

ALBA Tango CS Status

27/June/2023



- Team updates
- Current Status Highlights
- Organization of Activities
- Contributions to the Community
- ALBA II

Team Updates







ia Jorge Villanueva Cuenda € 4392 ≅ jvillanueva@cells.es Is absent today



>8 years: 9 people
>2 years: 1 person
Newcomers (<2y): 8 people</p>
Students
Controls Section: 20 people (2 vacants)

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Current Status - Highlights -ALBA Controls Systems Upgrade to Tango 9



ALBA Control System started development on 2006, starting operation in 2010 (booster commissioning) and **production** status since **2012**.

ALBA CS was based on Tango 7 running mostly on 32 bit cpci machines.

Upgrade to Tango 9 have been initiated **top-to-bottom**, starting on Tango DB, GUI's and middle layer devices (not tied to hardware) like Sardana and HDB++.

The SuSE diskless image have been finally replaced by Debian 10 in 2022.

Tango 7 hosts still pending to be migrated affect mostly beamlines were hardware is highly heterogeneous.

First tests with 9.4.x have been started on middle-layer devices, finding several incompatibilities with Tango 7 events from legacy systems.

Current Status - Highlights - Accelerators



Accelerator Control Systems:

6162 Tango devices1015 servers694 already upgraded to Tango9 (68%)

174 control hosts:

Tango7 (suse11): 50 Tango8 (suse12): 18 Tango9 (debian9-10): **106**

Alarm System:

461 Alarms declared 3327 Attributes checked 102 PyAlarm devices 60 PyAlarm servers

Accelerators Archiving (HDB++, 6 months):

hdbacc: 943 attributes, 437 GB hdbct: 3984 attributes, 576 GB hdbdi: 3905 attributes, 2198 GB hdbpc: 3127 attributes, 1112 GB hdbrf: 3950 attributes, 525 GB hdbvc: 4976 attributes, 1115 GB

Secondary host stores decimated historical data (5 years, 5TB)

44 Event Subscribers + 52 Periodic Archivers for legacy systems.

Current Status - Highlights - Beamlines



Beamlines Control Systems:

7717 Tango devices982 servers414 already upgraded to Tango9

128 control hosts

Tango7 (suse11): 34 Tango8 (suse12): 11 Tango9 (debian9-10): **83** Upgrade to Tango 9 Status (42%):

BL01:	100%
BL04 : 29/117 upgraded	27%
BL06 :	100%
BL09 : 26/85 upgraded	33%
BL11 : 28/94 upgraded	36%
BL13 : 36/98 upgraded	40%
BL16 :	100%
BL20 :	100%
BL22 : 34/93 upgraded	37%
BL24 : 20/117 upgraded	21%
BL25 :	100%
BL29 : 17/126	15%

Current Status - Highlights - Deployment



At ALBA **several approaches** are used depending on the domain (from less updated to more frequently updated):

- Input-Output Diskless machines for acquisition and control hardware. The **shared image** is updated from production repository (our own Debian packages)

- Service-dedicated **VM machines**: alarms, archiving, experiment control, on-the-fly calculation, ... This machines are updated via salt recipes specific for each service and tagged by service releases

- Operator-validated GUI applications: control room follows an **specific workflow validating each release during a machine run** (5-6 weeks) prior to releasing the update to all operators consoles

These 3-level approaches allowed to have frequently updated user applications while keeping the backbone as stable as possible.

Current Status - Highlights - Deployment



- Controls Software deployment via:
 - Debian packages (80%)

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- conda (10%)
- pip (5%)
- Docker (5%)
- Conda & Docker are being evaluated for ALBA II
- Configuration management via Salt
 - packages installation
 - basic software configuration
 - custom implementation with Services
- Control System configuration to be evaluate for ALBA II

Current Status - Highlights - ALBA II GUIs strategy



- Considering desktop applications, a priori, we don't see a need to replace Taurus, but we should invest time in improving scalability and performance of Taurus GUIs
- Web technologies needs to be explored as a complementary solution because of the cross-platform compatibility, reduced cost of maintenance and native remote access (concerning the security aspects)
- Regarding web application we selected: Taranta and Jupyter Lab because of their generic approach and a strong community (Taranta Community is gaining more popularity and is a lead Web project in Tango)
- In terms of the technology stack the most common within our community (ICALEPCS) is React (+Redux), Plotly, GraphQL and REST and we will follow this trend



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Organization - Activities



Sources for our developments

- Annual Objectives
 - Controls Section
 - Computing Division
- Accelerator & Experiment:
 - New Beamlines Program
 - Priority Operation Projects
- Internal Controls Developments
 - Projects
 - New technologies
 - Students
 - Maintenance

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Organization - Service Support





27-Jun-23 - 37th TANGO Community meeting @SKAO HQ

Organization - Development



- Any type of work is represented on the board One board for the whole section
- Each team has its own view by filtering the main board Cross team assignees ٠
- ٠

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Organization - Big Picture



Different workflows:

- Planning: Backlog -> Dev
- Local modifications SS -> Dev
- Not SS -> Backlogs
- SS Follow-up -> Backlogs

Different Classes of Service:

- T2 CU prioritized issues
- T3 CO prioritized Activities
- T4 CT prioritized Activities
- T5 CT prioritized issues (mainly Maintenance)





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Contributions - Tango & PyTango



- Contributions to Tango & PyTango require deep kernel knowledge.
- Currently there are 3 persons which contribute to Tango and PyTango:
 - Jairo Moldes, Jose Ramos and Sergi Rubio
- Tango SIG IDLv6 organized at ALBA report will be presented on Wednesday afternoon



Contributions - Taurus & Sardana



- Sardana & Taurus has mature communities of users and developers
- Due to a big turnover and Carlos leave the newcomers had to be trained in Taurus
- Currently there are at least 3-4 persons at ALBA actively contributing to Sardana and Taurus
- Taurus & Sardana status report talks on Wednesday afternoon





Contributions - HDB++ & Alarms



ALBA Developments presented in this Tango Meeting:

- TaurusTrend with HDB++ archiving support
- pyhdbpp library for python access to archiving data will be presented Tuesday afternoon
- Panic alarms and fandango utilities







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Current situation as of June 2023





- JEMCA (Joint Electron Microscopy Center at ALBA)
 - <u>https://www.albasynchrotron.es/en/instrumentation/jemca</u>
 - it already hosts two Transmission Electron Microscopes
 - A 200 kV TEM, Glacios from ThermoFisher Scientific (Life Sciences)
 - A 300 kV (S)TEM, Spectra 300 from ThermoFisher Scientific (Material Science)
 - a third Microscope will be arriving in the near future





2020

- Starting the design
- Present "pre- White Paper" to funding agencies <u>https://www.cells.es/en/science-at-alba/alba-ii-upgrade/alba-ii-short-version</u> <u>december-2020.pdf</u>
- ALBA II included in the Strategy Plan 2021-2024
- Funding for prototyping (7.5M€)
- Funding for first ALBA II BL (10M€)
- New terrain plots assigned for Long Beamlines (16M€)
- Proposals for Long Beamlines being evaluated
- White Paper ready for evaluaton
- 1st ALBA II MAC held last week 22-23/June/2023 https://indico.cells.es/event/1341/

Dark Period foreseen for 2030-2031

2022

2021

2023





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Thank you all for your time

We will be happy to take your comments and questions