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Netherlands Institute for Radio Astronomy

Scheduling on the Low Frequency Array (LOFAR) telescope

An advanced graphical scheduling tool to create, interact and optimize schedules for the LOFAR telescope

Alwin de Jong

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LOFAR super-terp (6 core stations) 360m diameter

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LOFAR System overview

- 41 sensor stations
- 10-90MHz (LBA), 110-250MHz (HBA)
- Baselines of up to 1500km
- Blue Gene real-time processing
- CEP-II cluster of 100 processing nodes
- 2 petabyte temporary storage
- Parallel observations
- High speed optical fiber network

Scheduler operational requirements

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- Storage capacity prediction and planning
- Support parallel observations
- Schedule processing pipelines and link them to the data generating observations
- Capability to reserve system resources
- Automatic constraints & conflicts resolving
- Early feedback on wrong specifications
- Hardware failure monitoring and adaptation
- Option of manual override for all resources
- Publish schedule on the web

Scheduler software requirements

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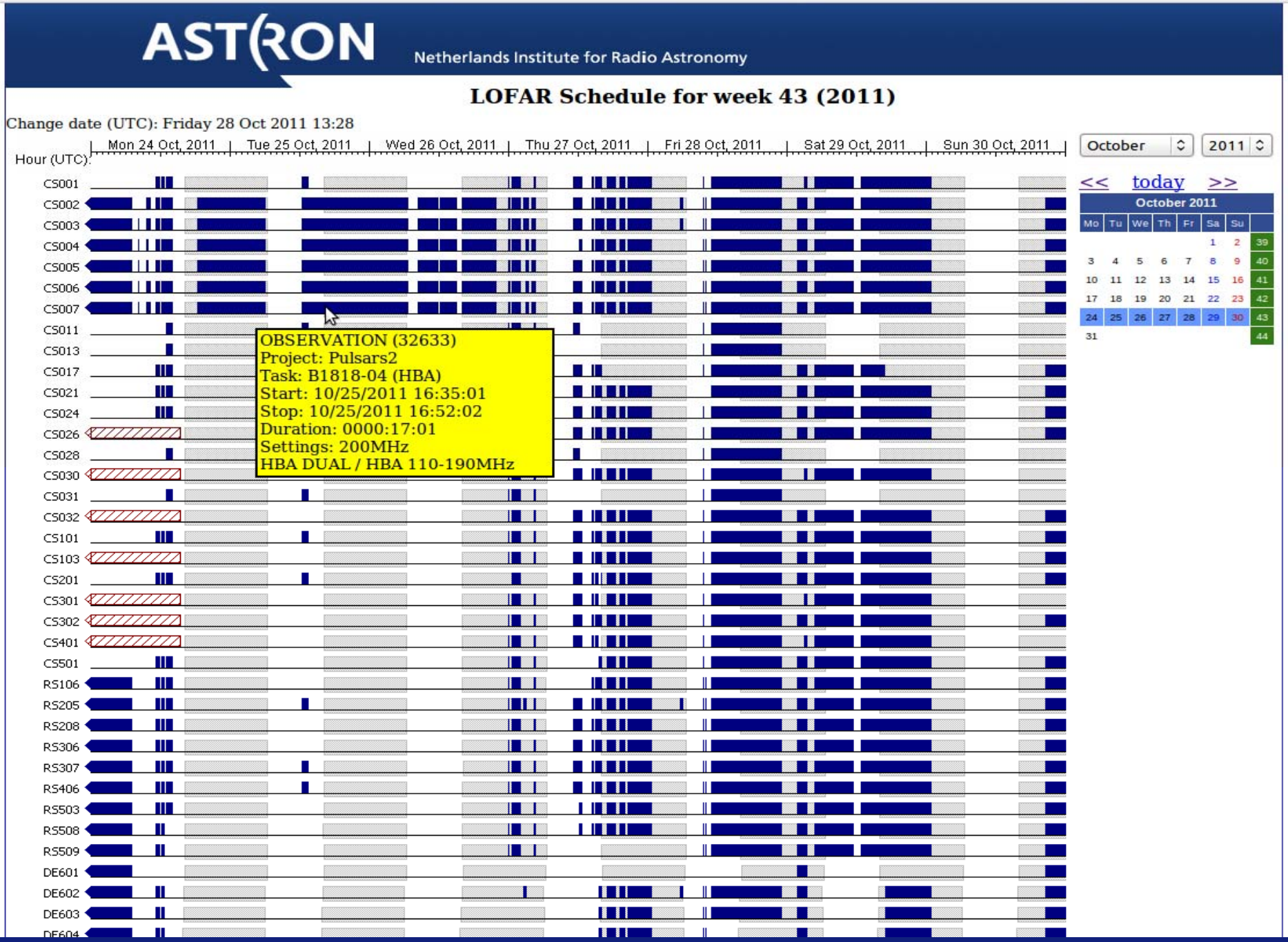
- Strong visualisation needs due to schedule complexity ->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LOFAR Schedule for week 43 (2011)
Change date (UTC): Friday 28 Oct 2011 13:28
Hour (UTC):
Mon 24 Oct, 2011
Tue 25 Oct, 2011
Wed 26 Oct, 2011
Thu 27 Oct, 2011
Fri 28 Oct, 2011
Sat 29 Oct, 2011
Sun 30 Oct, 2011
October
2011
<< today >>
October 2011
Mo Tu We Th Fr Sa Su
CS001
CS002
CS003
CS004
CS005
CS006
CS007
CS011
CS013
CS017
CS021
CS024
CS026
CS028
CS030
CS031
CS032
CS101
CS103
CS201
CS301
CS302
CS401
CS501
RS106
RS205
RS208
RS306
RS307
RS406
RS503
RS508
RS509
DE601
DE602
DE603
DE604
OBSERVATION (32633)
Project: Pulsars2
Task: B1818-04 (HBA)
Start: 10/25/2011 16:35:01
Stop: 10/25/2011 16:52:02
Duration: 0000:17:01
Settings: 200MHz
HBA DUAL / HBA 110-190MHz

