Pulsar Pipeline Integration

- Pulsar Pipeline
  - Design/development work for BGP 2nd transpose
  - Implement BGP 2nd data transpose
  - Document "new" BGP output stream (post 2nd transpose)
  - Test and bug fix 2nd transpose
  - Implement LOFAR center as LBA center position of station CC02
  - Implement Phase Frequency data due to cable lengths
  - Implement proper Stokes I,Q,U,V on the BGP
  - Implement the fly-squaring of channels per subbands for BF (M+BF obs)
  - Task Key Multi-beam observations
  - Synopsys 2nd Polynamical Filter in TAB pipeline
- BF ICD
  - BF ICD for Beamforming/stokes data (post H5 CS)
  - Implement BGP 2nd data transpose for New Voltage (BF) data (post H5 CS, B6)
- Online Coherent De-dispersion on CEP
- Online Coherent De-dispersion Search Mode on CEP (multi beams all de-dispersed)
- Separate BF from IM data writing on subclusters and data create test non-rare after Phase II
- Integrate phase correction (BF obs) into (test) workflow before priority (BF single station)
- Investigate extending the single clock on the entire core (hardware)

SAS / MAC/MoM
- Integrate TAB modules into SAS/MAC
  - Multiple BF observations with MOM/templates
  - Multiple Imaging observations with MOM/templates
  - Multi-Beam IMF = legacy obs w/MOM-templates
  - Multiple BF/related switches, allow MOM obs name separate column, BF pos input
  - BF-Observing Goldbook
  - MoM additional features/changes to SAS/MAC (DM field, Pulse Catalog down, etc)
- Offline Pipeline Framework connection to SAS/MAC (automated kickoff)
  - BF observing kickoff maintenance and updates as needed
  - Add new switches to the Multi-template creation script for IM to match some BF switches
- MoM additional features tied to BF data (H5 writing, TAB Pipeline)
  - Maintenance of anti-rotat (Mom Importexport) scripts

BF2HS version online
- BeamFormer Wilker (1st version to OLD ICD spec)
  - Test set system when building LORIS/LOFAR with the DAL
  - Integrate parent reader into BF writer in LENFORT/LOFARST
  - Integrate DAL classes into BF2HS
  - BF ICD data writer (outside by ICDe) (BGSP CS out data)
  - BF ICD data writer (outside by ICDe) (raw data)
  - Integrate BF reader into BF writer (outside by ICDe)

BF ICD
- Create new BF H5 base with 4 types of data storage containers
  - Finalize BF ICD
  - Profile BF Observations (BF Pipeline) for typical stats on sizes
  - Benchmark (DAL C+H1+4 storage types to choose optimum BF container
  - Future work on the building integration and optimization
  - Identify source of metadata values (what calculations)

DAL
- Create DAL classes for BF metadata and structure (outside by ICD)
- Create DAL modules to access data from BF structure (outside by ICD)
  - Hook to Coordinate Group-related material into the DAL
  - Wrap BF DAL classes and methods with Python for PyDAL
  - Cogring PyDAL updates and bugfixes
  - Integrate IBFS into the VO for PyDAL/TEMPDOS

Pulsar Tools
- Daily build of USG repository on offline cluster
- Integrate FFTW 3.1.2 into cmake
- Integrate PPLOPT into cmake
- Integrate TEMPO into cmake
- Integrate PRESTO into cmake
- Integrate STROBOS into cmake
- Integrate PFSRCH into cmake
- Integrate MPSRS into 1st Pulse and done (injected into cmake)
- Integrate PSRSDA into injection
- Integrate DDSR into cmake
  - Test software installation/components on new cluster
  - Test software installation/components on user machines
  - Integrate "connect" (bottom) into cmake
  - Update/maintain Test/developer (bottom) structure for BF observations
  - Assist Pulsar Group with integration of tools/scripts for USG & OSS
  - Maintain/upgrade Pulsar shell script pipeline
  - More some Pulsar packages to external for automated download instead of USG (not applicable)
  - Design/implement Pulsar pipeline(s) for other observing modes (HAPI, Voltage, OCD)
  - Maintain daily build of USG (Pulsar) repository on offline cluster
  - Test software installation/components on Phase II cluster
  - BF-Observing Goldbook
  - BF ICD data writer (outside by ICDe) (raw data)

