

Software Efforts @ Heidelberg

- My personal progress since the Mainz meeting
- Observations and conclusions drawn after becoming a little bit familiar with HDMC and the L1 trigger software requirements
- Slice test software development and HDMC
- How and when to do it
- Computing infrastructure @HD

My scope of duties

I was hired by the ATLAS group to develop software for the Level-1 Calorimeter Trigger.

Especially it will be my duty to develop software which enables us to control, monitor and read out the PPM modules during the upcoming slice tests.

It was explained to me that this is the development and promotion of the HDMC package

The next few slides deal with my present understanding of what needs to be done and how it can be achieved

My first four months in ATLAS

- Joined the ATLAS officially at the 01.07.2001.
- This was 1 day after my „Disputation“
- The first few weeks i spend on „recovering“ from that and on having a bit of holiday
- Effectively started to work for ATLAS around the 01.09
- I tried to find out what has been done and what needs to be done in the next year
- I spent some time understanding HDMC and what it can do. Still not finished understanding whats going on internally inside HDMC.
- I read the most of the existing software notes available from the L1 software web pages. L1 software webpages, i tried to comment on two of them

Conclusions (general aspects)

Writing the software needed for the slice tests is a big and complex task

It is crucial to have a thorough understanding of what needs to be done and at least fairly detailed roadmap on how to do it.

Those people writing software for the slice test need to agree on a set of rules and a framework in which the software will be developed, otherwise there is no chance that the different pieces will work together in the end.

Consequences (1)

Tried to establish a working relationship with the other members involved with writing software for the L1 Calorimeter trigger.

This resulted in e-mail exchanges, a video conference between RAL and Heidelberg during one of the UK software meetings

lots of discussions on software matters during the last TDAQ week at CERN

At this point i wish to express my gratitude to the L1 trigger software people for the warm welcome i received and the many explanations concerning ATLAS software i got

Consequences (2)

After reading the software notes 7 and 8 (software organisation and requirement models) i found that i essentially immediatly could agree on what is written there and i am convinced that this is the road to go ahead.

I will therefore try to fully pull along the ideas expressed there and to follow the scheme proposed there

I wish to express (again) my firm believe that we need to establish a reasonable and sufficiently lightweighted software process. More work needs to be done to define this process.

Conclusions (HDMC)

HDMC is a valuable tool for **interactively** diagnosing and monitoring hardware

but it is only half the thing we need for the slice tests because

HDMC is a stand alone monolithic product which is (basically) not distributed in it's nature. To use it as a **run control software** would not be possible at the moment.

HDMC does has essentially **no DAQ capabilities**, like writing the read out data to a database, ROOT file or ntuple
This will be absolutely necessary in the final stages of the slice tests.

HDMC is **not compliant with ATLAS online software**. It's not what is needed in the long run

Consequences (3)

I wish to proceed as follows

Keep HDMC the way it is and not attempt to change its nature
(need to agree what this exactly means)

Extend HDMC such that as new hardware arrives it will be included in HDMC.

HDMC will play a central role in the first steps of the module and slice tests to debug and understand the hardware. It will be developed and maintained towards this purpose.

HDMC will not be expanded towards a DAQ like application

Consequences (4)

HDMC will be reorganised internally in a way that the basic hardware access capabilities, the hardware access layer HAL, will be put in a library of its own.

The HAL will be reused and be used a basic building block for a slice test DAQ system which will be developed from scratch inside the ATLAS online software framework

This software software will be hopefully also be re-usable for the final system

The PPM readout

As you all heard in the talk given by D. Kaiser the REM-FPGA code is currently under development

Obviously, in case you put data on the pipeline bus, you need to have a receiver station too.

Lots of work has been done by B. Stelzer on that topic, but since the REM-FPGA code is completely written from scratch, this has to be adapted or redone too.

Since Dominique probably (?) will not have the time to do this we need to start working on this as long as he is still with the group, otherwise we might have to reinvent the wheel again.

To be done until the slice tests

- reorganize HDMC
- extend and prepare HDMC for the slice tests
- complete the PPM ROD
- help to establish a software process within the L1 Trigger software group
- install and understand the ATLAS online software
- develop a slice test DAQ and run control software inside the online framework

How and when to be done

- reorganization of HDMC Oliver (End 2001)
- completion of the PPM Rod Dominique + Oliver (Jan – March 2002)
- Extension and preparation of HDMC for the slice test Karsten
- Installation and preparation of the online software @ HD Oliver + a paid student (try hard to find one)
- Development of slice test control and DAQ software All (start look into it in March)

Is this achievable in time

Lots of work to be done and i have teaching obligations until mid february which will cause me to be not available at least 4 days a week from 14-18:00 ☹

but ist becoming clear what needs to be done and to a certain extend also how it can be done ☺

Nevertheless i hope that the software needed will become available as being needed but dont expect it to be perfect from the beginning.

It's hard to develop software for a system you dont have at your hands to right away test what you have done

Computing infrastructure @HD

There exists a central HP machine cluster, but it plays no role for ATLAS.

Every member has his own desktop PC running whatever he thinks is necessary (Windows, Mandrake, Debian or SuSE Linux)

I agree that we need to have a common system (same OS, compilers, a set of installed applications). I think we can easily agree on that from a HD point of view and provide such an environment for the slice tests

Computing and slice test

In summer we will have many visitors at Heidelberg and I would already now like to ask you to think what you need when you come to HD so that it can be arranged.

We probably have to organize a certain amount of temporary office space and desktop PC's etc.

Please communicate your computing needs to me as soon as possible.