

Minutes of Meeting LOFAR Software

Date:	2009-03-25
Next meeting:	2009-04-01 9:15-10:15
	Multimedia room
Present:	
Andre Gunst	Yes
Ronald Nijboer	Yes
Ruud Overeem	Yes
John Romein	Yes
Michael Wise	No

cc: Arnold Meijster, Rob van Nieuwpoort, Arthur Coolen, Jurjen Sluman, Pieter Donker, Chris Broekema, Martin Gels, Joris v. Zwieten, Marcel Loose, Adriaan Renting, Ger van Diepen, Max Avruch, Michiel v. Haarlem, Jan Reitsma, Ger de Bruyn, Arno Schoenmaker, Hanno Holties, Corina Vogt, Jan Noordam, Joe Masters, Lars Bühren, Dion Kant, Johan Hamaker, Maaijke Mevius, Sven Duscha, Jan-David Mol, Teun Grit, Alwin de Jong.

Remarks previous minutes

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Announcements

- There is a TBB busy week scheduled at 30 March – 3 April 2009.
- Yesterday we said goodbye to Maaijke Mevius. She will be on a pregnancy leave and thereafter she will work for KVI (new moon project which is also related to LOFAR).
- Currently the network is made conform the IP plan. This might cause hick ups in this week.
- The CS302 field is flattened. Currently the antenna positions are marked in the field. This field is also connected to the Concentrator Node now.
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Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
79	20090121	Setup meeting to discuss the next steps concerning the pulsar pipeline. A meeting was held.. Currently we will optimize the tied-array beamformer and implement the data writer on the BG/P. Also a variable polyphase filter bank will be implemented.	Andre	20090128	Closed
81	20090311	Investigate possibility of “in between modes” of the LBA configuration (different than sparse, dense, ...)	Ruud	20090318	Open
82	20090311	Arrange a CEP001 machine for Arthur. This machine will be called CCU and a LCU will be used for this.	André	20090318	Closed

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Progress

Stations (André):

Achieved since last meeting:

- For the TBB it is not possible (yet) to use 2 unregistered 4 GByte modules. Probably the load of the memory lines is too high. Using 2 registered 4 GByte modules is possible. One the issues is that the core generator of Xilinx cannot generate those modules. To use still 32 GByte per TBB board we could also consider to use one 8 GByte registered or unregistered memory module. The unregistered 8 GByte modules are not available yet.
- An observation is submitted to observe with 48 MHz.

Problems / current activities:

- The HBA calibration waits for the first HBA field.
- The LBA calibration verification waits for the first LBA field.

Next actions:

- Continue with LOFAR20

OLAP (John):

Achieved since last meeting:

- Martin made OLAP work under Cmake. John will test it too.
- Martin made format changes for MAC.
- Currently OLAP is limited to a fixed amount of subbands. Rob implemented a piece of code that gives more freedom in the amount of subbands we use in an observation.
- Chris fixed a kernel bug. Now the IO node does not need a reboot anymore if the application breaks.
- Chris made changes to enlarge the socket buffer.
- Jan-David was mainly busy with the pulsar busy week. In this week real-time observations have been done with a limited number of tied array beams and subbands.
- John finalized the performance measurements with 2.5 racks of BG/P. The EOR observation mode can work on one rack with 48 stations including a split HBA field with 4 bit words, a bandwidth of 32 MHz and 4 beams.

Problems / current activities:

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Next actions:

- Continue with LOFAR20

Offline pipeline (Ronald):

Achieved since last meeting:

- John Swinbank discussed the pipeline integration with Marcel and it seems that he can instantly use this in the standard pipeline framework. Also BBS and source finding are ready to integrate within this pipeline.
- Pandey is busy with the global bandpass determination. He found that the subbands have a stable linear phase slope. However the observation done for this cannot be used fully because of the self generated RFI.
- Joris started the implementation of the clock phase correction.
- Joris and John discussed the use of multiple threads for BBS. The bottom line is that you want to use multi-threading only if it is essential. Preferably you do not use this because it complicates programming. Probably because BBS can process the subbands in parallel multi-threading is not necessary.
- Maaijke is almost finished with the document.
- Ger has made an image in facets. The code hangs; this will be checked with ATNF.
- Last Friday another GSM meeting was held: The LSM is in MySQL and the GSM in Monet db. Once in LOFAR was decided to use the PostgreSQL database instead of MySQL. Hence the rest of the software should be made compatible with PostgreSQL instead of MySQL. In 2003 a document is written about this. The conclusion was: "When comparing MySQL with PostgreSQL it is clear that PostgreSQL is much more mature than MySQL. MySQL is a nice database when you need 'some data storage' in an application. It is easy to use and fast as long as you are the only user. PostgreSQL on the other hand is much more powerful when dealing with multiple users and transactions."

Problems / current activities:

- Polarisation imaging is done by Maxime (this starts in April).
- Evert Rol will work on the regression test suite for the imager.
- Ronald is busy with a document about beam modeling.

