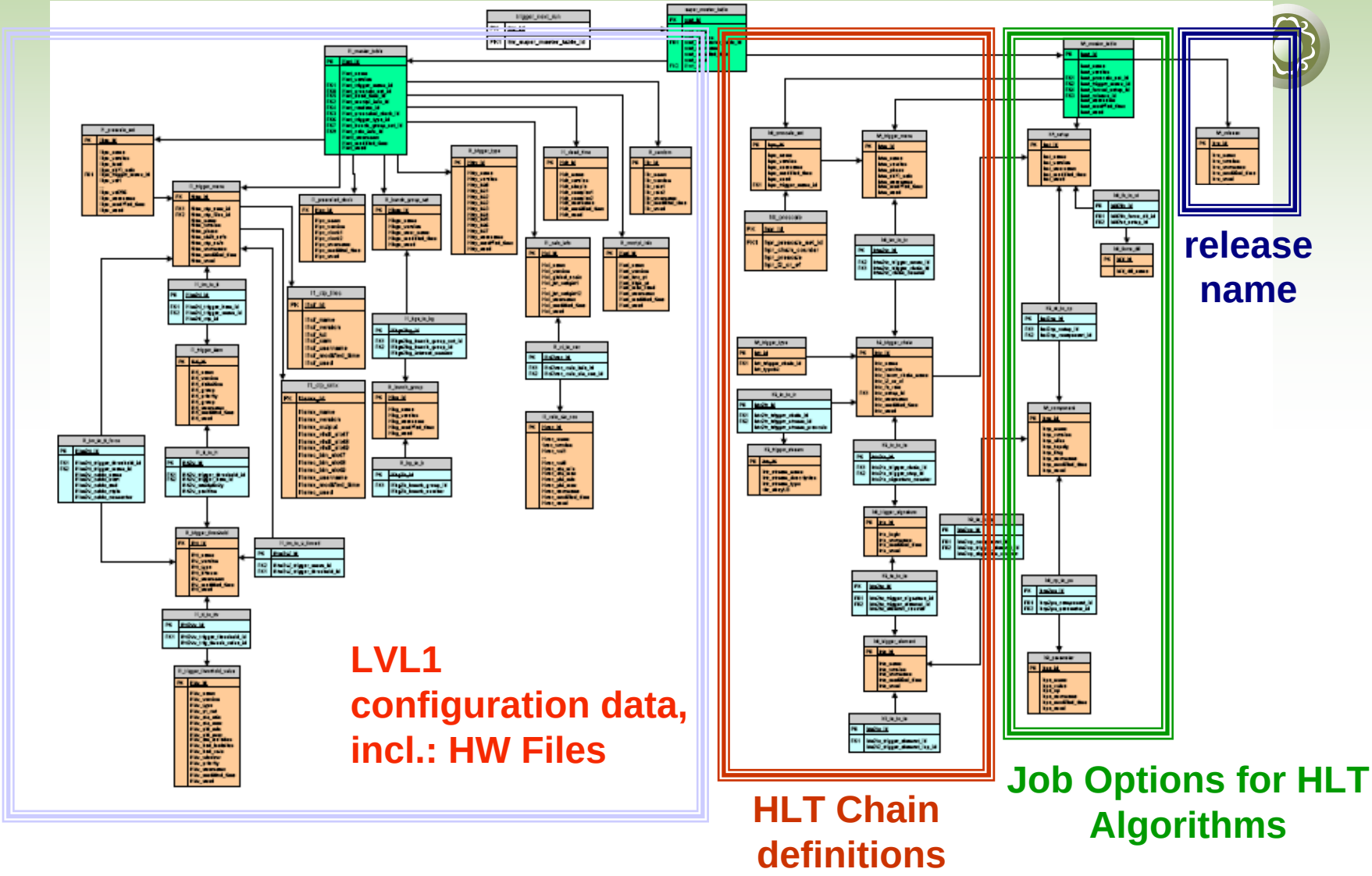
Online: ”Trigger Control Centre”

