EVLA Computing

Organization/Development

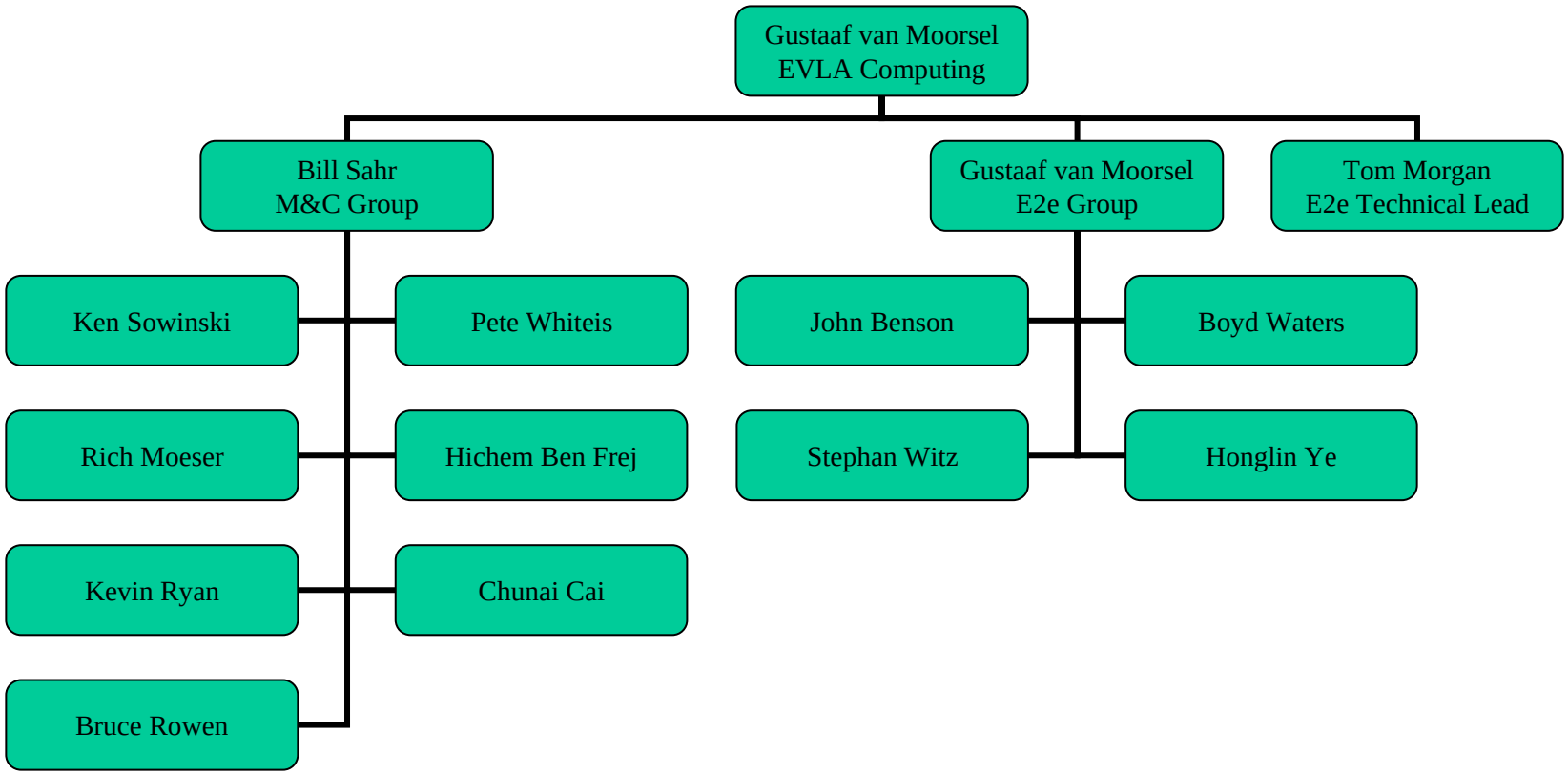
Gustaaf van Moorsel

EVLA Advisory Committee Meeting
December 14-15, 2004

EVLA Computing

- Started September 1, 2003
- Head (Gustaaf van Moorsel)
- M&C Group (Bill Sahr)
  - 7 software engineers (2 device-level programmers, 5 general real-time programmers)
  - All from ‘old’ computing division real-time group
- E2e group (Gustaaf van Moorsel/Tom Morgan)
  - 3 software engineers, 1 scientist
  - 3 moved over from ‘old’ Data Management, and have largely retained their previous responsibilities
- Associated:
  - Bryan Butler (EVLA Software Project Scientist)
  - Barry Clark (EVLA System Engineer for Software)

