

Minutes of Meeting LOFAR Software

Date:	2008-10-08
Next meeting:	2008-10-08 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, 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 Bähren, Dion Kant, Johan Hamaker, Maaijke Mevius

Remarks previous minutes

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Announcements

- The SHM contract with Max will continue.
- Michael initiated to organize a LOFAR data processing school, to get people who have to work with LOFAR data up to speed.
- The priority to connect Effelsberg will be set to a higher level. The extra equipment is already ordered.
- Two developers have been hired from the NOVA money. One in Leiden and one in Amsterdam.

Action item overview

ID	Date submitted	Description	Owner	Planned date	Status
68	20080723	Test whether TBB dumps are actually possible from the station hardware (not just the test hardware).	Michael	20081020	Open
69	20080813	Draft set of regression tests for CIMAGER (with input from Casey).	Michael	20081031	Open
70	20080820	Contact Tim Cornell about CIMAGER testdata.	Ronald	20081020	Open
71	20080820	Organise data format meeting. Lars, Michael and Ger had a pre-meeting and agreed on a couple of tests to get a feel for performance issues. Meeting target date is early October. Lars and Ger are doing the performance tests.	Michael	20080827	Closed
72	20080917	Use rs002 as weekly build machine for the MAC/SAS software. Marcel did one weekly build with the rs002.	Ruud	20080924	Closed

Progress

Stations (André):

Achieved since last meeting:

- Arie is busy implementing a new firmware version in the field for TBB tests. This version is including the ARP protocol.

Problems / current activities:

- Dips: Michiel Brentjens can currently predict the dips and the cause appears to be in the BeamServer software. The problem has not been solved yet.

Next actions:

- Continue with LOFAR20

OLAP (John):

Achieved since last meeting:

- Martin has implemented the change to ITRF. Michiel Brentjens will verify it.
- Martin is busy integrating the new correlator with MAC/SAS.
- Martin and Rob are working on the integration of the superstation tied-array module.
- Chris is working on the new network design. He got stuck with adding interrupts to the device driver of the collective tree network.
- The bug of last weekends meeting was found! The cause was a mismatch of two parentheses.
- A 64 hour weekend observation worked fine with all 12 microstations, 64 subbands.
- Performance of IO tests is now really good. In only one station mode (no output) it could accept 248 subbands at 200 MHz (~48 MHz).

Problems / current activities:

- Asynchronous transpose is implemented, but not tested yet.
- Chris is busy to improve the memory speed of the IO nodes in collaboration with Argonne. It works on the IO node, but currently Chris has no access to the compute nodes anymore. Currently there are two implementations. One stable but that one does not provide enough memory and one unstable version.
- Robustness for failing disks is not included yet (Arnold Meijsters).

Next actions:

- Continue with LOFAR20

Offline pipeline (Ronald):

Achieved since last meeting:

- Marcel has implemented back-tracing in the full LOFAR software but this change has produced a build error in the MAC/SAS software. He and Ruud are working to track this down.
- Marcel is working on a framework which controls the standard imaging pipeline.
- Adriaan has finished the time integration in DP³. He will work on the VDS files for distributing the datasets next.
- Ronald has been looking at the details of Johan's solver.
- The HBA dipole beam model have been tested in BBS by Johan, Joris and Sarod.
- The clock phase correction definition is done for the LBA core stations. For the remote stations the ionosphere will give an effect as large as the clock phase which complicates the clock phase correction. Furthermore for the HBA the source CASA can be outside the tile beam and those sources are resolved such that they are not point sources anymore, which also complicates the clock phase correction.
- Maaijke delivered a first SPAM implementation and is busy testing with Gianni Bernardi on WSRT data.

Problems / current activities:

- Joris is busy to adapt BBS for the new parameter database.
- Ger is busy with implementing the parameter database.
- Joris is looking at the solution based flagging.
- Online bandpass correction verification by Pandey waits for station data. An observation of 48 hours was defined.
- Pandey's flagger in DP³ is not working properly yet.
- Pandey will commission the Global Solver in the next phase.

Next actions:

- Continue with LOFAR20

SAS + MAC + SHM (Ruud):

Achieved since last meeting:

- Max will continue on wrapping up the SHM work.
- Pieter is making progress on the temperature control loop. The monitoring loop works on the LCU. Currently fixing the last bugs (95% done).
- Arthur has built a translation layer into Navigator 2.0. For a given choice of observing mode, this layer determines the required hardware components. Performance testing is underway.
- Ruud is considering using the Matlab to C++ translator to aid in converting Stefan's station calibration routines to C++. One question which still needs to be explored is whether the resulting code is efficient enough.

- The TBB driver has been updated with the ARP.
- Ruud has integrated Andreas' trigger code into the TBB driver.
- Ruud has spent a lot of time supporting the observers to get them going.
- Currently the LCU time is synchronized to the GPS paths on the Red Hat 5.2 version.
- The gains can be exported to the CalServer file.

Problems / current activities:

- Red Hat licenses are not bought yet (waiting for ETM).
- Issue: 7 seconds per subband. Optimization is already made. Three seconds can be gained with this.
- Metadata flow work is ongoing. Arno is busy with a mechanism to distribute the static meta data from SAS to the stations.
- Extra status registers which are implemented in the FPGAs are not driven yet by the LCU. This will be moved to Step 2.

Next actions:

- Continue with LOFAR20

User Software (Michael):

Achieved since last meeting:

- Lars has been chasing down a number of bugs in the DAL build that the Archive group in Groningen have uncovered. These bugs were slowing down the updates to the Archive ingest script. The build errors have been resolved.
- Lars has been updating some of the TBB data classes in the DAL to deal with the relative time shifts when merging the TBB data dumps from multiple dipoles.
- Joe has been assisting in tracking down several DAL bugs.
- Joe and Lars both been doing some profiling work on HDF5 image cubes and table arrays.
- John Swinbank, Casey, Lars, Adriaan, and Marcel had a meeting to discuss the pipeline environments. Another one is planned.
- Alexander has a prototype of the radio image mosaicing script ready. He and Niruj have started doing some testing and will make it available for wider test soon.
- Sven is continuing to work on the RM-imager prototype and has a FITS I/O module nearly ready to connect into the DAL.

Problems / current activities:

- Casey will design a set of scientific validation tests for the CIMAGER.
- Lars is continuing to work on the CR near-field imager.

- Members of the Magnetism KSP are exploring using the VisIVO package to visualize RM synthesis cubes.

Next actions:

- Continue with LOFAR20

Software integration

Achieved since last meeting:

- Marcel made again a weekly build. However a main part of the software was not successfully build. One of the reason that the MAC/SAS software did not built was because PVSS is not installed on those particular machines. Ruud will communicate to Marcel to include for the MAC/SAS software the rs002 machine.
- LOFAR development machine is currently the DOP143 where multiple virtual machines are installed.
- Martin, Marcel and Lars are busy to compile LOFAR code with cmake. Some issues are not solved yet. A meeting with Martin, Lars, Marcel and Ger will be held to summarize the results.

Problems / current activities:

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

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.

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 CSI 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.

Last: 35

Table round

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