Offline: Tool to browse the TriggerDB

- **TriggerTool:**
  Java Front-End to TriggerDB
  modification, browsing of TriggerDB
- **TriggerDB**
  relational DB (Oracle and MySQL)
  complete description of online event selection
  all versions (archiving)
- **Clients:**
  online: central trigger, L1Muon, L1Calo, all nodes of HLT farm
  offline: simulation jobs, also from TriggerDB
- **Not shown:**
  Distribution of configuration data to reconstruction and analysis



Ralational Schema of TriggerDB



Operation

TriggerTool can be run in three modes with different levels of sophistication and functionality implemented suited to the experience and knowledge of the operator.

- Shift
- User
- Expert

One can navigate between them using the Mode Menu.

Currently the whole development takes place in Expert mode, during data taking this mode will be restricted to Trigger system experts.

Three modes

- **Trigger experts:**
  - Prepares trigger configurations offline
  - Access to all details
  - Quick access during data-taking.
- **Shift crew:**
  - Can choose from selected configurations (“physics”, “cosmics”, “calibration” etc.).
  - (Switch On/Off of TriggerChains)
- **Offline User:**
  - Read-Only
  - browse TriggerDB
  - Extraction of trigger configuration into file for local studies

Tools for consistency checks

- Implement various consistency checks as JAVA classes to validate a given Trigger Configuration.
- Software exists that performs crosschecks between LVL1 and LVL2 menus stored in the Trigger Database:

  The LVL1/LVL2 consistency check tool receives a pair of LVL1 and a LVL2 menu and the following two points are checked for each LVL2 chain.

  * The LVL1 item required by it exists in the LVL1 menu (prevents each LVL2 chain from never running due to human error of forgetting to define the corresponding item at LVL1)

  * The RoIs required by it is defined as the corresponding threshold in the LVL1 menu. (is needed due to the RoI mechanism, to make sure that the LVL2 algorithm in the chain is called as intended.)

- The tool is written in Java and is available within the TriggerTool. The inconsistency errors are reported on the output for every LVL2 chain indicating what is missing in LVL1.
- The GUI(Graphical User Interface) of this tool still needs to be developed as part of the TriggerTool.

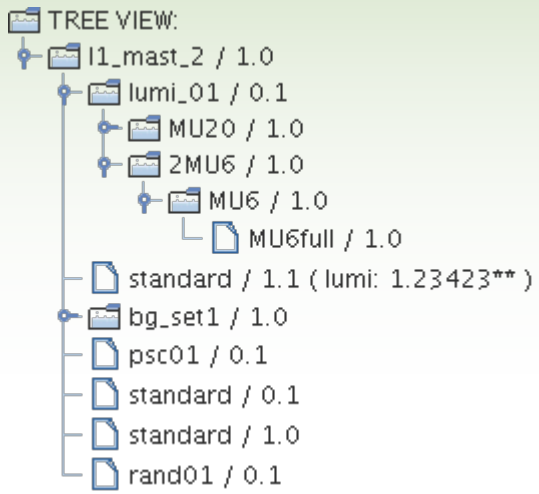
Build and run the TriggerTool

- Set up the offline environment with a recent release (version: 12.0.4)
- Check out package:

  cmt co Trigger/TrigConfiguration/TriggerTool
- Modify the code as you want
- Compile the TriggerTool
- Execute : java –jar TriggerTool.jar

The process of triggertool(LVL1)

- Removed 200+ compile warnings, reducing the number to 2. Although some more have crept back in now…
- Fixed a few bugs when accessing Oracle
- Added Super Master table
- Added HLT Master table
- Added LVL1 Master table
- Changed the Tree Viewer class so that it can deal with an item from any table (rather than just those with children)
- LVL1 "Write XML" button moved to the LVL1 Master table (Expert view - and can now enter a filename)
- Very big internal change to class structure…