Pulsar Pipeline Integration
- Design Pulsar Pipeline for basic observing modes
  - Multiple BF observations with BF ICD
  - Implement Pulsar Pipeline Design within the (IPython Framework) (** See Motes Document **)
- Pipeline Testing
  - J. Hessels, B. Stappers, J. van Leeuwen, A2, M. Wise
  - A2, Jason, Jan David, John Romein
| **PWG learning curve of Pipeline Framework** | PWG, John Swinbank, Marcel |
| **Write "how-to" run the Known Pulsar Pipeline into the Framework** | Ken |
| **Pipeline Framework issues/problems/known type action item** | Ken, John S., A2, Adriaan |
| **Release Pipeline** | M. Wise |
| **Design Pulsar Pipeline(s) for other observing modes including survey** | J. Hessels, B. Steppens, J. van Leeuwen, A2, M. Wise |
| **Integrate prototype Pulsar Search Pipeline (script) into USG (summer student)** | A2, Vlad |
| **Integrate new Pulsar Search Pipeline into USG env/GUI** | Thijs, Lars, A2 |
| **Pulsar Search Pipeline: finalize data/code + add ESPS functionality & perform extensive testing** | Thijs, Ben, Jason, Vlad, Joeri |
| **Pulsar Search Pipeline: profiling and speed up in multi-beam modes for science users** | Thijs + Pulsar Group |
| **Documentation/diagrams/switches of Pulsar Pipeline + tools for LOFAR science users** | PWG |
| **Observing Plan / Regular weekly testing of BF observations** | Adrian, Michael B. |
| **Pulsar Pipeline (sh & py) profiling (if speed is less than real-time, most relevant for multi-beam modes)** | A2 |

**BF2H5 offline version**

| **Extraction process of parameterDB out of LOFARSOFT & distribute offline** | Mike to assign this issue to different group |
| **UDP reader/interpreter library (UK)** | Alessio, Aris, Chris, Fred, Ben |
| **Integrate PELICAN & PELICAN-LOFAR into USG** | Lars |
| **Link Pelican-LOFAR with PELICAN and DAL** | Jan David, Lars, Oxford Group |
| **TCP-packet convert module for Pelican** | Jan David, Oxford group |
| **HDF5 data writer module for Pelican** | Jan David, Oxford Group |

**Archive**

| **SARA Pulsar Archive (organise, create scripts, maintain web pages)** | Joeri, Vlad |
| **Investigate SARA + Grid processing & LTA potential** | Joeri, Jason, A2 |
| **Sync Archive schema with BF ICD** | A. Renting, A2, L. Baehren, M. Wise, R. Overeem |
| **Archive Pulsar raw data** | A. Renting |
| **Archive Pulsar Pipeline Processed data** | A. Renting, A2 |

**1st version Apr 7th**
Remarks

John, Jan David and Rob have completed the discussions; 4-phased for transpose prep, then transpose.
Rob will no longer be involved. Jan David will implement the entirety of the 2nd transpose.

Need to ask Jan David for a status on this issue; rumor has it that this is working.

John is working with Ruud on the messaging/communication aspect.

Working again; can read parse file and feed keys to header; works w/o UDP.
Lars has spoken to Marcel and emailed relevant info. Lars to touch base with Marcel to implement in.

4 types are: 1D arrays, ND arrays, 1D tables, ND tables (note ND arrays are memory limited).
John Romain’s comments and James Anderson’s comments integrated; moved Coord Group; may c
should be a chart in the ICD to view typical data sizes for types of observations; waiting on Jason.
DAL is missing Array/Table real() methods from sub-groups. Lars to add functionality before benchmark.

Put this as an agenda item for discussion during the next BF status meeting.

implemented three highest tiers of HS structure (not yet lowest tier where the data structures are).

Need to formalize the to-do and bug list.

Mike to start up the process of asking Arno to include this in a daily build.

note, depends on system install of PGPLOT.
workaround for problems with reading files with line length > 70 chars; fix requested to developer.
accelearch sef fault (non LOFAR data); cmake external dependencies can be made smarter (Lars).

Does not build on the Mac (needs specific version of X11).
Does not build on the Mac (needs specific version of X11).

Fixing problems as they unfold.
Ramesh would like a copy of the software suite within cmake; TEMPO doesn’t build on Mac OS 10.6.
Tom needs to check in his version into the ISG repository.
A2 updated to use 8-cores per mode; speed increase 5-6 times.

Create use-cases and map these to tools/parameter settings, start at PBW #6.
do we need to integrate the Transient SW repository with the USG SW repository?
current SH scripts pipeline described and sent to Ken. John & Ken to meet about Python Framework.
not needed for completion of first pipeline release.

...on target to meet one month deadline from start-up of project.

...meetings took place to mesh the LOFAR ICD with the Archive schema.