Minutes of Meeting LOFAR Software

Date:	2009-08-12
Next meeting:	2009-08-19 9:15-10:15
	Multimedia room
Present:	
Andre Gunst	Yes
Ronald Nijboer	Yes
Ruud Overeem	Yes
John Romein	Yes
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

- RS208 is currently up. Only the CEP coordinates are missing.
- RS106 will be connected on Thursday. Also there the CEP coordinates are missing.
- Last Wednesday the policy was communicated. Teun already send an email around which subclusters are up.
- Next week there is an imaging busy week.
- The KPN backbone replacement will most probably (90%) be moved one week.
- All machines in the subclusters will get new Ethernet cards which supports jumbo frames. The target date is 17 August.

Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
83	20090520	Organise small meeting about the use of bugzilla or an alternative for the commissioning phase.	Andre	20090701	Open
84	20090623	Discuss the addition of USG software components to Bugzilla with Marcel.	Michael	20090701	Open
86	20090729	Arrange a new storage node for the old storage cluster.	Andre	20090731	Closed
87	20090812	Can the LOFAR software be public available, just like the USG software.	Andre	20090830	Open

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Progress

Stations (André):

Achieved since last meeting:
- Stefan's LBA calibration already gives a factor two sensitivity improvement. Since the current observations are done without station calibration Stefan is planning to release a 1.0 version soon which can be used in the observations as well. Next week he plans a meeting to define the 1.0 version.
- Single clock on the superterp is not the highest priority and formally not started yet. Only the infrastructure is laid down.
- The Effelsberg datalink is operational. For this the RSP Driver and firmware have been changed (IP options field is removed from the IP header, because this was processed by the router switch for each packet resulting in an overloaded switch). This will be changed also in the TBB Driver. From these versions on the LCU driver software cannot work with a older version of the firmware and vice versa.

Problems / current activities:
- Stefan is busy together with the beam team to figure out the antenna coupling and use these information to make a more accurate beam model.
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Next actions:
- Continue with LOFAR20

OLAP (John):

Achieved since last meeting:
- Chris worked on the new clusters and also the storage writer software. He showed that the software in combination with the new cluster works by showing fringes. The time stamps in the packets make sometimes a very small jump. Currently it is not known why those jumps are happening. It is certainly not the SERDES links in between the RSP boards (figured out by Eric).
- With the old storage writer data was lost between the IO node and storage node. This is not seen yet with the new storage writer. We have to do stress test with more stations to figure out of this holds for more data too.
- A memory leak has been found by Jan-David.
- The UV plot program of Michiel Brentjens breaks if there is too much data.
- For the offline software we need to use the latest CASA core (because that is compatible with the new storage writer). This has a high priority.
- For the busy week we will use the old cluster.
- We need a shared home directory for all machines. There should be one place where there is a shared NFS home directory.
- The data averaging in the beamformer datawriter was too slow and Alwin is busy improving this.

- Pencil beamtracking with shared clock is necessary. As a testbed we can use CS302 which has a splitted HBA field.
- The current flagger is too slow; John was checking how much BG/P capacity is necessary for that. Conclusion was that a lot of BG/P racks are necessary to implement the current flagger. The flagger can be optimized and this will be discussed with Andre Offringa.
- John investigated how we can implement multiple observations on the BG/P. Since the BG/P is not really suitable for this, this will be a long task and is planned to be done later (Step 4+).

Problems / current activities:
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Next actions:
- Continue with LOFAR20

Offline pipeline (Ronald):

Achieved since last meeting:
- Adriaan is busy fixing the last known bug in DP^3. He has to replace the storage manager to a new one.
- Joris is actively involved with the commissioning work the summer students are doing.
- John will assist Joris in suggesting how we can speed up BBS.
- Joris has been busy in implementing spectral index in BBS.
- Joris merges the solution based flagging in the main repository branch. One algorithm was selected to be used.
- Bas van der Tol takes over the ionospheric module in BBS of Maaijke.
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Problems / current activities:
- Global bandpass determination needs a new observation. This can be done now with the new stations.
- Franseco is looking at the phase solution and if you can distinguish between clock and ionospheric corrections. Clock phase correction is not easy to implement. So, the question is open how to proceed.

Next actions:
- Continue with LOFAR20

SAS + MAC + SHM (Ruud):

Achieved since last meeting:

- Pieter has been working on the user interface for the temperature control. You can now start a program which shows an overview of all temperature controllers in LOFAR. This information is also available in PVSS.
- Pieter is working on the RSPDriver to enable the split HBA field.
- Pieter modified the TBB Driver. He removed the IP options field in the IP header of the packages.
- Ruud did the same for the RSP data packages.
- Raw block command was not working properly and works again. As a bonus it works now twice as fast.

Problems / current activities:
- Both the BF data writer and TBB data writer are not ready for integration into MAC/SAS in this Step.
- There is now a beamserver which takes ITRF antenna coordinates. A 6 hour observation is done. When it is correct, it needs to be optimized. It waits for checking of Michiel Brentjens.
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Next actions:
- Continue with LOFAR20

User Software (Michael):

Achieved since last meeting:
- Lars and Joe have been working on build problems.
- Two solar observations have been done. Frank Breitling made a first spectrum. These are the first steps towards the dynamic output spectrum software.

Problems / current activities:
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Next actions:
- Continue with LOFAR20

Software integration

Achieved since last meeting:
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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 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.

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Holidays

- Ronald: 26 August – 14 September

Table round

- Ronald: Heard of issues (concerning the BF datawriter) because we have two different repositories on two different machines. During the meeting was said that we should merge the repositories. After the meeting Andre had a discussion with Marcel. According to Marcel the only thing necessary is to put the repositories on the same server. In principle software can be build using code from multiple repositories. Hence it is not necessary to merge the repositories. Furthermore it would be convenient to merge the user administration of both repositories.
- Ruuds wants to install a new build system. He will upgrade all development machines and two test machines in the lab.
- Andre: Does the test environment need a connection with the lofar.nl domain? John: No, this is not necessary anymore. For tests real stations can be reserved.
- Ronald: How up to date is the software plan. Michael, Andre: about 1.5 years old and yes it should be updated.