

Manage the MAX IV Laboratory Control System as an Open Source Project

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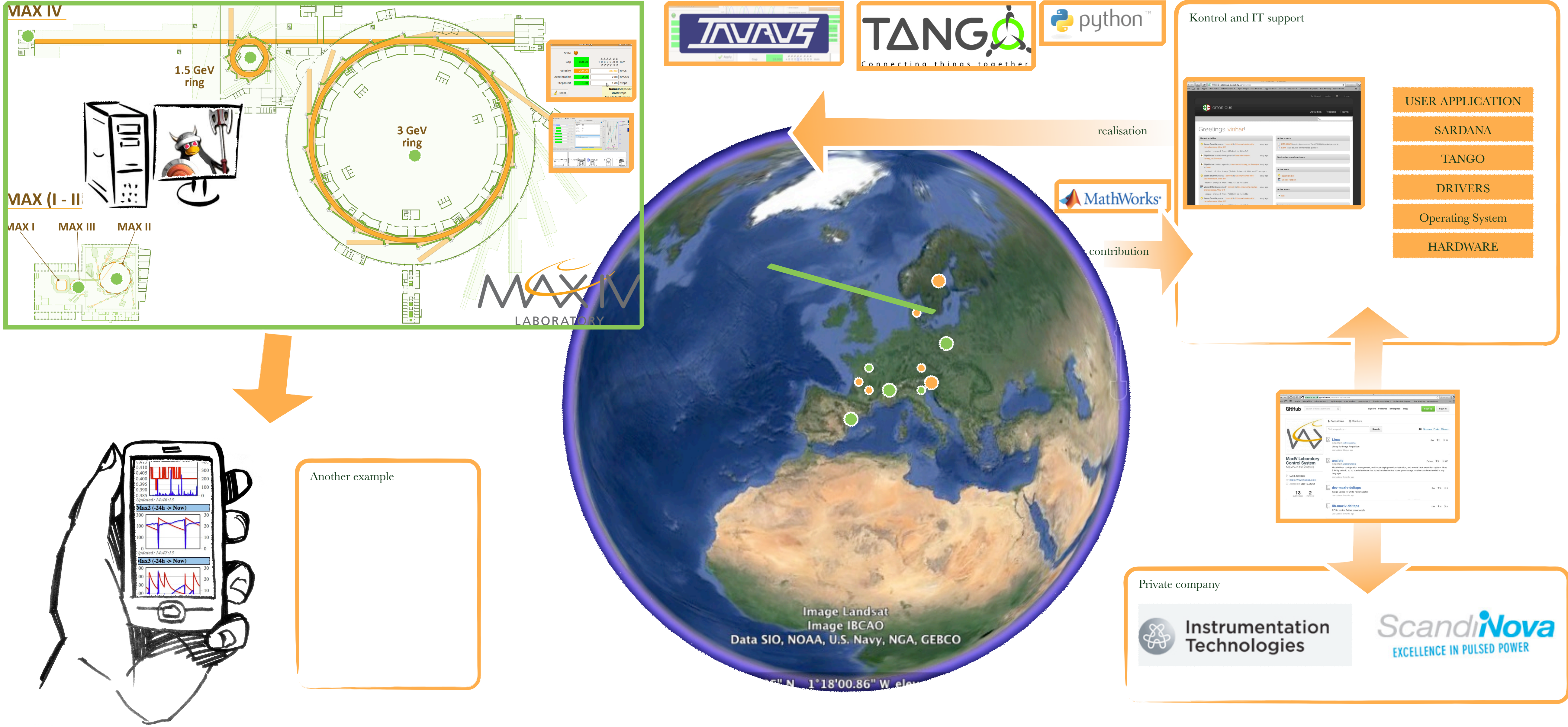
User Autonomy

Our mission is to offer an Open Control System easy for everyone to contribute.

Tango and Sardana[1] make transparent the complexity of the network and open the development of application to the Machine and Beamline scientists. They access the data and action published by the control system like any library API.

KITS Café

Since October 2012 the staff of MAX IV Laboratory benefits from a regular and very informal event set up by the Control team. The purpose is to meet each other and to share the knowledge about the control system and any activities related to the software. The different actions described below are directly inspired by the ones used by the Linux User Group and the Agile movement.



Origin of Control System Contributions

Staff (users with programming skills): the users of the MAX IV control system are the beamline and machine scientists. They have varying programming skills and interests. Some are able to write their own control system components for their domain, using C++ or Python while others are satisfied with writing their own high level scripts for running experiments, using Matlab, Python etc.

Collaboration: the software backbone of the MAX IV control system relies on collaboration with other synchrotron facilities. The TANGO distributed control system relies on contributions from all the facilities in the TANGO collaboration. MAX IV is also a contributor to Sardana and Taurus[1] and benefits from its community.