EVLA Computing Org Chart



Current Manpower breakdown (FTEs)

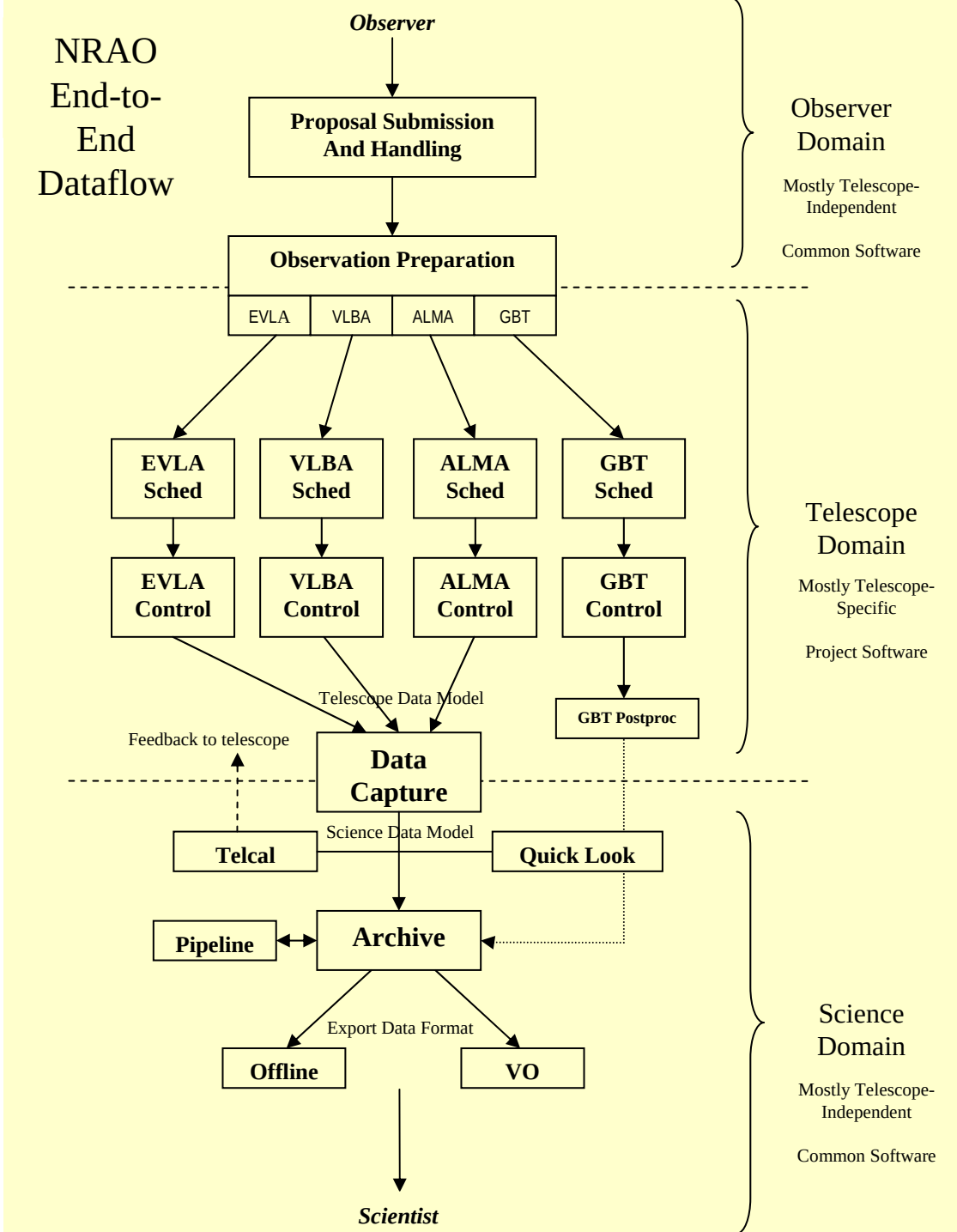
	#staff	total EVLA	contributed effort	EVLA funded	non-EVLA duties
management	1.0	0.7	0.7	0.0	0.3
M&C Group	8.7	7.5	4.3	3.2	1.2
E2e Group	4.3	1.7	1.0	0.7	2.6
total	**14.0**	**9.9**	**6.0**	**3.9**	4.1

