Minutes of Meeting LOFAR Software

Date:	2009-11-18
Next meeting:	2009-11-25 9:15-10:15
	Multimedia room
Present:	
Andre Gunst	Yes
Ronald Nijboer	Yes
Ruud Overeem	Yes
John Romein	No
Michael Wise	Yes

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

Remarks previous minutes

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Announcements

- A hardware busy week is held from 30 November – 4 December 2009.
- An imaging busy week from 14-18 December is planned.
- Meeting about LOFAR CEP data management was held.
- The fields are wet, especially the core station fields. This delays the reparation of antennas. Decided is to validate the stations but not repair the HBA elements if the field is too wet.

Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
88	20090825	Migrate the USG repository on the LOFAR repository server. No urgency.	Michael via Lars	20100601	Open
89	20091015	Scale up the benchmark numbers of BBS and the imager. In progress.	Ronald	20091030	Open
90	20091111	Communicate MSSS to do list and remaining work with ASTRON/LOFAR management. Done.	Michael, Ronald, Andre	20091115	Closed
91	20091118	Setup cosmic ray pipeline meeting.	Michael	20091215	Open
92	20091118	Re-discuss the HBA beam pointing issue for multiple digital beams.	All	20091203	Open

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Progress

Stations (André):

Achieved since last meeting:

- When switching on the HBA, it turned out that the HBA gain took on average 15 minutes to become stable. A workaround have been found without modifying the circuit. The solution is to set the switches in the RF off state first before starting to use them. This can eventually be done even without losing anytime because this could be set in the same message as switching the HBAs on. However for the moment only a separate message will be sent in the Beamserver (swlevel 3).
- During the development of the LBA and HBA it was always assumed to power them both. So switching between the one and another can be done rapidly. However to safe energy the HBAs are switched off in the LBA mode. This is ok if long observations are done, but if there are applications which are constantly switching between both, then both should be powered up to prevent decreasing the lifetime of the equipment. This has not been tested.
- The MAC addresses for all TBBs are now equal. This is currently being fixed by Arie and Pieter and expected to be the reason that the data was not entering the new storage nodes.
- The LBA calibration module in Matlab is compiled to a C library and waits to be tested. This can be done after the LCU software is compatible with ITRF coordinates. See MAC/SAS section.
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Problems / current activities:

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Next actions:

- Continue with LOFAR20

OLAP (John):

Achieved since last meeting:

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Problems / current activities:

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Next actions:

- Continue with LOFAR20

SAS + MAC + SHM (Ruud):

Achieved since last meeting:

- Pieter fixed some issues in the TBB found in the TBB busy week. Something went wrong in releasing the channels. This caused that some TBB saw triggers, while others don't.
- Pieter finished the documentation for the environmental controller.
- Ruud had discussions about the antenna sets. For the HBAs one ear or both ears separately can be used now. He will add the option to use both ears at the same time, so that those can be correlated in OLAP.
- In the TBB busy week also the TBB controller was used. They found only one issue.
- A new station and clock controller are build (bugs have been fixed).
- Michiel Brentjens validated a prototype ITRF beamserver which produced the same results as the original. We can track sources which are defined in the J2000 coordinate system.

Problems / current activities:

- Look into enhancing the temperature control.
- Analyzing the log stream of the BG/P happens after MAC/SAS integration.
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Next actions:

- Continue with LOFAR20

Offline pipeline (Ronald):

Achieved since last meeting:

- Goals for the next imaging busy week: apply and test direction dependent corrections. If we have 8-10 stations before the 1st of December the ionospheric model can be determined as well. Furthermore an analytical beam model will be used.
- Profiling of the pipeline is in progress and scaled up to the final LOFAR numbers.
- DP^3 is working fine now. We can do MSSS with the hardware we have. If you scale to full LOFAR you need multi-threading.
- Currently the imager is taking most of the processing time.

Problems / current activities:

- The bug in facet imaging is partially solved by the Australians.
- The ability to apply direction dependent corrections will be available at the end of next week. A beam model and ionospheric model is necessary to connect to that.
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Next actions:

- Continue with LOFAR20

User Software (Michael):

Achieved since last meeting:

- Lars is updating the BF data classes in the DAL to support new BF format.
- PRESTO is connected into the Cmake build environment.
- This afternoon a beamformed pipeline meeting will be held.
- A checklist of the beamformed data pipeline is drafted.
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Problems / current activities:

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Next actions:

- Continue with LOFAR20

Software integration

Achieved since last meeting:

- A new verson of Cmake has been released. This new version includes enhanced functionality for handling external packages.
- There is some concern about the communication and synchronization between developers, observatory people and commissioners. Within this meeting and outside the meeting there have been discussions about this. The current state of affairs is to hold specific pipeline meetings. In those meetings all groups will be represented and participating. The advantage of such a construction is that the work is more focused and there will be short loops between the developers, observatory people and commissioners. In fact the imaging pipeline already works a bit like that (called the offline meetings). Now there is also a BF pipeline meeting and a cosmic ray pipeline meeting is the next in line. The subsystem interfaces and dependencies will be kept tackled in the software coordination meeting.

Problems / current activities:

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Next actions:

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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 µStations/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 soft/firm ware 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.
45	20090813	No connection from the Dwingeloo test environment to Groningen is necessary anymore.
46	20090825	Create a Bugzilla environment for the USG software.
47	20090825	Use one subcluster per group, contactpersons and guidelines defined (see section Software integration).
48	20090909	Use the filter range names of MAC/SAS for the ICDs and the archive model.

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Holidays

- John: November 16-20
- Michael: November 23-27, meeting
- Ronald: end of November

Table round

- Ruud: How do we handle multiple digital beams when the HBA is used? The HBA can only point in one direction at the same time. You could determine this position as an average of the digital beams. Another solution is to set the HBA beam independently from the digital beams. One of the issues is how this should work when one observation is running with one beam and an additional observation is started in HBA mode. Should the analog beam then changed? A solution for this is to define one of the observations which run in parallel as prime and the others as secondary. This will be re-discussed in two weeks time. For the clock its implemented such that the first observation determines the clock.