Next actions:

- Continue with LOFAR20

SAS + MAC + SHM (Ruud):

Achieved since last meeting:

- Arthur is busy with a new SAS interface to do the correct antenna selection in SAS. He is ready to check this in.
- Ruud is busy with ring splitter control in MAC layer. Probably the task management framework of MAC needs an upgrade as well to make the software more simple.

Problems / current activities:

- Michiel and Ruud made a beamsolver which calculated all positions per second. This does not work yet.
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Next actions:

- Continue with LOFAR20

User Software (Michael):

Achieved since last meeting:

- Andreas faced some problems of being able to display created image files. The CASA viewer should be capable of displaying HDF5 images. Ger van Diepen will bring this up to NRAO.
- Lars cleaned up the Doxygen documentation significantly.
- Lars has been busy updating the list of installable Fink packages for Cmake.
- The CR-Tools GUI module showed build problems. The most have been tracked down by Heino and Lars.
- Lars worked together with Mattheijs Eikelboom to solve problems to channel the TBB data to a cluster node at CEP (list002).
- Additional Cmake scripts are created by Lars.

Problems / current activities:

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Next actions:

- Continue with LOFAR20

Software integration

Achieved since last meeting:

- Marcel, Martin and Lars are busy merging to Cmake.

Problems / current activities:

- Compile a list of anticipated data products and calibration or metadata files associated with each of the pipelines. It is a task on the task list.

Next actions:

- 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.
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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.
19	20070814	Joe Masters makes the routine to read in the TBB data.
20	20071002	Fault tolerance of the system (mainly OLAP) is put at the top of the priority list after closing the SAS-MAC and CEP integration.
21	20071123	Kubuntu 7.10 desktop 64 bit OS is chosen for all machines except the BG/L and MAC/SAS machines
22	20071123	Station calibration work is smeared out over Step 4 and Step 5.
23	20071123	Global bandpass shape is moved to Step 5 because of its low priority.
24	20071211	Multiple beams per observation will be implemented instead of multiple observations (this is consistent with the plan).
25	20071211	Step 3 will be closed next Thursday. Any open items will be finished in Step 4.
26	20080130	Multiple beams are defined as multiple directions with the same set of antennas. Hence, only the angle, subbands and beamlets can be modified per beam.
27	20080206	Step 4 and Step 5 for MAC/SAS will be changed. The control of the offline pipeline will be postponed because the offline subsystems are not fixed yet. Currently the definition and design of the metadata flows will be set as goal for Step 4 and the implementation of the metadata flow will be the end goal of Step 5. Hence, after Step 5 (part of) the metadata is included in the Measurement Set.

28	20080213	Currently a single subband and single beam is stored in a Measurement Set. As soon as we are ready for mosaicing this probably should be changed in the future.
29	20080220	For storing the raw station beams the sanitizing operations like input buffer will be included in the online part. For this OLAP has to give operational support or instructions to the observers how to start up manually such observations. Since, this is an between solution this will not be automated via SAS/MAC.
30	20080227	Weekly build environment will be updated and automated.
31	20080227	After Step 5 the software documentation will be updated and obsolete packages will be removed.
32	20080423	Basically two Low Band modes will be supported initially: a LBL and LBH mode. The connection between antennas and RCUs have to be chosen such that those to modes make sense.
33	20080528	The position of all individual dipoles will be made available centrally in the database.
34	20080603	The data format of the positions will be delivered in ETRS coordinates by the roll out team. However, the data format of the positions will be stored in ITRF format in the LOFAR databases. Hence, all software and configuration files dealing with coordinates must be made compatible with the ITRF dataformat. Hans van de Marel is responsible to convert the ETRS coordinates to ITRF coordinates for the LOFAR system.
35	20080903	Kubuntu will be installed on LOFAR18, which will serve as a software development machine.
36	20081022	Station cabinet will be heated (if necessary) to 10 degrees Celsius (for the LCU).
37	20081029	We will transfer the build environment to cmake.
38	20081029	Step 1 will be closed at 11 November.
39	20081112	Bugs found in the field have the highest priority to solve. Bugs which take more than a week to solve will be added to the task list and prioritized in the software meeting. During bug solving tests should be written up, which proves the correct behavior. These tests will result in a procedure to check the functionality when new software is loaded.
40	20081126	The 4 bit mode will be supported after MS ³ .
41	20081203	We will modify the build environment to cmake from now on.
42	20090129	Transient source modeling tool under Python will be used for source modeling.
43	20090129	Delay deadline of Step 2 to 26 February 2009.
44	20090209	Remote Stations including the ring splitter near the core will be renamed to CS stations.

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Table round

- Andre: There is a need to integrate commissioning activities with the LOFAR roll out plan. This will be in terms of: x stations are necessary to do ionospheric calibration, etc. Ronald will discuss this with Ger. October 2008 a document about these links is generated. This will be updated.
- Ronald is next week in Socorro for the SKA calibration and imaging workshop.
- Andre: Now OLAP can be build with Cmake, what is the status of for example MAC/SAS. Can that be build as well? It seems that Marcel is busy with that.
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