Methodology

- Most work done in teams
  - Membership from both groups (M&C and e2e)
  - Each team is handed a well-defined task
  - Disbanded when task finished; members reassigned
  - Bi-weekly coordination meeting with progress reports
- Examples of teams:
  - Overall design (December 03 – June 04)
  - Module/device programming (continuous)
  - Distributed communications (July – October 04)
  - Proposal tool (February 04 –)

EVLA Overall Software Design

- First priority after creation of division
- Start delayed by two months until December 2003 because of unexpected departure of designated team lead
- Based on number of existing requirement documents (scientific, operations, engineering, real-time)
- Additional constraint: compliance with models developed by the e2e oversight committee
  - Observatory, project, observing, science data
  - Challenge: development of models concurrent with overall design
  - Necessary (but not sufficient) condition for possible code re-use
- Series of three intermediate reviews by non-EVLA NRAO staff during spring 2004
- Final review by e2e oversight committee June 2004
- Approved by committee; final report not out yet


NRAO End-to-End Dataflow
Observer
Proposal Submission And Handling
Observation Preparation
EVLA
VLBA
ALMA
GBT
EVLA Sched
VLBA Sched
ALMA Sched
GBT Sched
EVLA Control
VLBA Control
ALMA Control
GBT Control
GBT Postproc
Telescope Data Model
Feedback to telescope
Data Capture
Science Data Model
Telcal
Quick Look
Pipeline
Archive
Export Data Format
Offline
VO
Scientist
Observer Domain
Mostly Telescope-Independent
Common Software
Telescope Domain
Mostly Telescope-Specific
Project Software
Science Domain
Mostly Telescope-Independent
Common Software

EVLA Dataflow

Dataflow

M&C Subsystem Design

- Logical next step after overall design
- Serves as foundation for
  - Specification of smaller development tasks
  - Identifying dependencies between these tasks
  - Assignment of resources to these tasks
  - Comprehensive project plan and WBS
- In EVLA computing: M&C subsystem design has been deferred in order to start implementation of M&C software transition plan allowing upgraded EVLA antennas to function in the VLA array
- M&C subsystem design and M&C software transition plan now closely interrelated
- E2e subsystems treated in later presentation

M&C Software Transition Plan

- Formulation and implementation of this plan started after the conclusion of the overall design
- Timeline determined by retirement of old and delivery of new hardware:
  - EVLA antennas taking part in the array
  - Retirement of MODCOMPs
  - Availability of prototype correlator
  - Availability of production WIDAR correlator
- 7 phases:
  - Phase I: one or more EVLA antennas in array
    - Started summer 2004
    - Software ready January 31, 2005
  - Phases II, III: off-load all MODCOMP-based functionality
    - Software ready December 31, 2005
  - Phases IV,V,VI,VII: WIDAR correlator related

Transition Plan and M&C Subsystem Design

- At end of Phase I (January 31, 2005):
  - document details of each M&C subsystem under development
  - Convert document into prototype design for that subsystem
  - Identify smaller development tasks, their interdependencies, and resource needs
  - Produce first version of WBS
- At end of Phase II (June 30, 2005):
  - refine design existing subsystems, development tasks, WBS
  - Add prototype design of remaining subsystems
  - M&C PDR?
- Similar for remaining phases
- This approach – using the transition plan as a design prototype - minimizes the amount of code that has to be rewritten