

## Minutes of Meeting LOFAR Software

<b>Date:</b>	2008-02-27
<b>Next meeting:</b>	2008-03-05 9:15-10:15
	Paviljoen West room
<b>Present:</b>	
Andre Gunst	Yes
Ronald Nijboer	Yes
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, Ger van Diepen, Max Avruch, Peter Boonstoppel, 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

### Remarks previous minutes

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### Announcements

- A meeting was held to discuss the weekly builds and its usefulness. Currently the builds fail. Decided was to make this environment fully automatic again on a new system (replacement of the LOFAR17) and start first with weekly builds. If that is again operational the frequency of the builds can be enlarged to daily builds.
- A new machine for LOFAR17 is ordered.

### Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
46	20080109	Testing SAS/MAC on CS001T with the new OLAP software. SAS part is producing a parameter set which can be used by OLAP. Almost done. The connection to Groningen was down, which needs to be solved.	Ruud	20080116	Ongoing
48	20080116	Plan discussion about HDF5	Michael	20080330	Open
49	20080116	Simultaneous data storage of TBB and in OLAP to validate inverse poly phase filter bank of Kalpana. Dataformat should be changed. A new format was defined.	John/Andre	20080204	Ongoing
51	20080206	Ruud made a meta data chart. John should check the inputs and the outputs of the online subsystem and Ronald of the offline subsystem.	John, Ronald	20080220	Open
52	20080206	What functionalities are required for the 18 stations (expected end 2008). This is discussed in a DMT meeting at 20 Febr. 2008.	Andre	20080220	Closed
53	20080206	Estimation of work if CS1 is scaled up to 20 stations.	John, Ruud, Ronald	20080227	Open

## **Progress**

### **Stations (André):**

Achieved since last meeting:

- Gijs installed two TBBs on CS010

Problems / current activities:

- Eric Kooistra is busy implementing ARP in the FPGAs. Each second a packet will contain an ARP message, so that the switch can find the destination. If this works a ping from CEP is not necessary anymore.
- The WAN still does not work.
- Long distance delay tracking is not tested again
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Next actions:

- Step 4

### **OLAP (John):**

Achieved since last meeting:

- Software can correlate with pseudo data, so that the development in CEP can be done without using the station data
- Lots of hardware in BG/L was replaced after diagnostic tests. The last night run was stable.
- Two core ZOID variant of Peter works stable for at least 1.5 week now.
- Multiple beams works within one observation.

Problems / current activities:

- Chris is busy with input cluster removal.
- John was busy writing raw data after the buffer in the BG/L solution, which is necessary for the Kalpana experiment and for pulsar observations. This includes coarse delay tracking.
- John discovered that one link of CS010 was degrading. Operations have not solved this yet.
- Robustness for failing disks is not included yet (Arnold Meijsters).

Next actions:

- Step 4

## Offline pipeline (Ronald):

Achieved since last meeting:

- Marcel and Joris is working on the Global Solver.

Problems / current activities:

- An agreed specification document must be written first before writing software for the Global Sky Model.
- Ger is writing a converter to convert the LOFAR parset format (distributed by SAS/MAC) and CONRAD parset.
- The distributed imager has problems with 64 bit machines (low priority).
- Open tasks which are not assigned yet due to lack of people:
  - documentation of the imager,
  - profiling of the imager,
  - speed up of the BBS parameter database (question: is this the bottle neck?),
  - global sky model,
  - station beam modeling and validation (LBA and HBA),
  - flagger
- Maaijke is ready to start implementing an ionospheric model, but it is not clear yet which model to implement. It is wise to implement a framework wherein the model can be included.
- Pandey is completing the validation and testing of the pipeline including UV-fitting.

Next actions:

- Step 4.

## SAS + MAC + SHM (Ruud):

Achieved since last meeting:

- Screens for SAS and Navigator are ready for multi-beaming (4/5 screens are done).
- Integration tests between OLAP and MAC/SAS have to be done.
- Max worked on the webpages of SHM: currently from every station an actual picture of the sky is visible.
- Pieter made changes in rspctl to specify with the subband argument also the receiver and beamlets.
- Changes in the TBB driver are made due to firmware changes (reset mechanism was changed in the firmware).
- The RSP driver and TBB driver are build from scratch.

Problems / current activities:

- Pieter is busy to work on the cable length compensation, which must be set from the LCU. Furthermore he is working on the temperature control with a low priority.
- Arthur is working on Navigator 2.0 screens, which looks very usefull. This Navigator version gives much more insights in the relation between hardware, observation and the processes running.
- Ruud made changes in SAS, PVSS and MAC for supporting multi-beaming. Databases are updated and ready to be tested.
- Ruud will check with Pandey the DP3 interface.

Next actions:

- Step 4

### **User Software (Michael):**

Achieved since last meeting:

- Joe is dumping data from the TBB to his program. Due to network issues he has problems testing this with real data. Conversion programs are written to read in raw beamformed daa and write out HDF5 files.
- Joe created a first draft of a software specifications template.

Problems / current activities:

- Alexander writes a requirements document for the mosaicing feature.
- John S. wrote a framework design how the pipeline generates events for transient detection.
- Webserver machine is going down frequently. A newer machine will be setup (LOFAR26).
- Next step for Lars is to work on the near field imager (skymapper). Lars wants to test it with LOFAR data.
- Joe will make the hooks in DAL to include metadata (some of the metadata should end up in the header of the dataproducs).
- Joe is checking how much work is required to connect DAL to CASA core for using the HDF5 data format.

Next actions:

- Review activities for Step 4.

### ***Software integration***

Achieved since last meeting:

- After Step 5 one week will be reserved to update the software documentation based on Doxygen. The most important generic part is well documented for developers.

- Michael is still busy with making Gantt charts out of the activities of the software plan.
- Version control numbering is implemented in the RUB tool. The software builds and a version can be included. The MAC software is not conform the directory structure used throughout the rest of LOFAR. This needs to be solved in RUB or MAC.

Problems / current activities:

- Marcel is busy with streamlining the build environment
- Compile a list of anticipated data products and calibration or metadata files associated with each of the pipelines.
- LOFAR development software needs to be build in Kubuntu (Michael has volunteered)

Next actions:

- Define the length of Step 4.
- 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.
<del>03</del>	<del>20061220</del>	<del>The project team starts immediately with the preparations of the next CDR in order to preserve progress of the CS1 realization</del>
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 $\mu$ 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.

Last: 31

### **Table round**

- André is on a holiday from 10-14 March.
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