



Queen Mary
University of London

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Calorimeter trigger offline simulation

Edward Moyse

e.moyse@qmul.ac.uk

- Update on progress
- LVL1/LVL2 Integration
- Persistancy
- Outlook & Timing

Progress:

♦ **Em/Tau Trigger:**

- ♦ Alan has found several bugs, mostly due to rounding problems at boundaries. One unresolved “quirk” - which I'm investigating – has been delayed by a problem with SmartRefVectors (see later)

♦ **JetTrigger:**

- ♦ Finished
 - ♦ Linked with CTP Config (reads in Trigger Menu)
 - ♦ Produces Rols
 - ♦ Still not completed bug-testing yet ...

♦ **Energy Trigger**

- ♦ Linked to CTP (for missing E_T – rest to follow).
- ♦ Produces “JEM” objects but sumation not complete...

LVL1/LVL2 Integration

♦ RDOs

- ♦ There's been lots of discussion about the format of “RDOs” which I've been involved in, and lots (!) of debate about persistency. More later ...

♦ Status

- ♦ Hardware decoder : **finished** for EmTauRols, and tested.
- ♦ EmTau completely integrated.
- ♦ Jet and Energy mostly integrated, at least at my end and it should be fairly easy for Thomas to add the Jet and Energy Rols

Persistancy

◆ Requirements

- ◆ We need to be able to save Rols, and then load them back into Athena
- ◆ L2 requires that Rols be able to return threshold values

◆ Solution

- ◆ Suggested solution was that each Rol has vectors of the values of the thresholds they pass. This leads to lots of duplication though (i.e. If 5000 Em/Tau Rols all pass thresholds 1,2,3 we have 15 numbers duplicated 5000 times.
- ◆ My solution was Rols contain a pointer to Thomas' config object, and return thresholds by querying this
- ◆ ... however pointers are invalid once an object is “persistified”

Persistancy(2)

◆SmartRefs

- ◆ The persistence issue is not new and I had always planned to use SmartRefs.
- ◆ These behave like pointers but are in fact much more intelligent.
 - ◆ They understand the underlying StoreGate “database” technology.
 - ◆ When called a SmartRef searches SG for its object, and returns a pointer to it wherever it is in memory.
- ◆ SmartRefs and SmartRefVectors are the preferred solution, as documented in the latest versions of the “Athena Users Guide”, the “Athena Developer's Guide” and the “Gaudi Developer's Guide”

◆However

- ◆ ... they are not supported any more. After discussion, I was told to try DataLinks.

Persistancy(3)

◆DataLinks

- ◆ There's a family of DataLinks: SequenceLinks, MapLinks etc.
- ◆ Very similar to SmartRef – behave like pointers, but provide a “persistable” link to other StoreGate objects.
- ◆ Part of a new (& much better) version of StoreGate which no longer requires stored objects to inherit from DataObject i.e. My Rol and TriggerTower classes no longer need to have any Athena dependency.
- ◆ DataLinks are the preferred solution, as documented in the latest StoreGate tutorial and the “ATLAS Data Model Users Guide”

◆However

- ◆ SequenceLinks etc are no longer supported.

Persistancy(4)

◆ **ElementLinks**

- ◆ New type of DataLink that replaces SequenceLink, MapLink etc. with one class.
- ◆ Not documented anywhere
- ◆ Not currently compatible with the output of Atlfast.

◆ **Summary**

- ◆ It's been a frustrating couple of weeks.
- ◆ Really, really frustrating.
- ◆ I plan to use ElementLinks and either
 - ◆ Temporarily suspend Atlfast compatability
 - ◆ Use SequenceLinks for Atlfast until Atlfast is re-written for the new SG.

Outlook and Timing

♦ **Todo:**

- ♦ Test and finish Jet/Energy Triggers
- ♦ Continue validation
- ♦ ...get a PhD

♦ **Timing**

- ♦ Highly dependant on bugs, and Athena developers not requiring me to rewrite half my code again, but hopefully by mid november all code will be written and obvious bugs found.
- ♦ Validation – this really depends on how busy Alan is.
- ♦ PhD – might be finished before ATLAS starts. Possibly.