

Minutes of Meeting LOFAR Software

Date:	20070710
Next meeting:	20070724 11:00-12:00
	Paviljoen West Room
Present:	
Andre Gunst	Yes
Ronald Nijboer	No
Ruud Overeem	Yes
John Romein	Yes
Michael Wise	Yes

cc: Arthur Coolen, Jurjen Sluman, Pieter Donker, Chris Broekema, Martin Gels, Joris v. Zwieten, Marcel Loose, Adriaan Renting, Max Avruch, Peter Boonstoppel, Michiel v. Haarlem, Jan Reitsma, Ger de Bruyn, Arno Schoenmaker, Hanno Holties, Corina Vogt, Jan Noordam, Joe Masters, Lars Bähren

Remarks previous minutes

- In various sections old information is present in the first paragraph. This should be deleted.

Announcements

- Peter is in Chicago for two weeks now to continue his work at the Argonne National Lab (ANL).
- The IP addresses of the BG/L will be renumbered in a more logical way in the first week of August.
- In Dwingeloo an operators room will be arranged for LOFAR operations.
- Extra funding will be requested for the core beamformer development

Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
35	20070605	Specify input node requirements for the test environment. This waits on data which has to flow from Dwingeloo to Groningen. Currently data is flowing but alternatives are investigated to omit the use of an input cluster.	John	20070724	Open
37	20070703	Organise a meeting about which operating system to use in the LOFAR system.	Andre	20070703	Closed
38	20070704	Investigate if the OS of the input nodes can be lined up with the BG/L front node.	John/Chris	20070717	Open
39	20070704	Order new storage nodes. The RUG will be made responsible to arrange the necessary storage nodes.	Andre	20070724	Open
40	20070710	Define stappen plan for the pulsar mode.	Michael	20070723	Open
41	20070710	Installation of CASA core tools on build environment.	Ruud	20070723	Open
42	20070710	Can the HDF5 format handle data with	Michael	20070723	Open

		corrupted blocks in it.			
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Progress

Stations (André):

Since no extra functionality is needed for Step 2, this step mainly comprises enhancing robustness. Current status:

Achieved since last meeting:

- The test environment is now sending data to Groningen.
- Two HBA front end units have survived the environmental tests in the climate chamber. Now more front end units are reworked and tested.

Problems / current activities:

- All interfaces of the Transient Buffer Boards are tested. Only the CEP interface is not working yet.
- Step 2: The even Nyquist zones should be spectrally inverted. This is already implemented in the firmware but not driven by the control software yet in a proper way. This is more work than foreseen because the DIAG register in the firmware must be driven, which is not implemented yet (the DIAG register is mainly used to activate built in self test functionalities in the firmware).
- Step 2: The control of the HBA beamforming and validation is ongoing.

Next actions:

- Step 2: Solve problems.

OLAP (John):

Activities for Step 2 comprise integration with MAC (ongoing) and adding the ability to measure with higher bandwidth (done).

Achieved since last meeting:

- All parts of the OLAP pipeline have been successfully tested with MAC except the BG/L. This is due to the fact that the IP number of the BG/L is not unique. This is solved this afternoon.
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Problems / current activities:

- Step 2: Integration MAC / OLAP is continuing (Martin). The remaining task is to integrate BG/L in the complete pipeline. Furthermore the pipeline should work under SAS as well.
- John is busy to integrate the input section functionality on BG/L. Lots of progress has been made and currently the transpose, connection to the delay compensation and buffering work. The station data is simulated by the input clusters. Currently the problem is that the kernel crashes frequently.
- Chris is clarifying why the storage section is currently working slow. This was done to get the specifications clear for the new storage nodes.

- Step 3: When one station stops sending data, OLAP gets confused (Chris).
- Step 5: Peter is busy with making the 2nd core available in the ZOID communication software, so that the input bandwidth can be increased even more.
- Post CS1: In a plot of RMS against frequency, one of the subbands shows a periodic variation. It is unknown what causes this, and this has to be investigated / solved.
- Post CS1: Stopping an observation sometimes had a corrupt Measurement Set as a result. A workaround has been implemented, but a structural solution has to be realized. This has to be solved in the architecture of CEP-frame. If the current workaround is stable, this issue can be solved after Step 5 (=CS1).
- Post CS1: The CEPFrame framework is very developer unfriendly, and has some technical limitations. A work item to refactor CEPFrame will be added to the Work Breakdown as a mid term activity.

Next actions:

- Step 2: Solve problems that are related to Step 2.

Offline pipeline (Ronald):

Activities for Step 2 are finished.

Achieved since last meeting:

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Problems / current activities:

- Step 2: Joris will work on updating the BBS code, and making it faster (now MeqTrees is still 15 times faster than BBS).
- Step 2: The default data products of the standard imaging mode have to be defined (Ronald). No significant effort is spend right now. This item will most probably lead to lengthy discussions with the astronomers. Hence, it gets a high priority from now on.
- Step 2: Data reduction tools are needed and gets a higher priority driven by the needs of BBS. Adriaan has finished working on combining multiple Measurement Sets and reducing the data of the Measurement Sets by integration. The MSs seems ok, but the AIPS++ table browser cannot deal with them. Sarod was able to deliver this functionality with Glish.
- Step 3: Adriaan is writing a C++ version of a DFT imager -> Low priority -> Step 3
- Step 5: Tools are needed to inspect Measurement Set data. At the moment Westerbork tools are used, but this will lead to scalability problems. This will be solved by using the CASA core tools (see User Software for the status).
- Step 5: MeqTrees started to work on station beams and ionosphere calibration.

