Software for Science Support Systems

EVLA Advisory Committee Meeting, March 19-20, 2009

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Atacama Large Millimeter/submillimeter Array
Expanded Very Large Array
Robert C. Byrd Green Bank Telescope
Very Long Baseline Array

NRAO

Major Subsystems

- NRAO OEO
  - User Portal
  - Proposal Preparation & Submission
- EVLA SSS
  - Source Catalog
  - Observation Preparation
  - Array Scheduling
  - Archive Access

Development Process

- Documented build process
- High and low level software documentation
- Source code control
- Suite of unit tests, run during nightly builds
- Pre-release test machine for user acceptance

(URLs to documents on final slide)

Current Status

- Interaction with NRAO User Database
- Fetching Proposals and Creating Projects
- Source Catalog Tool
- Resource Catalog Tool
- Observation Preparation Tool
- Observation Scheduling Tool
- Archive Access Tool

Interaction with NRAO User Database

- OPT talks to query server, receives user information as XML
- Authentication: user has valid ID and password
  - This works now
- Authorization: user is permitted to perform requested activity
  - OEO will provide support in user DB
  - SSS will then update its applications to give:
    - Project author the ability to allow others to view / edit their projects
    - Selected NRAO staff ability to update read-only values

Fetching Proposals & Creating Projects

- Goal: fetch newly approved proposals from DB and have software create skeleton projects
- SSS is working with OEO on XML representation of proposal
- OEO will have query server for fetching proposals

Source Catalog Tool

- Loosely coupled to OPT; can be used on its own
- Supports text file import / export
  - Formats: XML, PST, (partial GBT)
- Beyond 2009:
  - Ability to call up flux density history
  - Connection to archive for images
  - Graphical displays of calibrator positions
  - Intelligent selection of calibrators

Resource Catalog Tool

- Also loosely coupled to OPT
- Original intent: support only WIDAR
  - Agreed to support VLA correlator for Ka band
    - Has been used for real science
- All planned 2009 work will be to support WIDAR
  - Starting with user interface for experts
    - Experts can fine tune, but will not get much guidance
  - For OSRO we will have preconfigured standard setups
    - Users will be able to customize tuning, but little else
- Ultimate plan for non-experts: allow observer to enter science-oriented criteria and have software auto-configure WIDAR
  - Users can choose to adjust configuration

Observation Preparation Tool

- Current version is 0.5.x
  - Will probably deem OSRO / WIDAR release as 1.0
- Major features are in place
- Is being used now for Ka-band
  - Can also use for any EVLA receiver band
  - Is only supported way to access new tuning ranges of EVLA
- Bulk of 2009 work will be:
  - Supporting major browsers
  - Responding to issues found in testing
  - Improving user experience
    - Eg, bulk updates, easy way to survey hundreds of sources
  - Need only limited changes for WIDAR
    - Most of the hardware variability is in RCT

Observation Scheduling Tool

- Functioning dynamic scheduling system currently used in transition observing, has been used for several years now (derived from the VLBA dynamic scheduling system)
- All command line
- Providing us with invaluable information on the practical aspects of dynamic scheduling of a many-element radio interferometer
- New tool which fits in to the rest of the EVLA software system has been developed
- GUI – much easier to use than old CLI
- Provides framework for testing many different heuristic schemes
- Will be deployed as resources allow

Archive Access Tool

- VLA and VLBA data currently accessible via web application (all unprocessed visibility data as well as ~100000 pipeline-reduced VLA "reference images" from 1991-2003; images also available via VO)
- Extensively tested; available since October 2003
- Non-proprietary data openly available
- Proprietary data made available via Portal login or staff-generated “key”
- Both simple (Project ID, for example), and complex (akin to VO cone search) searches supported
- More data downloaded via this mechanism than is taken real-time at the VLA (~3 GB/day)
- Built on the foundation of the ALMA NGAS data storage system
- EVLA data taken via prototype WIDAR and WIDAR0 automatically handled

Very Brief Demonstration of OPT

References

- Observation Preparation Tool (OPT)
  - Test: https://webtest.aoc.nrao.edu/opt
  - Production: https://e2e.nrao.edu/opt
- Source Catalog Tool (SCT)
  - Test: https://webtest.aoc.nrao.edu/sct
  - Production: https://e2e.nrao.edu/sct
- Archive Access Tool (AAT): http://archive.cv.nrao.edu/
- SSS Documentation: https://staff.nrao.edu/evla/sss/
- SSS Wiki (internal):
  https://staff.nrao.edu/wiki/bin/view/EVLA/SSS