Scheduler software requirements (continued)

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- Cross-platform (linux, windows, macintosh)
- Possibility to schedule world-wide
- Object Oriented, data abstraction & data-hiding
- Postgress and MySQL connectivity
- Fast execution and schedule optimization

Design choices

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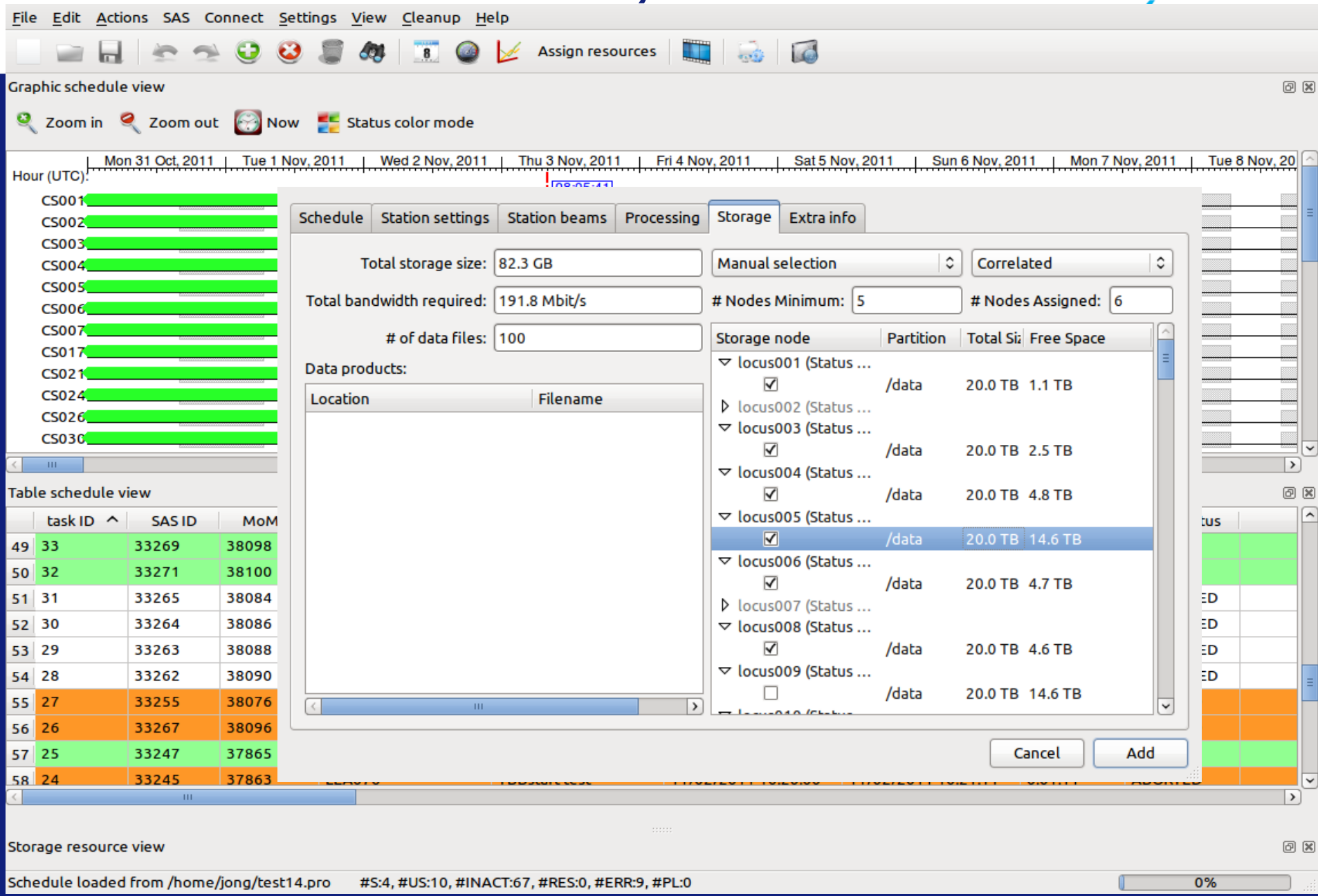
- Application core developed in object oriented C++
- Qt4 cross-platform framework for GUI and interfaces
- Model-view-controller design
- Strong visualization and graphical interaction
- (Development in open-source Eclipse IDE)

The LOFAR Scheduler, what does it look like?



Conclusions

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The LOFAR Scheduler

- Is flexible and uses LOFAR to its fullest potential
- Generates schedules that maximize scientific value
- Makes sure LOFAR is reliably and stable operated
- Fully supports parallel observations
- Is still being developed further to support new types of observations & processing pipelines