Next actions:

- Continue with step 2 activities.

SAS + MAC + SHM (Ruud):

Activities for Step 2 are ongoing. Integration with OLAP and adding functionality to SAS + MAC + Navigator to control OLAP, are the main activities.

Achieved since last meeting:

- The software necessary to remotely download new firmware in the RSPIII boards is finished and tested by Pieter Donker.
- The SHM system receives now also the crosslet statistics.
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Problems / current activities:

- Step 2: Integration with OLAP / ACC is ongoing (Ruud).
- Ruud finished the bottom layer (one out of three) for the property agent alternative.
- For SHM the MISS (interface between SHM and MAC) should be modified to get the basic SHM functionalities again operational.

Next actions:

- Solve the problems related with Step 3.

User Software (Michael):

Achieved since last meeting:

- Joe investigated the possibility to install the CASA core software under multiple operating systems. Amongst them are SUSE 10.1 and Debian.
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Problems / current activities:

- Joe has been busy to detail out, how the data access layer can interface with the MS IO of the CASA core software.
- Together with Ben and Jason a first specification has been made of the tied array beamformer output format in such a way that a convenient connection can be made with the pulsar software.
- Lars is busy with an imager for the cosmic rays pipeline.
- Post CS1: Joe Masters is busy with handling the streaming data coming out of the correlator and writing this into HDF5 format or Measurement Sets. The first version is done and needs to be tested.

Next actions:

- Solve the problems that are related with the Step 3 activities.

Software integration

Achieved since last meeting:

- A meeting with the pulsar KSP has been taken place about the software plan. This resulted in the following prioritization based on the available off-line software:
 1. Establish the pipeline with raw station data for the known pulsar mode

2. Implement the Tied Array Beamforming on-line and do the rest of the pipeline off-line (software for that is already available).
3. Integrate the Tied Array Beamforming under control of SAS/MAC
4. Implement the pulsar survey mode (long term)
5. Implement the known pulsar mode partly on-line (long term)

Problems / current activities:

- Meetings with the EOR and survey KSPs are planned.
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Next actions:

- Step 2+: A test program will be initiated to verify the functioning of the LOFAR software in a more structured way. In OLAP it is possible to store the raw station data and feed this into the pipeline later on. This makes it possible to define a standard data set, which can be applied to the pipeline as soon as major software changes have been taken place.

Decisions

ID	Date submitted	Decision
02	20061220	Every Step will start with a Kick-off meeting, in which the complete software team participates.
03	20061220	The project team starts immediately with the preparations of the next CDR in order to preserve progress of the CS1 realization
04	20070116	This meeting will take place every week on Tuesday 11:00. The existing software team meeting with all developers will stop to exist.
05	20070130	Step 1 will be changed to 16 subbands instead of 32 subbands.
06	20070130	Step 2 will contain a multiple node BBS. 6 μ Stations/Station will be postponed. Instead of this, 32 subbands measurements will be realized.
07	20070206	Step 1 will support 160 MHz observations. The other steps will support 200 MHz as well.
08	20070424	Step 2 will support 16 subbands @ 200MHz and 24 MHz at 160 MHz
09	20070424	During the rest of step two, OLAP will only support observations during the weekend.
10	20070522	The number of subbands per Measurement Set is set to 6 or 8 default.
11	20070522	Scheduler activities will be preferably activated in Q4 2007.
12	20070522	Procure, three Local Control Units to accommodate 12 microstations in CS010 in a quick way.
13	20070529	Integrate version numbers in all software.
14	20070529	Distinguish the software between a production version and an engineering version (partly now already the case).
15	20070605	All developed software under CVS will be transferred to Subversion. The main reason for this is that Subversion supports the integration of version numbers in the executables. In this way you can always retrieve which software is used for a certain build. First the impact of the transfer will be investigated by Marcel.
16	20070619	Marcel Loose will be the librarian of the LOFAR software. The available time for this will be shared with his BBS work.
17	20070710	The known pulsar survey mode will be the next mode to support (not in its full extent but partly on-line and off-line).
18	20070710	The temporarily off-line part of the known pulsar mode pipeline will not be under control of SAS/MAC. This will be put under control of SAS/MAC as soon as that

	software is available in the on-line part of the system.
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Table round

- John: Can the HDF5 format handle data with corrupted blocks in it. Answer: this will be sorted out by Michael.
- Michael: What is the status of Subversion. André: A Subversion server is ordered by ICT and will be available as soon Marcel is back from holiday.
- Ruud: Can the AIPS++ software be replaced by the CASA core software.
Michael: We first have to find out what the dependencies are. As a quick action Ruud will install the CASA core tools on one of the build machines to check what breaks. André: Independent of this Marcel will make an inventory of all the dependencies in the software and which libraries are used by the software.