Third party contributors: collaborating with subcontractors and suppliers requires a somewhat different effort. As far as possible MAX IV strives to maintain ownership of the code base so that it can remain open source.

Implementation

Open the market: We provide a standardised development platform to anyone with a Maxlab user account, this is achieved by hosting an NX Server[3] with the standardised MAX IV environment.

Open the source: the git software repositories are made available through Gitorious[4], a webserver that allows any user to manage their own repositories. The internal policy of creating unit tests for all software developed by KITS plays the role of example and documentation.

Open the usage: the default software delivered by the control system group can be interacted with in different ways, from a graphical user interface (GUI) to a command line interface (CLI). The Sardana distribution helps us a lot to achieve this goal.

Collaboration possibilities

At many levels:

- Share the Library to the Hardware
- Share the Tango Device
- Share the Tango Service
- Share the Sardana component
- Share the GUI and CLI
- Share the Development Infrastructure

KITS Café in details

Install fest

The “install fest” [http://www.tldp.org/HOWTO/Installfest-HOWTO/introduction.html] was the first event we organised to help our colleagues to install Tango on their laptops. The goal was to break the first barrier to start using the control system. This method had the advantage that we could manage the installation of plenty of computers at the same time while the users could learn and ask about the process.

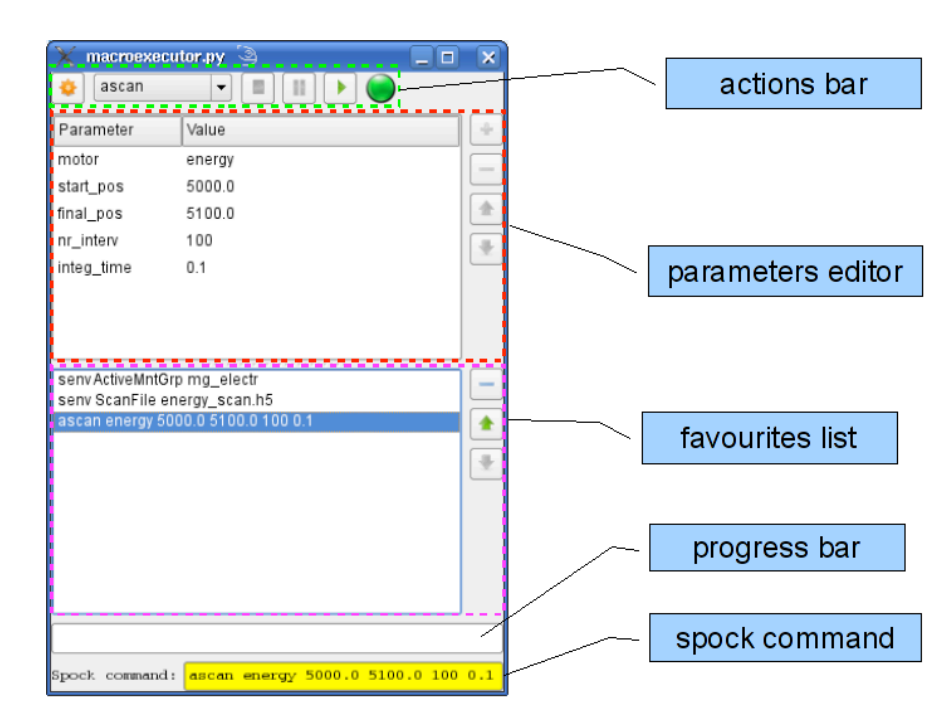
Coding Dojo

During this session the main objective is to involve the users in the development of some simple exercises in order to make them familiarise themselves with the subject

proposed for the workshop. Also, they will learn useful lessons about the control system that will help them to contribute to the project in the future.

The workshop consists of a well defined pair programming problem that the whole audience must solve together. To arrive at that goal, there is a main workstation shared by two people, one “driver” and one “co-pilot”. After 5 minutes, the driver must leave his place to the co-pilot and another person from the audience must take the place of the co-pilot. This 5 minutes iteration is repeated during the two hours of the session.