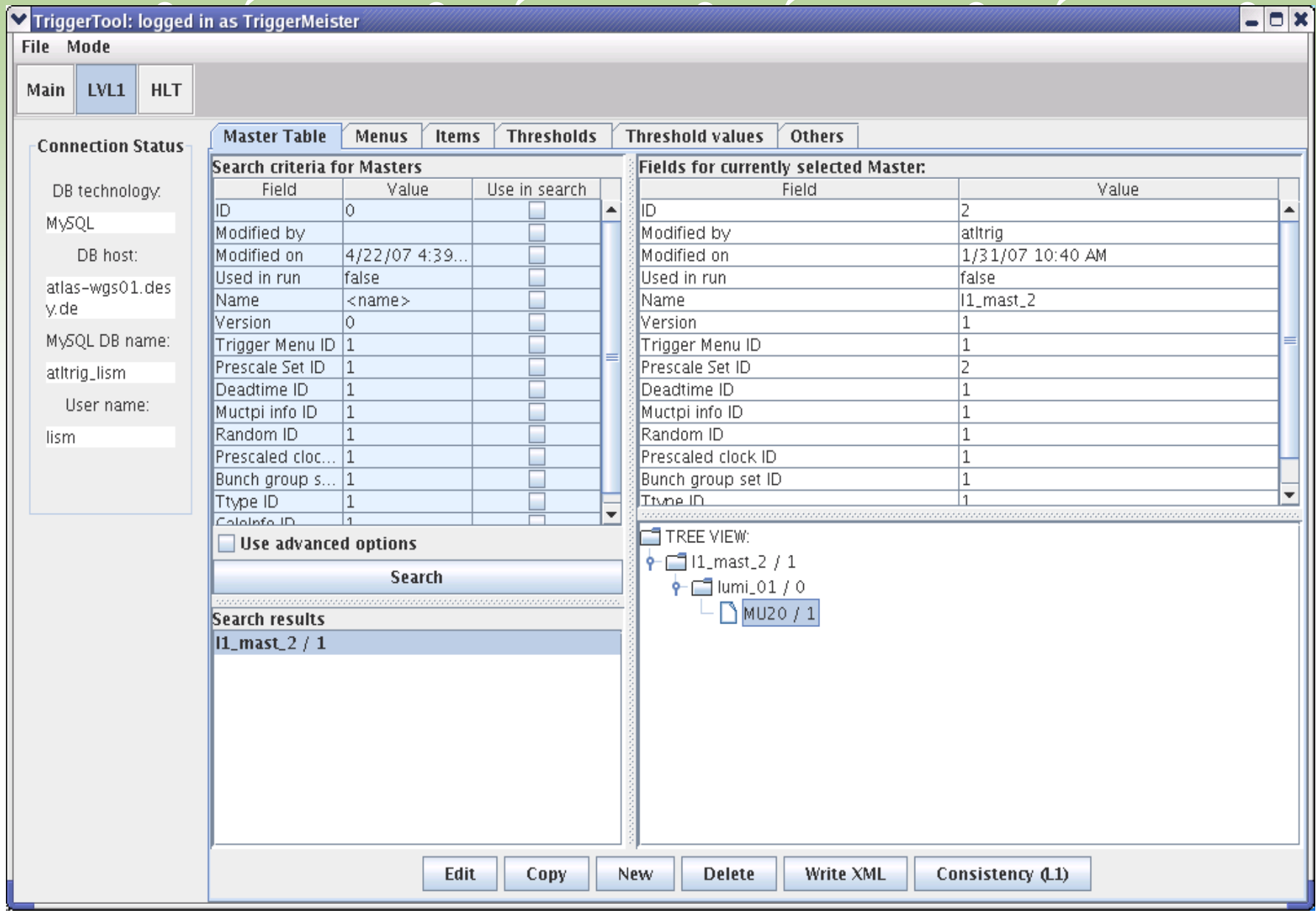


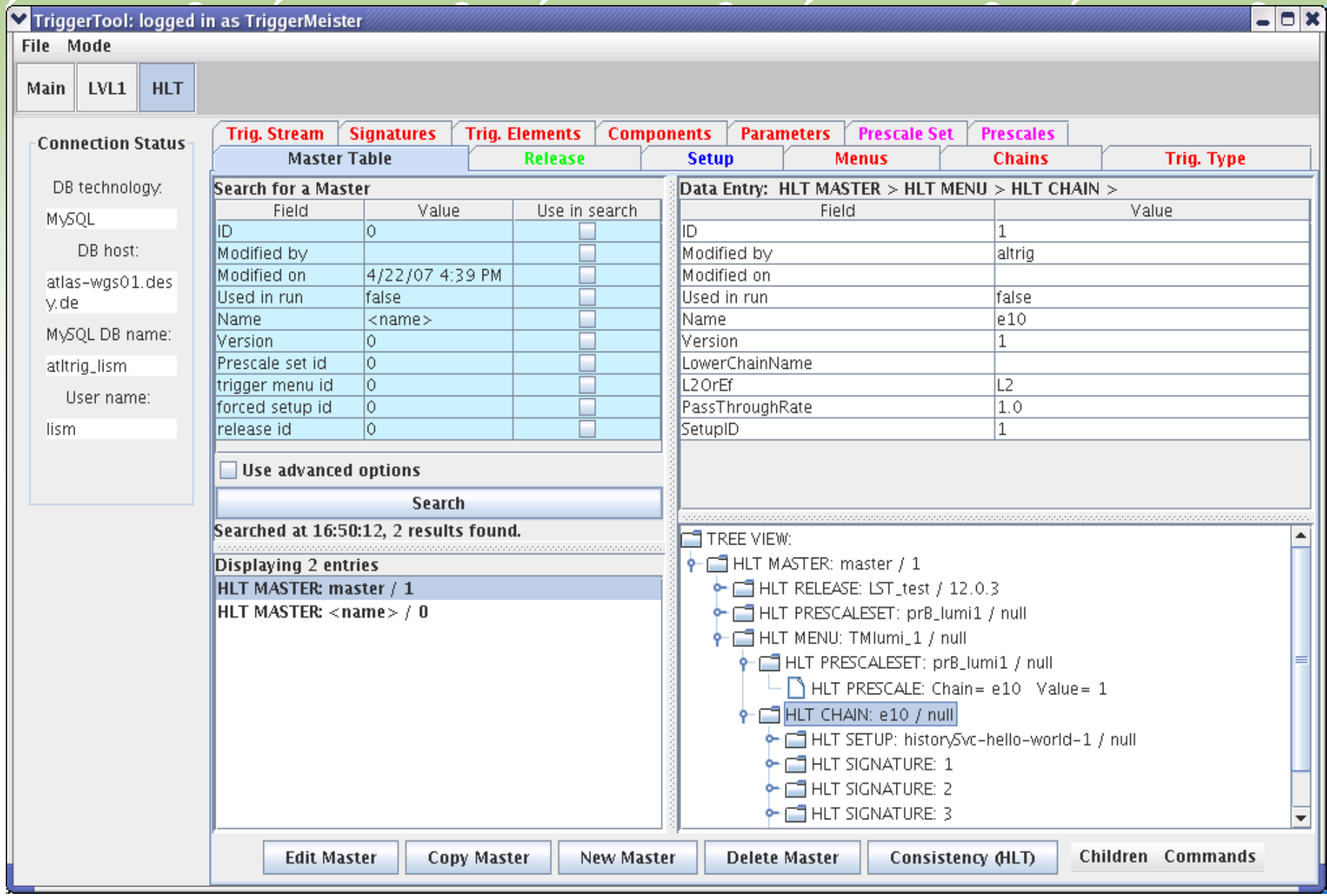
Simon Head

Trigger Configuration Meeting

The process of triggertool(HLT)

