Scientific Oversight and Testing of Software

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Keeping Track of Software

• Software issues
  – deliverables and requirements
  – what exactly is an “acceptable" user interface?
  – research problems (e.g., dealing with RFI)
  – requirement creep
  – written by software professionals
  • can no longer assume astronomical outlook or knowledge
  • most experienced/demanding users do not write code

High-level Requirements & Priorities

• EVLA Project Scientist for Software: Rupen
  – responsible for requirements, timescales, project book, inter-project interactions, …

• EVLA SW Science Requirements Committee
  – Rupen, Butler, Chandler, Clark, McKinnon, Myers, Owen, Perley, Brogan, Fomalont, Hibbard
  – consultation for scientific requirements
  – source group for more targeted work

Subsystem Scientists

• scientific guidance for individual subsystems
• day-to-day contacts for programmers
• interpret scientific requirements for programmers
• oversee (and are heavily involved in) tests
• heavily involved in user documentation
• consult with other scientific staff
• duties vary with subsystem status

• Currently:
  – Proposal Submission Tool: Wrobel
  – ObsPrep: Chandler (“daughter of JOBSERVE”)
  – WIDAR: Rupen/Romney
  – Post-processing: Rupen/Owen
  – TBD: Scheduler, ObsMon, Archive
Less Formal Contacts

- Less formal, more direct contacts
  - e.g., Executor (e.g., ref. ptg. priorities and testing)
  - e.g., Greisen developing plotting programs based on Perley hardware testing
- Testers
  - On-going tests: small in-house group (fast turn-around, very focused)
  - Pre-release tests: larger group of staff across sites and projects
  - External tests: staff + outside users

Why Test?

- Set priorities & deliverables
  - tied to scientific and hardware requirements
- Check (and force) progress on long-term goals
  - wide-field, wide-band, low-noise, high dynamic-range, full polarization imaging
  - user interface
- Sign off on finished products
- Public reports
- Planned opportunities for scientist/programmer collaboration

Scientific Support Systems: Prop. Submission Tool

- Feb 10: post-mortem based on user comments
  - set timetable and requirements for releases
- Mar 1: internal test-I (van Moorsel, Butler, Rupen)
  - overall functionality and ease-of-use
- Mar 20: internal test-II (+Frail)
  - “delta” test: bug fixes and “easy” new requirements
- Apr 18: NRAO-wide test (14, incl. CV/GB)
  - suitability for general release; documentation

Scientific Support Systems Tests: Summary

- short initial “pure software” period followed by testing and interaction
- size and scope of test group grows from a few locals, to NRAO staff, to outside users
- subsystem scientist responsible for documentation
- subsystem scientist + Proj. Sci./SW + operations decide on public release

Post-Processing:

- NRAO “AIPS++” Users’ Group (NAUG)
  - progress reports & most recent internal release
  - requests for testing and comments
  - e.g., first look at python interface
- NRAO Algorithms Working Group (NAWG)
  - high-level discussion of algorithms and progress
  - e.g., Urvashi reports on wide-band imaging tests
- Includes Myers, Birken, Brogan, Chandler, Fomalont, Greisen, Hibbard, Owen, Rupen, Shepherd, Whysong, + developers
Post-Processing:

**Leveraging ALMA**

- EVLA participation in ALMA formal tests
  - outside testers with VLA expertise (e.g., Testi)
  - ALMA2006.01-4 (python + single baseline calibration) included Brisken, Owen, Rupen
- goals
  - CASA experience
  - influence common development (e.g., interface)

Rupen EVLA Advisory Committee Meeting
May 8-9, 2006

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Post-Processing:

**EVLA Tests**

- May-July 2005: w-projection
  - first step in the Big Imaging Problem
  - generally good performance (speed, robustness) but lots of ease-of-use issues
  - Myers, Brisken, Butler, Fomalont, van Moorsel, Owen
- Currently concentrating on
  - long lead-time items (e.g., high DR imaging)
  - H/W driven items (e.g., proto-type correlator)
  - shift to user-oriented system

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Post-Processing:

**EVLA Fall 2006 Test**

- User interface
  - revised UI (tasks etc.)
  - revamped module organization
  - new documentation system
- Reading and writing SDM
  - ASDM ➔ CASA MS ➔ UVFITS ➔ AIPS
- Basic calibration, incl. calibration of weights
- “Testers’ choice” of data sets, plus a couple common

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Post-Processing:

**Winter 2006/7**

- NOT a formal test
- NAUG and “dedicated” staff
- user interface discussions/testing
- documentation
- “EVLA stress test:” basic calibration and imaging of a many-channel data set, both in CASA and in AIPS

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Post-Processing:
EVLA Spring 2007 Test

- “Format test” (SDM)
- Focus on calibration and data examination
  - flexible, simple-minded, quick displays
  - wideband issues
- Driven by need to support initial basic modes
  (e.g., big spectral line cubes), and to learn from
  the new hardware (e.g., WIDAR + wide-band
  feeds)
- Currently working on associated requirements

Involving Outside Users

- Scientific Support Systems
  - currently mostly at end of testing/release cycle
- Post-processing
  - algorithmic development: publications,
    discussions, interactions, student involvement
  - focus shifting to user interactions
    - as this happens, we will involve more non-NRAO
      astronomers