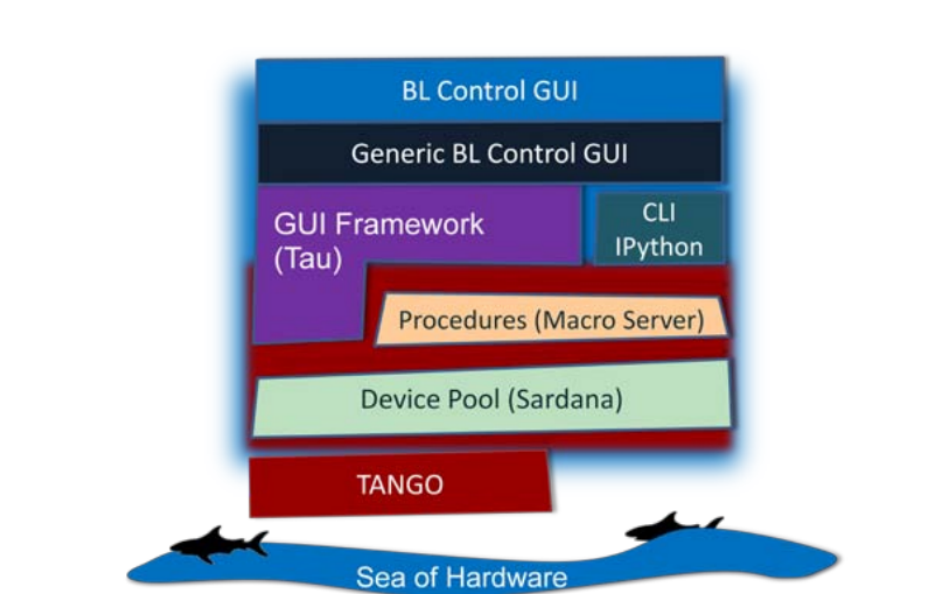
GUI or CLI ?



Really it doesn't matter !!! The business logic is kept in each Tango Device (act as a middleware). In this way a request to a device has the same behaviour whatever the client. You could even have the both open. The GUI is used to display several information at the same time. The CLI has the efficiency to change the system if you know the

command. The user have several ways to test different behaviour of the system. One way is given by Sardana by programming a new virtual device. Other commercial products are available to communicate with Tango : MatLab which will be used by the MAXIV physicists.

Sardana in details

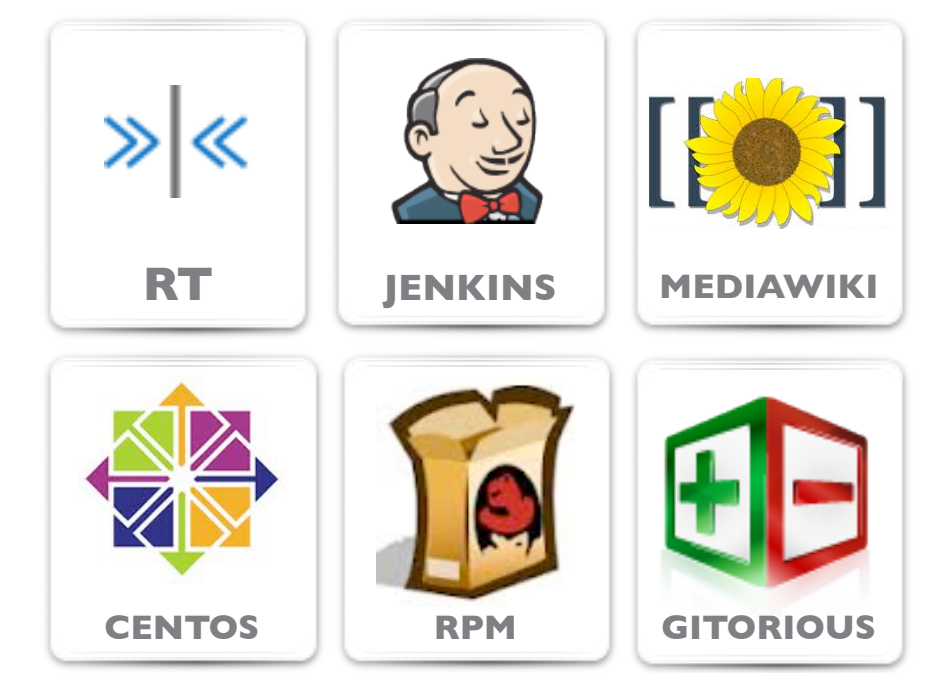


Up to now, control applications in large installations have been notoriously difficult to share. Inspired by the success of the Tango collaboration, ALBA decided to start the creation of a generic tool to enlarge the scope of theTango project to include a standard client program - or better a standard generic user environment. From the beginning our aim has been to involve others in this process. At this moment in time the user environment consists of a highly configurable standard graphical user

interface, a standard command line interface understanding SPEC commands, and a standard way to compose new applications either by programming or with a graphical tool. It further consists of a standard macro executor, standard set of macros, a standard range of common hardware types (like motors, counters, cameras and so on) and a configuration editor to set all this up.

Source : <http://www.tango-controls.org/static/sardana/latest/doc/html/users/overview.html#sardana-overview>

Development Infrastructure



Several Open Source Software composed our toolbox to support the development of the control system. RT the request tracker gathers the requirements and issues from the users. Git is used to manage the source code of each project, even the user's program.

MediaWiki publishes the information useful to steer the control system. Jenkins automatically builds the last project from the standard platform, ready for deployment. Finally the project is deployed via a RPM package with all its dependencies.



The MAX IV Laboratory References

- [1] Tango, Sardana, and Taurus: <http://www.tango-controls.org/>
- [2] No Machine: <http://web10.nomachine.com/>
- [3] Gitorious: <https://gitorious.org/>