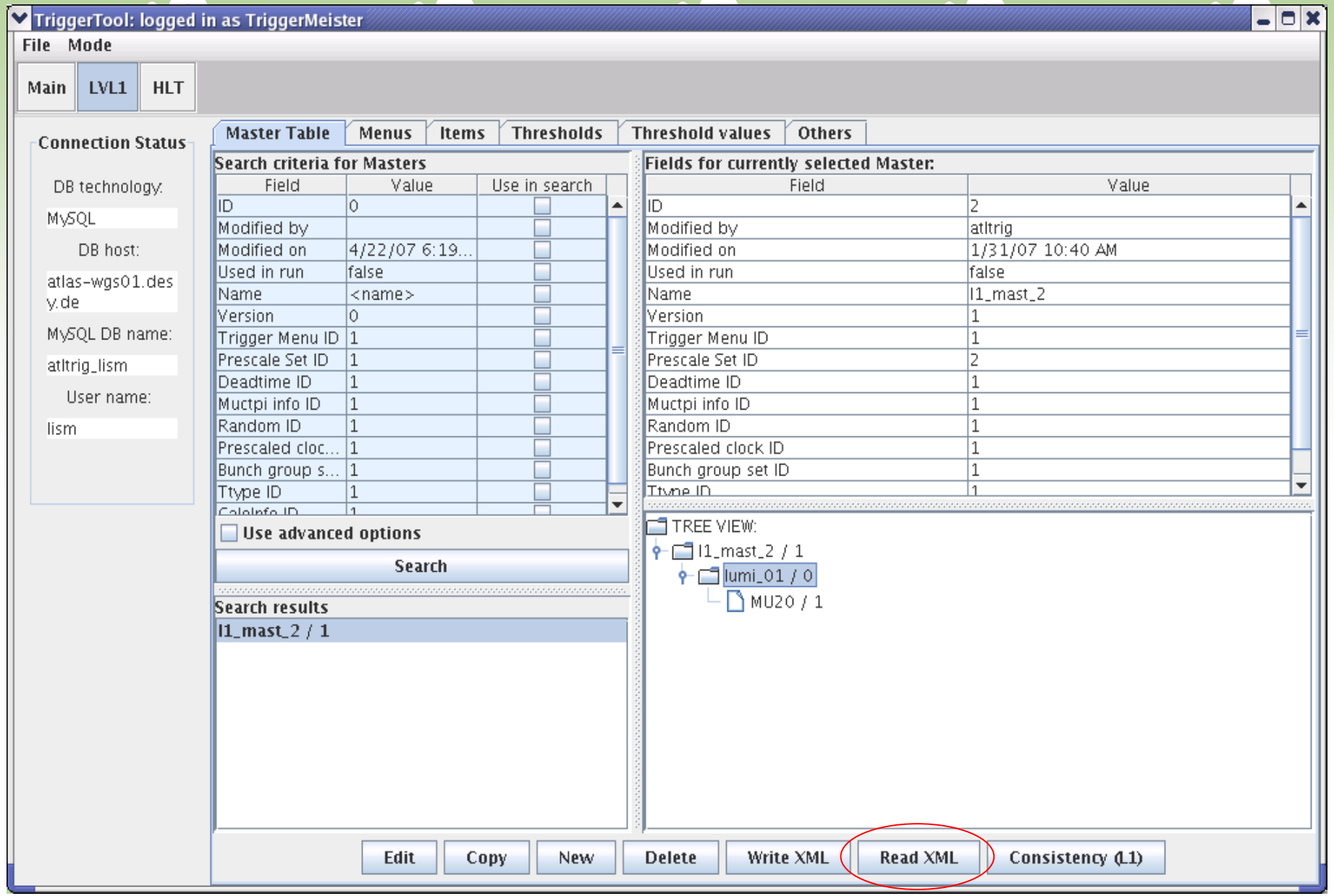
- Upload from xml has been completed.
  - Has been tested on MySQL only.
  - Correctly uploads only parts of the configuration which is new, updating links to existing records if appropriate.
  - Committed to HEAD of CVS.
- Currently updating to new xml format, and new DB schema for release 13.
  - Added trigger type, trigger stream tables. Need to include viewing of these in GUI.
  - Should be ready, tested and committed by the end of the week.
- Need to check if upload to DB and then write to xml, we get back what we started with.


