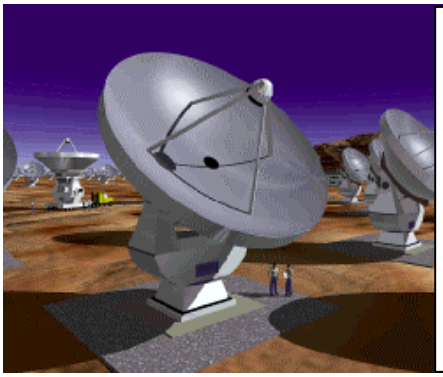

Atacama Large Millimeter Array	ALMA-SW-NNNN Revision: 2 2002-04-17 *Software Standard* Mzampare

ALMA Software and Hardware Standards

Software Standard, Hardware Standard

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1 Introduction

This document contains a short reference list of all standards and reference products, which shall be used both in software and hardware by the ALMA Computing group. By *standard* we mean, most of the times, a written formal document issued by a well-known standardization organization, at national or international level, with a clear identification tag and checklist to measure its adoption. This document tries to be as specific as possible when mentioning references to standards. Also *de facto* standards shall be used for those situations when reference to a specific issue of a document or to a certifying authority is not possible.

This document will be updated, following the procedure specified in [2] whenever ALMA Computing will opt for new or different standard or reference product.

The communication standards for the ABM and ARTM have been taken from the document Bill of Materials: ABM and ARTM, by Mick Brooks, document which is superseeded by this one.

1.1 Scope

This document does not address standards and products for Software Engineering already mentioned in [1].

1.2 Glossary

Refer to the project glossary in:

http://www.alma.nrao.edu/development/computing/docs/joint/draft/Glossary.htm

1.3 References

1. ALMA-SW-Draft, ALMA Software Engineering Practices, 2001-08-29 M.Zamparelli
2. ALMA-SW-Draft, ALMA Document Review Procedure, M.Zamparelli
3. ALMA Reviewed Document 16, 2001-SEPT-09, ALMA Common Software Architecture, G. Chiozzi et al.

2 Programming Languages

Object-oriented programming languages shall be used whenever possible. Interpreted scripting languages are to be used for less complex tasks of maintenance and administration.

Adopted programming Languages shall be:

C++	for computationally intensive service providers, daemon applications and hardware interaction
Java	main subsystem development language for non computationally intensive applications. Also used for graphical user interfaces
Python	for technical scripts written by the users

3 Operating Systems

Operating System for non real-time computers will be Linux (www.linux.org). The distribution chosen is Red Hat www.redhat.com)

Operating System for Real Time Computers will be VxWorks 5.4 (including Tornado 2.0.2) from WindRiver. An evaluation of RTLinux as a possible alternative will be carried out.

4 Inter-process Communication

Inter-process communication as developed in ACS will be granted by CORBA from OMG (CORBA 2 is a collection of specifications, see http://www.omg.org for details).
In general, ALMA SW Code shall be based on POA rather than BOA to warrant ORB Vendor independence.

Three types of ORB will be supported:

Name	*Producer*	*Language*	*Operating System*
Orbacus	IONA Tech	Java	Windows/Linux
ACE/TAO	Wustl	C++/C	VxWorks/Linux
Omniorb	ATT Cambridge	Python	Linux

XML (the Extensible Markup Language, version 1.0 from W3C) shall be used for object serialization.
Ideally the majority of the application will not need to be CORBA aware.

5 Computer Architecture

Real Time computers will be based on the Motorola PowerPC M-VME 27xx family of scalable CPUs.
Non real-time computers acting as servers will be Intel x86 based PC.
Auxiliary tasks for Software Engineering will be carried out on Sun SPARC workstations on a 'as needed' basis, but this architecture will by no means be supported or necessary for normal development activities.
No standards concerning the Correlator are known at this stage.

6 Generic Communication Standards

The LANs connecting the central computers will be Ethernet - IEEE 802.3. For development currently 100Mbps, with Gigabit used at the test interferometer and to be used for the ALMA correlator. It is expected that Gigabit will replace 100Mbps everywhere in the coming years.

Standard field bus to be used is CAN bus (ISO 11898). The CAN Bus interface will be TEWS TPMC816

6.1 ABM

- MVME2700 with MVME761 I/O, IEEE 1101 Extractor Handles and at least 64 MB of RAM
- MVME761-011 Transition Module with five-row P2 Adapter
- VME64x crate with P0, P1, and P2 connectors (Systems Integration Plus special order)

- SBS-Greenspring PMC-ECAN2 or Tews Datentechnik TPMC816-10
- Dynamic Engineering IP-Parallel-IO-4
- Acromag AVME9670 VME64 IP Carrier board

6.2 ARTM

- MVME2700 with MVME761 I/O, IEEE 1101 Extractor Handles and at least 64 MB of RAM
- MVME761-011 Transition Module with five-row P2 Adapter
- VME64x crate with P0, P1, and P2 connectors (Systems Integration Plus special order)
- SBS-Greenspring PMC-ECAN2 or Tews Datentechnik TPMC816-10
- Dynamic Engineering IP-Parallel-IO-4 (from Dynamic Engineering CA. USA)

- Acromag AVME9670 VME64 IP Carrier board
- TrueTime XL-AK-101 GPS Receiver

7 Databases

Current Configuration Database is an in-house re-implementation of the RTAP real-time hierarchical object oriented database.

The Environment Database, handling information on host and LCU availability is based on mySQL (www.mysql.com) from MySQL AB.

The two databases will be phased out in favor of one unique database accessible via a pure SQL interface. The underlying engine shall be selected between mySQL and IBM DB2 (www.ibm.com).