

ALMA Computing G. Raffi, J. Schwarz, G. Chiozzi, A. Wicenec

Atacama Large Millimeter Array

- Computing Organization
- European Computing Team
- Computing Physical Architecture
- European Team Structure for Phase 1 & for Construction
- Achievements in 2002
- Goals for 2003
- 2003 Calendar
- ESO Activities
- OT, Architecture, ACS, Archive

ESO-Wide Review 13-17 February 2003



EWR 13-17 Feb.2003



European Computing Team

ALMA Project

ESO staff (12 FTEs):

- G.Chiozzi, R.Georgieva, B.Gustafsson, B.Jeram, (TEC)
- M.Pasquato, P.Sivera, H.Sommer, M.Zamparelli (TEC)
- M.Chavan, P.Grosbol, H.Meuss, A.Wicenec (DMD)
- G.Raffi, J.Schwarz (ALMA)

Other European Institutes (10 FTEs: 7.5 budgeted + 2.5 in-kind):

ADACE: IRAM: D.Broguiere, F.Cosson, F.Gueth, R.Lucas, A.Perrigouard

LERMA: P.Caillat, A.Coulais, F.Viallefond

MPIfR: H.Hafok, D.Muders

IEM/CSIC: J.Pardo, M.Sempere

PPARC: ATC: J.Clarke, A.Bridger,

JBO/UMIST: S.Farrow

Contracts (1.8 FTEs): JSI (.8) and AOT (1.0)





European team structure in Phase 1

ADACE and PPARC Agreements for Phase 1

- Declarations of interest by Heads of Institutes (meeting Spring 2001)
- Repartition of effort by committee of Computing group
- Signature of 2 Agreements for 2002 to complete Phase 1 work

Achieved:

- high involvement of European Institutes taking advantage of their expertise
- but no fragmentation & few new recruitments
- ESO as main partner, with coordination and core activities (Architecture, ACS, Archive)
- \Rightarrow Requirements, Architecture, Design for PDR

Challenges:

- Overcome geographical/cultural distance and build trust
- Agree on re-use level of existing software (VLT, NGAS,AIPS++)



European team structure for Construction phase

Agreements with ADACE, PPARC for next 4.5 years (Value 3.5 MEuro):

- Based on Requirements and PDR design
- Continue involvement of SSR subsystem scientists
- Based on same teams (whose effectiveness has been demonstrated): balance achieved in subsystems is essential
- Role of ESO:
 - active technical coordination
 - participation in key developments (see later)

=>Software for Interim Science Operations in 2007



Achievements in 2002

- SSR requirements extended to Archive/Offline package and Data Reduction User Interface.
- Architecture work completed=>ACS extension
- ACS further developed to support control and data flow software (Release 2.0 in Nov.)
- Software Engineering and Integration work intensified Subsystem work:
- Major week long workshop in Sept. on:
 - Detailed subsystem responsibilities
 - First definitions of standardized interfaces
- Internal subsystem design review in December



Goals for 2003

- Agree on a clean baseline design at PDR
- Establish Agreements with European Institutes
- Support AEC antenna acceptance
- Complete feasibility tests:
 - AIPS++ benchmarking
 - ACS framework within AIPS++
- Prove PDR concepts with whole ALMA software Release
- ESO to continue its key role in Computing

2003: Paperware => Software

(all subsystems, not only for test site)



2003 Calendar

- Computing PDR (all subsystems) March
- Prototype subsystem software (R0)- May
- First Incremental Critical Design June
- First subsystem Release (R1.0) Oct.
- First Integration Release (IDR1.0) Dec.

based on:

- Synchronous software development
- Methodology as agile as compatible with distributed development



ESO Activities

- Architecture (J.Schwarz)
- ALMA Common Software (ACS G.Chiozzi)
- Integration and Test (P.Sivera): ACS /TICS
- Software Engineering (M.Zamparelli): Tools and Procedures
- Executive (P.Grosbol)
- Archive (A.Wicenec)
- + participation in:
- Observing Preparation Tool development (with ATC)
- Control software (test of antenna prototypes)



Observing Preparation Tool Demo

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🏀 Observing Tool (demo)				-10	×
File Edit Map to SBs					
ALMA-0052 Script(<default>) Target Space("M100", 2 regions of interest), -1.0 s</default>		<u></u>			
E Region of Interest("First Area")	Name	Second Area			
E Region of Interest("Second Area")	RA	157.31		dea	-
Rectangle Second Area (157.31 deg, -24.66 deg, 31.0 arcsecx12.4 arcsec)	DEC	-24.66		deg	•
Script(<default>)</default>	Width	31.0	arc	sec	-
Target Space("M123", 1 region of interest), -1.0 s Image: Space("M123", 1 region of interest), -1.0 s	Height	12.4	arc	sec	•
Circle Third Area (0.0 deg, 0.0 deg, 0.0 arcsec)					

(courtesy of M. Chavan)

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ALMA Computing Logical Architecture





ALMA Common Software: ACS

- common software infrastructure supporting the whole ALMA software, from HW control to Data Flow (e.g. Proposal Preparation GUI)
- Container-Component model separates functional and technical concerns
- founded on mature and reliable technology and widely adopted free-software implementations
- high-level framework hides complexity and makes development (by distributed group) uniform



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ALMA Archive Architecture