TriggerTool: logged in as TriggerMeister
File
Mode
Main
LVL1
HLT
Connection Status
DB technology:
MySQL
DB host:
atlas-wgs01.desy.de
MySQL DB name:
atltrig_lism
User name:
lism
Master Table
Menus
Items
Thresholds
Threshold values
Others
Search criteria for Masters
Field
Value
Use in search
ID
0
Modified by
Modified on
4/22/07 4:39...
Used in run
false
Name
<name>
Version
0
Trigger Menu ID
1
Prescale Set ID
1
Deadtime ID
1
Muctpi info ID
1
Random ID
1
Prescaled cloc...
1
Bunch group s...
1
Ttype ID
1
Use advanced options
Search
Search results
l1_mast_2 / 1
Fields for currently selected Master:
Field
Value
ID
2
Modified by
atltrig
Modified on
1/31/07 10:40 AM
Used in run
false
Name
l1_mast_2
Version
1
Trigger Menu ID
1
Prescale Set ID
2
Deadtime ID
1
Muctpi info ID
1
Random ID
1
Prescaled clock ID
1
Bunch group set ID
1
TREE VIEW:
l1_mast_2 / 1
lumi_01 / 0
MU20 / 1
Edit
Copy
New
Delete
Write XML
Consistency (L1)


TriggerTool: logged in as TriggerMeister
File Mode
Main LVL1 HLT
Connection Status
DB technology:
MySQL
DB host:
atlas-wgs01.desy.de
MySQL DB name:
atltrig_lism
User name:
lism
Trig. Stream Signatures Trig. Elements Components Parameters Prescale Set Prescales
Master Table Release Setup Menus Chains Trig. Type
Search for a Master
Field Value Use in search
ID 0
Modified by
Modified on 4/22/07 4:39 PM
Used in run false
Name <name>
Version 0
Prescale set id 0
trigger menu id 0
forced setup id 0
release id 0
Use advanced options
Search
Searched at 16:50:12, 2 results found.
Displaying 2 entries
HLT MASTER: master / 1
HLT MASTER: <name> / 0
Data Entry: HLT MASTER > HLT MENU > HLT CHAIN >
Field Value
ID 1
Modified by altrig
Modified on
Used in run false
Name e10
Version 1
LowerChainName
L2OrEf L2
PassThroughRate 1.0
SetupID 1
TREE VIEW:
HLT MASTER: master / 1
HLT RELEASE: LST_test / 12.0.3
HLT PRESCALESET: prB_lumi1 / null
HLT MENU: TMlumi_1 / null
HLT PRESCALESET: prB_lumi1 / null
HLT PRESCALE: Chain= e10 Value= 1
HLT CHAIN: e10 / null
HLT SETUP: historySvc-hello-world-1 / null
HLT SIGNATURE: 1
HLT SIGNATURE: 2
HLT SIGNATURE: 3
Edit Master Copy Master New Master Delete Master Consistency (HLT) Children Commands

My first work in this part

Add the button of “Read XML” at the screen of TriggerTool. It's used to run the code that reads an XML file and saves it to the database.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DB technology:
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DB host:
atlas-wgs01.desy.de
MySQL DB name:
atltrig_lism
User name:
lism
Master Table Menus Items Thresholds Threshold values Others
Search criteria for Masters
Field Value Use in search
ID 0
Modified by
Modified on 4/22/07 6:19...
Used in run false
Name <name>
Version 0
Trigger Menu ID 1
Prescale Set ID 1
Deadtime ID 1
Muctpi info ID 1
Random ID 1
Prescaled cloc... 1
Bunch group s... 1
Ttype ID 1
Use advanced options
Search
Search results
l1_mast_2 / 1
Fields for currently selected Master:
Field Value
ID 2
Modified by atltrig
Modified on 1/31/07 10:40 AM
Used in run false
Name l1_mast_2
Version 1
Trigger Menu ID 1
Prescale Set ID 2
Deadtime ID 1
Muctpi info ID 1
Random ID 1
Prescaled clock ID 1
Bunch group set ID 1
Ttype ID 1
TREE VIEW:
l1_mast_2 / 1
lumi_01 / 0
MU20 / 1
Edit Copy New Delete Write XML Read XML Consistency (L1)

