VLA to EVLA Transition Plan

2005-2010

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First Version of Transition Plan

The talk includes

1) A broad outline of the hardware and scientific goals for EVLA transition.

2) Discussion of the some key aspects of this plan.

Note that detailed planning in each area is still very much underway.
Two Transition Plan Committees

- Scientific Committee (Owen, Butler, Carilli, Claussen, Chandler, Frail, Perley, Rupen, Myers)
- Overall Operations Committee (Owen, McKinnon, Van Buskirk, Van Moorsel)
Assumptions

- Accelerated funding continues.
- Hardware Milestones are met.
- Software is available on schedule.
- Necessary Personnel are available.
- EVLA Phase I only is considered.
EVLA Hardware Milestones

- Dec 2005: 5 EVLA Antennas
- Apr 2006: Prototype WIDAR Correlator
- Dec 2006: 10 EVLA Antennas
- Jan 2007: Interim WIDAR Correlator
- Dec 2007: 16 EVLA Antennas
- Jul 2008: Full WIDAR Correlator
- Dec 2008 22 EVLA Antennas
- Oct 2009 27 EVLA Antennas
- Dec 2009 28 EVLA Antennas
- Jun 2012 Final EVLA Receiver
Science Goals

- Feb 2005: Start Integrating EVLA antennas into VLA
- Apr 2006: Begin Prototype Correlator Testing
- Jan 2007: Begin Using New Frequencies on EVLA antennas with old correlator
- Mar 2007: Begin Science Commissioning of WIDAR
- May 2008: Begin “Shared Risk” Observing
- Oct 2009: Regular Observing with 27 Antennas
Individual Areas

• Progress is still needed in some key areas to achieve these goals.

• In a number of areas decisions still need to be made on what we need to attempt within the scope of EVLA phase I.
Post-Processing: Priority 1

• EVLA continuum sensitivity probably requires imaging sources over the full primary beam even at the highest frequencies.
• EVLA gets its continuum sensitivity mostly by using large bandwidths.
• We currently have no algorithm which can image wide-field, wide-bandwidth data adequately.
• The highest priority for post-processing is to produce such algorithms we need for EVLA.
Post-Processing: 2005-2006

1) New Algorithms: Imaging, Interference
2) Computing Hardware Requirements
3) A Conceptual Model for How we will reduce EVLA data in 2009

Need to keep both AIPS and AIPS++ paths open for now to reach these goals and maintain our existing operations.

Usability issues wait till 2007 when when our staff start to work with WIDAR.
e2e

• E2e needs more people to meet the minimum goals in the EVLA I proposal: both programmers and astronomers.
• Desires exist for services beyond the EVLA I goals which will require more people.
• However, we can descope e2e if necessary and run EVLA more like VLA.
Computing Hardware

- In 2008-2010 timeframe it is hard to see how most users can reduce EVLA data from the large configurations at home.
- Probably need to do calibration and imaging at the AOC for many (most?) projects.
- Some sort of computing cluster with a very large memory is likely needed but more work is required to define the details.
Array Operations

• Major and continuing changes will occur from 2005-2010
• One or two additional operators may be needed in the 2006-2009
• A move of most EVLA operations to the AOC in 2010 and some decrease in operations staff is planned.
The nature of the AOC operations seems likely to change starting in 2008.

EVLA data volume, computing requirements, and new calibration techniques may require most users to come to the AOC at least in the early years.

AOC infrastructure and services will need to adapt.
Scientific Staffing

• In 2005, VLA Scientific staffing will be at a historical low point.
• Scientific Staff needs to expand, especially in 2006-2009 timeframe to deal with EVLA requirements.
• After 2009, the staffing levels of 2000 may be adequate for the long term for EVLA I.
EVLA Scientific Staff Tasks

• Hardware Commissioning:
  Antennas, Receivers, WIDAR Correlator, Sensors, Misc EVLA testing
• Software Specifications, Advising, Testing:
  e2e, Algorithms, Postprocessing
• User Support:
  Dynamic Scheduling, Handholding, Documentation
• Scientific Operations Planning
EVL A Scientific Staffing Profile

- 2006 +2.5 FTE’s (4-5 scientists)
- 2007 +0.5 FTE’s (1 more scientist)
- 2008 +0.5 FTE’s (1 more scientist)
- 2010 begin to return to pre-EVLA level

Increases can be a combination of new tenure track astronomers, scientists, postdocs and visiting appointments
EVLA II and beyond

- When and if EVLA II is funded, we can add its requirements to the current plan.
- However, NRAO may want to think about EVLA II in choosing transition options for EVLA I.
- For example, EVLA I may not require FPGA assisted CPU’s but EVLA II (and SKA) will. Maybe we should plan AOC computing with the future in mind?
Questions?

- This plan is fairly aggressive and could well slip in time due to any of several factors.
- However, it may seem to the community that EVLA capabilities come fairly slowly.
- Does it seem too aggressive or not aggressive enough to the committee?
- What areas of the transition plan need more discussion?