Next steps in LVL1 TriggerTool

- **Implement the class changes from LVL1 in to the HLT**
- **New interface to allow the user to edit Foreign keys by searching, rather than remembering an ID number**
- **Need to check Java 1.6 compatibility**
- **Remove the final warnings** (some more have crept back in)
- **Tree Viewer needs a speed improvement to work properly. Just-about OK at CERN at the moment. Due to lots of database access. When it is loaded it populates the full tree.**
- **Propose to merge Lvl1AbstractData and HltAbstractData** (since they're carbon copies with different names)

Next steps in HLT TriggerTool

- **Add safety measures to make sure a configuration cannot be edited if it has already been used.**
  - Get new master key when required.
  - Global commit? Or done like Lvl1?
  - Easy to do, once philosophy is agreed on.
- **Improve usability by implementing new GUI features:**
  - Searching, sorting, wildcard selection (many parameters in even a simple configuration, navigation must be made easier).
  - Can always think of an endless number of improvements
- **Once a version is available for release 13, need to target a few Beta testers and get feedback**
  - Sooner rather than later – in my opinion this is the most important next step!!

Feature requests from the wiki

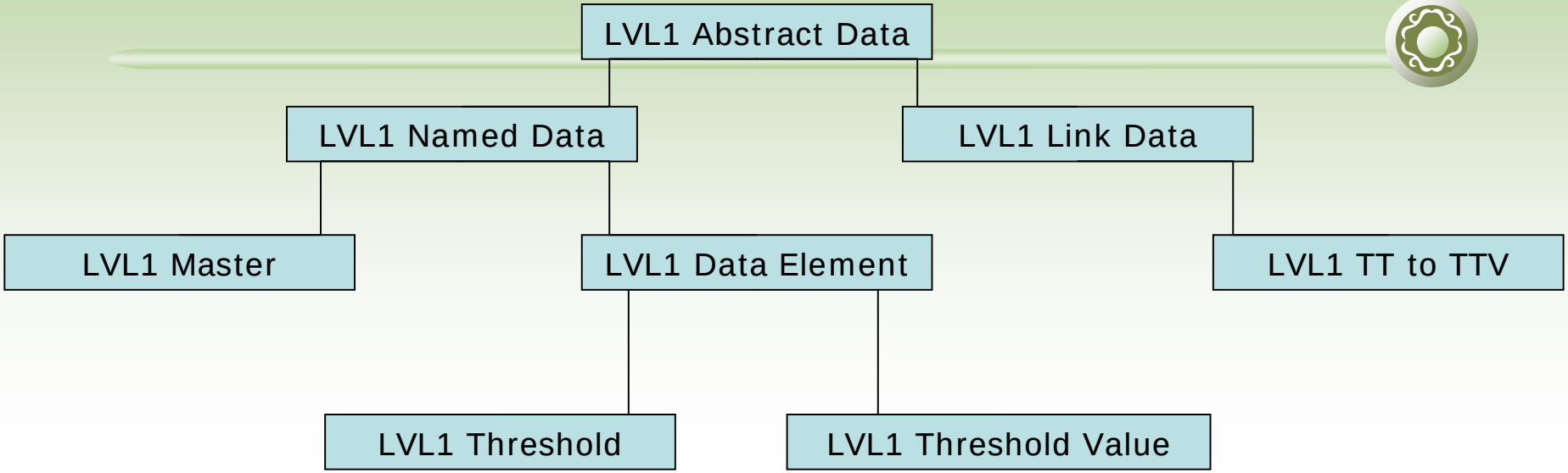
- **Better search for Lvl1 in user mode: at the moment the search function can only be started when the menu name and version is given. No wildcards are allowed. The search functionality from the expert mode is desirable. Also, when a search result is returned the tree view should be expanded to list this menu. (WolfgangEhrenfeld)**
- **Edit the lvl1 master table/key (WolfgangEhrenfeld)**
- **Edit and build a super master table/key. This should include the consistency checking. (WolfgangEhrenfeld)**
- **Import/export of Lvl1/HLT/master tables. (WolfgangEhrenfeld)**
- **Better writing of xml file for Lvl1. At the moment two boxes are opened requesting a file name for the threshold file and one for the menu file. Both names are not used and the new standard file is written to the current directory with the default name. One should choose a directory and a file name. E.g. starting from the web it is not clear what the default directory is. In addition file errors are written only to the console and no window is opened. (WolfgangEhrenfeld)**
- **The tree view for lvl1 is not updated after changes to a menu, trigger item, ... Either update it or close the tree view. The tree view might suggest things which are not there any more. (WolfgangEhrenfeld)**
- **Adding private favourites (database/user). At the moment you either at them to the code or type them in by hand. Reading them from a file in the home directory would be nice. (WolfgangEhrenfeld)**
- **For some inputs it is not clear what the available input is, e.g. item priority. One can use tool tips to show them. Or a reasonable default value would also be good. Is the correct input checked by the tool, the database or when using a configuration? (WolfgangEhrenfeld)**
- **It would be nice to have a 'set all' field for the prescale factors that allows setting all of the items to one value; as this field is also used for the trigger mask, it would be even better if one could specify a range of trigger items to be set to a certain value. Then one could switch on say the first 16 items and disable item 32 to 63.... (DavidBerge)**
- **Add 'sort-by' functionality to the list of search results. Currently, entries are ordered by insert date, which is a bit anti-intuitive. Items ordered alphabetically would be better. (DavidBerge)**

Summary and future work

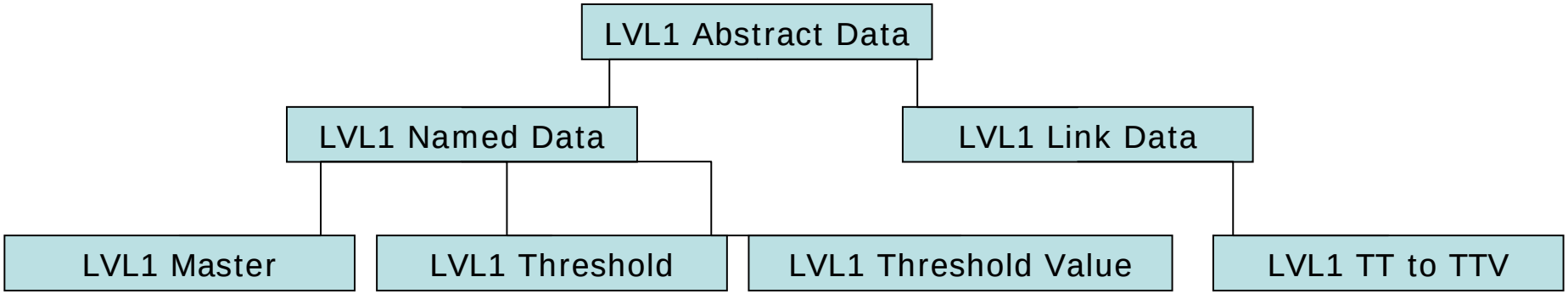
- Learn Java, Python, XML, SQL and so on……
- Try to understand how the triggertool works
- Build the offline environment
- Modify the code to add/delete buttons
- Just have the permit to commit the code to the Triggertool with the help of Simon George (yesterday)
- Add the button of "Read XML" and make it works well.
- Do consistency checks of the new version
- Work with simon, paul and others to perfect the Triggertool

Thanks!

Old Class structure



New Class structure



Old Class structure